
Utility FGD Survey January - December 1987

Design Performance Data for Operating FGD Systems

Volume 2 (Part 3 of 3)

June 1989

DOE Contract No. DE-AC05-84OR21400

**DO NOT MICROFILM
COPY**

Prepared for:

U.S. Department of Energy
Office of Policy, Planning and Analysis
Office of Environmental Analysis

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

DISCLAIMER

"This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof."

This report has been reproduced directly from the best available copy.

Available from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161.

Price: Printed Copy A24
Microfiche A01

Codes are used for pricing all publications. The code is determined by the number of pages in the publication. Information pertaining to the pricing codes can be found in the current issues of the following publications, which are generally available in most libraries: *Energy Research Abstracts*, (ERA); *Government Reports Announcements and Index* (GRA and I); *Scientific and Technical Abstract Reports* (STAR); and publication, NTIS-PR-360 available from (NTIS) at the above address.

Utility FGD Survey January - December 1987

Design Performance Data for Operating FGD Systems

Volume 2 (Part 3 of 3)

June 1989

Prepared by:

PEI Associates, Inc.
Cincinnati, Ohio 45246-0100
DOE Contract No. DE-AC05-84OR21400

Prepared for:

U.S. Department of Energy
Office of Policy, Planning and Analysis
Office of Environmental Analysis
Washington, DC 20585

MASTER

eb

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

UTILITY FLUE GAS DESULFURIZATION SURVEY

JANUARY - DECEMBER 1987

CONTENTS

		<u>Page</u>
Section 13	Design and Performance Data for Operational Domestic FGD Systems	
	Philadelphia Electric	
	Cromby 1	13-1336
	Eddystone 1	13-1343
	Eddystone 2	13-1350
	Plains Electric G&T	
	Plains Escalante 1	13-1357
	Platte River Power Authority	
	Rawhide 1	13-1363
	Public Service of Indiana	
	Gibson 5	13-1371
	Public Service of New Mexico	
	San Juan 1	13-1397
	San Juan 2	13-1422
	San Juan 3	13-1446
	San Juan 4	13-1466
	Salt River Project	
	Coronado 1	13-1481
	Coronado 2	13-1492
	San Miguel Electric	
	San Miguel 1	13-1502
	Seminole Electric	
	Seminole 1	13-1513
	Seminole 2	13-1520
	Sierra Pacific Power	
	North Valmy 2	13-1526
	Sikeston Board of Municipal Utilities	
	Sikeston 1	13-1531
	South Carolina Public Service	
	Cross 2	13-1541
	Winyah 2	13-1552
	Winyah 3	13-1571
	Winyah 4	13-1590
	South Mississippi Electric Power	
	R. D. Morrow, Sr. 1	13-1606
	R. D. Morrow, Sr. 2	13-1624

(continued)

CONTENTS (continued)

	<u>Page</u>
Southern Illinois Power	
Marion 4	13-1642
Southern Indiana Gas & Electric	
A. B. Brown 1	13-1658
A. B. Brown 2	13-1679
Southwestern Electric Power	
Dolet Hills	13-1684
Henry W. Pirkey 1	13-1689
Springfield Water, Light & Power	
Dallman 3	13-1696
Sunflower Electric	
Holcomb 1	13-1715
Tampa Electric	
Big Bend 4	13-1726
Tennessee Valley Authority	
Paradise 1	13-1734
Paradise 2	13-1742
Shawnee 9	13-1750
Widows Creek 7	13-1753
Widows Creek 8	13-1762
Texas Municipal Power Agency	
Gibbons Creek 1	13-1783
Texas Utilities	
Martin Lake 1	13-1792
Martin Lake 2	13-1806
Martin Lake 3	13-1820
Monticello 3	13-1833
Sandow 4	13-1846
United Power Association	
Stanton 10	13-1854
Utah Power & Light	
Hunter 1	13-1862
Hunter 2	13-1876
Hunter 3	13-1889
Huntington 1	13-1896
Naughton 3	13-1911
West Penn Power	
Mitchell 3	13-1919
West Texas Utilities	
Oklaunion 1	13-1927

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	PHILADELPHIA ELECTRIC
PLANT NAME	CROMBY
UNIT NUMBER	1
CITY	PHOENIXVILLE
STATE	PENNSYLVANIA
REGULATORY CLASSIFICATION	C
PARTICULATE EMISSION LIMITATION - NG/J	43. (0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	387. (0.900 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	***** (***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	351
GROSS UNIT GENERATING CAPACITY - MW	188
NET UNIT GENERATING CAPACITY W/FGD - MW	147
NET UNIT GENERATING CAPACITY WO/FGD - MW	154
EQUIVALENT SCRUBBED CAPACITY - MW	176
** UNIT DATA - BOILER AND STACK	
BOILER SUPPLIER	****
BOILER TYPE	****
BOILER SERVICE LOAD	BASE
DESIGN BOILER FLUE GAS FLOW - CU.M/S	***** (***** ACFM)
BOILER FLUE GAS TEMPERATURE - C	***** (**** F)
STACK HEIGHT - M	***** (**** FT)
STACK SHELL	CONCRETE
STACK TOP DIAMETER - M	***** (***** FT)
** FUEL DATA	
FUEL TYPE	COAL
FUEL GRADE	****
AVERAGE HEAT CONTENT - J/G	***** (***** BTU/LB)
RANGE HEAT CONTENT - BTU/LB	****
AVERAGE ASH CONTENT - %	8.20
RANGE ASH CONTENT - %	*****
AVERAGE MOISTURE CONTENT - %	*****
RANGE MOISTURE CONTENT - %	****
AVERAGE SULFUR CONTENT - %	2.00
RANGE SULFUR CONTENT - %	2.0-4.0
AVERAGE CHLORIDE CONTENT - %	*****
RANGE CHLORIDE CONTENT - %	****
*** PARTICLE CONTROL	
** FABRIC FILTER	
NUMBER	1
NUMBER OF SPARE COMPARTMENTS	0
** PARTICLE SCRUBBER	
NUMBER	3
NUMBER OF SPARES	1
INITIAL START-UP DATE	10/1982
GENERIC TYPE	VENTURI TOWER
SPECIFIC TYPE	VARIABLE-THROAT/VERTICALLY ADJUSTABLE ROD DECKS
TRADE NAME/COMMON NAME	ROD SCRUBBER
SUPPLIER	ENVIRONEERING
SHELL GENERIC MATERIAL	NA
SHELL SPECIFIC MATERIAL	NA
LINER GENERIC MATERIAL	NA
LINER SPECIFIC MATERIAL	NA
PRESSURE DROP - KPA	2.5 (10.0 IN-H2O)
INLET GAS TEMPERATURE - C	138.3 (281 F)
SO2 REMOVAL EFFICIENCY - %	6.0
*** FGD SYSTEM	
** GENERAL DATA	
SALEABLE PRODUCT/THROWAWAY PRODUCT	SALEABLE PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	MAGNESIUM OXIDE
SYSTEM SUPPLIER	UNITED ENGINEERS
A-E FIRM	UNITED ENGINEERS & CONSTRUCTORS

DO NOT MICROFILM
THIS PAGE

PHILADELPHIA ELECTRIC: CROMBY 1 (CONT.)

DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	RETROFIT	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	92.00	
ENERGY CONSUMPTION - %	3.7	
CURRENT STATUS	1	
COMMERCIAL START-UP	1/1983	
INITIAL START-UP	10/1982	
CONTRACT AWARDED	8/1979	
** DESIGN AND OPERATING PARAMETERS		
DESIGN COAL SULFUR CONTENT - %	3.50	
DESIGN CHLORIDE CONTENT - %	*****	
** QUENCHER/PRESATURATOR		
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** ABSORBER		
NUMBER	3	
NUMBER OF SPARES	1	
GENERIC TYPE	SPRAY TOWER	
SPECIFIC TYPE	NR	
TRADE NAME/COMMON TYPE	NR	
SUPPLIER	ENVIRONEERING	
SHELL GENERIC MATERIAL	NR	
SHELL SPECIFIC MATERIAL	NR	
SHELL MATERIAL TRADE NAME/COMMON TYPE	NR	
LINER GENERIC MATERIAL	NR	
LINER SPECIFIC MATERIAL	NR	
LINER MATERIAL TRADE NAME/COMMON TYPE	NR	
INLET GAS TEMPERATURE - C	60.6	(141 F)
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
TRADE NAME/COMMON TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** REHEATER		
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
TRADE NAME/COMMON TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** FANS		
DESIGN	NR	
FUNCTION	NR	
APPLICATION	NR	
SERVICE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
** DAMPERS		
FUNCTION	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	
** DUCTWORK		
SHELL GENERIC MATERIAL TYPE	NR	
SHELL SPECIFIC MATERIAL TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PHILADELPHIA ELECTRIC: CROMBY 1 (CONT.)

** REAGENT PREPARATION EQUIPMENT
 FUNCTION SLAKER
 DEVICE NR
 DEVICE TYPE NR

** PUMPS
 SERVICE NUMBER

 NA *****

** SOLIDS CONCENTRATING/DEWATERING
 DEVICE CENTRIFUGE
 OVERFLOW STREAM CHARACTERISTICS 25%

*** SALEABLE BYPRODUCTS
 NATURE SULFURIC ACID
 DISPOSITION MARKETING

*** SLUDGE

** TREATMENT
 METHOD N/A
 DEVICE NA
 PROPRIETARY PROCESS NA

** DISPOSAL
 NATURE N/A
 TYPE NONE
 SITE TREATMENT NR

** PROCESS CONTROL AND INSTRUMENTATION
 CONTROL LEVELS 15% SOLIDS SLURRY IN ABSORBER RECYCLE TANK; ABSO

** FGD SPARE CAPACITY INDICES
 ABSORBER - % 50.0

** FGD SPARE COMPONENT INDICES
 ABSORBER 0.1

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

10/82 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT INITIAL START-UP OF THE FGD SYSTEM OCCURRED DURING OCTOBER, 1982.

11/82 SYSTEM 720

12/82 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR OCTOBER TO DECEMBER 1982.

1/83	SYSTEM	100.0	100.0	100.0	54.9	744	408	408
2/83	SYSTEM	100.0			0.0	672	0	0
3/83	SYSTEM	100.0	100.0	100.0	70.8	744	526	526

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PHILADELPHIA ELECTRIC: CROMBY 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING THE FIRST QUARTER OF 1983.

4/83	SYSTEM	100.0	100.0	100.0	90.2	720	649	649
5/83	SYSTEM	100.0	100.0	100.0	70.0	744	521	521
6/83	SYSTEM	100.0	100.0	100.0	94.9	720	683	683

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING THE SECOND QUARTER OF 1983.

7/83	SYSTEM	100.0	100.0	100.0	100.0	744	744	744
8/83	SYSTEM	100.0	100.0	100.0	88.0	744	655	655
9/83	SYSTEM	100.0	100.0	100.0	89.7	720	646	646

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING THE THIRD QUARTER OF 1983.

10/83	SYSTEM	100.0	100.0	100.0	92.8	744	690	690

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING THE MONTH OF OCTOBER.

11/83	SYSTEM					720		
12/83	SYSTEM					744		

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR NOVEMBER AND DECEMBER 1983.

1/84	SYSTEM					744		
2/84	SYSTEM					696		
3/84	SYSTEM					744		
4/84	SYSTEM					720		
5/84	SYSTEM					744		
6/84	SYSTEM					720		
7/84	SYSTEM					744		
8/84	SYSTEM					744		
9/84	SYSTEM					720		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PHILADELPHIA ELECTRIC: CROMBY 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS	FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED NO MAJOR FGD-RELATED PROBLEMS DURING THE FIRST THREE QUARTERS OF 1984. FGD SYSTEM AVAILABILITY WAS ESTIMATED AT 98.4%.

10/84	SYSTEM						744			
11/84	SYSTEM						720			
12/84	SYSTEM						744			

** PROBLEMS/SOLUTIONS/COMMENTS

UNIT WAS DOWN MOST OF OCTOBER AND PART OF DECEMBER FOR A SCHEDULED 6 WEEK BOILER/TURBINE OUTAGE. NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED.

1/85	SYSTEM						744			
2/85	SYSTEM						672			
3/85	SYSTEM						744			
4/85	SYSTEM						720			
5/85	SYSTEM						744			
6/85	SYSTEM						720			
7/85	SYSTEM						744			
8/85	SYSTEM						744			
9/85	SYSTEM						720			
10/85	SYSTEM						744			
11/85	SYSTEM						720			
12/85	SYSTEM						744			

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM						774			
2/86	SYSTEM						672			
3/86	SYSTEM						774			
4/86	SYSTEM						720			
5/86	SYSTEM						774			
6/86	SYSTEM						720			
7/86	SYSTEM						774			
8/86	SYSTEM						774			
9/86	SYSTEM						720			
10/86	SYSTEM						774			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PHILADELPHIA ELECTRIC: CROMBY 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR

11/86	SYSTEM							720		

12/86	SYSTEM							774		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT DURING 1986 THERE WERE NO BOILER OUTAGES DUE TO FGD-RELATED PROBLEMS. A SCHEDULED UNIT OUTAGE FOR BOILER/TURBINE WORK OCCURRED FROM APRIL 18 THROUGH MAY 24. IN ADDITION, THE UNIT WAS DOWN FOR AN ADDITIONAL 14 DAYS FOR OTHER MALFUNCTIONS. BOILER AVAILABILITY FOR THE YEAR WAS APPROXIMATELY 86%.

1/87	SYSTEM							744		

2/87	SYSTEM							672		

3/87	SYSTEM							744		

4/87	SYSTEM							720		

5/87	SYSTEM							744		

6/87	SYSTEM							720		

7/87	SYSTEM							744		

8/87	SYSTEM							744		

9/87	SYSTEM							720		

10/87	SYSTEM							744		

11/87	SYSTEM							720		

12/87	SYSTEM							744		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO FGD-RELATED BOILER OUTAGES OCCURRED DURING 1987. SCHEDULED UNIT OUTAGES FOR BOILER/TURBINE WORK TOOK PLACE ON MAY 15 THROUGH MAY 19 AND ON NOVEMBER 11 THROUGH DECEMBER 13. BOILER AVAILABILITY FOR THE YEAR WAS APPROXIMATELY 83.2 PERCENT.

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	PHILADELPHIA ELECTRIC	
PLANT NAME	EDDYSTONE	
UNIT NUMBER	1	
CITY	EDDYSTONE	
STATE	PENNSYLVANIA	
REGULATORY CLASSIFICATION	C	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	193.	(0.450 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	1395	
GROSS UNIT GENERATING CAPACITY - MW	354	
NET UNIT GENERATING CAPACITY W/FGD - MW	274	
NET UNIT GENERATING CAPACITY WO/FGD - MW	298	
EQUIVALENT SCRUBBED CAPACITY - MW	354	
*** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	****	
BOILER TYPE	****	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	*****	(***** ACFM)
BOILER FLUE GAS TEMPERATURE - C	157.2	(315 F)
STACK HEIGHT - M	*****	(**** FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	*****	(**** FT)
*** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	****	
AVERAGE HEAT CONTENT - J/G	31634.	(13600 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		****
AVERAGE ASH CONTENT - %	8.70	
RANGE ASH CONTENT - %	****	
AVERAGE MOISTURE CONTENT - %	5.90	
RANGE MOISTURE CONTENT - %	****	
AVERAGE SULFUR CONTENT - %	2.00	
RANGE SULFUR CONTENT - %	****	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** PARTICLE SCRUBBER		
NUMBER	3	
NUMBER OF SPARES	0	
INITIAL START-UP DATE	6/1980	
GENERIC TYPE	VENTURI TOWER	
SPECIFIC TYPE	NA	
TRADE NAME/COMMON NAME	NA	
SUPPLIER	PEABODY-LURGI	
SHELL GENERIC MATERIAL	STAINLESS STEEL	
SHELL SPECIFIC MATERIAL	AUSTENITIC	
LINER GENERIC MATERIAL	NONE	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	NONE	
NUMBER OF CONTACTING ZONES	1	
*** FGD SYSTEM		
** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	SALEABLE PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	
PROCESS TYPE	MAGNESIUM OXIDE	
SYSTEM SUPPLIER	UNITED ENGINEERS	
A-E FIRM	UNITED ENGINEERS & CONSTRUCTORS	
DEVELOPMENT LEVEL	DEMONSTRATION	
NEW/RETROFIT	RETROFIT	
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.00	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	92.00	
ENERGY CONSUMPTION - %	6.8	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PHILADELPHIA ELECTRIC: EDDYSTONE 1 (CONT.)

CURRENT STATUS	1	
COMMERCIAL START-UP	12/1982	
INITIAL START-UP	9/1982	
CONTRACT AWARDED	8/1979	
** DESIGN AND OPERATING PARAMETERS		
DESIGN CHLORIDE CONTENT - %	*****	
** QUENCHER/PRESATURATOR		
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** ABSORBER		
NUMBER	3	
NUMBER OF SPARES	0	
GENERIC TYPE	PACKED TOWER	
SPECIFIC TYPE	GRID PACKING	
TRADE NAME/COMMON TYPE	N/A	
SUPPLIER	ENVIRONEERING, RILEY STOKER	
SHELL GENERIC MATERIAL	STAINLESS STEEL	
SHELL SPECIFIC MATERIAL	AUSTENITIC	
SHELL MATERIAL TRADE NAME/COMMON TYPE	TYPE 316L	
LINER GENERIC MATERIAL	NONE	
LINER SPECIFIC MATERIAL	N/A	
LINER MATERIAL TRADE NAME/COMMON TYPE	N/A	
GAS CONTACTING DEVICE TYPE	ROD DECKS	
NUMBER OF CONTACTING ZONES	2	
LIQUID RECIRCULATION RATE - LITER/S	843.	(13384 GPM)
L/G RATIO - L/CU.M	6.5	(48.5 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	2.5	(10.0 IN-H2O)
INLET GAS FLOW - CU. M/S	188.76	(400000 ACFM)
INLET GAS TEMPERATURE - C	160.0	(320 F)
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
TRADE NAME/COMMON TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** REHEATER		
GENERIC TYPE	DIRECT COMBUSTION	
SPECIFIC TYPE	IN-LINE BURNER	
TRADE NAME/COMMON TYPE	OIL	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** FANS		
DESIGN	NR	
FUNCTION	NR	
APPLICATION	NR	
SERVICE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
** DAMPERS		
FUNCTION	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	
** DUCTWORK		
SHELL GENERIC MATERIAL TYPE	NR	
SHELL SPECIFIC MATERIAL TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	

```

REAGENT PREP
FUNCTION
DEVICE
DEVICE TYPE

```

SLAKER
NR
NR

**** PUMPS
SERVICE**

NUMBER

NA

★★★★

** SOLIDS CONCENTRATING/DEWATERING
DEVICE

NA

*** SALEABLE BYPRODUCTS
NATURE
DISPOSITION

SULFURIC ACID
MARKETED

*** SLUDGE

** TREATMENT
 METHOD
 DEVICE
 PROPRIETARY PROCESS

N/A
NA
NA

** DISPOSAL
 NATURE
 TYPE
 SITE TREATMENT

N/A
NONE
N/A

** WATER BALANCE
WATER LOOP TYPE
MAKEUP WATER ADDITION - LITERS/S

OPEN
8.3 (132 GPM)

-PERFORMANCE DATA-

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

5/82 SYSTEM

744

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MAY INITIAL DEBUGGING OPERATIONS COMMENCED WITH ONE MODULE OUT OF THREE ON-LINE. PRESENTLY, THE SYSTEM IS IN THE SHAKEDOWN PHASE OF OPERATION.

6/82 SYSTEM

720

**** PROBLEMS/SOLUTIONS/COMMENTS**

DURING JUNE INITIAL DEBUGGING OPERATIONS CONTINUED WITH ONE MODULE OUT OF THREE ON-LINE. PRESENTLY, THE SYSTEM IS IN THE SHAKEDOWN PHASE OF OPERATION.

7/82 SYSTEM

744

8/82 SYSTEM

744

9/82 SYSTEM

720	0	0	0.0

10/82 SYSTEM

744	0	0	0.0

11/82 SYSTEM

720	0	0	0.0

12/82 SYSTEM

744	0	0	0.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PHILADELPHIA ELECTRIC: EDDYSTONE 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS HOURS	FGD HOURS	CAP. FACTOR
1/83	SYSTEM	100.0			0.0		744	0	0 0.0
2/83	SYSTEM	100.0			0.0		672	0	0 0.0
3/83	SYSTEM	100.0	100.0	100.0	11.2		744	83	83 6.7
4/83	SYSTEM	100.0			0.0		720	0	0 0.0
5/83	SYSTEM	100.0			0.0		744	0	0 0.0
6/83	SYSTEM	100.0			0.0		720	0	0 0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT HAS BEEN DOWN SINCE THE FALL OF 1982 DU TO BOILER STEAM TUBE CRACKING, HOWEVER IT DID OPERATE FOR A BRIEF PERIOD DURING MARCH 1983. IT WILL MOST LIKELY BE DOWN FOR THE REMAINDER OF 1983.

7/83	SYSTEM	100.0			0.0		744		0
8/83	SYSTEM	100.0			0.0		744		0
9/83	SYSTEM	100.0			0.0		720		0

** PROBLEMS/SOLUTIONS/COMMENTS

BOILER-RELATED PROBLEMS CONTINUED THROUGH SEPTEMBER 1983.

10/83	SYSTEM	100.0			0.0		744	0	0 0.0

** PROBLEMS/SOLUTIONS/COMMENTS

A BOILER-RELATED FORCED OUTAGE OCCURRED DURING OCTOBER 1983.

11/83	SYSTEM	100.0			0.0		720	0	0 0.0
12/83	SYSTEM	100.0			0.0		744	0	0 0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT UNIT 1 WAS OFF LINE DURING NOVEMBER AND DECEMBER 1983.

1/84	SYSTEM						744		
2/84	SYSTEM						696		
3/84	SYSTEM						744		
4/84	SYSTEM						720		
5/84	SYSTEM						744		
6/84	SYSTEM						720		
7/84	SYSTEM						744		
8/84	SYSTEM						744		
9/84	SYSTEM						720		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PHILADELPHIA ELECTRIC: EDDYSTONE 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD SYSTEM WAS BROUGHT BACK ON LINE IN MID-FEBRUARY 1984. FGD SYSTEM AVAILABILITY WAS ESTIMATED AT 75% FOR THE FIRST THREE QUARTERS OF 1984. OUTAGE TIME WAS ATTRIBUTED TO SCHEDULED OUTAGES FOR ROUTINE MAINTENANCE AND CLEANING.

10/84	SYSTEM								744	
11/84	SYSTEM								720	
12/84	SYSTEM								744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER OF 1984.

1/85	SYSTEM								744	
2/85	SYSTEM								672	
3/85	SYSTEM								744	
4/85	SYSTEM								720	
5/85	SYSTEM								744	
6/85	SYSTEM								720	
7/85	SYSTEM								744	
8/85	SYSTEM								744	
9/85	SYSTEM								720	
10/85	SYSTEM								744	
11/85	SYSTEM								720	
12/85	SYSTEM								744	

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM								774	
2/86	SYSTEM								672	
3/86	SYSTEM								774	
4/86	SYSTEM								720	
5/86	SYSTEM								774	
6/86	SYSTEM								720	
7/86	SYSTEM								774	
8/86	SYSTEM								774	
9/86	SYSTEM								720	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PHILADELPHIA ELECTRIC: EDDYSTONE 1 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR

10/86	SYSTEM						774
11/86	SYSTEM						720
12/86	SYSTEM						774

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT DURING 1986 THERE WERE NO BOILER OUTAGES DUE TO FGD-RELATED PROBLEMS. A SCHEDULED UNIT OUTAGE FOR BOILER/TURBINE WORK OCCURED FROM FEBRUARY 28 THROUGH JUNE 5. IN ADDITION, THE UNIT WAS DOWN FOR AN ADDITIONAL 28 DAYS FOR OTHER MALFUNCTIONS. BOILER AVAILABILITY FOR THE YEAR WAS APPROXIMATELY 65% .

1/87	SYSTEM						744
2/87	SYSTEM						672
3/87	SYSTEM						744
4/87	SYSTEM						720
5/87	SYSTEM						744
6/87	SYSTEM						720
7/87	SYSTEM						744
8/87	SYSTEM						744
9/87	SYSTEM						720
10/87	SYSTEM						744
11/87	SYSTEM						720
12/87	SYSTEM						744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THERE WERE NO FGD-RELATED BOILER OUTAGES DURING 1987. A SCHEDULED UNIT OUTAGE FOR BOILER/TURBINE WORK BEGAN ON OCTOBER 15 AND CONTINUED THROUGH THE REMAINDER OF THE YEAR. NO SPRING UNIT OUTAGES WERE SCHEDULED DURING 1987 FOR EDDYSTONE 1. BOILER AVAILABILITY FOR THE YEAR WAS APPROXIMATELY 65.1 PERCENT.

**DO NOT MICROFILM
THIS PAGE**

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	PHILADELPHIA ELECTRIC
PLANT NAME	EDDYSTONE
UNIT NUMBER	2
CITY	EDDYSTONE
STATE	PENNSYLVANIA
REGULATORY CLASSIFICATION	C
PARTICULATE EMISSION LIMITATION - NG/J	43. (0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	193. (0.450 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	***** (***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	1395
GROSS UNIT GENERATING CAPACITY - MW	354
NET UNIT GENERATING CAPACITY W/FGD - MW	283
NET UNIT GENERATING CAPACITY WO/FGD - MW	300
EQUIVALENT SCRUBBED CAPACITY - MW	354
** UNIT DATA - BOILER AND STACK	
BOILER SUPPLIER	****
BOILER TYPE	PULVERIZED COAL
BOILER SERVICE LOAD	BASE
DESIGN BOILER FLUE GAS FLOW - CU.M/S	***** (***** ACFM)
BOILER FLUE GAS TEMPERATURE - C	***** (**** F)
STACK HEIGHT - M	***** (**** FT)
STACK SHELL	CONCRETE
STACK TOP DIAMETER - M	***** (**** FT)
** FUEL DATA	
FUEL TYPE	COAL
FUEL GRADE	****
AVERAGE HEAT CONTENT - J/G	***** (***** BTU/LB)
RANGE HEAT CONTENT - BTU/LB	*****
AVERAGE ASH CONTENT - %	7.40
RANGE ASH CONTENT - %	*****
AVERAGE MOISTURE CONTENT - %	*****
RANGE MOISTURE CONTENT - %	****
AVERAGE SULFUR CONTENT - %	2.00
RANGE SULFUR CONTENT - %	*****
AVERAGE CHLORIDE CONTENT - %	*****
RANGE CHLORIDE CONTENT - %	****
*** PARTICLE CONTROL	
** PARTICLE SCRUBBER	
NUMBER	3
NUMBER OF SPARES	0
GENERIC TYPE	NA
SPECIFIC TYPE	NA
TRADE NAME/COMMON NAME	NA
SHELL GENERIC MATERIAL	NA
SHELL SPECIFIC MATERIAL	NA
LINER GENERIC MATERIAL	NA
LINER SPECIFIC MATERIAL	NA
*** FGD SYSTEM	
** GENERAL DATA	
SALEABLE PRODUCT/THROWAWAY PRODUCT	SALEABLE PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	MAGNESIUM OXIDE
SYSTEM SUPPLIER	UNITED ENGINEERS
A-E FIRM	UNITED ENGINEERS & CONSTRUCTORS
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	RETROFIT
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	92.00
ENERGY CONSUMPTION - %	4.8
CURRENT STATUS	1
COMMERCIAL START-UP	12/1982
INITIAL START-UP	11/1982
CONTRACT AWARDED	8/1979

PHILADELPHIA ELECTRIC: EDDYSTONE 2 (CONT.)

** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
** QUENCHER/PRESATURATOR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** ABSORBER	
NUMBER	2
NUMBER OF SPARES	1
GENERIC TYPE	SPRAY TOWER
SPECIFIC TYPE	NR
TRADE NAME/COMMON TYPE	NR
SUPPLIER	AMERICAN AIR FILTER
SHELL GENERIC MATERIAL	STAINLESS STEEL
SHELL SPECIFIC MATERIAL	AUSTENITIC
SHELL MATERIAL TRADE NAME/COMMON TYPE	TYPE 316L
LINER GENERIC MATERIAL	NONE
LINER SPECIFIC MATERIAL	N/A
LINER MATERIAL TRADE NAME/COMMON TYPE	N/A
INLET GAS FLOW - CU. M/S	283.14 (600000 ACFM)
INLET GAS TEMPERATURE - C	160.0 (320 F)
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
TRADE NAME/COMMON TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** REHEATER	
GENERIC TYPE	NR
SPECIFIC TYPE	NR
TRADE NAME/COMMON TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** FANS	
DESIGN	NR
FUNCTION	NR
APPLICATION	NR
SERVICE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	SLAKER
DEVICE	NR
DEVICE TYPE	NR
** PUMPS	
SERVICE	NUMBER
-----	-----
NA	****

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PHILADELPHIA ELECTRIC: EDDYSTONE 2 (CONT.)

** SOLIDS CONCENTRATING/DEWATERING
DEVICE NA

*** SALEABLE BYPRODUCTS
NATURE SULFURIC ACID
DISPOSITION MARKETING

*** SLUDGE

** TREATMENT
METHOD N/A
DEVICE NA
PROPRIETARY PROCESS NA

** DISPOSAL
NATURE N/A
TYPE NONE
SITE TREATMENT N/A

-----PERFORMANCE DATA-----
PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
SO2 PART. HOURS HOURS HOURS FACTOR

11/82 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT INITIAL START-UP OF THE FGD SYSTEM OCCURRED
DURING NOVEMBER, 1982.

12/82 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR DECEMBER 1982.

1/83 SYSTEM 100.0 100.0 100.0 86.4 744 643 643

2/83 SYSTEM 100.0 100.0 100.0 88.9 672 597 597

3/83 SYSTEM 100.0 100.0 100.0 86.0 744 640 640

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
DURING THE FIRST QUARTER OF 1983.

4/83 SYSTEM 100.0 100.0 100.0 99.9 720 719 719

5/83 SYSTEM 100.0 100.0 100.0 91.2 744 678 678

6/83 SYSTEM 100.0 100.0 100.0 100.0 720 720 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
DURING THE SECOND QUARTER OF 1983.

7/83 SYSTEM 100.0 100.0 100.0 80.4 744 598 598

8/83 SYSTEM 100.0 100.0 100.0 79.9 744 594 594

9/83 SYSTEM 100.0 100.0 100.0 44.7 720 322 322

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PHILADELPHIA ELECTRIC: EDDYSTONE 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE THIRD QUARTER OF 1983.

10/83	SYSTEM	100.0	0.0	744	0	0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED AN ANNUAL OUTAGE AT UNIT 2 DURING OCTOBER 1983.

11/83	SYSTEM	100.0	0.0	720	0	0	0.0

12/83	SYSTEM	100.0	0.0	744	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT UNIT 2 WAS OFF LINE DURING NOVEMBER AND DECEMBER 1983.

1/84	SYSTEM			744		

2/84	SYSTEM			696		

3/84	SYSTEM			744		

4/84	SYSTEM			720		

5/84	SYSTEM			744		

6/84	SYSTEM			720		

7/84	SYSTEM			744		

8/84	SYSTEM			744		

9/84	SYSTEM			720		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD SYSTEM WAS BROUGHT BACK ON LINE IN MID-FEBRUARY 1984. FGD SYSTEM AVAILABILITY WAS ESTIMATED AT 75% FOR THE FIRST THREE QUARTERS OF 1984. OUTAGE TIME WAS ATTRIBUTED TO SCHEDULED OUTAGES FOR ROUTINE MAINTENANCE AND CLEANING.

10/84	SYSTEM			744		

11/84	SYSTEM			720		

12/84	SYSTEM			744		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER OF 1984.

1/85	SYSTEM			744		

2/85	SYSTEM			672		

3/85	SYSTEM			744		

4/85	SYSTEM			720		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PHILADELPHIA ELECTRIC: EDDYSTONE 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

5/85	SYSTEM					744
6/85	SYSTEM					720
7/85	SYSTEM					744
8/85	SYSTEM					744
9/85	SYSTEM					720
10/85	SYSTEM					744
11/85	SYSTEM					720
12/85	SYSTEM					744

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTHS OF
 JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM					774
2/86	SYSTEM					672
3/86	SYSTEM					774
4/86	SYSTEM					720
5/86	SYSTEM					774
6/86	SYSTEM					720
7/86	SYSTEM					774
8/86	SYSTEM					774
9/86	SYSTEM					720
10/86	SYSTEM					774
11/86	SYSTEM					720
12/86	SYSTEM					774

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT DURING 1986 THERE WERE NO BOILER OUTAGES DUE
 TO FGD-RELATED PROBLEMS. A SCHEDULED UNIT OUTAGE FOR BOILER/TURBINE WORK
 OCCURRED FROM SEPTEMBER 4 THROUGH DECEMBER 8. IN ADDITION, THE UNIT WAS
 DOWN FOR AN ADDITIONAL 84 DAYS FOR OTHER MALFUNCTIONS. BOILER AVAIL-
 ABILITY FOR THE YEAR WAS APPROXIMATELY 51% .

1/87	SYSTEM					744
2/87	SYSTEM					672
3/87	SYSTEM					744
4/87	SYSTEM					720
5/87	SYSTEM					744
6/87	SYSTEM					720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PHILADELPHIA ELECTRIC: EDDYSTONE 2 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.		PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
7/87	SYSTEM							744			
8/87	SYSTEM							744			
9/87	SYSTEM							720			
10/87	SYSTEM							744			
11/87	SYSTEM							720			
12/87	SYSTEM							744			

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO FGD-RELATED UNIT OUTAGES WERE ENCOUNTERED DURING 1987. HOWEVER, A FORCED 3-WEEK TURBINE-RELATED OUTAGE OCCURRED IN MAY AND A 1-WEEK BOILER-RELATED OUTAGE OCCURRED IN OCTOBER. NO SCHEDULED UNIT 2 OUTAGES TOOK PLACE DURING 1987. BOILER AVAILABILITY FOR THE YEAR WAS APPROXIMATELY 75.8 PERCENT.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	PLAINS ELECTRIC G & T
PLANT NAME	PLAINS ESCALANTE
UNIT NUMBER	1
CITY	PREWITT
STATE	NEW MEXICO
REGULATORY CLASSIFICATION	D
PARTICULATE EMISSION LIMITATION - NG/J	***** (***** LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516. (1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	***** (***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	210
GROSS UNIT GENERATING CAPACITY - MW	233
NET UNIT GENERATING CAPACITY W/FGD - MW	210
NET UNIT GENERATING CAPACITY WO/FGD - MW	219
EQUIVALENT SCRUBBED CAPACITY - MW	233

** UNIT DATA - BOILER AND STACK

BOILER SUPPLIER	COMBUSTION ENGINEERING
BOILER TYPE	PULVERIZED COAL
BOILER SERVICE LOAD	BASE
DESIGN BOILER FLUE GAS FLOW - CU.M/S	***** (***** ACFM)
BOILER FLUE GAS TEMPERATURE - C	***** (**** F)
STACK HEIGHT - M	***** (**** FT)
STACK SHELL	CONCRETE
STACK TOP DIAMETER - M	***** (**** FT)

** FUEL DATA

FUEL TYPE	COAL
FUEL GRADE	SUBBITUMINOUS
AVERAGE HEAT CONTENT - J/G	***** (***** BTU/LB)
RANGE HEAT CONTENT - BTU/LB	****
AVERAGE ASH CONTENT - %	*****
RANGE ASH CONTENT - %	****
AVERAGE MOISTURE CONTENT - %	*****
RANGE MOISTURE CONTENT - %	****
AVERAGE SULFUR CONTENT - %	0.80
RANGE SULFUR CONTENT - %	0.6-1.0
AVERAGE CHLORIDE CONTENT - %	*****
RANGE CHLORIDE CONTENT - %	****

*** PARTICLE CONTROL

** FABRIC FILTER

NUMBER	1
SUPPLIER	GE ENVIRONMENTAL SERVICES

** PARTICLE SCRUBBER

NUMBER	0
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON NAME	N/A
SHELL GENERIC MATERIAL	N/A
SHELL SPECIFIC MATERIAL	N/A
LINER GENERIC MATERIAL	N/A
LINER SPECIFIC MATERIAL	N/A
GAS CONTACTING DEVICE TYPE	N/A

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
SYSTEM SUPPLIER	COMBUSTION ENGINEERING
A-E FIRM	BURNS & MCDONNELL
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	75.00
ENERGY CONSUMPTION - %	3.9
CURRENT STATUS	1

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PLAINS ELECTRIC G & T: PLAINS ESCALANTE 1 (CONT.)

COMMERCIAL START-UP	12/1984
INITIAL START-UP	11/1984
CONTRACT AWARDED	4/1980
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
** QUENCHER/PRESATURATOR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** ABSORBER	
GENERIC TYPE	SPRAY TOWER
SPECIFIC TYPE	NR
TRADE NAME/COMMON TYPE	NR
SHELL GENERIC MATERIAL	NR
SHELL SPECIFIC MATERIAL	NR
SHELL MATERIAL TRADE NAME/COMMON TYPE	NR
LINER GENERIC MATERIAL	NR
LINER SPECIFIC MATERIAL	NR
LINER MATERIAL TRADE NAME/COMMON TYPE	NR
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
TRADE NAME/COMMON TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** REHEATER	
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON TYPE	N/A
CONSTRUCTION MATERIAL GENERIC TYPE	N/A
CONSTRUCTION MATERIAL SPECIFIC TYPE	N/A
** FANS	
DESIGN	NR
FUNCTION	NR
APPLICATION	NR
SERVICE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	NR
DEVICE TYPE	NR
** PUMPS	
SERVICE	NUMBER
-----	-----
NA	****

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PLAINS ELECTRIC G & T: PLAINS ESCALANTE 1 (CONT.)

** SOLIDS CONCENTRATING/DEWATERING
DEVICE

NA

*** SALEABLE BYPRODUCTS
NATURE
DISPOSITION

NONE
N/A

*** SLUDGE

** TREATMENT
METHOD
DEVICE
PROPRIETARY PROCESS

STABILIZATION
NR
NR

** DISPOSAL
NATURE
TYPE
LOCATION
SITE TREATMENT

FINAL
LANDFILL
ON-SITE
NA

-----PERFORMANCE DATA-----
PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
SO2 PART. HOURS HOURS HOURS FACTOR

11/84 SYSTEM 720

12/84 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT INITIAL AND COMMERCIAL OPERATIONS OF THE FGD SYSTEM AT PLAINS ESCALANTE 1 TOOK PLACE IN NOVEMBER AND DECEMBER 1984 RESPECTIVELY.

THE FGD SYSTEM WAS UP AND DOWN DURING THIS PERIOD DUE TO A VARIETY OF SHAKEDOWN PROBLEMS. HIGH EXCESS AIR PROBLEMS HAVE RESULTED IN POOR ABSORBER PERFORMANCE DUE TO EXCESSIVE OXIDATION. THE UTILITY STATED HAVING PROBLEMS WITH MIST ELIMINATOR PLUGGING WHICH IS ATTRIBUTED TO THE EXCESSIVE AIR. COAL PULVERIZATION AND AIR PREHEATER LEAKS ARE BELIEVED TO BE THE SOURCE OF THE PROBLEM. ABSORBER B WAS ALSO REPORTED STRIPPED FOR SPARE PARTS TEMPORARILY TO FIT MODULES A AND C IN ORDER TO MAINTAIN FGD OPERATION.

1/85 SYSTEM 744

2/85 SYSTEM 672

3/85 SYSTEM 744

4/85 SYSTEM 720

5/85 SYSTEM 744

6/85 SYSTEM 720

7/85 SYSTEM 744

8/85 SYSTEM 744

9/85 SYSTEM 720

10/85 SYSTEM 744

11/85 SYSTEM 720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PLAINS ELECTRIC G & T: PLAINS ESCALANTE 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

12/85 SYSTEM

744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT DURING 1985 NO MAJOR BOILER OUTAGES (FORCED OR SCHEDULED) WERE ENCOUNTERED. HOWEVER, NUMEROUS FGD OUTAGES WERE ENCOUNTERED DURING THE YEAR DUE TO CONTINUED PROBLEMS. THE MOST IMPORTANT PROBLEM TO DATE HAS BEEN THE SYSTEM'S INABILITY TO MEET THE DESIGNED SO2 REMOVAL EFFICIENCY OF 95% (THE ACTUAL REMOVAL EFFICIENCY HAS BEEN IN THE 84%-85% RANGE). BECAUSE OF THIS, THE UNIT HAS BEEN UNABLE TO MEET COMPLIANCE. THE SYSTEM SUPPLIER, COMBUSTION ENGINEERING, IS CURRENTLY INSTALLING ADDITIONAL SPRAY NOZZLES AND HEADERS TO IMPROVE GAS/LIQUID CONTACT AND HOPEFULLY SO2 REMOVAL EFFICIENCY. NEW CENTERLESS NOZZLES ARE BEING INSTALLED IN ALL THE MODULES. INSTALLATION BEGAN IN JANUARY AND IS SCHEDULED TO BE FINISHED BY THE SPRING OF 1986.

1/86 SYSTEM

774

2/86 SYSTEM

672

3/86 SYSTEM

774

4/86 SYSTEM

720

5/86 SYSTEM

774

6/86 SYSTEM

720

7/86 SYSTEM

774

8/86 SYSTEM

774

9/86 SYSTEM

720

10/86 SYSTEM

774

11/86 SYSTEM

720

12/86 SYSTEM

774

** PROBLEMS/SOLUTIONS/COMMENTS

COMBUSTION ENGINEERING ATTEMPTED USING DIBASIC ACID DURING THE FOURTH QUARTER OF 1986 TO TRY TO IMPROVE THE SYSTEM SO2 REMOVAL EFFICIENCY. RESULTS FROM THESE TESTS, HOWEVER, SHOWED NO IMPROVEMENT IN SO2 REMOVAL. COMBUSTION ENGINEERING HAS SINCE ABANDONED DIBASIC ACID AS A SOLUTION FOR IMPROVING SYSTEM SO2 REMOVAL.

THE UTILITY REPORTED THAT DURING 1986 NO MAJOR BOILER OUTAGES WERE ATTRIBUTED TO THE FGD SYSTEM. THE UNIT HAD A FORCED OUTAGE FROM MID-MAY TO MID-JULY DUE TO CRACKED TURBINE BLADES. ALL SCRUBBER MODIFICATIONS WERE COMPLETED DURING THIS PERIOD. THE UTILITY IS CURRENTLY ABLE TO MEET THE EPA REQUIRED SO2 REMOVAL EFFICIENCY OF 90%. HOWEVER, THE SYSTEM SUPPLIER IS STILL UNABLE TO OBTAIN THEIR DESIGNED GUARANTEED REMOVAL EFFICIENCY OF 95%.

1/87 SYSTEM

744

2/87 SYSTEM

672

3/87 SYSTEM

744

4/87 SYSTEM

720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PLAINS ELECTRIC G & T: PLAINS ESCALANTE 1 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR UNIT OR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE PERIOD JANUARY THROUGH APRIL 1987.

5/87	SYSTEM						744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT WAS OFF-LINE FOR APPROXIMATELY 4 WEEKS IN MAY DUE TO CRACKED TURBINE BLADES. THE PROBLEM IS THOUGHT TO BE DUE TO POOR INSTALLATION WORK AND BAD CONSTRUCTION MATERIALS.

6/87	SYSTEM						720
7/87	SYSTEM						744
8/87	SYSTEM						744
9/87	SYSTEM						720
10/87	SYSTEM						744
11/87	SYSTEM						720
12/87	SYSTEM						744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT PERIODIC ABSORBER LINER FAILURES HAVE BEEN ENCOUNTERED. A CEILCOTE EPOXY MATERIAL PERIODICALLY FLAKES OFF AND MUST BE PATCHED. THE PROBLEM HAS BEEN OCCURRING LESS FREQUENTLY AS TIME PASSES.

**DO NOT MICROFILM
THIS PAGE**

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	PLATTE RIVER POWER AUTHORITY	
PLANT NAME	RAWHIDE	
UNIT NUMBER	1	
CITY	WELLINGTON	
STATE	COLORADO	
REGULATORY CLASSIFICATION	A	
PARTICULATE EMISSION LIMITATION - NG/J	13.	(0.030 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	56.	(0.130 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	215.	(0.500 LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	250	
GROSS UNIT GENERATING CAPACITY - MW	278	
NET UNIT GENERATING CAPACITY W/FGD - MW	255	
NET UNIT GENERATING CAPACITY WO/FGD - MW	267	
EQUIVALENT SCRUBBED CAPACITY - MW	278	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	552.12	(1170000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	132.2	(270 F)
STACK HEIGHT - M	154.	(505 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	5.3	(17.5 FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	19771.	(8500 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		7943-9064
AVERAGE ASH CONTENT - %	5.47	
RANGE ASH CONTENT - %	3.7-11.6	
AVERAGE MOISTURE CONTENT - %	25.96	
RANGE MOISTURE CONTENT - %	23.8-27.7	
AVERAGE SULFUR CONTENT - %	0.34	
RANGE SULFUR CONTENT - %	0.2-0.4	
AVERAGE CHLORIDE CONTENT - %	0.01	
RANGE CHLORIDE CONTENT - %	0.00-0.02	
*** PARTICLE CONTROL		
** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
** FABRIC FILTER		
NUMBER	2	
TYPE	STEPPED TUBE SHEET	
SUPPLIER	JOY MFG.	
INLET FLUE GAS CAPACITY - CU.M/S	563.0	(1193000 ACFM)
INLET FLUE GAS TEMPERATURE - C	76.7	(170 F)
PRESSURE DROP - KPA	0.7	(3.0 IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.7	
TYPICAL GAS/CLOTH RATIO - M/MIN	0.5	(1.8 FT/MIN)
** ESP		
NUMBER	0	
TYPE	NONE	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PLATTE RIVER POWER AUTHORITY: RAWHIDE 1 (CONT.)

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	SPRAY DRYING
PROCESS TYPE	LIME/SPRAY DRYING
SYSTEM SUPPLIER	JOY MFG/NIRO ATOMIZER
A-E FIRM	BLACK & VEATCH
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.79
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	80.00
ENERGY CONSUMPTION - %	4.3
CURRENT STATUS	1
COMMERCIAL START-UP	12/1984
INITIAL START-UP	12/1983
CONTRACT AWARDED	3/1980

** DESIGN AND OPERATING PARAMETERS

DESIGN CHLORIDE CONTENT - %	*****

** QUENCHER/PRESATURATOR

CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR

** ABSORBER

NUMBER	3
GENERIC TYPE	SPRAY DRYER
SPECIFIC TYPE	CROSSFLOW
TRADE NAME/COMMON TYPE	ROTARY ATOMIZER
SUPPLIER	JOY MFG/NIRO ATOMIZER
DIMENSIONS - FT	46.0 X 36.0
SHELL GENERIC MATERIAL	CARBON STEEL
SHELL SPECIFIC MATERIAL	AISI 1110
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A
LINER GENERIC MATERIAL	NONE
LINER SPECIFIC MATERIAL	N/A
LINER MATERIAL TRADE NAME/COMMON TYPE	N/A
GAS CONTACTING DEVICE TYPE	NONE
LIQUID RECIRCULATION RATE - LITER/S	9. (145 GPM)
GAS-SIDE PRESSURE DROP - KPA	0.9 (3.5 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/SEC	24.4 (80.0 FT/S)
INLET GAS FLOW - CU. M/S	252.94 (536000 ACFM)
INLET GAS TEMPERATURE - C	132.2 (270 F)
SO2 REMOVAL EFFICIENCY - %	80.0
PARTICLE REMOVAL EFFICIENCY - %	99.8

** MIST ELIMINATOR

PRE-MIST ELIMINATOR/MIST ELIMINATOR	NONE
GENERIC TYPE	N/A
SPECIFIC TYPE	N/A
TRADE NAME/COMMON TYPE	N/A
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR

** REHEATER

NUMBER	0
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON TYPE	N/A
PERCENT GAS BYPASSED - AVG	10.0
CONSTRUCTION MATERIAL GENERIC TYPE	NONE
CONSTRUCTION MATERIAL SPECIFIC TYPE	N/A

** FANS

NUMBER	6
DESIGN	NR
SUPPLIER	WESTINGHOUSE; NOVENCO
FUNCTION	NR
APPLICATION	NR

PLATTE RIVER POWER AUTHORITY: RAWHIDE 1 (CONT.)

SERVICE	DRY	
FLUE GAS FLOW RATE - CU.M/S	92.74	(196534 ACFM)
FLUE GAS TEMPERATURE - C	76.7	(170 F)
CONSTRUCTION MATERIAL GENERIC TYPE	HIGH ALLOY	
** DAMPERS		
FUNCTION	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	
** DUCTWORK		
SHELL GENERIC MATERIAL TYPE	NR	
SHELL SPECIFIC MATERIAL TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	
** REAGENT PREPARATION EQUIPMENT		
FUNCTION	WET BALL MILL	
DEVICE	COMPARTMENTED	
DEVICE TYPE	NR	
NUMBER	2	
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	1.8	(2 TPH)
** REAGENT PREPARATION EQUIPMENT		
FUNCTION	SLAKER	
DEVICE	NR	
DEVICE TYPE	NR	
NUMBER	2	
PRODUCT QUALITY - % SOLIDS	20.0	
** PUMPS		
SERVICE	NUMBER	
-----	-----	
NA	****	
** SOLIDS CONCENTRATING/DEWATERING		
DEVICE	NONE	
*** SALEABLE BYPRODUCTS		
NATURE	NONE	
DISPOSITION	N/A	
*** SLUDGE		
** TREATMENT		
METHOD	UNSTABILIZED	
DEVICE	N/A	
PROPRIETARY PROCESS	N/A	
** DISPOSAL		
NATURE	INTERIM	
TYPE	LANDFILL	
SITE TRANSPORTATION METHOD	TRUCK	
SITE TREATMENT	NONE	
SITE CAPACITY - CU.M	2042410	(1670.0 ACRE-FT)
SITE SERVICE LIFE - YRS	35	
** WATER BALANCE		
WATER LOOP TYPE	CLOSED	
EVAPORATION WATER LOSS - LITER/S	27.0	(429 GPM)
MAKEUP WATER ADDITION - LITERS/S	0.4	(7 GPM)
SOURCE OF MAKEUP WATER	WATER REUSE PROGRAM	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PLATTE RIVER POWER AUTHORITY: RAWHIDE 1 (CONT.)

** CHEMICALS AND CONSUMPTION
 FUNCTION
 NAME
 CONSUMPTION

ABSORBENT
 LIME
 81 TPH

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

12/83 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD SYSTEM AT RAWHIDE 1 STARTED UP IN DECEMBER 1983 AND IS CURRENTLY IN THE SHAKEDOWN/DEBUGGING PHASE OF OPERATION. COMMERCIAL START-UP IS SCHEDULED FOR APRIL 1984.

1/84 SYSTEM 744

2/84 SYSTEM 696

3/84 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE SYSTEM WAS IN A START UP MODE DURING THE FIRST QUARTER OF 1984.

4/84 SYSTEM 720

5/84 SYSTEM 744

6/84 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD SYSTEM WAS DOWN APPROXIMATELY 50% OF THE TIME DURING THE SECOND QUARTER OF 1984. THE MAJORITY OF PROBLEMS HAVE BEEN DUE TO AN APPARENT DESIGN FLAW IN THE CAPACITY OF RECYCLED FLYASH WHICH WAS TO DROP INTO THE RECYCLE CHAMBER FOR CONVEYANCE TO THE SPRAY DRYER. MODIFICATIONS WERE COMPLETED IN JUNE ON THE CONVEYANCE SYSTEM.

7/84 SYSTEM 744

8/84 SYSTEM 744

9/84 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED PROBLEMS IN REMOVING FLYASH FROM A BAGHOUSE DURING THE THIRD QUARTER. FLUIDIZED BED STONES WERE ADDED TO INCREASE SURFACE AREA, HOWEVER THE ASH EVENTUALLY HAD TO BE REMOVED WITH A VACUUM TRUCK.

ADDITIONAL PROBLEMS AROSE IN REMOVING THE FLYASH FROM THE VACUUM TRUCK AND RESULTED IN A DECISION TO LANDFILL IT.

THE FGD SYSTEM WAS DOWN MORE THAN 50% OF THE TIME DURING THE THIRD QUARTER DUE TO RECYCLE ASH PROBLEMS.

10/84 SYSTEM 744

11/84 SYSTEM 720

12/84 SYSTEM 744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PLATTE RIVER POWER AUTHORITY: RAWHIDE 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED EXPERIENCING PLUGGING PROBLEMS WITH BOTH THEIR VACUUM AND PRESSURIZED PNEUMATIC CONVEYORS. THE UTILITY REPORTS PLUGGING IN THE ELBOWS OF THE LINES LOCATED BETWEEN THE BAGHOUSE AND STORAGE SILO AND FROM THE SILO TO THE RECYCLE HOPPER. ANALYSIS OF THE DEPOSITS INDICATED THAT SULFATES AND UNREACTED LIME IN THE FLY ASH MIGHT BE CAUSING THE ASH TO STICK IN THE ELBOWS.

THE UTILITY ALSO REPORTED EXPERIENCING PROBLEMS WITH PLUGGED ATOMIZER NOZZLES. FEED TANK SCALE SOLIDS WERE FLAKING OFF AND BEING PUMPED TO THE NOZZLES. UTILITY PLANS TO SOLVE THE PROBLEM BY CHANGING THE TANK AGITATOR BLADE CONFIGURATION AND SPEED.

1/85	SYSTEM	744
2/85	SYSTEM	672
3/85	SYSTEM	744
4/85	SYSTEM	720
5/85	SYSTEM	744
6/85	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE MONTHS OF JANUARY THROUGH JUNE 1985. THE UNIT WAS OFF-LINE MAY 17 THROUGH JUNE 9 FOR A SCHEDULED BOILER/TURBINE OUTAGE. MAINTENANCE CONDUCTED INCLUDED THE ADDITION OF SOOT BLOWERS AND TURBINE BLADE WORK.

7/85	SYSTEM	744
8/85	SYSTEM	744
9/85	SYSTEM	720
10/85	SYSTEM	744
11/85	SYSTEM	720
12/85	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE MONTHS OF JULY THROUGH DECEMBER. FGD SYSTEM OPERATION WAS REPORTED HAVING NOT ONCE CURTAILED BOILER LOAD ALL OF 1985. THE FOLLOWING OPERATING DATA WAS REPORTED FOR THE YEAR ENDING 1985: BOILER HOURS: 8142; BOILER CAPACITY FACTOR: 86%; BOILER AVAILABILITY: 92.9%; FGD SO2 REMOVAL EFFICIENCY: 83%.

A CONSULTANT WAS HIRED BY THE UTILITY TO INVESTIGATE THEIR PNEUMATIC PLUGGAGE PROBLEMS. IT WAS FIRST DETERMINED THAT THE LACK OR PRESENCE OF MOISTURE IN THE LINES WAS NOT THE PROBLEM. INITIAL INVESTIGATIONS HAVE DETERMINED THAT SOLIDS DEPOSITION IN ELBOWS WAS CAUSED BY PARTICLE IMPINGEMENT. PLUGGAGE HAS SINCE BEEN REDUCED BY LOWERING THE PNEUMATIC BLOWER SPEED (I.E., CONVEYING VELOCITIES WERE REDUCED). INVESTIGATIONS ARE STILL ONGOING.

1/86	SYSTEM	774

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PLATTE RIVER POWER AUTHORITY: RAWHIDE 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR
2/86	SYSTEM						672		
3/86	SYSTEM						774		
4/86	SYSTEM						720		
5/86	SYSTEM						774		
6/86	SYSTEM						720		
7/86	SYSTEM						774		
8/86	SYSTEM						774		
9/86	SYSTEM						720		
10/86	SYSTEM						774		
11/86	SYSTEM						720		
12/86	SYSTEM						774		

** PROBLEMS/SOLUTIONS/COMMENTS

1986 UNIT AVAILABILITY WAS 87.2%. THE CAPACITY FACTOR WAS 79.3%, AND THE UNIT OPERATING HOURS WERE APPROXIMATELY 7637.

THE UNIT RECORDED ITS FIRST ANNUAL MAJOR TURBINE OUTAGE SINCE STARTUP ON MARCH 1 - APRIL 12, 1986. NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE YEAR 1986. HOWEVER, THE UNIT WAS CURTAILED A FEW TIMES DUE TO ATOMIZER PLUGGING.

1/87	SYSTEM						744		
2/87	SYSTEM						672		
3/87	SYSTEM						744		
4/87	SYSTEM						720		
5/87	SYSTEM						744		
6/87	SYSTEM						720		
7/87	SYSTEM						744		
8/87	SYSTEM						744		
9/87	SYSTEM						720		
10/87	SYSTEM						744		
11/87	SYSTEM						720		
12/87	SYSTEM						744		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED 2 SCHEDULED UNIT OUTAGES FOR 1987. THE FIRST TOOK PLACE FROM APRIL 11 THROUGH MAY 4 FOR MAJOR BOILER/TURBINE MAINTENANCE. THE SECOND TOOK PLACE FROM OCTOBER 9 THROUGH OCTOBER 14 FOR AIR-PREHEATER CLEANING. NO FGD-RELATED UNIT OUTAGES WERE ENCOUNTERED DURING 1987 AND NO FGD-RELATED PROBLEMS WERE REPORTED BY THE UTILITY.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PLATTE RIVER POWER AUTHORITY: RAWHIDE 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

THE UTILITY REPORTED A 1987 UNIT AVAILABILITY OF 91.3%. THE CAPACITY
 FACTOR WAS 83.6% AND THE UNIT OPERATING HOURS WERE APPROXIMATELY 7995.
 THE AVERAGE SO2 REMOVAL EFFICIENCY FOR THE YEAR WAS 80.5%.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	PUBLIC SERVICE INDIANA	
PLANT NAME	GIBSON	
UNIT NUMBER	5	
CITY	PRINCETON	
STATE	INDIANA	
REGULATORY CLASSIFICATION	D	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	3250	
GROSS UNIT GENERATING CAPACITY - MW	667	
NET UNIT GENERATING CAPACITY W/FGD - MW	637	
NET UNIT GENERATING CAPACITY WO/FGD - MW	654	
EQUIVALENT SCRUBBED CAPACITY - MW	667	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	FOSTER WHEELER	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	*****	(***** ACFM)
BOILER FLUE GAS TEMPERATURE - C	*****	(**** F)
STACK HEIGHT - M	152.	(500 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	5.8	(19.0 FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	****	
AVERAGE HEAT CONTENT - J/G	*****	(***** BTU/LB)
RANGE HEAT CONTENT - BTU/LB		10282-11516
AVERAGE ASH CONTENT - %	*****	
RANGE ASH CONTENT - %	8.4-15.3	
AVERAGE MOISTURE CONTENT - %	*****	
RANGE MOISTURE CONTENT - %	****	
AVERAGE SULFUR CONTENT - %	3.30	
RANGE SULFUR CONTENT - %	2.0-4.4	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
** ESP		
NUMBER	1	
NUMBER OF SPARES	0	
TYPE	COLD SIDE	
SUPPLIER	ENVIROTECH	
INLET FLUE GAS CAPACITY - CU.M/S	1076.9	(2282000 ACFM)
INLET FLUE GAS TEMPERATURE - C	148.9	(300 F)
PARTICLE REMOVAL EFFICENCY - %	99.5	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
*** FGD SYSTEM		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

** GENERAL DATA	
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
PROCESS ADDITIVES	MAGNESIUM OXIDE
SYSTEM SUPPLIER	M.W. KELLOGG
A-E FIRM	SARGENT & LUNDY
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	86.00
ENERGY CONSUMPTION - %	2.5
CURRENT STATUS	1
COMMERCIAL START-UP	3/1983
INITIAL START-UP	10/1982
CONTRACT AWARDED	5/1979
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
** QUENCHER/PRESATURATOR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** ABSORBER	
NUMBER	4
NUMBER OF SPARES	1
GENERIC TYPE	SPRAY TOWER
SPECIFIC TYPE	OPEN CROSSCURRENT SPRAY
TRADE NAME/COMMON TYPE	HORIZONTAL SPRAY CHAMBER
SUPPLIER	PULLMAN KELLOGG
SHELL GENERIC MATERIAL	CARBON STEEL
SHELL SPECIFIC MATERIAL	AISI 1110
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A
LINER GENERIC MATERIAL	INORGANIC
LINER SPECIFIC MATERIAL	HYDRAULICALLY-BONDED MORTAR
LINER MATERIAL TRADE NAME/COMMON TYPE	PRE-KRETE G-8
GAS CONTACTING DEVICE TYPE	NONE
NUMBER OF CONTACTING ZONES	4
LIQUID RECIRCULATION RATE - LITER/S	2327. (36930 GPM)
L/G RATIO - L/CU.M	7.2 (53.5 GAL/1000 ACF)
INLET GAS FLOW - CU. M/S	325.74 (690280 ACFM)
INLET GAS TEMPERATURE - C	137.8 (280 F)
SO2 REMOVAL EFFICIENCY - %	95.0
PARTICLE REMOVAL EFFICIENCY - %	80.0
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
NUMBER PER SYSTEM	4
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
NUMBER OF STAGES	1
NUMBER OF PASSES PER STAGE	1
SUPERFICIAL GAS VELOCITY - M/S	6.7 (22.0 FT/S)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPHENYLENE
WASH WATER SOURCE	MAKEUP
WASH RATE - L/S	50.5 (800 GAL/MIN)
** FANS	
NUMBER	4
NUMBER OF SPARES	1
DESIGN	CENTRIFUGAL
SUPPLIER	GREEN FAN
FUNCTION	BOOSTER
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	365.72 (775000 ACFM)
FLUE GAS TEMPERATURE - C	143.3 (290 F)
CONSTRUCTION MATERIAL GENERIC TYPE	NR

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

** FANS	
NUMBER	2
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
SUPPLIER	WESTINGHOUSE
FUNCTION	UNIT
APPLICATION	FORCED DRAFT
SERVICE	DRY
** FANS	
NUMBER	2
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
SUPPLIER	WESTINGHOUSE
FUNCTION	UNIT
APPLICATION	FORCED DRAFT
SERVICE	DRY
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	DOWN STREAM OF ABSORBERS
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	INORGANIC
LINER SPECIFIC MATERIAL TYPE	HYDRAULICALLY-BONDED MORTAR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED
DEVICE TYPE	NR
MANUFACTURER	KENNEDY VAN SAUN
NUMBER	1
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	SLAKER
MANUFACTURER	WALLACE & TIERNAN
NUMBER	1
** PUMPS	
SERVICE	NUMBER
-----	-----
RECIRCULATION	16
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	2
NUMBER OF SPARES	1
CONFIGURATION	CIRCULAR
DIMENSIONS - FT	150.0 DIA
SHELL SPECIFIC MATERIAL TYPE	CONCRETE
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
FEED STREAM CHARACTERISTICS	10% SOLIDS
OUTLET STREAM CHARACTERISTICS	30% SOLIDS
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	VACUUM FILTER
NUMBER	4
NUMBER OF SPARES	1
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
FEED STREAM CHARACTERISTICS	30% SOLIDS
OUTLET STREAM CHARACTERISTICS	50% SOLIDS

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

*** SALEABLE BYPRODUCTS
 NATURE NONE
 DISPOSITION N/A

*** SLUDGE

** TREATMENT
 METHOD FIXATION
 DEVICE PUG MILL
 PROPRIETARY PROCESS CONVERSION SYSTEMS 'POZ-O-TEC!

** DISPOSAL
 NATURE FINAL
 TYPE LANDFILL
 SITE TREATMENT NR

** PROCESS CONTROL AND INSTRUMENTATION
 CHEMICAL PARAMETERS INLET SO2,PH
 MONITOR LOCATION ABSORBER INLET
 PROCESS CONTROL MANNER AUTOMATIC
 PROCESS CHEMISTRY MODE FEEDBACK/FEED FORWARD

** WATER BALANCE
 WATER LOOP TYPE CLOSED
 MAKEUP WATER ADDITION - LITERS/S 38.4 (609 GPM)

** CHEMICALS AND CONSUMPTION
 FUNCTION ABSORBENT
 NAME LIMESTONE
 PRINCIPAL CONSTITUENT CAC03
 POINT OF ADDITION BALL MILL

** FGD SPARE CAPACITY INDICES
 ABSORBER - % 33.3

** FGD SPARE COMPONENT INDICES
 ABSORBER 1.0

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

10/82 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT INITIAL START-UP OF THE FGD SYSTEM OCCURRED
 DURING OCTOBER, 1982.

11/82 SYSTEM 720

12/82 SYSTEM 744

1/83 SYSTEM 744

2/83 SYSTEM 672

3/83 SYSTEM 744

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED EXPERIENCING PROBLEMS WITH SLURRY REENTRAINMENT TO THE GAS STREAM RESULTING IN AN INCREASED CONCENTRATION OF PARTICULATE MATTER IN THE FLUE GAS. THE PROBLEM FORCED THEM TO LIMIT BOILER LOAD TO 410 MW.

4/83 SYSTEM 720

5/83 SYSTEM 744

6/83 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

UTILITY REPORTED THAT ITS SLURRY REENTRAINMENT PROBLEM IS BELIEVED TO BE DUE TO UNDERDESIGNED DOWNCOMERS AND DRAIN TUBES. DESIGN MODIFICATIONS WILL BE IMPLEMENTED AND TESTED ON ONE OF THE FOUR WEIR MODULES. TESTING IS SCHEDULED FOR SOMETIME IN AUGUST OR SEPTEMBER. IF TESTS ARE SUCCESSFUL, THE UTILITY PLANS TO MAKE MODIFICATIONS ON THE REMAINING 3 MODULES AND SCHEDULE A FULL LOAD COMPLIANCE TEST IN NOVEMBER.

7/83	A	27.3	27.3	100.0	27.3			
	B	98.5	98.5	99.9	98.5			
	C	75.7	75.5	99.6	75.5			
	D	95.4	95.4	99.9	95.4			
	SYSTEM	99.0	98.9	100.0	98.9	744	744	736

8/83	A	100.0	75.7	100.0	75.5			
	B	95.0	94.3	98.7	94.1			
	C	0.0	0.0		0.0			
	D	99.3	94.2	99.1	94.0			
	SYSTEM	98.1	88.1	99.3	87.9	744	742	654

9/83	A	86.7	99.9	100.0	84.6			
	B	86.0	92.8	100.0	78.6			
	C	33.3	37.7	100.0	31.9			
	D	53.3	62.8	100.0	53.2			
	SYSTEM	86.4	97.7	100.0	82.8	720	610	596

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE TESTS WERE SUCCESSFUL AND THE MODIFICATIONS WILL BE IMPLEMENTED ON THE REMAINING 3 MODULES. THE MODIFICATIONS SEEMED TO HAVE SOLVED THEIR WATER CARRYOVER AND OPACITY PROBLEMS. THE UNIT WILL UNDERGO CERTIFICATION IN NOVEMBER.

THE SYSTEM SUPPLIER IS PRESENTLY WORKING TO SOLVE A HIGH ABSORBER FLUE GAS VELOCITY PROBLEM. THE DESIGN AND ACTUAL FLUE GAS VELOCITIES ARE 24.5 AND 60.0 FT/SEC, RESPECTIVELY. THE SUPPLIER BELIEVES THAT THE SLURRY SPRAY FROM THE HIGH PRESSURE NOZZLES IS COMPRESSING THE GAS FLOW AND SUBSEQUENTLY CAUSING POOR GAS DISTRIBUTION AND HIGHER THAN DESIGN GAS VELOCITIES. THE SUPPLIER PLANS TO TEST LOW PRESSURE NOZZLES AND/OR INSTALL GAS DISTRIBUTION VANES.

CORROSION WAS REPORTED IN THE LOWER PLENUM ON THE BYPASS REHEAT DUCT. GIBSON 5 USES TWO TYPES OF REHEAT, DEPENDING UPON THE SULFUR CONTENT OF THE COAL BEING BURNED. PRIMARY REHEAT IS DONE WITH 17-20% BYPASS WHEN BURNING PERFORMANCE COAL. THE INDIRECT HOT AIR STEAM HEAT EXCHANGERS ARE ONLY USED WHEN THEY HAVE TO BYPASS LESS WHEN THE SULFUR CONTENT OF THE COAL GETS TOO HIGH.

10/83 A 9.7 25.2 100.0 2.6

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	B	100.0	100.0	100.0	11.3						
	C	100.0	94.2	100.0	9.5						
	D	0.0	0.0		0.0						
	SYSTEM	69.9	73.1	100.0	7.8		744	75	58	2.8	

** PROBLEMS/SOLUTIONS/COMMENTS

MODULES A AND D WERE NOT AVAILABLE DURING OCTOBER DUE TO ABSORBER WATER CARRYOVER PROBLEMS. THE SYSTEM SUPPLIER IS MAKING MODIFICATIONS.

11/83	A	63.6	85.0	100.0	76.9					
	B	46.9	51.8	100.0	46.9					
	C	94.7	93.9	100.0	85.0					
	D	53.2	34.7	100.0	31.4					
	SYSTEM	86.2	88.4	100.0	80.1		720	652	577	

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED OUTAGES WERE REPORTED DURING NOVEMBER 1983.

12/83	A	91.9	89.4	100.0	89.0					
	B	0.0	0.0		0.0					
	C	96.8	92.0	100.0	91.5					
	D	92.7	82.5	100.0	82.1					
	SYSTEM	93.8	88.0	100.0	87.5		744	740	651	

** PROBLEMS/SOLUTIONS/COMMENTS

DURING DECEMBER, MODIFICATIONS WERE BEING MADE BY THE VENDOR AT THE B MODULE TO CORRECT A DRAINAGE PROBLEM FROM THE ABSORBER TO THE REACTOR.

1/84	A	59.8	58.3	98.4	58.3					
	B	62.0	62.0	100.0	62.0					
	C	70.0	70.0	99.0	70.0					
	D	73.0	61.0	100.0	61.0					
	SYSTEM	88.3	83.8	100.0	83.8		744	744	623	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT ONE MODULE WAS DOWN DURING THE MONTH FOR DESIGN MODIFICATIONS.

THE REMAINING MODULES WERE HELD OUT APPROXIMATELY TWO DAYS EVERY TWO TO THREE WEEKS FOR MIST ELIMINATOR CLEANING.

2/84	A	97.0	70.7	91.4	29.0					
	B	100.0	62.0	96.2	25.4					
	C	84.8	34.0	100.0	13.9					
	D	100.0	96.6	100.0	39.7					
	SYSTEM	100.0	87.8	100.0	36.0		696	286	251	

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING FEBRUARY.

3/84	A	76.5	67.1	100.0	55.2					
	B	94.5	92.4	100.0	76.1					
	C	96.0	90.8	100.0	74.7					
	D	60.5	66.9	100.0	55.1					
	SYSTEM	100.0	100.0	100.0	87.1		744	613	648	

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

SLURRY RECIRCULATION SPRAY NOZZLES WERE CLEANED DURING MARCH.

THE REACTOR BLOW DOWN VALVES OF MODULES A AND D WERE REPLACED DURING MARCH

MODULE A AND D REACTOR VENT BLOWER WERE REBUILT, AND THE REACTOR VENT BLOWER BEARINGS OF MODULE C WERE REPLACED DURING THE MONTH.

THE REACTOR SUMP PUMP SUCTION VALVES OF MODULE D WERE REBUILT DURING MARCH

MODULE D BOOSTER FAN BEARINGS WERE REPLACED DURING THE MONTH.

THE MIST ELIMINATOR STIFFENERS FOR MODULE D WERE INSTALLED DURING MARCH.

MODULE B AND D FILTER DRUMS WERE RECLOTHED DURING THE MONTH.

THE BALL MILL SUMP PUMPS OF MODULES A AND B WERE REBUILT DURING MARCH.

A BROKEN SCREW IN THE MODULE B FLYASH ADDITIVE LIME SCREW CONVEYOR CAUSED ADDITIONAL OUTAGE TIME IN MARCH.

A BROKEN SUPPORT BEAM IN MODULE A CONTRIBUTED TO FGD OUTAGE DURING THE MONTH.

THE UTILITY REPORTED REPLACING SLURRY FEED PUMP BELTS DURING MARCH.

4/84	A	0.0	0.0		0.0			
	B	23.3	100.0	100.0	22.2			
	C	23.3	94.8	100.0	21.0			
	D	20.0	78.5	82.8	17.4			
	SYSTEM	22.2	91.1	94.7	20.2	720	159	145

** PROBLEMS/SOLUTIONS/COMMENTS

THE FLYASH SILO BAG FILTERS OF MODULE B WERE REPLACED DURING THE MONTH.

A UNIT OUTAGE OCCURRED FROM APRIL 8 TO MAY 7, 1984, DURING WHICH TIME NUMEROUS REPAIRS WERE MADE.

THE 117 LA SLAKER WAS REBUILT DURING APRIL.

THE FOLLOWING FAN REPAIRS WERE MADE DURING THE APRIL UNIT OUTAGE:

- (1) MODULE A'S REACTOR VENT BLOWER WAS REPLACED.
- (2) MODULE C'S REACTOR VENT BLOWER BEARINGS WERE REPLACED.
- (3) THE BOOSTER FANS OF MODULES A, B AND C WERE INSPECTED.

THE MIST ELIMINATOR TRAYS OF MODULES A AND C WERE REBUILT DURING APRIL.

THE FOLLOWING VALVE REPAIRS WERE MADE DURING THE APRIL UNIT OUTAGE:

- (1) THE REPLACEMENT OF TWO REACTOR VENT BLOWER CHECK VALVES.
- (2) THE RUBBER BOOT ON THE SUCTION VALVE OF UNDER FLOW PUMP, B-2, WAS REPLACED.
- (3) THE MANUAL BLOCKING VALVE ON UNDERFLOW PUMP, B-2, WAS REPLACED.
- (4) THE SLURRY RECIRCULATION PUMP SUCTION VALVES OF MODULES B AND C WERE REPACKED.

THE FOLLOWING PUMP REPAIRS WERE MADE DURING THE APRIL UNIT OUTAGE:

- (1) THE SLURRY FEED PUMPS OF MODULES A, B AND C WERE REBUILT.
- (2) THE SEAL WATER BOOSTER PUMPS OF MODULES A AND B WERE REBUILT.
- (3) THE SLURRY RECIRCULATION PUMPS, A-1 THROUGH A-4 AND B-1 THROUGH B-4, WERE REPACKED.
- (4) THE SLURRY RECIRCULATION PUMP, A-1, WAS REBUILT (NEW PROPELLER, SLEEVE

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

SEALS, RUBBER LINE).

(5) THE SLURRY RECIRCULATION PUMP, B-3, WAS REBUILT.

(6) THE SLURRY RECIRCULATION PUMP OIL OF MODULES A, B AND C WAS CHANGED.

THE SLURRY RECIRCULATION SPRAY NOZZLES WERE CLEANED DURING APRIL.

THE FOLLOWING BALL MILL REPAIRS WERE MADE DURING THE APRIL UNIT OUTAGE:

(1) MAIN JOURNAL BEARINGS WERE REPACKED.

(2) CLUTCH BOOTS WERE REPLACED.

(3) OIL WAS CHANGED.

(4) FEED CHUTE, TROMMEL SCREEN, OUTLET DISCHARGE HOOD AND DISSECTOR VALVE WERE REPLACED.

THE PUG MILL BEARINGS, SEALS, SLEEVES, WIPERS AND OIL WERE REPLACED DURING THE APRIL UNIT OUTAGE.

THE SURGE TANK AGITATOR RUBBER LINING WAS REPLACED DURING APRIL.

DURING APRIL, THE OUTLET DUCTWORK WAS CLEANED OF SLURRY AND SLUDGE. ALSO, APPROXIMATELY 20% OF THE PRE-KRETE WAS REPLACED.

5/84	A	0.0	0.0	0.0				
	B	65.5	87.9	100.0	61.8			
	C	71.0	87.7	100.0	61.7			
	D	71.0	74.4	99.2	52.3			
	SYSTEM	69.1	83.3	99.7	58.6	744	523	436 38.7

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS OUT OF SERVICE DURING MAY TO CHANGE MIST ELIMINATOR SUPPORTS.

THE SLEEVES AND THROAT LINES OF SLURRY RECIRCULATION PUMPS, C-1, C-2, C-3 AND A-2, WERE INSTALLED DURING MAY.

THE 117L SLAKER WAS REBUILT DURING MAY.

THE BALL MILL CLASSIFIER WAS REBUILT DURING THE MONTH.

THE REACTOR SLURRY RECIRCULATION PUMP SUCTION VALVES OF MODULE C WERE REPACKED DURING MAY.

6/84	A	89.4	81.4	100.0	81.4			
	B	96.5	88.2	100.0	88.2			
	C	63.9	42.2	100.0	42.2			
	D	80.7	75.0	100.0	75.0			
	SYSTEM	100.0	95.6	100.0	95.6	720	720	688 70.8

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE C WAS OUT OF SERVICE FOR SEVEN DAYS DURING JUNE DUE TO MIST ELIMINATOR MODIFICATION.

THE FOLLOWING VALVE REPAIRS WERE MADE DURING JUNE:

(1) THE VACUUM FILTER REGULATING VALVE BOOTS OF MODULES 5B AND 5C WERE REPLACED.

(2) THE FILTER FEED PUMP RECIRCULATION VALVE OF MODULE 5A WAS REBUILT.

(3) THE SUCTION VALVES OF THICKENER UNDERFLOW PUMPS, 5A-1 AND 5A-2, WERE REBUILT.

(4) 117L AND 117LA SLAKER TORQUE VALVES WERE REPLACED.

(5) THE A-2 MIST ELIMINATOR VALVE WAS REPLACED.

THE 117LA SLAKER BELT WAS REPLACED DURING JUNE.

THE VACUUM FILTER DRUM OF MODULE C WAS REWIRED DURING JUNE.

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR

DURING THE MONTH, THE SLEEVE AND THROAT RING OF RECIRCULATION PUMP, D-1, WERE REBUILT, AND THE 5A-1 UNDERFLOW PUMP WAS REBUILT.										
MODULES C AND D ABSORBER SPRAY NOZZLES WERE CLEANED DURING JUNE.										
7/84	A	88.7	83.0	100.0	80.4					
	B	50.1	32.2	100.0	31.2					
	C	61.8	34.7	99.6	33.6					
	D	96.6	89.1	99.8	86.3					
	SYSTEM	99.1	79.6	100.0	77.2		744	721	574	48.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE MIST ELIMINATOR BRACING OF MODULES B AND C WAS MODIFIED DURING JULY.

THE 5B SLAKER WEIGH FEEDER BELT WAS REPLACED DURING THE MONTH.

THE ABSORBER NOZZLES OF MODULE B WERE CLEANED DURING JULY.

THE EXPANSION JOINTS ON THE FLYASH ROTARY FEEDERS 5A AND 5B WERE REPLACED DURING JULY.

THE UTILITY REPORTED THAT THE EXPANSION BOOT FOR THE ADDITIVE AND DOLOMITI LIME SILOS LIVE BOTTOM WAS REPLACED DURING THE MONTH.

THE FILTER BAGS IN THE ADDITIVE AND DOLOMITIC LIME DAY BIN DUST COLLECTORS WERE REPLACED DURING JULY.

DURING JULY, NEW METAL WAS WELDED ONTO THE BALL MILL CENTER PARTITION IN AREAS OF EXCESSIVE WEAR.

THE 5A9 MIST ELIMINATOR VALVE WAS REPLACED DURING JULY.

THE REGULATING VALVE BOOT WAS REPLACED ON FILTER VAT 5A DURING JULY.

FILTER DRUM 5A RECEIVED A NEW WIRE WRAP DURING JULY.

8/84	A	68.4	47.8	100.0	42.9					
	B	80.8	83.0	88.4	74.5					
	C	87.4	92.0	89.1	82.5					
	D	34.9	33.0	100.0	29.6					
	SYSTEM	90.5	85.3	100.0	76.5		744	667	569	51.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT SLAKER REPAIRS WERE MADE DURING THE MONTH OF AUGUST.

REPAIRS WERE MADE ON THE BALL MILL DURING THE MONTH OF AUGUST.

A RUBBER EXPANSION JOINT WAS REPLACED ON THE LIME SILO.

A REACTOR VENT BLOWER WAS REBUILT DUE TO BAD INBOARD BEARINGS.

MODULES A,B,C,D UNDERWENT ROUTINE PUMP MAINTENANCE.

SLURRY CIRCULATION PUMP VALVES WERE REPLACED DUE TO LEAKS.

THE UTILITY REPORTED THAT THE FGD SYSTEM SUPPLIER MADE DESIGN MODIFICATION DURING THE MONTH.

PRECRETE AND FLAKEGLASS ABSORBER LININGS WERE REPAIRED.

SLURRY SPRAY NOZZLES WERE CLEANED DURING AUGUST.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

MIST ELIMINATOR SUPPORT BEAMS WERE REPLACED DURING THE MONTH.

AN INLET SLIDE GATE DAMPER WAS REPLACED DURING AUGUST.

THE UTILITY REPORTED THAT A VACUUM FILTER CLOTH WAS REPLACED DURING AUGUST

BAGS AND SEPARATOR STONES WERE REPLACED ON THE FLY ASH SILO.

9/84	A	50.3	46.3	100.0	46.3				
	B	96.4	83.5	100.0	83.5				
	C	83.9	56.0	100.0	56.0				
	D	93.9	81.1	100.0	81.1				
	SYSTEM	100.0	88.9	100.0	88.9	720	720	640	57.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE 5C SLURRY FEED PUMP WAS REBUILT DURING THE MONTH OF SEPTEMBER.

THE UTILITY CHANGED THE GEARS ON REACTOR AGITATORS 5A-1, 5A-2, AND 5A3.

REPAIRS WERE MADE TO THE 5A ABSORBER SUMP PUMP.

THE 4C EXPANSION JOINT WAS REPLACED DURING SEPTEMBER.

THE PACKING WAS CHANGED ON THE SLURRY CIRCULATION PUMPS ON MODULES 5A-1 5A-2, 5A-3, AND 5A-4.

THE FLAKEGLASS MIST ELIMINATOR WASH HEADERS WERE REPAIRED ON MODULE 5C.

THE BAGS WERE REPLACED IN THE COLLECTOR ASH SILO OF MODULE 5A.

10/84	A	83.7	75.4	100.0	75.4				
	B	91.4	78.6	100.0	78.6				
	C	96.2	80.0	100.0	80.0				
	D	55.6	50.7	100.0	50.7				
	SYSTEM	100.0	94.9	100.0	94.9	744	744	706	67.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE FOLLOWING FGD MAINTAINENCE WAS CONDUCTED DURING OCTOBER:

- (1) BALLS WERE ADDED TO THE BALL MILL.
- (2) REPAIRED TORQUE VALVE ON THE 5A SLAKER.
- (3) REPAIRED BROKEN VALVE ARM ON 5B THICKENER.
- (4) REPLACED CLOTH ON THE 5A VACUUM FILTER.
- (5) REPLACED SECTION OF PARTITION LINER IN BALL MILL.
- (6) REPLACED BELT ON BOTH THE 5A AND 5B SLAKERS.
- (7) INSTALLED ROPE AND WIRE ON NEW CLOTH OF THE 5C VACUUM FILTER.
- (8) REBUILT THE PURGE AIR FAN FOR THE REHEAT SYSTEM.
- (9) REPLACED THE EMERGENCY POND LINE FLUSH WATER VALVES.
- (10) REPLACED THE PACKING HOUSING SLEEVE AND IMPELLER ON 5D1 SLURRY CIRCULATION PUMP.
- (11) REPLACED THE THROAT LINER AND IMPELLER ON THE 5D3 SLURRY CIRCULATION PUMP.
- (12) REPLACED PACKING ON THE 5D1 AND 5D4 SLURRY CIRCULATION PUMPS.
- (13) CHANGED LUBE OIL IN 5D BOOSTER FAN.
- (14) REPLACED ONE SECTION IN THE 5D MIST ELIMINATOR.

11/84	A	23.3	92.1	100.0	20.7				
	B	6.7	29.4	100.0	6.6				
	C	23.3	89.7	100.0	20.1				
	D	16.7	25.4	100.0	5.7				
	SYSTEM	23.3	78.8	100.0	17.7	720	162	128	9.1

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE FOLLOWING FGD MAINTAINENCE WAS CONDUCTED DURING NOVEMBER:

- (1) REPLACED PACKING, ADJUSTED IMPELLER AND BELTS AND CHANGED OIL ON 5C1 5C2, 5C3, AND 5C4 SLURRY CIRCULATION PUMPS.
- (2) CHANGED THE OIL ON THE FILTRATE PUMPS (5A - 5D) FEED PUMPS (5A - 5D) BALL MILL GEAR BOX, BALL MILL BEARINGS AND BOOSTER FAN TURNING GEAR AND CLUTCHES.
- (3) REPLACED OUTBOARD BEARINGS ON PUG MILL MIXER.
- (4) REPLACED AND REPAIRED 5A - 5D MIST ELIMINATORS.
- (5) REPLACED PACKING IMPELLERS, AND CHANGED THE OIL ON 5B AND 5C SLURRY FEED PUMPS.
- (6) REPAIRED REACTOR BLOWDOWN VALVES AND SUCTION AND DISCHARGE SLURRY FEED PUMP VALVES.
- (7) REBUILT 5A AND 5C REACTOR VENT BLOWERS.
- (8) REPLACED 5A1 THICKENER UNDERFLOW PUMP RUNNER.
- (9) CLEANED AND INSPECTED 5A - 5D BOOSTER FANS.
- (10) REPAIRED BALL MILL.
- (11) REPAIRED FLY ASH SILO.
- (12) REBUILT 5A AND 5B SLAKERS.
- (13) REPAIRED RUBBER ON ALL AGITATORS WHERE NEEDED.
- (14) REPAIRED PRE-KRETE AND POLYESTER LININGS ON ABSORBERS AND PORTIONS OF DUCT WORK.
- (15) REBUILT REACTOR SLURRY FEED VALVES.
- (16) REPLACED SCRAPER BLADES ON FIXATION CONVEYOR BELTS.
- (17) REPLACED BELT ON AGGREGATE CONVEYOR.

12/84	A	98.8	72.4	100.0	62.6				
	B	54.8	42.2	100.0	36.6				
	C	96.5	61.0	100.0	52.8				
	D	96.2	93.6	100.0	81.0				
	SYSTEM	100.0	89.8	100.0	77.7	744	644	578	46.9

** PROBLEMS/SOLUTIONS/COMMENTS

THE FOLLOWING FGD MAINTAINENCE WAS CONDUCTED DURING DECEMBER:

- (1) REPLACED BEARINGS ON THE 5A AND 5B LIME/FLY ASH SCREW CONVEYOR.
- (2) REPLACED SLURRY CIRCULATION AND FEED PUMPS ON 5A2 AND 5B RESPECTIVELY.
- (3) REPLACED BROKEN COUPLING ON THE 5B LIME/FLY ASH SCREW CONVEYOR.
- (4) REPLACED GEAR BOX ON THE 5A SLAKER.
- (5) REBUILT THE 5A REACTOR VENT BLOWER.
- (6) REPLACED THE REHEAT EXPANSION JOINT ON MODULE 5A.
- (7) MODIFIED PIPING ON THE PUG MILL.
- (8) REBUILT THE 5A AND 5B LIME/FLY ASH SCREW CONVEYOR.

1/85	A	100.0	96.6	99.1	62.6				
	B	93.5	17.4	100.0	11.3				
	C	88.7	77.9	98.9	50.5				
	D	93.8	91.4	99.1	59.3				
	SYSTEM	100.0	94.4	100.0	61.2	744	483	456	35.2

** PROBLEMS/SOLUTIONS/COMMENTS

BELT REPAIRS WERE PERFORMED ON BOTH THE MIXER FEED CONVEYOR AND COKE TRANSFER CONVEYORS IN THE WASTE HANDLING SYSTEM.

SUCTION PIPING MODIFICATIONS TO THE PUG MILL DUST COLLECTOR WERE COMPLETED.

TWO FILTER FEED VALVES WERE REPLACED.

RECYCLE PUMPS ON MODULES A AND D WERE REPACKED DURING THE MONTH. ONE OF

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

THE MODULE D PUMPS REQUIRED A MOUNTING BRACKET REPAIR.

WORK WAS UNDERTAKEN TO BUILD UP THE BALL MILL INTERNAL PARTITIONING.

THE MODULE C MIST ELIMINATOR TRAYS WERE REPAIRED DURING THE MONTH.

THE UTILITY REPORTED THAT PREKRETE REPAIR WORK WAS PERFORMED ON MODULE C AND D ABSORBERS.

THE MODULE B VACUUM FILTER CLOTH WAS REPLACED DURING THE PERIOD.

SLAKER REPAIR WORK WAS PERFORMED ON MODULES A AND B DURING THE MONTH. THE REPAIRS INCLUDED FEED BELT AND STRAINER WORK.

LIME DAY BIN TRUCK UNLOADING LINE REPAIR AND REPLACEMENT WORK WAS PERFORMED IN JANUARY.

2/85	A	72.9	49.9	100.0	41.1				
	B	90.8	70.8	100.0	58.3				
	C	100.0	95.6	100.0	78.7				
	D	96.4	72.6	100.0	59.8				
	SYSTEM	100.0	96.3	100.0	79.3	672	554	533	49.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPLACED A FEED BELT ON THE B-MODULE SLAKER.

VALVE REPLACEMENTS WERE REPORTED FOR THE WASTE HANDLING FILTER FEED SYSTEM.

SLURRY PUMP REPAIRS DURING THE MONTH INCLUDED BELT REPLACEMENT AND REPACKING. AN UNDERFLOW PUMP WAS TAKEN OFF LINE FOR AN INSPECTION.

REPAIRS WERE MADE TO A FLY ASH SILO ROTARY VALVE DURING FEBRUARY. SHAFT AND SCREW REPLACEMENTS WERE MADE TO THE FLY ASH SCREW CONVEYOR AND BAG AND CAGE REPLACEMENTS WERE PERFORMED ON THE FLY ASH DUST COLLECTOR.

THE UTILITY PERFORMED REPAIR WORK ON THE MODULE B MIST ELIMINATOR TRAYS DURING THE MONTH.

3/85	A	87.8	57.3	100.0	57.3				
	B	92.9	92.9	100.0	92.9				
	C	87.0	86.0	100.0	86.0				
	D	85.3	65.7	100.0	65.7				
	SYSTEM	100.0	100.0	100.0	100.0	744	744	744	69.7

** PROBLEMS/SOLUTIONS/COMMENTS

REACTOR VENT BLOWERS ON MODULES A AND B WERE REBUILT DURING THE MONTH.

A GEAR BOX WAS REPLACED ON THE LIMESTONE FEEDER DRAG CHAIN EQUIPMENT.

THE BOOSTER FAN LUBE OIL PUMP WAS REPLACED ON MODULE D AND THE MODULE A BOOSTER FAN UNDERWENT AN INLET VANE DRIVE ARM REPLACEMENT.

THE MODULE B VACUUM FILTER CLOTH WAS REPLACED DURING THE MONTH.

A PUG MILL DUST COLLECTOR DRAG CHAIN WAS REPAIRED AND A PADDLE WAS REPLACED IN MARCH.

SLURRY RECYCLE PUMPS ON MODULES A AND D WERE PULLED FOR REPACKING DURING THE MONTH.

THE UTILITY REPORTED SOME MODULE D DOWNTIME TO REPAIR A SLURRY RECYCLE

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

PUMP BLOWDOWN LINE.

WORK ON THE SLAKER IN MARCH INCLUDED GEAR BOX REPAIR/REPLACEMENT AND WEIGH
 FEEDER BELT REPLACEMENT.

THE QUICK LINKS ON A FLYASH/LIME SCREW CONVEYOR WERE REPLACED.

4/85	A	60.0	86.5	100.0	54.6				
	B	49.3	55.7	100.0	35.1				
	C	64.7	73.0	100.0	46.1				
	D	53.3	60.7	100.0	38.3				
	SYSTEM	75.8	92.0	100.0	58.1	720	455	418	36.1

** PROBLEMS/SOLUTIONS/COMMENTS

BELTS WERE TIGHTENED ON A SLURRY RECYCLE PUMP ON MODULE A. A THICKENER
 OVERFLOW PUMP AND SEAL WATER BOOSTER PUMP ON MODULE A WERE REBUILT DURING
 THE MONTH.

A MODULE B VACUUM FILTER BLADE REPLACEMENT TOOK PLACE IN APRIL.

THE UTILITY REPORTED A VALVE REPLACEMENT IN THE MAKE-UP WATER SYSTEM TOOK
 PLACE IN APRIL.

A PILLOW BLOCK BEARING ON A LIME/ASH SCREW CONVEYOR REQUIRED REPLACEMENT.

THE MODULE A REACTOR VENT BLOWER WAS REBUILT DURING THE PERIOD.

5/85	A	38.7			0.0				
	B	38.7			0.0				
	C	38.7			0.0				
	D	38.7			0.0				
	SYSTEM	51.6			0.0	744	0	0	

** PROBLEMS/SOLUTIONS/COMMENTS

PREKRETE AND FLAKEGLASS LININGS IN DUCT AREAS WERE REPAIRED. IN ONE DUCT
 RUN NOTED THE PREKRETE MATERIAL WAS REPLACED WITH ALLOY C-276.

THE SLUDGE FIXATION PROCESS SCREW CONVEYORS WERE REBUILT DURING THE
 PERIOD. A FLYASH TRANSPORT BLOWER WAS REPLACED AND A COKE TRANSFER
 CONVEYOR BELT WAS REPLACED.

THE UTILITY REPORTED 32 DIFFERENT VALVE REPAIR AND/OR REPLACEMENTS
 OCCURRED DURING THE MONTH. THE VALVES WERE IDENTIFIED AS BLOWDOWN, SLURRY
 FEED, REACTOR VENT BLOWER CHECK, VACUUM DISTRIBUTOR, BALL MILL RECYCLE AND
 OTHER TYPES.

PREKRETE REPAIR WAS PERFORMED ON ABSORBERS DURING THE MONTH.

THE PUG MILL MIXER AND DUST COLLECTOR WERE REBUILT.

DURING MAY A FLUIDIZING BLOWER AND FLYASH SILO FLUIDIZING STONES WERE
 REPLACED. IN ADDITION, FLYASH SILO PRIMARY SEPARATOR AND SLIDE GATES WERE
 REBUILT.

THE A AND B MODULE BALL MILL SUMP PUMPS WERE REBUILT. SLURRY RECYCLE
 PUMPS ON MODULES A, B, C AND D WERE REBUILT. SLURRY FEED PUMPS ON MODULES
 B AND C WERE REBUILT AS WERE THE THICKENER OVERFLOW PUMPS ON MODULES A AND
 B.

A BALL MILL CLUTCH WAS REBUILT IN MAY. ALSO A LINER WAS REPLACED AND
 PARTITION REMOVED.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

MODULE C AND D BOOSTER FANS WERE INSPECTED AND REPAIRED DURING THE MONTH.

FOUR EXPANSION JOINTS WERE REPLACED IN MAY.

A FILTER CLOTH WAS REPLACED ON THE MODULE A VACUUM FILTER IN MAY.

THE MODULE A AND B SLAKERS WERE REBUILT.

6/85	A	100.0	89.7	100.0	18.1				
	B	100.0	0.0		0.0				
	C	100.0	25.5	100.0	5.1				
	D	100.0	74.5	100.0	15.0				
	SYSTEM	100.0	63.2	100.0	12.7	720	145	92	8.4

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR REPAIR WORK WAS PERFORMED IN JUNE.

7/85	A	94.6	83.6	100.0	83.6				
	B	84.9	37.6	100.0	37.6				
	C	82.8	72.7	100.0	72.7				
	D	95.4	48.9	100.0	48.9				
	SYSTEM	100.0	81.0	100.0	81.0	744	744	602	44.2

** PROBLEMS/SOLUTIONS/COMMENTS

A MODULE C SLURRY RECYCLE PUMP SUCTION VALVE WAS REPAIRED DURING THE MONTH.

THE BEARINGS WERE REPLACED ON AN A-MODULE SLURRY FEED PUMP. THE THICKENER OVERFLOW PUMP ON MODULE B REQUIRED REPLACEMENT OF A BROKEN SHAFT.

THE FLYASH SEPARATOR FLUIDIZING STONES ON THE A-MODULE WERE REPLACED AS WAS THE FLOP GATE ACTUATOR.

THE UTILITY REPORTED THAT THE VACUUM FILTER ON MODULE B REQUIRED WORM GEAR BEARING REPLACEMENT AND THE MODULE C VACUUM FILTER DRUM WAS REWRAPPED.

A LIME TRANSFER BLOWER WAS REPLACED.

A PUG MILL MIXER OUTBOARD BEARING WAS REPLACED.

ABSORBER NOZZLE CLEANING WAS PERFORMED ON MODULE A IN JULY.

8/85	A	87.6	100.0	98.3	62.5				
	B	85.6	100.0	100.0	67.7				
	C	63.4	67.6	100.0	41.7				
	D	87.1	100.0	100.0	62.9				
	SYSTEM	100.0	100.0	100.0	78.3	744	459	582	42.8

** PROBLEMS/SOLUTIONS/COMMENTS

A NEW WEIGH FEEDER GEAR BOX WAS INSTALLED ON THE MODULE B SLAKER DURING THE PERIOD.

SUPPORT BEAMS WERE REPAIRED ON THE MODULE A MIST ELIMINATORS.

DURING THE MONTH THE UTILITY REPORTED THAT A DRAG CHAIN GEAR BOX WAS REPLACED ON A PUG MILL DUST COLLECTOR.

THE 72-INCH LIFTER IN THE A-MODULE BALL MILL LINER WAS REPLACED IN AUGUST.

FILTER CLOTH REPLACEMENTS TOOK PLACE ON THE MODULE A, C AND D VACUUM FILTERS DURING THE MONTH. A DRIVE BELT REPLACEMENT WAS MADE ON THE MODULE

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

B UNIT.

VALVE BOOT REPLACEMENT WAS PERFORMED ON TWO VALVES, ONE SLURRY RECYCLE PUMP SUCTION VALVE WAS REPLACED, AND AN OPERATOR DIAPHRAGM AND VALVE UNIT WERE REPLACED.

THE CHAIN TIE DOWN BOLTS ON THE A-MODULE OUTLET SLIDE GATE WERE REPAIRED.

9/85	A	85.3	83.4	100.0	76.4				
	B	85.0	50.3	100.0	46.1				
	C	74.0	49.0	100.0	44.9				
	D	82.9	70.0	100.0	64.2				
	SYSTEM	100.0	84.2	100.0	77.2	720	660	556	45.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE MODULE D BOOSTER FAN INLET VANES WERE CLEANED, THE BALLS AND BUSHINGS WERE FREED UP AND THE LINKAGE WAS REPLACED DURING THE MONTH.

THE PREKRETE LINER MATERIAL IN THE D-MODULE ABSORBER WAS REPAIRED.

THREE VALVES WERE REBUILT DURING THE MONTH. TWO WERE PART OF THE SLURRY FEED SYSTEM.

ONE EXPANSION JOINT REPLACEMENT WAS REPORTED DURING SEPTEMBER.

WEIGH FEEDER BELT AND BROKEN PADDLE SHAFT REPLACEMENTS TOOK PLACE ON THE MODULE B SLAKER DURING THE PERIOD.

THE UTILITY REPORTED PUMP WORK ON MODULES B, C AND D. A B-MODULE REACTOR SUMP PUMP WAS REBUILT, A SLURRY RECYCLE PUMP MOTOR BELT SHEAVE WAS REPLACED ON MODULE D, AND BELTS WERE REPLACED ON A MODULE C SLURRY RECYCLE PUMP.

THE MODULE A VACUUM FILTER DRUM DRIVE WAS REBUILT AND THE MODULE B FILTER CLOTH WAS REPLACED IN SEPTEMBER.

10/85	A	90.9	60.8	99.1	60.1				
	B	93.7	81.6	100.0	80.6				
	C	83.6	82.3	100.0	81.3				
	D	90.3	44.3	97.9	43.8				
	SYSTEM	100.0	89.7	100.0	88.6	744	735	659	61.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE MODULE A FILTER FEED PUMP WAS REBUILT AND THE MODULE B FILTRATE PUMP RECYCLE BOOT WAS REPLACED. PACKING REPLACEMENT WORK WAS PERFORMED ON THE A-MODULE SEAL WATER BOOSTER PUMP.

THE BEARING AND COUPLING SHAFT WERE REPLACED AND A CRACK WAS REPAIRED ON THE B-MODULE LIME/FLYASH SCREW CONVEYOR.

THE MODULE A SLAKER WEIGH FEEDER BELT AND ROLLER BEARING WERE REPLACED. THE MODULE B SLAKER FEEDER WAS REBUILT.

11/85	A	86.1	66.1	100.0	66.1				
	B	79.6	71.1	100.0	71.1				
	C	81.5	74.3	100.0	74.3				
	D	66.4	55.3	100.0	55.3				
	SYSTEM	100.0	88.9	100.0	88.9	720	720	640	59.0

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

FLAKE GLASS AND PREKRETE REPAIR WORK WAS PERFORMED IN THE MODULES A, B AND C ABSORBERS AND A HOLE IN A C MODULE ABSORBER WALL WAS REPAIRED DURING THE MONTH.

THE BAG FILTERS ON THE MODULE A AND B FLYASH SILOS UNDERWENT BAG AND CAGE REPLACEMENT DURING NOVEMBER.

A MODULE C BOOSTER FAN OIL PUMP WAS REPLACED DURING NOVEMBER.

THE PACKING WAS REPLACED ON A MODULE B SLURRY RECYCLE PUMP. A LINER AND PACKING SLEEVE WAS REPLACED IN ONE MODULE D PUMP AND THE PACKING IN ANOTHER, AND THE OIL WAS CHANGED IN TWO MODULE C PUMPS. THE UTILITY REPLACED THE BEARINGS AND LINING IN THE MODULE B FILTRATE PUMP AND REPLACED A SUCTION SIDE LINER AND IMPELLER IN THE A-MODULE BALL MILL SUMP PUMP.

A TORQUE VALVE WAS REPLACED ON THE MODULE A SLAKER.

A BEARING AND BRACKET REPLACEMENT WAS PERFORMED ON A LIME SCREW CONVEYOR.

THE UTILITY REPORTED THAT THE LINER WAS REPLACED IN A BALL MILL CYCLONE CLASSIFIER DURING THE PERIOD.

THE UTILITY REBUILT A PUG MILL DUST COLLECTOR BLOWER IN NOVEMBER.

12/85	A	74.3	60.5	98.7	60.1				
	B	80.6	72.2	98.9	71.6				
	C	79.3	74.8	100.0	74.2				
	D	83.9	63.0	98.7	62.5				
	SYSTEM	100.0	90.1	100.0	89.5	744	738	666	60.4

** PROBLEMS/SOLUTIONS/COMMENTS

A MIST ELIMINATOR VALVE AND A FILTER FEED PUMP RECYCLE VALVE RUBBER BOOT WERE REPLACED DURING THE MONTH.

A FLYASH SILO EXHAUSTER BLOWER WAS REMOVED AND REPLACED IN DECEMBER.

THE UTILITY REPORTED THAT A SLAKER WEIGH FEEDER BELT WAS REPLACED.

A BEARING REPLACEMENT WAS PERFORMED ON A LIME/FLYASH SCREW CONVEYOR AND SCRAPER BLADES WERE REPLACED ON A FIXATION PROCESS CONVEYOR. A FIXATION PROCESS AIR DRYER WAS ALSO REPAIRED DURING THE MONTH.

THE MODULE A AND C BOOSTER FANS UNDERWENT OIL CHANGES DURING DECEMBER.

A PUG MILL DUST COLLECTOR UNDERWENT A SHAFT AND BEARING REPLACEMENT IN DECEMBER.

PREKRETE AND/OR FLAKE GLASS ABSORBER LINER REPAIR WORK WAS PERFORMED ON MODULES A, B, C AND D.

1/86	A	63.2	63.3	100.0	51.5				
	B	67.7	68.4	100.0	55.6				
	C	68.0	67.6	100.0	55.0				
	D	67.5	65.4	100.0	53.2				
	SYSTEM	88.8	88.2	100.0	71.8	744	605	534	46.1

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE INLET SLIDE GATE ON MODULES A AND B WAS REPAIRED.

NEW CLOTH WAS NEEDED ON MODULE A'S VACUUM FILTER DRUM.

DUCTWORK REPAIR WAS NEEDED IN THE LINING NEAR AN ABSORBER OUTLET.

THE OUTBOARD BEARINGS AND MECHANICAL SEAL WERE REPLACED ON MODULE B'S SLAKER AND THE WEIGH FEEDER WAS REBUILT.

THE SLURRY CIRCULATION PUMPS ON MODULE A WERE REPACKED AND THE ABSORBER SUMP PUMP BELT WAS REPLACED. THE SIDE THROAT RING AND SEAL WAS REPLACED ON ONE OF THE SLURRY CIRCULATION PUMPS ON MODULE C, THE SLURRY FEED PUMP WAS REPACKED, AND THE BELTS AND CHECK VALVE WERE REPLACED ON THE FILTRATE PUMP.

THE PUG MILL DUST COLLECTOR WAS REPAIRED DURING THE MONTH.

REPAIR WAS REQUIRED ON THE SURGE TANK AGITATOR AND THE REACTOR AGITATORS ON MODULE A NEEDED MAINTENANCE.

THE ABSORBERS ON MODULES A, B, C, AND D REQUIRED PREKRETE REPAIR; MODULES B, C, AND D ALSO NEEDED FLAKEGLASS REPAIR. THE H-BEAMS WERE REPAIRED ON MODULES B AND C, AS WERE THE WASH HEADERS ON MODULE C.

THE STONES WERE REPLACED ON THE FLY ASH PRIMARY SEPARATOR ON MODULE B AND THE CARRIER BEARING WAS REPLACED ON THE LIME/FLY ASH SCREW CONVEYOR.

2/86	A	89.7	80.3	100.0	79.8				
	B	76.3	54.4	100.0	54.0				
	C	81.1	60.2	100.0	59.8				
	D	74.3	62.5	100.0	62.1				
	SYSTEM	100.0	85.8	100.0	85.2	672	668	573	50.3

** PROBLEMS/SOLUTIONS/COMMENTS

RUBBER BOOT REPLACEMENT ON VACUUM FILTER LEVEL CONTROL VALVES D AND B TOOK PLACE IN FEBRUARY.

THE UTILITY REPLACED SOME UNSPECIFIED VALVES IN THE SYSTEM AND REBUILT TWO VALVES ON THE LIME BLOWER DURING THE MONTH.

BOTH THE PREKRETE AND THE FLAKE GLASS LINING WERE REPAIRED ON MODULE B AND D ABSORBERS; MODULE C ABSORBER ONLY NEEDED PREKRETE REPAIR.

ABSORBER INLET SLIDE GATE REPAIRS ON MODULE D WERE REPORTED.

A PUG MILL REPAIR WAS REQUIRED DURING THE MONTH.

HEAD PULLEY BEARINGS AND ROLLERS WERE REPLACED ON THE CAKE TRANSFER CONVEYOR.

ROLLERS AND TAIL PULLEY BEARINGS WERE REPLACED ON THE MIXER FEED CONVEYOR.

3/86	A	81.7	79.6	100.0	79.3				
	B	79.6	51.5	100.0	51.3				
	C	78.2	54.8	100.0	54.6				
	D	75.8	74.3	100.0	74.1				
	SYSTEM	100.0	86.7	100.0	86.4	744	741	643	55.9

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS POURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

TEMPORARY PATCHES WERE INSTALLED OVER HOLES IN THE DUCTWORK IN MARCH.
 THE UTILITY REPORTED UNSPECIFIED VALVE REPLACEMENTS ON THE FGD SYSTEM.
 THE DRUM ON MODULE B'S VACUUM FILTER REQUIRED CLOTH REPLACEMENT.
 THE RUBBER LINING ON A MODULE B SLURRY PUMP WAS REPAIRED.
 THE BALL MILL WEIGH FEEDER ON MODULE A WAS REPAIRED DURING THE MONTH.
 THE SLAKERS ON BOTH MODULES A AND B NEEDED REPAIR.
 THE UTILITY REPLACED THE BLOWER ON THE DOLIMITIC LIME TRANSPORTER AND
 BAG CAGES ON MODULE B'S FLYASH SILO DUST COLLECTOR IN MARCH.
 PREKRETE REPAIR WAS NEEDED ON THE ABSORBERS ON MODULES A, B, AND D.
 THE BOOSTER FAN HOUSING LINING WAS REPAIRED ON MODULES A, B, C, AND D.

4/86	A	76.7	74.1	100.0	71.9				
	B	76.9	71.1	100.0	69.0				
	C	73.8	61.1	99.5	59.3				
	D	79.3	75.1	100.0	72.9				
	SYSTEM	100.0	93.8	100.0	91.1	720	699	656	65.8

** PROBLEMS/SOLUTIONS/COMMENTS

REPAIRS WERE MADE TO THE AGITATOR ON MODULE C'S VACUUM FILTER.
 THE UTILITY REPORTED THAT THEY REBUILT THE ABSORBER AREA SUMP PUMP,
 FILTRATE PUMP, AND FLOCCULANT PUMP ON MODULE A AND THE FLOCCULANT PUMP ON
 MODULE B.
 THE UTILITY REPAIRED THE VACUUM FILTER ON MODULE C.
 A PUG MILL DUST COLLECTOR CHAIN DRIVE REPAIR WAS REQUIRED IN APRIL.
 SPRAY NOZZLE CLEANING WAS NEEDED ON MODULE A AND C ABSORBERS DURING THE
 MONTH.
 A SLURRY FEED TANK PIPING REPAIR TOOK PLACE IN APRIL.
 THE SLAKER ON MODULE B NEEDED A NEW FEEDER BELT IN APRIL.
 THE UTILITY REPLACED THE ADJUSTING BOLT ON THE MODULE B DAMPER.
 REPLACEMENT OF SEVERAL UNSPECIFIED VALVES TOOK PLACE IN APRIL.
 GENERAL REPAIR WAS NEEDED ON THE LIME SCREW, FLYASH SCREW, AND MIXER
 FEED CONVEYORS.
 PREKRETE AND FLAKE GLASS LINING REPAIR WAS NECESSARY ON MODULE A, B, C,
 AND D ABSORBERS.

5/86	A	88.4	74.6	100.0	73.8				
	B	78.0	64.8	100.0	64.1				
	C	87.2	75.7	100.0	74.9				
	D	63.7	62.3	97.0	61.6				
	SYSTEM	100.0	92.5	100.0	91.4	744	736	680	67.2

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. HOURS	Factor

** PROBLEMS/SOLUTIONS/COMMENTS

MISCELLANEOUS VALVES WERE REPLACED THROUGHOUT THE FGD SYSTEM.

PREKRETE REPAIR WAS NEEDED ON MODULE A, B, C, AND D ABSORBERS. LATER THE PREKRETE WAS REPLACED ON MODULE D.

THE SPRAY NOZZLES ON MODULE A, B, AND C ABSORBERS WERE CLEANED IN MAY.

THE SLAKER FEEDER BELT WAS REPLACED ON MODULE B.

PIPING FROM THE BALL MILL TO THE STORAGE TANK WAS PATCHED DURING THE MONTH.

IT WAS NECESSARY TO REPLACE A CONVEYOR BELT ON THE ADDITIVE LIME FEEDER AND STONES ON MODULE A'S FLY ASH SEPARATOR.

THE COUPLING BOLTS HOLDING THE SURGE TANK AGITATOR FAILED DURING THE MONTH.

THE UTILITY REPORTED THEY FREED AND CLEANED THE BOOSTER FAN INLET VANES ON MODULE D. LATER REPAIR WAS ALSO NEEDED.

NEW CLOTH WAS NEEDED ON MODULE D'S VACUUM FILTER DRUM.

DURING MAY THE UTILITY REPACKED AND REPAIRED THE SLURRY PUMPS ON MODULES A AND D AND REBUILT THE SERVICE WATER BOOSTER PUMP ON MODULE B.

THE CHAIN ADJUSTING BOLTS ON MODULE B'S ABSORBER DAMPER WERE REPLACED IN MAY.

6/86	A	67.5	57.8	98.7	51.3						
	B	84.0	74.8	97.4	66.4						
	C	86.4	81.4	96.5	72.2						
	D	87.4	65.6	100.0	58.2						
	SYSTEM	100.0	93.2	100.0	82.7		720	639	595	56.9	

** PROBLEMS/SOLUTIONS/COMMENTS

THE SLAKER WEIGH FEEDER ON MODULES A AND B WAS REBUILT. JUNE.

VALVE INSPECTION AND REPLACEMENT OF RUBBER BOOTS WAS PERFORMED IN JUNE.

GEARBOX REPAIR WAS PERFORMED ON MODULE D'S REACTOR AGITATOR AND THE SPARE AGITATOR.

GENERAL REPAIR WAS NEEDED ON THE ADDITIVE LIME DAY BIN, DOLIMITIC SILO, AND ON MODULE B'S FLY ASH ADDITIVE LIME SCREW CONVEYOR.

REPAIR WAS NEEDED ON THE VACUUM FILTERS ON MODULES A, B, C, AND D INCLUDING NEW CLOTH ON C.

TWO OF THE UNDERFLOW PUMPS ON MODULE A WERE REBUILT, THE FILTER FEED PUMPS ON MODULES C AND D WERE REPACKED AND THE OIL CHANGED ON D'S

THE UTILITY REPAIRED THE RUBBER ON MODULE A'S THICKENER.

THE UTILITY REPORTED THE INLET VANE ON MODULE A'S BOOSTER FAN JAMMED AGAIN.

TWO OF THE UNDERFLOW PUMPS ON MODULE A WERE REBUILT, THE FILTER FEED PUMPS ON MODULES C AND D WERE REPACKED AND THE OIL CHANGED ON D'S

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

SLURRY PUMP.

MODULE D NEEDS REPAIR TO THE REACTOR SLURRY FEED PIPING.

BOTH MODULES A AND B DEVELOPED PLUGGED SPRAY NOZZLES TWICE DURING THE MONTH.

7/86	A	93.4	89.2	100.0	89.2				
	B	83.9	71.8	96.6	71.8				
	C	92.3	87.6	97.0	87.6				
	D	16.1	12.5	100.0	12.5				
	SYSTEM	95.3	87.1	100.0	87.1	744	744	648	62.6

** PROBLEMS/SOLUTIONS/COMMENTS

THE SLAKER ON MODULE B NEEDED REPAIR DURING THE MONTH.

REPAIR WORK WAS NEEDED ON THE MIST ELIMINATORS ON MODULES A AND D.

THE CAKE TRANSFER BELT NEEDED REPAIR AND STONES WERE REPLACED ON MODULE B'S SEPARATOR FLY ASH SILO.

THE BAGS ON BOTH MODULE A AND B'S FLY ASH SILO FABRIC FILTERS WERE REPLACED.

MODULE D'S REACTOR AGITATOR NEEDED REPAIR IN JULY.

SEVERAL VALVES NEEDED TO BE REPAIRED OR REBUILT DURING JULY.

THE SLURRY PUMPS ON MODULE D NEEDED REPAIR SEVERAL TIMES DURING JULY. OTHER PUMP WORK INCLUDED THE BALL MILL SUMP PUMPS ON MODULES A AND B AND THE FILTER FEED PUMP ON MODULE A. RELATED WORK WAS FREEING THE HIGH PRESSURE SEAL WATER STRAINER.

BALL MILL REPAIRS WERE MADE IN JULY.

THE REACTOR VENT BLOWER ON MODULE D WAS REBUILT IN JULY.

MINOR REPAIRS WERE NEEDED ON THE LIME/FLY ASH SCREW CONVEYOR ON MODULE B.

NEW CLOTH WAS PUT ON MODULE A'S VACUUM FILTER.

8/86	A	53.8	78.7	100.0	47.4				
	B	50.3	75.6	100.0	45.6				
	C	53.5	86.5	100.0	52.2				
	D	0.0	0.0		0.0				
	SYSTEM	52.5	80.2	100.0	48.4	744	449	360	29.7

** PROBLEMS/SOLUTIONS/COMMENTS

ABSORBER WORK ON MODULE A INVOLVED REPAIRING THE PREKRETE.

THE LIME/FLY ASH SCREW CONVEYOR ON MODULE B DEVELOPED CRACKS IN THE SCREWS AND NEEDED REPAIR.

THE UTILITY REBUILT THE BALL MILL CYCLONES DURING AUGUST.

THE FLY ASH EXHAUSTER BLOWER WAS REPLACED ON MODULE C.

THE OVERFLOW PUMP ON MODULE A AND THE SLURRY PUMPS ON BOTH MODULES A AND B REQUIRED REPAIR.

EYEBOLTS WERE REPLACED ON THE GAS DAMPER ON MODULE A.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

ONLY TWO VALVES WERE REPAIRED/REPLACED DURING AUGUST.

MODULE C'S VACUUM FILTER DRUM WAS WRAPPED.

9/86	A	0.0			0.0				
	B	0.0			0.0				
	C	0.0			0.0				
	D	0.0			0.0				
	SYSTEM	0.0			0.0	720	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS SHUT DOWN FOR A SCHEDULED OUTAGE DURING SEPTEMBER.
 MAINTENANCE WORK/PROBLEMS ARE INCLUDED IN OCTOBER'S REPORT.

10/86	A	0.0	0.0		0.0				
	B	44.0	88.4	95.3	44.0				
	C	41.4	81.9	100.0	40.7				
	D	46.2	83.6	100.0	41.5				
	SYSTEM	43.9	84.6	98.7	42.1	744	370	313	25.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE PUG MILL DUST COLLECTOR WAS REBUILT AND THE BEARINGS REPLACED ON THE MIXER.

THE BAGS WERE REPLACED, AGAIN, ON THE FLY ASH SILO FABRIC FILTERS ON MODULES A AND B.

BOOSTER FAN REPAIRS OVER THE PERIOD INCLUDED INSPECTING THE BEARINGS, COUPLINGS, AND ROTORS, CHECKING ALIGNMENT, REPAIRING INLET VANES, AND CLEANING THE OIL RESERVOIR AND CHANGING OIL ON ALL MODULES.

A VARIETY OF GAS DAMPER REPAIR WAS PERFORMED DURING THE PERIOD INCLUDING REPLACEMENT OF THE SYSTEM OUTLET EXPANSION JOINT AND THE BY PASS EXPANSION JOINT ON MODULES A, B, AND D. ALL PURGE AIR BLOWERS WERE REBUILT, AS WAS THE BYPASS MODULATING DAMPER. MISCELLANEOUS REPAIRS AND CLEANING WERE PERFORMED AS WELL.

DURING SEPTEMBER AND OCTOBER, VARIOUS PARTS OF THE BALL MILL NEEDED REPAIR OR REPLACEMENT AND THE CLASSIFIER WAS REBUILT.

VALVE WORK PERFORMED OVER THE TWO MONTHS INVOLVED THE REACTOR BLOWDOWN AND MAKEUP VALVES, SEVERAL SLURRY FEED VALVES, VARIOUS PUMP VALVES, THE LIME SILO KNIFE GATE VALVE, AND THE FLY ASH SILO TWO WAY VALVE.

THE SLAKER AND SLAKER FLOP GATE ON MODULES A AND B WERE COMPLETELY REBUILT.

THE REACTOR VENT BLOWERS WERE REBUILT ON MODULES B, C, AND D.

THE VACUUM FILTER DISTRIBUTOR WAS REPLACED ON MODULES A, B, C, AND D.

THE FLY ASH SILO DIFFUSER STONES WERE REPLACED AND THE FLOP GATES REPAIRED DURING THE PERIOD.

THE DOLOMITIC DRY BIN EXPANSION JOINT WAS REPLACED, AS WERE ALL THE BEARINGS AND 5 OF THE SCREWS ON THE FLY ASH AND LIME SCREW CONVEYORS. ALL OTHER SCREWS WERE REBUILT. IN ADDITION, THE SLURRY FEED LINES TO MODULES B, C, AND D'S REACTORS WERE REPLACED.

THE UTILITY REPLACED THE STABILIZER SHOES, PILOT, AND THE GEAR BOX SEALS ON THE SURGE TANK AGITATOR.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

DURING SEPTEMBER AND OCTOBER, PUMP REPAIR INCLUDED REBUILDING THE SLURRY CIRCULATORY AND FEED PUMPS ON MODULES A, B, C, AND D; THE OVERFLOW AND UNDERFLOW PUMPS ON MODULE B; AND THE FILTER FEED, OVERFLOW, AND FLOCCULANT PUMPS ON MODULE A. THE OIL WAS CHANGED IN THE FILTRATE AND VACUUM FILTER PUMPS ON ALL MODULES. THE MOTOR ADJUSTERS WERE REBUILT AND THE DISCHARGE HEADERS INSPECTED AND REPAIRED ON MODULE A AND D SLURRY CIRCULATORY PUMPS. FINALLY, THE FLOCCULANT PUMP DISCHARGE LINES FROM MODULES A AND B WERE TIED TOGETHER.

11/86	A	0.0	0.0	0.0				
	B	70.1	92.5	100.0	68.2			
	C	70.4	84.0	100.0	61.9			
	D	73.6	80.1	100.0	59.0			
	SYSTEM	71.4	85.5	100.0	63.1	720	531	454 43.5

** PROBLEMS/SOLUTIONS/COMMENTS

SEALS AND O-RINGS WERE REPLACED AT THE INLET DAMPERS ON MODULES B, C, AND D.

EXTENSIVE VALVE WORK, BEGUN IN THE SEPTEMBER/OCTOBER PERIOD, CONTINUED INTO NOVEMBER. SEVERAL FILTER REGULATOR VALVES AND A FILTER FEED RECIRCULATION VALVES WERE REPAIRED OR PARTLY REPLACED AS WERE SOME UNDERFLOW SUCTION VALVES AND AN UNDERFLOW FLUSHWATER VALVE.

THE UTILITY REPORTED THEY INSTALLED A FALSE FLOOR AND REPAIRED AND RELINED A DUCT AT THE SYSTEM OUTLET GAS DAMPER.

MODULE C REQUIRED SEVERAL MINOR REPLACEMENT PARTS ON THE VACUUM FILTER AND THE VARIABLE SPEED DRIVE WAS REPAIRED ON MODULE D.

THE FIXATION PROCESS AIR DRYER NEEDED SOME REPAIR DURING NOVEMBER.

BOLTS NEEDED REPLACEMENT ON THE SLURRY CIRCULATION PUMPS ON MODULE B.

12/86	A	48.4	34.2	100.0	33.6			
	B	94.4	87.8	100.0	86.3			
	C	91.7	79.1	100.0	77.7			
	D	93.1	50.9	100.0	50.0			
	SYSTEM	100.0	84.0	100.0	82.5	744	731	614 51.6

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED REPAIRS TO THE BALL MILL AND BALL MILL FEED CONVEYOR DURING DECEMBER.

BELTS AND SEALS REQUIRED ATTENTION ON SLURRY CIRCULATION PUMPS ON MODULES A, B, AND C AND ON AN OVERFLOW PUMP ON MODULE B.

THE REACTOR MAKE UP VALVE AND FILTER FEED PUMP RECIRCULATION VALVE ON MODULE A REQUIRED REPAIR IN DECEMBER.

THE SCRAPER BLADE WAS REPAIRED ON THE MIXER FEED CONVEYOR.

THE SLAKER ON MODULE A HAD ONE BROKEN PADDLE WHICH NEEDED TO BE REPLACED; MODULE B HAD FIVE BROKEN PADDLES.

1/87	A	67.7	33.1	100.0	29.6			
	B	88.8	87.2	99.7	77.8			
	C	82.5	77.3	100.0	69.0			
	D	93.5	65.7	100.0	58.6			
	SYSTEM	100.0	87.8	100.0	78.3	744	664	583 56.2

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

FLY ASH EXHAUST BLOWER AND BOOSTER FAN OIL PUMP REPLACEMENTS OCCURRED DURING THE MONTH.

SPRINGS AND TORQUE BAR ON BALL MILL CLUTCH HAD TO BE REPLACED.

2/87	A	0.0	0.0		0.0				
	B	93.8	93.2	100.0	92.7				
	C	90.6	83.9	99.1	83.5				
	D	91.2	82.4	100.0	82.0				
	SYSTEM	91.9	86.5	99.7	86.1	672	668	578	60.5

** PROBLEMS/SOLUTIONS/COMMENTS

REPAIRS WERE UNDERTAKEN TO STOP A LINING LEAK IN ABSORBER 5B. IN ADDITION, ROUTINE MAINTENANCE WAS REQUIRED ON VARIOUS PROCESS EQUIPMENT.

3/87	A	58.5	63.4	99.8	58.3				
	B	42.1	38.3	100.0	35.2				
	C	93.7	91.8	100.0	84.4				
	D	92.9	95.0	99.8	87.4				
	SYSTEM	95.7	96.2	100.0	88.4	744	684	658	62.8

** PROBLEMS/SOLUTIONS/COMMENTS

MIST ELIMINATOR TRAY H BEAMS HAD TO BE REPLACED IN MARCH.

4/87	A	90.1	94.6	100.0	87.6				
	B	1.4	1.5	100.0	1.4				
	C	89.4	94.5	100.0	87.5				
	D	91.7	96.3	99.8	89.2				
	SYSTEM	90.9	95.6	100.0	88.6	720	667	638	68.9

** PROBLEMS/SOLUTIONS/COMMENTS

ROUTINE MAINTENANCE WAS PERFORMED ON VARIOUS PROCESS EQUIPMENT IN APRIL.

5/87	A	88.2	95.8	100.0	85.6				
	B	80.6	89.3	100.0	79.8				
	C	65.5	73.1	100.0	65.3				
	D	26.2	26.8	100.0	23.9				
	SYSTEM	86.8	95.0	100.0	84.9	744	665	632	61.9

** PROBLEMS/SOLUTIONS/COMMENTS

A FEED CHUTE WAS REPAIRED AND TWO LIFTER BARS WERE INSTALLED AT A BALL MILL FEED END.

DURING MAY, SCRUBBER TRAYS WERE REPLACED AND MIST ELIMINATOR STRUCTURAL REPAIR TOOK PLACE.

6/87	A	95.3	95.3	100.0	95.3				
	B	95.0	94.9	100.0	94.9				
	C	0.0	0.0		0.0				
	D	97.9	97.9	100.0	97.9				
	SYSTEM	96.1	96.0	100.0	96.0	720	720	691	64.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPLACED A FLY ASH EXHAUST BLOWER.

A SURGE TANK AGITATOR GEAR BOX WAS REPLACED DURING THE MONTH.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

THE UTILITY REPLACED IMPELLERS AND PERFORMED OTHER MAINTENANCE WORK ON
 BALL MILL SUMP PUMP IN JUNE.

7/87	A	19.4	18.8	100.0	18.8				
	B	96.0	96.0	99.7	96.0				
	C	79.8	79.8	99.0	79.8				
	D	96.2	96.1	100.0	96.1				
	SYSTEM	97.1	96.9	100.0	96.9	744	744	721	63.1

** PROBLEMS/SOLUTIONS/COMMENTS

A HIGH PRESSURE GREASE MANIFOLD HAD TO BE REPLACED IN JULY.

DURING THE MONTH A SURGE TANK AGITATOR GEAR BOX NEEDED REPLACEMENT.

FLY ASH SILO DUST COLLECTOR FILTER BAGS AND CAGE REPLACEMENT WAS
 UNDERTAKEN IN JULY.

THE UTILITY REPORTED THAT A VACUUM FILTER CLOTH HAD TO BE REPLACED
 IN JULY.

8/87	A	52.0	53.7	100.0	50.8				
	B	92.7	98.0	99.4	92.7				
	C	96.8	100.0	99.3	95.7				
	D	51.6	54.5	100.0	51.6				
	SYSTEM	97.7	100.0	100.0	97.0	744	704	721	59.5

** PROBLEMS/SOLUTIONS/COMMENTS

VACUUM FILTER SCRAPER BLADES WERE REPLACED IN AUGUST. THE HEAD AND TAIL
 PULLEYS, BEARINGS AND ROLLER WERE REPLACED ON CAKE DISCHARGE CONVEYORS
 DURING THE MONTH AS WELL.

ABSORBER NOZZLES WERE CLEANED IN AUGUST.

9/87	A	100.0			0.0				
	B	0.0			0.0				
	C	100.0			0.0				
	D	0.0			0.0				
	SYSTEM	66.7			0.0	720	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPLACED BALL MILL PINION BEARINGS, AIR CYLINDER, AND A
 DISCHARGE SLEEVE IN SEPTEMBER. ALSO, A NEW LINING WAS INSTALLED IN
 ADDITION TO REGULAR MAINTENANCE.

THE 5A AND 5B SLAKERS WERE REBUILT IN SEPTEMBER.

DAMAGED TRAYS WERE REPLACED DURING SEPTEMBER.

10/87	A	100.0	67.1	93.8	10.2				
	B	22.6	30.9	94.6	4.7				
	C	99.6	85.7	97.0	13.0				
	D	100.0	100.0	97.8	18.1				
	SYSTEM	100.0	94.6	100.0	15.4	744	113	114	6.7

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MONTH OF
 OCTOBER.

11/87	A	87.5	75.6	100.0	75.3				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE INDIANA: GIBSON 5 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	B	82.9	45.3	99.1	45.1					
	C	85.7	80.5	100.0	80.1					
	D	96.3	95.0	100.0	94.6					
	SYSTEM	100.0	98.8	100.0	98.4		720	717	708	60.9

** PROBLEMS/SOLUTIONS/COMMENTS

DOWN COMER BRACKETS FOR ABSORBER 5D HAD TO BE REPLACED IN NOVEMBER.

AN ABSORBER SUMP PUMP HAD TO BE REBUILT DURING NOVEMBER.

12/87	A	98.9	99.0	100.0	91.8					
	B	100.0	31.3	100.0	29.0					
	C	100.0	99.6	100.0	92.3					
	D	100.0	69.3	100.0	64.2					
	SYSTEM	100.0	99.7	100.0	92.5		744	690	688	56.1

** PROBLEMS/SOLUTIONS/COMMENTS

ROUTINE MAINTENANCE ON PUMPS, FILTERS, BLOWERS AND OTHER PROCESS EQUIPMENT WAS CARRIED OUT DURING THIS OPERATING PERIOD.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	PUBLIC SERVICE OF NEW MEXICO	
PLANT NAME	SAN JUAN	
UNIT NUMBER	1	
CITY	WATERFLOW	
STATE	NEW MEXICO	
REGULATORY CLASSIFICATION	A	
PARTICULATE EMISSION LIMITATION - NG/J	9.	(0.020 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	279.	(0.650 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	1614	
GROSS UNIT GENERATING CAPACITY - MW	361	
NET UNIT GENERATING CAPACITY W/FGD - MW	316	
NET UNIT GENERATING CAPACITY WO/FGD - MW	332	
EQUIVALENT SCRUBBED CAPACITY - MW	361	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	FOSTER WHEELER	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	750.32	(1590000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	122.8	(253 F)
STACK HEIGHT - M	122.	(400 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	6.1	(20.0 FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	SUBBITUMINOUS	
AVERAGE HEAT CONTENT - J/G	20934.	(9000 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		8000-11628
AVERAGE ASH CONTENT - %	22.00	
RANGE ASH CONTENT - %	12.6-22.5	
AVERAGE MOISTURE CONTENT - %	14.82	
RANGE MOISTURE CONTENT - %	****	
AVERAGE SULFUR CONTENT - %	0.80	
RANGE SULFUR CONTENT - %	0.6-1.3	
AVERAGE CHLORIDE CONTENT - %	0.03	
RANGE CHLORIDE CONTENT - %	0.00-0.09	
*** PARTICLE CONTROL		
** ESP		
NUMBER	1	
TYPE	HOT SIDE	
SUPPLIER	WESTERN PREC. DIVISION, JOY	
INLET FLUE GAS CAPACITY - CU.M/S	943.8	(2000000 ACFM)
INLET FLUE GAS TEMPERATURE - C	371.1	(700 F)
PRESSURE DROP - KPA	0.6	(3. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.8	
** PARTICLE SCRUBBER		
NUMBER	4	
NUMBER OF SPARES	1	
INITIAL START-UP DATE	4/1978	
GENERIC TYPE	VENTURI TOWER	
SPECIFIC TYPE	VARIABLE-THROAT/BOTTOM-ENTRY PLUMB BOB	
TRADE NAME/COMMON NAME	N/A	
SUPPLIER	DAVY MCKEE	
DIMENSIONS - FT	12.5 DIA X 28.0	
SHELL GENERIC MATERIAL	CARBON STEEL	
SHELL SPECIFIC MATERIAL	AISI 1110	
LINER GENERIC MATERIAL	INORGANIC	
LINER SPECIFIC MATERIAL	PREFIRE BRICK/SHAPES	
GAS CONTACTING DEVICE TYPE	STAINLESS STEEL	
NUMBER OF CONTACTING ZONES	1	
LIQUID RECIRCULATION RATE - LITER/S	224.9	(3570 GPM)
L/G RATIO - LITER/CU.M	0.9	(7.1 GAL/1000ACF)
PRESSURE DROP - KPA	3.1	(12.5 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/S	48.8	(160.0 FT/S)

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

INLET GAS FLOW RATE - CU.M/S	237.4	(503000 ACFM)
INLET GAS TEMPERATURE - C	134.4	(274 F)
PARTICLE REMOVAL EFFICIENCY - %	75.0	

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	SALEABLE PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	WELLMAN LORD
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	DAVY MCKEE
A-E FIRM	STEARNS-ROGER
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	RETROFIT
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.80
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	90.00
ENERGY CONSUMPTION - %	4.4
CURRENT STATUS	1
COMMERCIAL START-UP	4/1978
INITIAL START-UP	4/1978
CONTRACT AWARDED	2/1974

** DESIGN AND OPERATING PARAMETERS

DESIGN CHLORIDE CONTENT - %	*****

** QUENCHER/PRESATURATOR

CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR

** ABSORBER

NUMBER	4
NUMBER OF SPARES	1
GENERIC TYPE	TRAY TOWER
SPECIFIC TYPE	VALVE TRAY
TRADE NAME/COMMON TYPE	BUBBLE CAP TRAY TOWER
SUPPLIER	DAVY MCKEE
DIMENSIONS - FT	24.0 X 29.0 X 79.0
SHELL GENERIC MATERIAL	INORGANIC
SHELL SPECIFIC MATERIAL	HYDRAULICALLY-BONDED CONCRETE
SHELL MATERIAL TRADE NAME/COMMON TYPE	PORTLAND CEMENT
LINER GENERIC MATERIAL	INORGANIC
LINER MATERIAL TRADE NAME/COMMON TYPE	ACID-RESISTANT BRICK 'LOW H2O ABSORPTION!
GAS CONTACTING DEVICE TYPE	VALVE TRAY
NUMBER OF CONTACTING ZONES	5
DISTANCE BETWEEN GAS CONTACTING ZONES - CM	5.1 (2.0IN)
LIQUID RECIRCULATION RATE - LITER/S	47. (750 GPM)
L/G RATIO - L/CU.M	0.2 (1.7 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	4.0 (16.0 IN-H2O)
SUPERFICAL GAS VELOCITY - M/SEC	3.3 (10.8 FT/S)
INLET GAS FLOW - CU. M/S	205.28 (435000 ACFM)
INLET GAS TEMPERATURE - C	48.9 (120 F)
SO2 REMOVAL EFFICIENCY - %	90.0

** MIST ELIMINATOR

PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
NUMBER PER SYSTEM	4
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
CONFIGURATION	HORIZONTAL
NUMBER OF PASSES PER STAGE	1
PRESSURE DROP - KPA	0.0 (0.0 IN-H2O)
SUPERFICAL GAS VELOCITY - M/S	3.2 (10.5 FT/S)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPHENYLENE
WASH WATER SOURCE	BLENDED
WASH FREQUENCY	CONTINUOUS ON ONE & INTERMITTENT ON THE OTHER
WASH RATE - L/S	3.8 (60 GAL/MIN)

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

** REHEATER	
NUMBER	1
GENERIC TYPE	INDIRECT HOT AIR
SPECIFIC TYPE	EXTERNAL HEAT EXCHANGER
TRADE NAME/COMMON TYPE	STEAM TUBE BUNDLE
TEMPERATURE INCREASE - C	27.8 (50 F)
INLET FLUE GAS FLOW RATE - CU. M/S	647.45 (1372000 ACFM)
INLET FLUE GAS TEMPERATURE - C	51.7 (125 F)
CONSTRUCTION MATERIAL GENERIC TYPE	STAINLESS STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AUSTENITIC
** FANS	
NUMBER	4
DESIGN	CENTRIFUGAL
SUPPLIER	BUFFALO FORGE
FUNCTION	BOOSTER
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	276.06 (585000 ACFM)
FLUE GAS TEMPERATURE - C	122.8 (253 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	ESP TO FANS
DIMENSIONS	16.0 X 24.0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	MIX TANK
DEVICE	N/A
DEVICE TYPE	AGITATED TANK
** TANKS	
SERVICE	NUMBER
-----	-----
ABSORBER RECYCLE	1
** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER PRODUCT TRANSFER	2
SCRUBBER RECIRCULATION	4
ABSORBER RECIRCULATION	20
ABSORBER SPRAY RECIRCULATION	8
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	NONE
*** SALEABLE BYPRODUCTS	
NATURE	SULFURIC ACID
FULL LOAD QUANTITY - M T/H	1.45 (1.60 TPH)
QUALITY - %	99.0
DISPOSITION	MARKETED

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

*** SLUDGE

** TREATMENT	
METHOD	N/A
DEVICE	N/A
PROPRIETARY PROCESS	N/A
** DISPOSAL	
NATURE	N/A
TYPE	NONE
SITE TREATMENT	N/A
** PROCESS CONTROL AND INSTRUMENTATION	
CHEMICAL PARAMETERS	PH & DENSITY
CONTROL LEVELS	PH 5.5-6.5; SP.GR. 1.2-1.3
MONITOR LOCATION	ABSORBER BLEED & PRODUCT SOLUTION
PROCESS CONTROL MANNER	MANUAL
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
POND SEEPAGE/RUNOFF WATER LOSS - LITERS/S	45
MAKEUP WATER ADDITION - LITERS/S	23.0 (365 GPM)
** FGD SPARE CAPACITY INDICES	
ABSORBER - %	33.3
** FGD SPARE COMPONENT INDICES	
ABSORBER	1.0

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. HOURS	FACTOR

0/78 SYSTEM

** PROBLEMS/SOLUTIONS/COMMENTS

NOTE: ALTHOUGH THIS FGD SYSTEM IS DESIGNED TO BRING THE BOILER INTO COMPLIANCE WITH A 0.34 LB/MM BTU SO2 EMISSION STANDARD, THE STATE HAS INITIALLY ONLY REQUIRED A 1.2 LB/MM BTU SO2 CONTROL LEVEL. SAN JUAN 1 WILL BE REQUIRED TO MEET THE MORE STRINGENT SO2 EMISSION LIMITATION VALUE BY SEPTEMBER 1, 1980. THE UNIT ONLY REQUIRES TWO OF THE FOUR SCRUBBING TRAINS TO MEET THE 1.2 LB/MM BTU LIMITATION VALUE; HOWEVER, THREE ARE REQUIRED FOR THE MORE STRINGENT LIMITATION VALUE (THE SYSTEM IS DESIGNED TO INCLUDE ONE SPARE SCRUBBING TRAIN WHEN MEETING THE 0.34 LB/MM BTU SO2 EMISSION STANDARD). BECAUSE OF THIS CHANGE IN EMISSION LIMITATION VALUES THE FGD SYSTEM WILL EFFECTIVELY HAVE AN ABSORBER SPARE COMPONENT INDEX OF 2.0 (100% SPARE CAPACITY FOR THIS SYSTEM) THROUGH AUGUST, 1980 AND 1.0 (33.3% SPARE CAPACITY FOR THIS SYSTEM) THEREAFTER. CONSEQUENTLY THE "SYSTEM" DEPENDABILITY FACTORS WILL BE CALCULATED AS:

MODULAR AVERAGE X 2.00
THROUGH AUGUST, 1980 AND:
MODULAR AVERAGE X 1.33
THEREAFTER.

4/78 SYSTEM

720

** PROBLEMS/SOLUTIONS/COMMENTS

SO2 ABSORPTION BEGAN ON APRIL 8, 1978 USING TWO OF THE FOUR CELLS. ONE THIRD OF THE FLUE GAS IS BEING BYPASSED. THE FGD SYSTEM IS IN A SHAKEDOWN/DEBUGGING PHASE. FULL COMMERCIAL FGD SYSTEM OPERATION IS EXPECTED IN JUNE.

5/78 SYSTEM

744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

OVER THE APRIL-MAY PERIOD 22 DAYS OF DATA WERE ACCUMULATED FOR THE FGD SYSTEM. DURING THIS PERIOD THE BOILER WAS OUT OF SERVICE SEVEN HOURS AND THE FGD SYSTEM 28 HOURS FOR UNSCHEDULED CORRECTIONS. THE SYSTEM HAS STILL NOT STABILIZED. NO MAJOR FGD SYSTEM PROBLEMS WERE REPORTED.

6/78 SYSTEM 720

7/78 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

A HIGH PRESSURE DROP ACROSS THE VENTURIS PREVENTED FULL FLUE GAS FLOW THROUGH THE FGD SYSTEM IN JUNE AND JULY.

8/78 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE HIGH VENTURI PRESSURE DROP REPORTED FOR JULY WAS LOWERED BY ADJUSTING INTERNAL PLUMB BOBS IN THE VENTURI THROATS.

REPAIRS WERE MADE TO THE MIST ELIMINATORS WHILE THE MODULES WERE DOWN FOR VENTURI PLUMB BOB ADJUSTMENTS.

9/78 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

A FIRE IN THE START-UP TRANSFORMER DUCT BANK CAUSED A TWO WEEK BOILER OUTAGE.

10/78 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

HEAT TRACING FAILURES ALLOWED LINE FREEZING TO OCCUR.

SOME SULFUR PRODUCT HAS BEEN PRODUCED BUT THE CHEMICAL PLANT OPERATIONS HAVE NOT YET BEEN OPTIMIZED.

SHAKEDOWN/DEBUGGING OPERATIONS ARE CONTINUING.

11/78 SYSTEM 720

12/78 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

ALTHOUGH THE FGD SYSTEM HAS BEEN OPERATING, WEATHER-RELATED PROBLEMS HAVE LIMITED OPERATIONS TO TWO MODULES.

1/79 SYSTEM 744

2/79 SYSTEM 672

** PROBLEMS/SOLUTIONS/COMMENTS

FREEZE UPS RESULTED IN REHEATER LEAKS LIMITING ABSORBER OPERATIONS.

3/79 SYSTEM 744

4/79 SYSTEM 720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

5/79 SYSTEM

744

** PROBLEMS/SOLUTIONS/COMMENTS

HOURS ARE NOT YET AVAILABLE BECAUSE THE UTILITY IS CONCENTRATING EFFORTS ON OPERATION OF THIS NEW UNIT. THE UTILITY REPORTED THAT THE SCRUBBING MODULES THEMSELVES ARE OPERATING ACCEPTABLY. ALSO THE CHEMICAL PLANT IS AVAILABLE AND THERE IS NO SYSTEM PLUGGING WHATSOEVER.

THE MAJOR PROBLEM ENCOUNTERED WAS FAN VIBRATION. THE UTILITY HAS BEEN WORKING WITH THE SUPPLIER IN AN EFFORT TO DISCOVER WHY FAN BALANCE HAS BEEN DIFFICULT TO MAINTAIN.

7/79 SYSTEM

744

8/79 SYSTEM

744

9/79 SYSTEM

720

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE THIRD QUARTER THE UNIT OPERATED WITH TWO ABSORBERS. ALL FOUR ABSORBERS HAVE BEEN LARGELY AVAILABLE. ONE ABSORBER WAS DOWN DUE TO BOOSTER BLOWER VIBRATION PROBLEMS.

10/79 SYSTEM

744

11/79 SYSTEM

720

12/79	A	94.0	79.0	23.8			
	B	100.0	67.4	20.3			
	C	0.0	0.0	0.0			
	D	30.0	5.8	1.8			
	SYSTEM	100.0	76.1	23.0	744	224	171

** PROBLEMS/SOLUTIONS/COMMENTS

NOTE: SEE COMMENTS FOR 00/78 EXPLAINING SYSTEM DEPENDABILITY CALCULATIONS.

A REHEATER PROBLEM HAS LIMITED SCRUBBING OPERATIONS TO TWO TO THE FOUR ABSORBER MODULES. IF THE BOILER WERE TO OPERATE AT A HIGHER LOAD THE REHEATERS WOULD BE UNABLE TO BOOST THE TEMPERATURE OF THE FLUE GAS ABOVE DEW POINT. THE FGD SYSTEM HAS BEEN LIMITING UNIT MWH PRODUCTION.

1/80	A	81.0	51.0	41.8			
	B	96.0	42.3	34.7			
	C	0.0	0.0	0.0			
	D	83.0	79.3	65.1			
	SYSTEM	100.0	86.3	70.8	744	610	527

2/80	A	0.0	0.0	0.0			
	B	99.0	94.3	85.9			
	C	3.0	2.5	2.3			
	D	99.0	97.6	88.9			
	SYSTEM	100.0	97.2	88.6	696	634	616

3/80	A	0.0	0.0	0.0			
	B	100.0	50.4	17.6			
	C	58.1	82.8	29.2			
	D	97.5	85.5	30.1			
	SYSTEM	100.0	100.0	100.0	744	262	286 31.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

SCRUBBER OPERATIONS AT UNIT ONE ARE STILL LIMITED TO TWO MODULES BECAUSE OF THE CURRENT LACK OF REHEATER CAPACITY.

4/80	A	0.0	0.0		0.0				
	B	98.2	71.5		48.2				
	C	50.0	7.2		4.9				
	D	91.7	71.5		48.2				
	SYSTEM	100.0	75.1	100.0	50.7	720	485	365	55.8

** PROBLEMS/SOLUTIONS/COMMENTS

ONLY TWO MODULES ARE NEEDED AT THE PRESENT TIME TO MEET CURRENT SO2 EMISSION REGULATIONS (SEE COMMENTS FOR 00/78).

A TUBE WALL LEAK FORCED THE BOILER OUT OF SERVICE DURING APRIL.

HIGH VIBRATIONS IN THE BOOSTER BLOWER IN MODULE D FOLLOWED AFTER THE UNIT OUTAGE.

HIGH VIBRATIONS IN THE BOOSTER BLOWER CAUSED MODULE A TO BE UNAVAILABLE THE ENTIRE MONTH.

REPAIR AND MAINTENANCE OF THE BOOSTER BLOWER AND ISOLATION DAMPERS IN MODULE C WERE PERFORMED DURING APRIL.

5/80	A	73.1	62.1		55.9				
	B	99.7	37.2		33.5				
	C	75.5	71.8		64.7				
	D	80.2	19.9		17.9				
	SYSTEM	100.0	95.5	100.0	86.0	744	670	640	87.4

** PROBLEMS/SOLUTIONS/COMMENTS

BOOSTER BLOWER VIBRATIONS ARE CONTINUING IN ALL THE MODULES.

THERE WAS A UNIT OUTAGE SO THAT REPAIR WORK COULD BE UNDERTAKEN ON THE ESP

6/80	A	2.8	2.5		2.1				
	B	96.9	92.0		75.6				
	C	82.5	79.2		65.0				
	D	0.1	0.2		0.1				
	SYSTEM	91.2	87.0	79.8	71.4	720	591	514	65.4

** PROBLEMS/SOLUTIONS/COMMENTS

A BOILER TUBE LEAK FORCED THE UNIT OUT OF SERVICE IN JUNE.

REPAIR WORK WAS DONE ON THE ISOLATION DAMPERS DURING JUNE.

7/80	A	0.0	0.0		0.0				
	B	30.4	16.0		16.0				
	C	89.2	87.9		87.9				
	D	82.8	79.6		79.6				
	SYSTEM	100.0	91.7		91.7	744	744	683	91.7

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS UNAVAILABLE IN JULY BECAUSE OF REPAIRS MADE TO THE ISOLATION DAMPER AND THE LOWER CHIMNEY SEAL.

MODULE B WAS FORCED OUT BECAUSE OF HIGH VIBRATIONS IN THE BOOSTER BLOWER.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

VIBRATIONAL PROBLEMS ALSO KEPT MODULE D OFF LINE UNTIL JULY 4, WHEN THE BOOSTER BLOWER WAS BALANCED.

8/80	A	0.0	0.0		0.0				
	B	21.5	21.5		21.5				
	C	91.1	77.8		77.8				
	D	94.4	90.1		90.1				
	SYSTEM	100.0	94.7	93.2	94.7	744	744	704	82.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A DID NOT OPERATE IN AUGUST BECAUSE OF REPAIRS MADE TO THE LOWER CHIMNEY SEAL.

MODULE B WAS OUT OF SERVICE FOR OVER 3 WEEKS TO CLEAN, PAINT, AND BALANCE THE BOOSTER BLOWER ROTOR.

CRACKED WELDS ON THE WATER INLET NOZZLES WERE REPAIRED ON MODULE C.

9/80	A	0.0	0.0		0.0				
	B	37.2	57.4		31.4				
	C	39.4	56.1		30.7				
	D	45.1	71.8		39.3				
	SYSTEM	60.9	92.7	94.8	50.7	720	394	365	43.5

** PROBLEMS/SOLUTIONS/COMMENTS

HIGH VIBRATIONS IN THE BOOSTER BLOWER CAUSED MODULE C TO SHUT DOWN FOR PART OF SEPTEMBER.

THE FGD SYSTEM WAS DOWN FOR SEVERAL DAYS BECAUSE OF BOILER RELATED PROBLEMS.

THE BOILER AND FGD SYSTEM WENT DOWN ON SEPTEMBER 18, 1980 FOR SCHEDULED MAINTENANCE AND WERE UNAVAILABLE THE REST OF THE MONTH.

10/80	A	27.0	38.4		26.5				
	B	48.9	68.2		47.0				
	C	48.5	69.6		48.0				
	D	37.6	17.1		11.8				
	SYSTEM	50.8	73.3	73.7	50.0	744	513	376	58.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER WAS OUT OF SERVICE FROM OCTOBER 1 TO OCTOBER 3 FOR A SCHEDULED OVERHAUL.

A REHEAT TUBE LEAK CAUSED THE UNIT TO SHUTDOWN FROM OCTOBER 5 TO OCTOBER 11. SCRUBBER MODULES B AND C WERE RETURNED TO OPERATION ON OCTOBER 14. MAINTENANCE ON MODULE D WAS NOT COMPLETED UNTIL OCTOBER 19 AND MODULE A ON OCTOBER 23.

11/80	A	88.6	53.7		48.8				
	B	91.1	84.4		76.5				
	C	94.9	59.4		53.9				
	D	93.6	86.4		19.3				
	SYSTEM	96.1	86.4	95.8	78.3	720	653	564	69.6

** PROBLEMS/SOLUTIONS/COMMENTS

ALL FOUR ABSORBER MODULES WERE AVAILABLE FOR MOST OF NOVEMBER EXCEPT FOR MINOR OUTAGES CAUSED BY COMPUTER PROBLEMS.

A TOTAL POWER FAILURE OCCURRED ON NOVEMBER 14 CAUSING THE UNIT TO BE OFF

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

LINE FOR FOUR DAYS.

12/80	A	96.4	83.0		81.3				
	B	85.6	80.2		78.6				
	C	96.5	75.3		73.8				
	D	0.0	0.0		0.0				
	SYSTEM	100.0	90.1	99.4	88.3	744	729	657	73.3

** PROBLEMS/SOLUTIONS/COMMENTS

UNIT 1 WAS DOWN FROM DECEMBER 20 TO 22 IN ORDER TO TIE IN THE UNIT 4 MAIN TRANSFORMER.

THE "D" MODULE WAS DOWN THE ENTIRE MONTH SO THAT THE BOOSTER BLOWER ROTOR COULD BE CLEANED AND BALANCED. THE ABSORBER RECIRCULATING PUMP DISCHARGE VALVE WAS ALSO REPAIRED DURING THE MONTH.

1/81	A	98.9	96.3		94.3				
	B	99.2	97.0		95.0				
	C	98.3	94.0		92.1				
	D	0.0	0.0		0.0				
	SYSTEM	100.0	99.0	100.0	97.0	744	729	722	87.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JANUARY THE BOILER WAS OUT OF SERVICE APPROXIMATELY 15 HOURS TO REPAIR THE LEAK IN THE BOILER FEEDWATER PUMP DISCHARGE LINE.

MODULE D WAS OUT OF SERVICE DURING JANUARY TO CLEAN AND BALANCE THE BOOSTER BLOWER ROTOR.

2/81	A	79.9	73.7		67.3				
	B	97.3	93.1		85.0				
	C	29.6	26.8		24.4				
	D	67.4	43.9		40.0				
	SYSTEM	98.0	92.0	96.0	84.0	672	613	585	75.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING FEBRUARY THE BOILER WAS DOWN APPROXIMATELY 72 HOURS TO REPAIR THE AIR DUCT TO THE COAL MILL AND BECAUSE OF CONTAMINATED CONDENSATE AND BOILER FEEDWATER.

MODULES A AND C WERE DOWN APPROXIMATELY 72 HOURS DUE TO LACK OF DEMAND. MODULE C REMAINED DOWN APPROXIMATELY 384 HOURS DUE TO THE REPAIRS OF THE ISOLATION DAMPER.

MODULE D WAS IN SERVICE ON MARCH 2, 1981 AFTER ISOLATION DAMPER REPAIRS WERE COMPLETED.

MODULE D EXPERIENCED A 72 HOUR OUTAGE DUE TO LOW BOILER LOAD. THE OUTAGE CONTINUED FOR APPROXIMATELY 96 HOURS TO BALANCE THE BOOSTER BLOWER ROTOR.

3/81	A	97.4	76.8		34.7				
	B	95.0	55.4		25.0				
	C	27.0	22.9		10.3				
	D	0.0	0.0		0.0				
	SYSTEM	100.0	66.0	82.0	30.0	744	336	223	38.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MARCH OPERATION OF MODULE C WAS ERRATIC DUE TO SEVERAL BOILER TRIPS

MODULE D WAS OUT OF SERVICE THE ENTIRE MONTH TO BALANCE THE BOOSTER BLOWER

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

ROTOR.

THE BOILER WAS OUT OF SERVICE FROM MARCH 5 UNTIL MARCH 24 DUE TO A SCHEDULED OUTAGE. ADDITIONAL OUTAGE TIME ON MARCH 30 WAS DUE TO A LOSS OF POWER FEED FROM THE MAIN TRANSFORMER.

AN ADDITIONAL 24 HOURS OF OUTAGE TIME WAS DUE TO THE MALFUNCTION OF THE ESP.

4/81	A	96.9	94.0		84.2				
	B	92.2	82.9		74.3				
	C	96.7	94.0		84.2				
	D	8.5	9.5		8.5				
	SYSTEM	100.0	99.0	100.0	89.0	720	645	641	88.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING APRIL THE BOOSTER BLOWERS TRIPPED NUMEROUS TIMES BECAUSE OF COMPUTE PROBLEMS AND FOR REASONS UNKNOWN.

MODULE D REMAINED OUT OF SERVICE UNTIL APRIL 23, DUE TO THE BALANCING OF THE BOOSTER BLOWER AND THE REPAIRING OF THE SCREW DRIVE ON THE INLET ISOLATION DAMPER.

THE BOILER WAS OUT OF SERVICE APPROXIMATELY 72 HOURS TO REPAIR A WATERWALL TUBE LEAK.

5/81	A	97.0	63.6		63.6				
	B	94.8	90.6		90.6				
	C	29.2	28.9		28.9				
	D	95.2	93.7		93.7				
	SYSTEM	100.0	100.0	100.0	100.0	744	744	744	98.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MAY MODULE C EXPERIENCED SOME OUTAGE TIME DUE TO A BROKEN JACK SCREW ON THE ISOLATION DAMPER.

6/81	A	60.7	31.8		27.5				
	B	63.1	41.3		35.7				
	C	27.1	13.3		11.5				
	D	58.2	31.2		26.9				
	SYSTEM	64.7	45.0	50.8	38.9	720	622	280	80.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JUNE ALL THE MODULES WERE DOWN PART OF THE MONTH FOR INSTRUMENT AIR TIE-IN AT THE FLYASH FILTERS AND BECAUSE OF A MULTIPLEXER FAILURE.

MODULE C INLET ISOLATION DAMPER REPAIRS WERE PERFORMED DURING THE MONTH.

MODULE D WAS UNAVAILABLE PART OF THE MONTH WHILE THE BOOSTER BLOWER ROTOR WAS BALANCED.

7/81	A	54.8	0.0		0.0				
	B	97.2	92.5		92.2				
	C	99.5	88.0		87.8				
	D	99.7	89.8		89.5				
	SYSTEM	100.0	97.0	100.0	96.0	744	742	717	81.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS UNAVAILABLE FOR PART OF JULY AS A RESULT OF PROBLEMS WITH THE INLET ISOLATION DAMPER.

8/81	A	100.0	0.0		0.0				
	B	100.0	98.9		98.9				
	C	100.0	97.8		97.8				
	D	99.9	95.8		95.8				
	SYSTEM	100.0	100.0	100.0	100.0	744	744	744	88.0
9/81	A	100.0	0.0		0.0				
	B	98.5	57.2		24.3				
	C	99.2	71.2		30.3				
	D	99.4	67.0		28.5				
	SYSTEM	100.0	75.0	90.0	32.0	720	701	226	82.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS REMOVED FROM SERVICE FROM SEPTEMBER 11 TO SEPTEMBER 26 FOR A SCHEDULED FALL OUTAGE.

10/81	A	94.5	72.8		72.8				
	B	98.0	72.6		72.6				
	C	87.1	53.8		53.8				
	D	83.3	76.6		76.6				
	SYSTEM	100.0	95.6	100.0	95.6	744	744	711	90.0

** PROBLEMS/SOLUTIONS/COMMENTS

SEVERAL OUTAGES DURING OCTOBER WERE DUE TO ESP PROBLEMS.

11/81	A	98.1	86.9		73.9				
	B	100.0	56.7		48.2				
	C	100.0	0.0		0.0				
	D	99.6	88.7		75.4				
	SYSTEM	100.0	95.0	100.0	81.0	720	612	583	65.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF-LINE APPROXIMATELY FOUR DAYS DUE TO ECONOMIZER TUBE LEAKS.

THE B MODULE WAS TAKEN OFF-LINE APPROXIMATELY NINE DAYS DURING NOVEMBER DUE TO A LACK OF STACK REHEAT.

12/81	A	86.8	12.0		3.9				
	B	98.8	74.4		24.2				
	C	87.1	0.0		0.0				
	D	98.9	78.1		25.4				
	SYSTEM	98.9	78.1	100.0	25.4	744	242	189	26.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING DECEMBER THE UNIT WAS TAKEN OFF-LINE FOR THREE WEEKS TO REPAIR THE TURBINE.

MODULE A WAS DOWN PART OF THE MONTH WHILE BALANCING THE BOOSTER BLOWER ROTOR.

1/82	A	97.8	64.0		45.4				
	B	98.7	83.9		59.5				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR
	C	89.5	79.2		56.2				
	D	58.1	0.0		0.0				
	SYSTEM	100.0	92.0	99.0	65.0		744	528	487 40.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF-LINE FROM JANUARY 1 THRU JANUARY 9 TO COMPLETE TURBINE BEARING REPAIRS AND COUPLING ALIGNMENT.

MODULE C WAS UNAVAILABLE FOR 78 HOURS TO BALANCE THE BOOSTER BLOWER ROTOR.

MODULE D WAS OFF-LINE 312 HOURS BECAUSE THE INLET ISOLATION DAMPER WAS INOPERATIVE.

2/82	A	90.0	76.8		75.4				
	B	99.1	79.1		76.8				
	C	93.1	87.0		84.4				
	D	0.0	0.0		0.0				
	SYSTEM	94.0	91.0	96.0	88.0		672	652	591 80.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM OPERATION WAS SUSPENDED ON FEBRUARY 2 THRU FEBRUARY 4 DUE TO ESP PROBLEMS.

ON FEBRUARY 4 THRU FEBRUARY 8 THE FGD SYSTEM OPERATION WAS LIMITED TO TWO MODULES DUE TO THE LACK OF STACK GAS REHEAT (HIGH WATER CONSUMPTION).

MODULE D EXPERIENCED INLET DAMPER PROBLEMS CAUSING ADDITIONAL DOWN TIME.

3/82	A	97.0	92.0		69.8				
	B	99.9	91.3		69.2				
	C	99.7	92.7		70.3				
	D	54.8	0.0		0.0				
	SYSTEM	100.0	97.0	100.0	74.0		744	564	547 65.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS TAKEN OFF LINE TO PERFORM REPAIRS ON THE BURNER.

NUMEROUS TRIPS OF MODULE A WAS DUE TO THE BOOSTER BLOWER.

MODULE D WAS OUT OF SERVICE FROM MARCH 1 TO MARCH 15 DUE TO REPAIRS TO THE INLET DAMPERS.

MODULE D WAS TAKEN OFF-LINE ON MARCH 30 TO BALANCE THE BOOSTER BLOWER ROTO

4/82	A	98.2	75.0		68.1				
	B	96.8	54.5		49.4				
	C	97.1	78.9		71.5				
	D	92.8	77.9		70.7				
	SYSTEM	99.0	99.0	100.0	90.0		720	653	648 81.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF-LINE FOR THREE DAYS DURING APRIL DUE TO ECONOMIZER TUBE LEAKS.

MODULE D WAS OUT OF SERVICE FOR THREE DAYS TO REPLACE THE INBOARD MOTOR OIL SEAL AND BEARING ON THE BOOSTER BLOWER.

5/82	A	98.8	80.1		77.0				
	B	99.7	29.4		28.2				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	C	99.7	50.0		48.0						
	D	99.0	60.0		57.5						
	SYSTEM	100.0	95.0		91.0			744	715	678	52.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MAY THE UNIT WAS OPERATED AT REDUCED CAPACITY DUE TO MILL PROBLEMS.

6/82	A	66.7	25.9		25.7					
	B	67.8	50.7		50.3					
	C	43.2	0.1		0.1					
	D	64.9	60.1		59.6					
	SYSTEM	100.0	68.4		67.8		720	714	489	46.0

** PROBLEMS/SOLUTIONS/COMMENTS

ALL ABSORBERS WERE OUT OF SERVICE FROM JUNE 9 THROUGH JUNE 18 DUE TO COMPUTER PROBLEMS.

MODULE C WAS DOWN FROM JUNE 23 THROUGH JUNE 30 TO BALANCE A BOOSTER FAN ROTOR AND TO REPLACE ITS BEARINGS.

7/82	A	95.4	92.5		90.1					
	B	0.0	0.0		0.0					
	C	47.8	38.7		37.6					
	D	90.7	83.0		80.8					
	SYSTEM	100.0	100.0		100.0		744	724	744	69.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULES B AND C WERE DOWN DURING JULY TO REPLACE BEARINGS IN THE BOOSTER FAN MOTOR.

8/82	A	97.7	91.1		89.8					
	B	0.0	0.0		0.0					
	C	97.8	90.0		88.7					
	D	97.8	90.7		89.4					
	SYSTEM	100.0	100.0		100.0		744	733	744	80.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE B WAS DOWN FROM AUGUST 1 TO AUGUST 31 TO REPLACE A BEARING IN A BOOSTER FAN MOTOR.

9/82	A	56.7	98.7		21.7					
	B	0.0	0.0		0.0					
	C	56.7	98.7		21.7					
	D	56.7	99.4		21.8					
	SYSTEM	85.0	100.0		32.6		720	158	235	31.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN DURING PART OF SEPTEMBER DUE TO A CHEMICAL PLANT OUTAGE.

A BOILER TUBE LEAK ALSO CONTRIBUTED TO THE UNIT OUTAGE IN SEPTEMBER.

MODULE B WAS DOWN DURING THE MONTH FOR REPAIRS ON A BOOSTER FAN MOTOR.

10/82	A	0.0	0.0		0.0					
	B	0.0	0.0		0.0					
	C	18.8	53.2		11.3					
	D	12.5	41.8		8.9					
	SYSTEM	15.7	47.5		10.1		744	158	75	10.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM OCTOBER 1 TO OCTOBER 24 FOR A SCHEDULED OVERHAUL.

THE FGD SYSTEM RESUMED OPERATION ON OCTOBER 28 FOLLOWING A CHEMICAL PLANT OUTAGE.

11/82	A	78.6	30.6	28.1				
	B	56.3	4.1	3.8				
	C	97.8	94.6	86.8				
	D	80.1	86.4	79.3				
	SYSTEM	100.0	100.0	99.0	720	661	713	76.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE B WAS DOWN FROM NOVEMBER 18 TO NOVEMBER 30 TO REPAIR A DRIVE MOTOR ON AN INLET ISOLATION DAMPER.

ONLY TWO MODULES OPERATED DURING THE PERIOD DUE TO A LACK OF STACK REHEAT.

THE UNIT WAS DOWN FROM NOVEMBER 28 TO NOVEMBER 30 TO REPAIR AN ECONOMIZER TUBE LEAK.

MODULE A WAS DOWN FROM NOVEMBER 1 TO NOVEMBER 5 TO REPAIR AN INLET ISOLATION DAMPER.

12/82	A	91.3	68.1	66.5				
	B	62.2	4.4	4.3				
	C	97.7	60.7	59.3				
	D	96.2	90.1	88.0				
	SYSTEM	100.0	100.0	100.0	744	727	744	89.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS OUT OF SERVICE FROM DECEMBER 4 TO DECEMBER 6 TO BALANCE A BOOSTER FAN ROTOR.

MODULE B WAS DOWN FROM DECEMBER 1 TO DECEMBER 10 TO REPAIR A BOOSTER FAN MOTOR.

ONLY TWO MODULES OPERATED DURING MOST OF THE MONTH DUE TO A LACK OF STACK REHEAT.

1/83	A	88.4	82.5	71.5				
	B	39.9	22.2	19.2				
	C	75.1	49.0	42.5				
	D	92.2	81.6	70.7				
	SYSTEM	98.6	78.4	68.0	744	645	506	77.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN AT VARIOUS TIMES DURING JANUARY DUE TO BOILER-RELATED PROBLEMS.

AS OF JANUARY 1, 1983 THE NUMBER OF MODULES COMPRISING THE TOTAL FGD SYSTEM CHANGED FROM TWO TO THREE.

2/83	A	99.0	99.4	96.0				
	B	99.0						
	C	96.0	99.4	96.0				
	D	99.0	99.4	96.0				
	SYSTEM	100.0	99.4	96.0	672	649	645	90.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OUT OF SERVICE FROM FEBRUARY 26 TO FEBRUARY 27 DUE TO BOILER RELATED PROBLEMS.

MODULE B WAS DOWN DURING FEBRUARY TO REPAIR AN ABSORBER TRAY LEAK.

3/83	A	98.9	100.0	95.0				
	B	62.0	63.3	57.9				
	C	32.9	36.0	32.9				
	D	98.0	100.0	91.9				
	SYSTEM	97.3	99.8	92.6	744	681	689	83.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM MARCH 25 TO MARCH 27 DUE TO BOILER-RELATED PROBLEMS

MODULES B AND C WERE OUT OF SERVICE DURING PART OF MARCH DUE TO REPAIRS ON LEAKING COLLECTOR TRAYS.

4/83	A	50.0	54.1	50.0				
	B	98.1	100.0	96.9				
	C	54.0	54.1	50.0				
	D	99.0	100.0	96.9				
	SYSTEM	100.0	100.0	97.9	720	665	720	67.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN DURING PART OF APRIL TO REPAIR A BOILER TUBE LEAK.

MODULES A AND C WERE DOWN DURING PART OF APRIL TO REPAIR ABSORBER TRAY LEAKS.

5/83	A	71.0	74.9	65.1				
	B	88.0	95.7	83.1				
	C	84.0	95.7	83.1				
	D	29.0	32.2	28.0				
	SYSTEM	90.7	99.5	86.5	744	646	744	71.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FOR APPROXIMATELY THREE DAYS DURING MAY TO REPAIR A BOILER TUBE LEAK.

THE UNIT TRIPPED ON MAY 20 DUE TO A LOSS OF POWER TO THE BOILER BURNER CONTROL.

THE UNIT WAS REMOVED FROM SERVICE ON MAY 21 TO REPAIR A COMPUTER-RELATED MALFUNCTION.

A UNIT TRIP OCCURRED ON MAY 24 DUE TO COMPUTER-RELATED PROBLEMS AT MODULES A AND B.

MODULES A AND D WERE DOWN DURING PART OF MAY TO REPAIR ABSORBER TRAY LEAKS

6/83	A	52.9	49.0	49.0				
	B	93.1	93.1	93.1				
	C	99.0	99.0	99.0				
	D	56.9	56.9	56.9				
	SYSTEM	100.0	99.3	99.3	720	720	720	86.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

MODULES A AND D WERE DOWN DURING PART OF JUNE TO INSTALL SUMP LEVEL DETECTORS.

MODULES A AND D WERE OUT OF SERVICE DURING PART OF THE MONTH TO REPAIR ABSORBER TRAY LEAKS.

MODULE D WAS DOWN DURING PART OF JUNE DUE TO BLOWER VIBRATIONS.

THE UTILITY REPORTED THAT NO MAJOR OUTAGES OCCURRED DURING JUNE.

7/83	A	98.0	91.0		65.1				
	B	68.0	88.2		63.0				
	C	57.9	79.7		57.0				
	D	81.0	60.2		43.0				
	SYSTEM	100.0	100.0		76.0	744	532	566	60.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OUT OF SERVICE APPROXIMATELY 10 DAYS DURING JULY DUE TO BOILER-RELATED PROBLEMS.

THE UNIT WAS DOWN FROM JULY 29 TO 31 FOR REHEATER TUBE LEAK REPAIRS.

MODULE B WAS DOWN DURING PART OF JULY FOR MIST ELIMINATOR PAD REPAIRS.

MODULES C AND D WERE DOWN DURING PART OF THE MONTH DUE TO BOOSTER FAN BALANCING PROBLEMS.

8/83	A	97.0	75.9	100.0	72.6				
	B	16.9	16.0	22.8	15.3				
	C	75.0	27.0	38.2	25.8				
	D	88.0	83.0	100.0	79.3				
	SYSTEM	92.3	67.3	87.0	64.3	744	711	479	86.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM AUGUST 1 TO 2 FOR REHEATER TUBE LEAK REPAIRS.

MODULE A WAS DOWN DURING PART OF AUGUST FOR CONTROL INSTRUMENTATION REPAIRS.

MODULE B WAS DOWN DURING PART OF AUGUST FOR MIST ELIMINATOR PAD REPAIRS.

MODULE C WAS DOWN DURING PART OF THE MONTH DUE TO OUTLET DAMPER REPAIRS.

MODULE D WAS OUT OF SERVICE DURING PART OF AUGUST TO REPAIR EXPANSION JOINT LEAKS.

9/83	A	100.0	97.9	100.0	90.7				
	B	80.3	77.1	84.5	71.4				
	C	81.9	22.9	100.0	21.3				
	D	90.0	88.0	100.0	81.5				
	SYSTEM	100.0	95.3	100.0	88.3	720	667	636	77.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FOR APPROXIMATELY 5 DAYS DURING SEPTEMBER DUE TO BOILER-RELATED PROBLEMS.

MODULE B WAS DOWN DURING PART OF SEPTEMBER FOR A MIST ELIMINATOR INSPECTION

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

ABSORBER TRAYS WERE INSPECTED DURING SEPTEMBER AT MODULE B.

MODULE C WAS DOWN DURING PART OF SEPTEMBER DUE TO BOOSTER FAN PROBLEMS.

OUTLET DAMPER PROBLEMS CONTRIBUTED TO DOWN TIME AT MODULE C DURING THE MONTH.

10/83	A	98.9	81.6	81.6	28.0				
	B	98.9	88.6	88.6	30.4				
	C	98.9	89.8	98.7	30.8				
	D	9.0	9.0	100.0	3.1				
	SYSTEM	100.0	89.7	100.0	30.7	744	255	229	25.0
11/83	A	0.0	0.0		0.0				
	B	96.9	95.0	95.0	84.0				
	C	94.0	92.9	92.9	82.2				
	D	96.9	95.0	95.0	84.0				
	SYSTEM	96.0	94.3	94.3	83.4	720	637	601	75.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING OCTOBER AND NOVEMBER 1983.

12/83	A	0.0	0.0		0.0				
	B	96.4	95.0	95.0	94.4				
	C	94.4	90.0	90.0	89.4				
	D	96.4	97.0	97.0	96.4				
	SYSTEM	95.7	94.0	94.0	93.4	744	739	695	81.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS DOWN DURING DECEMBER DUE TO PROBLEMS WITH LEAKAGE.

1/84	A	0.0	0.0		0.0				
	B	99.7	97.8	97.8	97.7				
	C	98.7	85.9	85.9	85.8				
	D	99.7	97.8	97.8	97.7				
	SYSTEM	99.4	93.9	93.9	93.7	744	743	697	82.8

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS UNAVAILABLE DURING JANUARY DUE TO SUMP LEAKAGE.

2/84	A	95.0	93.0	100.0	93.0				
	B	98.0	98.0	100.0	98.0				
	C	99.0	99.0	100.0	99.0				
	D	3.0	2.0	20.0	2.0				
	SYSTEM	98.3	97.3	100.0	97.3	696	696	677	88.8

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE D WAS DOWN DURING FEBRUARY FOR MIST ELIMINATOR REPAIRS.

3/84	A	94.8	64.0	100.0	63.2				
	B	98.7	94.9	94.8	93.7				
	C	98.7	77.9	77.8	76.9				
	D	94.8	50.0	99.7	49.3				
	SYSTEM	100.0	95.6	100.0	94.4	744	735	702	87.3

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

A LACK OF REHEAT RESTRICTED FGD SYSTEM OPERATIONS AT MODULE D DURING
 FEBRUARY AND MARCH.

4/84	A	0.0	0.0		0.0				
	B	78.2	86.3	87.0	68.1				
	C	77.5	80.3	80.3	63.3				
	D	77.5	84.2	84.2	66.4				
	SYSTEM	77.7	83.6	83.8	65.9	720	568	475	64.4

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS DOWN DURING APRIL FOR ABSORBER TRAY SEAL REPAIRS.

5/84	A	74.6	65.9	90.2	65.6				
	B	85.5	76.9	100.0	76.6				
	C	83.6	65.9	90.0	65.6				
	D	98.5	72.9	94.7	72.6				
	SYSTEM	100.0	93.8	100.0	93.5	744	741	695	93.3

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS DOWN DURING THE MONTH FOR ABSORBER RECIRCULATING PUMP REPAIRS

ALL MODULES WERE DOWN AT VARIOUS TIMES DURING MAY DUE TO MULTIPLEXER
 PROBLEMS.

6/84	A	41.0	35.0	55.5	35.0				
	B	85.0	80.0	94.1	80.0				
	C	91.9	51.9	56.5	51.9				
	D	66.9	50.0	74.7	50.0				
	SYSTEM	95.0	72.3	93.6	72.3	720	720	521	85.0

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING JUNE.

7/84	A	64.7	55.9	73.6	50.9				
	B	86.4	66.2	93.7	60.3				
	C	72.8	52.9	70.4	48.3				
	D	86.4	51.9	66.4	47.3				
	SYSTEM	100.0	75.7	100.0	69.0	744	678	513	80.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT MULTIPLEXER PROBLEMS KEPT THE FGD SYSTEM FROM
 OPERATING MUCH DURING THE MONTH OF JULY.

8/84	A	95.0	88.0	88.0	88.0				
	B	0.0	0.0		0.0				
	C	95.0	84.9	84.9	84.9				
	D	95.0	87.0	87.0	87.0				
	SYSTEM	95.0	86.6	86.6	86.6	744	744	645	95.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING THE MONTH OF AUGUST.

9/84	A	65.0	91.4	91.4	63.8				
	B	0.0	0.0		0.0				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	C	65.7	89.4	89.4	62.4					
	D	66.4	89.4	89.4	62.4					
	SYSTEM	65.7	90.1	90.1	62.8		720	502	452	65.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD SYSTEM WAS DOWN FROM SEPT 22 THROUGH THE END OF THE MONTH FOR AN ANNUAL MAINTAINENCE OUTAGE.

MODULE B WAS DOWN ALL OF SEPTEMBER, OCTOBER, AND NOVEMBER FOR BOOSTER FAN MOTOR REPAIRS.

10/84	A	60.2	60.0	60.0	45.7					
	B	0.0	0.0		0.0					
	C	54.2	61.9	61.9	47.2					
	D	61.7	63.0	63.0	48.0					
	SYSTEM	58.7	61.6	61.6	47.0		744	567	349	67.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD-SYSTEM WAS DOWN MOST OF OCTOBER TO MAKE CONTROL SYSTEM REPAIRS.

11/84	A	89.9	96.0	96.0	86.3					
	B	0.0	0.0		0.0					
	C	89.9	96.0	96.0	86.3					
	D	89.9	96.0	96.0	86.3					
	SYSTEM	89.9	96.0	96.0	86.3		720	647	621	86.0

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING NOVEMBER WITH THE EXCEPTION OF MODULE B BOOSTER FAN MOTOR REPAIRS.

12/84	A	92.7	98.0	100.0	91.8					
	B	43.1	46.1	100.0	43.1					
	C	93.7	99.0	100.0	92.7					
	D	92.7	50.9	89.4	47.7					
	SYSTEM	100.0	98.0	100.0	91.8		744	697	683	89.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE MONTH OF DECEMBER.

1/85	A	98.0	32.9	88.8	32.9					
	B	98.9	98.0	100.0	98.0					
	C	98.9	98.9	100.0	98.9					
	D	98.9	66.0	100.0	66.0					
	SYSTEM	100.0	98.6	100.0	98.6		744	744	734	97.3

2/85	A	80.2	69.9	90.2	60.4					
	B	86.3	98.8	100.0	85.4					
	C	77.7	34.9	79.6	30.2					
	D	85.4	79.9	100.0	69.0					
	SYSTEM	100.0	94.5	100.0	81.7		672	581	549	80.6

3/85	A	74.1	63.0	100.0	63.0					
	B	87.0	47.0	85.2	47.0					
	C	96.9	84.9	100.0	84.9					
	D	100.0	96.9	100.0	96.9					
	SYSTEM	100.0	97.3	100.0	97.3		744	744	724	98.5

4/85	A	94.0	94.0	99.6	94.0					

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD CAP. HOURS FACTOR
	B	93.1	91.0	97.8	91.0				
	C	100.0	15.0	100.0	15.0				
	D	100.0	96.9	100.0	96.9				
	SYSTEM	100.0	99.3	100.0	99.3		720	720	715 97.4

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS OF JANUARY THROUGH APRIL.

5/85	A	0.0	0.0		0.0				
	B	90.1	98.5	98.5	87.4				
	C	90.1	95.5	95.5	84.7				
	D	83.7	90.3	90.3	80.1				
	SYSTEM	87.9	94.7	94.7	84.1		744	660	625 79.1
6/85	A	28.3	27.1	87.3	24.7				
	B	85.1	83.3	96.5	76.0				
	C	59.4	60.1	87.2	54.9				
	D	85.1	70.2	70.2	64.0				
	SYSTEM	86.0	80.2	100.0	73.2		720	657	527 79.4

** PROBLEMS/SOLUTIONS/COMMENTS

THE A-MODULE SCRUBBER SUMP BRICKWORK WAS REBUILT IN MAY AND JUNE. WORK ON THE C-MODULE BRICKWORK WAS PERFORMED IN JUNE.

7/85	A	100.0	98.9	98.9	98.9				
	B	100.0	98.9	98.9	98.9				
	C	0.0	0.0		0.0				
	D	100.0	98.0	98.0	98.0				
	SYSTEM	100.0	98.6	98.6	98.6		744	744	734 97.7
8/85	A	100.0	95.0	95.5	95.0				
	B	77.0	75.0	75.4	75.0				
	C	34.9	34.9	100.0	34.9				
	D	71.0	66.0	100.0	66.0				
	SYSTEM	94.3	90.3	100.0	90.3		744	744	672 98.8

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS OF JULY AND AUGUST.

9/85	A	87.2	94.0	100.0	84.4				
	B	87.2	96.0	100.0	86.3				
	C	87.2	97.1	100.0	87.2				
	D	0.0	0.0		0.0				
	SYSTEM	87.2	95.7	100.0	86.0		720	647	619 84.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT MODULE D ABSORBER SUMP BRICKWORK REBUILDING TOOK PLACE IN SEPTEMBER.

10/85	A	51.7	80.0	80.0	43.5				
	B	0.0	0.0		0.0				
	C	51.7	92.1	92.1	50.1				
	D	51.7	94.1	94.1	51.2				
	SYSTEM	51.7	88.7	88.7	48.3		744	405	359 49.5

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE B-MODULE ABSORBER SUMP BRICKWORK WAS REBUILT IN OCTOBER DURING A POWER PLANT MAINTENANCE OUTAGE.

11/85	A	88.2	91.5	91.6	84.6				
	B	0.0	0.0		0.0				
	C	72.8	64.9	64.9	60.0				
	D	84.6	88.7	88.7	81.9				
	SYSTEM	81.9	81.7	81.7	75.5	720	665	544	79.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT MODULE C WAS DOWN DURING PART OF THE MONTH FOR INLET DAMPER REPAIRS.

MODULE B WAS OUT OF SERVICE DURING THE MONTH FOR ABSORBER WALL REPAIRS.

12/85	A	51.5	41.0	86.0	40.6				
	B	60.3	57.0	100.0	56.5				
	C	98.9	97.9	98.0	96.9				
	D	98.9	96.0	96.1	95.0				
	SYSTEM	100.0	97.3	100.0	96.3	744	736	717	95.0

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED REPAIRS WERE REPORTED BY THE UTILITY FOR THE MONTH OF DECEMBER.

1/86	A	31.9	35.0	100.0	31.9				
	B	91.1	92.9	92.9	84.7				
	C	91.1	97.1	97.1	88.4				
	D	64.7	56.0	86.2	51.1				
	SYSTEM	92.9	93.7	100.0	85.3	744	678	635	85.7

2/86	A	63.8	56.0	100.0	55.8				
	B	99.7	61.9	100.0	61.8				
	C	99.7	79.0	86.7	78.7				
	D	99.7	94.0	94.0	93.8				
	SYSTEM	100.0	97.0	100.0	96.7	672	670	650	93.8

3/86	A	92.2	89.9	100.0	82.9				
	B	74.7	24.1	58.1	22.2				
	C	92.2	89.9	100.0	82.9				
	D	89.4	52.0	49.6	48.0				
	SYSTEM	100.0	85.3	100.0	78.7	744	686	585	81.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED NO FGD SYSTEM-RELATED PROBLEMS FOR THE FIRST QUARTER OF 1986.

4/86	A	86.4	53.0	100.0	47.2				
	B	14.2	0.0		0.0				
	C	86.4	52.0	100.0	46.3				
	D	86.3	46.0	100.0	41.0				
	SYSTEM	91.1	50.3	100.0	44.8	720	641	323	82.6

5/86	A	73.7	13.0	100.0	12.9				
	B	86.7	68.0	100.0	67.7				
	C	89.7	34.0	100.0	33.9				
	D	86.7	56.0	100.0	55.8				
	SYSTEM	100.0	57.0	100.0	56.8	744	741	422	77.7

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER BOILER HOURS	FGD CAP. HOURS FACTOR
6/86	A	38.1	31.6	100.0	28.9				
	B	91.4	90.1	100.0	82.4				
	C	85.4	64.1	100.0	58.6				
	D	91.4	98.0	100.0	89.6				
	SYSTEM	100.0	94.6	100.0	86.5			720 658	623 69.2
** PROBLEMS/SOLUTIONS/COMMENTS									
NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE SECOND QUARTER OF 1986.									
7/86	A	99.6	69.0	100.0	68.7				
	B	99.6	66.9	100.0	66.7				
	C	99.6	47.0	73.9	46.8				
	D	99.6	65.0	65.1	64.8				
	SYSTEM	100.0	82.6	100.0	82.3			744 741	612 75.8
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED NO FGD SYSTEM-RELATED PROBLEMS DURING THE MONTH OF JULY.									
8/86	A	87.8	53.0	100.0	46.5				
	B	85.1	64.9	66.3	57.0				
	C	87.8	88.1	85.4	77.3				
	D	85.1	23.0	100.0	20.2				
	SYSTEM	100.0	76.3	100.0	67.0			744 653	498 68.5
** PROBLEMS/SOLUTIONS/COMMENTS									
THE BOOSTER BLOWER ON MODULE D REQUIRED BALANCING IN AUGUST.									
9/86	A	94.2	51.8	100.0	48.1				
	B	94.2	69.0	64.0	64.0				
	C	94.2	78.1	72.5	72.5				
	D	94.2	30.4	100.0	28.2				
	SYSTEM	100.0	76.4	100.0	70.9			720 668	511 65.9
10/86	A	91.0	79.9	100.0	72.8				
	B	5.9	0.0		0.0				
	C	88.3	78.9	100.0	71.9				
	D	91.0	67.8	100.0	61.8				
	SYSTEM	92.1	75.6	100.0	68.9			744 678	512 62.8
11/86	A	100.0	46.9	96.6	46.9				
	B	16.9	1.0	100.0	1.0				
	C	100.0	91.0	100.0	91.0				
	D	83.1	58.1	100.0	58.1				
	SYSTEM	100.0	65.6	100.0	65.6			720 720	473 66.1
** PROBLEMS/SOLUTIONS/COMMENTS									
NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS OF SEPTEMBER THROUGH NOVEMBER.									
12/86	A	1.5	0.0		0.0				
	B	47.6	37.1	100.0	34.7				
	C	47.6	35.6	100.0	33.3				
	D	42.9	23.9	100.0	22.3				
	SYSTEM	46.5	32.2	100.0	30.1			744 696	224 27.5

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE ABSORBER TRAYS ON MODULES A, B, C, AND D REQUIRED REPAIR DURING
 DECEMBER.

1/87	A	55.0	55.8	100.0	45.0				
	B	100.0	84.3	100.0	68.0				
	C	6.5	0.0		0.0				
	D	94.0	83.0	100.0	66.9				
	SYSTEM	85.1	74.4	100.0	60.0	744	600	446	26.1

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM EXPERIENCED SOME DOWNTIME DUE TO WORK ON ABSORBER TRAYS.

2/87	A	100.0	58.9	100.0	58.9				
	B	96.0	76.0	100.0	76.0				
	C	4.0	0.0		0.0				
	D	100.0	91.1	100.0	91.1				
	SYSTEM	100.0	75.3	100.0	75.3	672	672	506	74.5
3/87	A	100.0	88.5	75.9	75.9				
	B	100.0	69.9	59.9	59.9				
	C	84.0	23.3	23.8	20.0				
	D	100.0	95.6	82.0	82.0				
	SYSTEM	100.0	92.4	80.6	79.3	744	638	590	774.0
4/87	A	100.0	88.9	100.0	76.0				
	B	76.9	29.3	100.0	25.0				
	C	100.0	75.0	100.0	64.0				
	D	100.0	70.2	100.0	60.0				
	SYSTEM	100.0	87.8	100.0	75.0	720	615	540	33.3
5/87	A	100.0	68.0	100.0	68.0				
	B	100.0	25.0	100.0	25.0				
	C	100.0	59.0	100.0	59.0				
	D	100.0	79.0	100.0	79.0				
	SYSTEM	100.0	77.0	100.0	77.0	744	744	573	49.2
6/87	A	93.1	35.2	100.0	35.0				
	B	100.0	67.4	100.0	66.9				
	C	100.0	65.5	100.0	65.0				
	D	93.1	48.4	100.0	48.1				
	SYSTEM	100.0	72.2	100.0	71.7	720	715	516	61.8
7/87	A	100.0	58.6	100.0	49.1				
	B	61.0	50.2	100.0	42.1				
	C	97.0	52.5	100.0	44.0				
	D	93.0	63.2	100.0	53.0				
	SYSTEM	100.0	74.9	100.0	62.7	744	623	466	51.1
8/87	A	97.0	30.0	100.0	30.0				
	B	94.0	49.1	100.0	49.1				
	C	97.0	77.7	100.0	77.7				
	D	97.0	63.0	100.0	63.0				
	SYSTEM	100.0	73.3	100.0	73.3	744	744	545	69.5
9/87	A	33.1	0.0		0.0				
	B	100.0	100.0	100.0	76.9				
	C	100.0	100.0	100.0	84.6				
	D	100.0	7.2	100.0	5.0				
	SYSTEM	100.0	69.1	100.0	55.5	720	500	400	37.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD FEBRUARY THROUGH SEPTEMBER 1987.

10/87	A	35.5	0.0		0.0				
	B	100.0	98.6	98.6	28.2				
	C	98.3	99.5	99.5	28.5				
	D	51.6	0.0		0.0				
	SYSTEM	95.1	66.0	99.1	18.9	744	213	141	17.4

** PROBLEMS/SOLUTIONS/COMMENTS

THE LOW UTILIZATION VALUE REPORTED RESULTED FROM LOW POWER DEMAND.

11/87	A	66.7			0.0				
	B	66.7			0.0				
	C	66.7			0.0				
	D	66.7			0.0				
	SYSTEM	88.9			0.0	720	0	0	0.0
12/87	A	71.0			0.0				
	B	71.0			0.0				
	C	71.0			0.0				
	D	71.0			0.0				
	SYSTEM	94.6			0.0	744	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS AVAILABLE REGARDING OUTAGE TIME DURING THE NOVEMBER-DECEMBER PERIOD.

**DO NOT MICROFILM
THIS PAGE**

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	PUBLIC SERVICE OF NEW MEXICO	
PLANT NAME	SAN JUAN	
UNIT NUMBER	2	
CITY	WATERFLOW	
STATE	NEW MEXICO	
REGULATORY CLASSIFICATION	A	
PARTICULATE EMISSION LIMITATION - NG/J	21.	(0.050 LB/MMBTU)
SO ₂ EMISSION LIMITATION - NG/J	228.	(0.530 LB/MMBTU)
NO _x EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	1614	
GROSS UNIT GENERATING CAPACITY - MW	350	
NET UNIT GENERATING CAPACITY W/FGD - MW	312	
NET UNIT GENERATING CAPACITY WO/FGD - MW	328	
EQUIVALENT SCRUBBED CAPACITY - MW	350	
 ** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	FOSTER WHEELER	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	725.78	(1538000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	122.8	(253 F)
STACK HEIGHT - M	122.	(400 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	6.1	(20.0 FT)
 ** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	SUBBITUMINOUS	
AVERAGE HEAT CONTENT - J/G	20934.	(9000 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		8000-11628
AVERAGE ASH CONTENT - %	22.00	
RANGE ASH CONTENT - %	12.6-22.5	
AVERAGE MOISTURE CONTENT - %	10.50	
RANGE MOISTURE CONTENT - %	8.1-15.0	
AVERAGE SULFUR CONTENT - %	0.80	
RANGE SULFUR CONTENT - %	0.6-1.3	
AVERAGE CHLORIDE CONTENT - %	0.03	
RANGE CHLORIDE CONTENT - %	0.00-0.09	
 *** PARTICLE CONTROL		
 ** ESP		
NUMBER	1	
TYPE	HOT SIDE	
SUPPLIER	WESTERN PREC. DIVISION, JOY	
INLET FLUE GAS CAPACITY - CU.M/S	943.8	(2000000 ACFM)
INLET FLUE GAS TEMPERATURE - C	371.1	(700 F)
PRESSURE DROP - KPA	0.6	(3. IN-H ₂ O)
PARTICLE REMOVAL EFFICIENCY - %	99.5	
 ** PARTICLE SCRUBBER		
NUMBER	4	
NUMBER OF SPARES	1	
INITIAL START-UP DATE	8/1978	
GENERIC TYPE	VENTURI TOWER	
SPECIFIC TYPE	VARIABLE-THROAT/BOTTOM-ENTRY PLUMB BOB	
TRADE NAME/COMMON NAME	N/A	
SUPPLIER	DAVY MCKEE	
DIMENSIONS - FT	12.5 DIA X 28.0	
SHELL GENERIC MATERIAL	CARBON STEEL	
SHELL SPECIFIC MATERIAL	AISI 1110	
LINER GENERIC MATERIAL	INORGANIC	
LINER SPECIFIC MATERIAL	REFIRED BRICK/SHAPES	
GAS CONTACTING DEVICE TYPE	STAINLESS STEEL	
NUMBER OF CONTACTING ZONES	1	
LIQUID RECIRCULATION RATE - LITER/S	224.9	(3570 GPM)
L/G RATIO - LITER/CU.M	0.9	(7.1 GAL/1000ACF)
PRESSURE DROP - KPA	3.1	(12.5 IN-H ₂ O)
SUPERFICIAL GAS VELOCITY - M/S	48.8	(160.0 FT/S)

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

INLET GAS FLOW RATE - CU.M/S	229.8	(487000 ACFM)
INLET GAS TEMPERATURE - C	134.4	(274 F)
PARTICLE REMOVAL EFFICIENCY - %	75.0	

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	SALEABLE PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	WELLMAN LORD
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	DAVY MCKEE
A-E FIRM	STEARNS-ROGER
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	RETROFIT
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	90.00
ENERGY CONSUMPTION - %	4.6
CURRENT STATUS	1
COMMERCIAL START-UP	8/1978
INITIAL START-UP	8/1978
CONTRACT AWARDED	2/1974

** DESIGN AND OPERATING PARAMETERS

DESIGN CHLORIDE CONTENT - %

** QUENCHER/PRESATURATOR

CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR

** ABSORBER

NUMBER	4	
NUMBER OF SPARES	1	
GENERIC TYPE	TRAY TOWER	
SPECIFIC TYPE	VALVE TRAY	
TRADE NAME/COMMON TYPE	BUBBLE CAP TRAY TOWER	
SUPPLIER	DAVY MCKEE	
DIMENSIONS - FT	24.0 X 29.0 X 79.0	
SHELL GENERIC MATERIAL	INORGANIC	
SHELL SPECIFIC MATERIAL	HYDRAULICALLY-BONDED CONCRETE	
SHELL MATERIAL TRADE NAME/COMMON TYPE	PORTLAND CEMENT	
LINER GENERIC MATERIAL	INORGANIC	
LINER SPECIFIC MATERIAL	PREFIRED BRICK/SHAPES	
LINER MATERIAL TRADE NAME/COMMON TYPE	ACID-RESISTANT BRICK 'LOW H2O ABSORPTION'	
GAS CONTACTING DEVICE TYPE	VALVE TRAY	
NUMBER OF CONTACTING ZONES	5	
DISTANCE BETWEEN GAS CONTACTING ZONES - CM	5.1	(2.0IN)
LIQUID RECIRCULATION RATE - LITER/S	47.	(750 GPM)
L/G RATIO - L/CU.M	0.2	(1.7 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	4.0	(16.0 IN-H2O)
SUPERFICAL GAS VELOCITY - M/SEC	3.3	(10.8 FT/S)
INLET GAS FLOW - CU. M/S	198.67	(421000 ACFM)
INLET GAS TEMPERATURE - C	48.9	(120 F)
SO2 REMOVAL EFFICIENCY - %	90.0	

** MIST ELIMINATOR

PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR	
NUMBER PER SYSTEM	4	
GENERIC TYPE	IMPINGEMENT	
SPECIFIC TYPE	BAFFLE	
TRADE NAME/COMMON TYPE	CLOSED VANE	
CONFIGURATION	HORIZONTAL	
NUMBER OF PASSES PER STAGE	1	
PRESSURE DROP - KPA	0.0	(0.0 IN-H2O)
SUPERFICAL GAS VELOCITY - M/S	3.2	(10.5 FT/S)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC	
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPHENYLENE	
WASH WATER SOURCE	BLENDED	
WASH FREQUENCY	CONTINUOUS ON ONE & INTERMITTENT ON THE OTHER	
WASH RATE - L/S	3.8	(60 GAL/MIN)

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

** REHEATER	
NUMBER	1
GENERIC TYPE	INDIRECT HOT AIR
SPECIFIC TYPE	EXTERNAL HEAT EXCHANGER
TRADE NAME/COMMON TYPE	STEAM TUBE BUNDLE
TEMPERATURE INCREASE - C	27.8 (50 F)
INLET FLUE GAS FLOW RATE - CU. M/S	62.67 (132800 ACFM)
INLET FLUE GAS TEMPERATURE - C	48.9 (120 F)
CONSTRUCTION MATERIAL GENERIC TYPE	STAINLESS STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AUSTENITIC
** FANS	
NUMBER	4
DESIGN	CENTRIFUGAL
SUPPLIER	BUFFALO FORGE
FUNCTION	BOOSTER
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	276.06 (585000 ACFM)
FLUE GAS TEMPERATURE - C	122.8 (253 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	ESP TO FANS
DIMENSIONS	16.0 X 24.0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	MIX TANK
DEVICE	N/A
DEVICE TYPE	AGITATED TANK
** TANKS	
SERVICE	NUMBER
-----	-----
ABSORBER RECYCLE	1
** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER PRODUCT TRANSFER	2
SCRUBBER RECIRCULATION	4
ABSORBER RECIRCULATION	20
ABSORBER SPRAY RECIRCULATION	8
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	NONE
*** SALEABLE BYPRODUCTS	
NATURE	SULFURIC ACID
FULL LOAD QUANTITY - M T/H	1.36 (1.50 TPH)
QUALITY - %	99.5
DISPOSITION	MARKETED

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

*** SLUDGE

** TREATMENT
METHOD
DEVICE
PROPRIETARY PROCESS

N/A
N/A
N/A

** DISPOSAL
NATURE
TYPE
SITE TREATMENT

N/A
NONE
N/A

** PROCESS CONTROL AND INSTRUMENTATION
CHEMICAL PARAMETERS
CONTROL LEVELS
MONITOR LOCATION
PROCESS CONTROL MANNER

PH & DENSITY
PH 5.5-6.5; SP.GR. 1.2-1.3
ABSORBER BLEED & PRODUCT SOLUTION
MANUAL

** WATER BALANCE

WATER LOOP TYPE

CLOSED

POND SEEPAGE/RUNOFF WATER LOSS - LITERS/S

45

MAKEUP WATER ADDITION - LITERS/S

22.4

(355 GPM)

** FGD SPARE CAPACITY INDICES

ABSORBER - %

33.3

** FGD SPARE COMPONENT INDICES

ABSORBER

1.0

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. HOURS	FGD CAP. FACTOR

0/78 SYSTEM

** PROBLEMS/SOLUTIONS/COMMENTS

NOTE: ALTHOUGH THIS FGD SYSTEM IS DESIGNED TO BRING THE BOILER INTO COMPLIANCE WITH A 0.34 LB/MM BTU SO2 EMISSION STANDARD, THE STATE HAS INITIALLY ONLY REQUIRED A 1.2 LB/MM BTU SO2 CONTROL LEVEL. SAN JUAN 2 WILL BE REQUIRED TO MEET THE MORE STRINGENT SO2 EMISSION LIMITATION VALUE BY APRIL 18, 1980. THE UNIT ONLY REQUIRES TWO OF THE FOUR SCRUBBING TRAINS TO MEET THE 1.2 LB/MM BTU LIMITATION VALUE; HOWEVER, THREE ARE REQUIRED FOR THE MORE STRINGENT LIMITATION VALUE (THE SYSTEM IS DESIGNED TO INCLUDE ONE SPARE SCRUBBING TRAIN WHEN MEETING THE 0.34 LB/MM BTU SO2 EMISSION STANDARD). BECAUSE OF THIS CHANGE IN EMISSION LIMITATION VALUES THE FGD SYSTEM WILL EFFECTIVELY HAVE AN ABSORBER SPARE COMPONENT INDEX OF 2.0 (100% SPARE CAPACITY FOR THIS SYSTEM) THROUGH APRIL 17, 1980 AND 1.0 (33.3% SPARE CAPACITY FOR THIS SYSTEM) THEREAFTER. CONSEQUENTLY THE "SYSTEM" DEPENDABILITY FACTORS WILL BE CALCULATED AS:

MODULAR AVERAGE X 2.0
THROUGH APRIL 17, 1980 AND:
MODULAR AVERAGE X 1.33
THEREAFTER.

8/78 SYSTEM

744

** PROBLEMS/SOLUTIONS/COMMENTS

INITIAL FGD OPERATIONS BEGAN IN LATE AUGUST. SHAKEDOWN/DEBUGGING OPERATIONS CONTINUED THROUGH AUGUST.

PROBLEMS WERE ENCOUNTERED WITH THE BOOSTER FAN CONTROL DAMPER.

10/78 SYSTEM

744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

HEAT TRACING FAILURES ALLOWED LINE FREEZING TO OCCUR.

A TEMPORARY HIGH FLYASH LOADING WAS THE RESULT OF AN ESP MALFUNCTION.

THE FGD SYSTEM IS STILL EXPERIENCING ROUTINE START UP PHASE PROBLEMS.

11/78 SYSTEM 720

12/78 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

ALTHOUGH FGD THE SYSTEM HAS BEEN OPERATING, WEATHER-RELATED PROBLEMS HAVE LIMITED OPERATIONS TO TWO MODULES. REHEATER LEAKS OCCURRED DURING THE PERIOD.

1/79 SYSTEM 744

2/79 SYSTEM 672

3/79 SYSTEM 744

4/79 SYSTEM 720

5/79 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

HOURS ARE NOT YET AVAILABLE BECAUSE THE UTILITY IS CONCENTRATING EFFORTS ON OPERATION OF THIS NEW UNIT. THE UTILITY REPORTED THAT THE SCRUBBING MODULES THEMSELVES ARE OPERATING ACCEPTABLY. ALSO THE CHEMICAL PLANT IS AVAILABLE AND THERE IS NO SYSTEM PLUGGING WHATSOEVER.

THE MAJOR PROBLEM ENCOUNTERED WAS FAN VIBRATION. THE UTILITY HAS BEEN WORKING WITH THE SUPPLIER IN AN EFFORT TO DISCOVER WHY FAN BALANCE HAS BEEN DIFFICULT TO MAINTAIN.

7/79 SYSTEM 744

8/79 SYSTEM 744

9/79 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE THIRD QUARTER TWO OF THE FOUR ABSORBERS WERE DOWN DUE TO BOOSTER BLOWER VIBRATION PROBLEMS.

10/79 SYSTEM 744

11/79 SYSTEM 720

12/79	E	100.0	80.1	66.9			
	F	100.0	73.3	61.3			
	G	0.0	0.0	0.0			
	H	0.0	0.0	0.0			
	SYSTEM	100.0	76.7	64.1	744	622	477

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NOTE: SEE COMMENTS FOR 00/78 EXPLAINING SYSTEM DEPENDABILITY CALCULATIONS.

DURING DECEMBER TWO MODULES WERE DOWN COMPLETELY AS A RESULT OF REHEATER PROBLEMS.

1/80	E	92.0	63.0		62.4			
	F	100.0	0.0		0.0			
	G	0.0	0.0		0.0			
	H	0.0	0.0		0.0			
	SYSTEM	96.0	31.5		31.2	744	737	232

** PROBLEMS/SOLUTIONS/COMMENTS

THE F-MODULE WAS AVAILABLE, HOWEVER, FGD SERVICE WAS NOT REQUIRED BECAUSE A BOILER-RELATED POWER FAILURE FORCED THE BOILER TO OPERATE AT LOW LOAD.

2/80	E	97.0	65.7		64.5			
	F	22.0	12.3		12.1			
	G	0.0	0.0		0.0			
	H	0.0	0.0		0.0			
	SYSTEM	59.5	39.0		38.3	696	683	267

3/80	E	87.0	0.0		0.0			
	F	85.0	93.6		59.4			
	G	0.0	0.0		0.0			
	H	0.0	0.0		0.0			
	SYSTEM	86.0	46.8		29.7	744	472	221 33.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE FIRST QUARTER ONLY ONE ABSORBER COULD BE OPERATED DUE TO AN ELECTRICAL PROBLEM. CURRENTLY, OPERATIONS ARE LIMITED TO TWO ABSORBERS UNTIL NEW REHEATERS ARE INSTALLED. REHEATER INSTALLATION IS EXPECTED TO BE COMPLETED IN APRIL.

4/80	E	99.3	91.3		68.5			
	F	99.9	71.1		53.3			
	G	0.0	0.0		0.0			
	H	44.2	58.5		43.9			
	SYSTEM	100.0	90.8	98.8	68.1	720	540	490 66.3

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE G IS DOWN FOR MAJOR REPAIRS WHICH WERE A RESULT OF AN INTERNAL FIRE EARLIER IN THE YEAR.

A REGULATION CHANGE EFFECTIVE APRIL 18, NOW REQUIRES THAT THREE MODULES OPERATE TO MEET SO2 REGULATIONS (SEE COMMENTS FOR 00/78).

MODULE H WAS UNAVAILABLE IN THE BEGINNING OF THE MONTH.

5/80	E	99.1	97.3		86.7			
	F	98.9	95.2		84.8			
	G	0.0	0.0		0.0			
	H	98.9	91.9		81.9			
	SYSTEM	99.0	94.8	100.0	84.5	744	663	628 79.1

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER WAS DOWN FOR SEVERAL HOURS FOR MINOR MAINTENANCE AND BOILER TUB REPAIRS.

6/80	E	89.2	72.4		56.0				
	F	89.6	74.1		57.4				
	G	0.0	0.0		0.0				
	H	88.8	83.8		64.9				
	SYSTEM	89.2	76.7	98.3	59.4	720	557	428	69.6

** PROBLEMS/SOLUTIONS/COMMENTS

AN ELECTRICAL CABLE FAILURE PREVENTED MODULES E AND F FROM OPERATING SIMULTANEOUSLY. AUXILIARY POWER COULD ONLY BE PROVIDED TO ONE MODULE.

7/80	E	97.6	55.4		49.1				
	F	96.9	85.0		75.3				
	G	0.0	0.0		0.0				
	H	98.9	91.0		80.6				
	SYSTEM	97.8	77.1		68.3	744	659	508	79.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER WAS DOWN FOR SEVERAL DAYS IN JULY TO REPAIR STEAM TUBE LEAKS.

THE POWER CABLE WHICH FAILED IN JUNE WAS REPAIRED THIS MONTH. THIS CABLE PERMITS SIMULTANEOUS OPERATION OF THE E AND F MODULES WITH THE H MODULE.

8/80	E	98.4	90.2		85.8				
	F	97.8	72.7		69.1				
	G	0.0	0.0		0.0				
	H	98.3	92.6		88.0				
	SYSTEM	98.2	85.2	100.0	81.0	744	707	602	88.7

** PROBLEMS/SOLUTIONS/COMMENTS

TUBE LEAK REPAIRS IN THE BOILER CAUSED THE FGD SYSTEM NO TO OPERATE FOR TWO DAYS.

9/80	E	99.0	56.1		51.9				
	F	99.3	56.1		51.9				
	G	0.0	0.0		0.0				
	H	97.6	56.2		52.1				
	SYSTEM	98.6	56.1	62.5	51.9	720	667	374	85.5

** PROBLEMS/SOLUTIONS/COMMENTS

ESP PROBLEMS CAUSED ERRATIC OPERATION OF THE FGD SYSTEM FOR SEVERAL DAYS IN SEPTEMBER.

THE FGD SYSTEM WAS NOT OPERATED DURING A SCHEDULED OUTAGE OF THE CHEMICAL PLANT. THE SYSTEM WAS AVAILABLE DURING THIS TIME.

MODULE G WAS UNAVAILABLE IN SEPTEMBER BECAUSE OF ONGOING REPAIR OF FIRE DAMAGE.

10/80	E	14.7	36.2		14.7				
	F	15.7	39.0		15.7				
	G	0.0	0.0		0.0				
	H	1.1	0.0		0.0				
	SYSTEM	10.5	25.0	27.0	10.1	744	301	75	40.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

UNIT 2 WAS OFF LINE FROM OCTOBER 4 TO OCTOBER 23 FOR A SCHEDULED FALL OUTAGE.

THE "H" MODULE WAS UNAVAILABLE ESSENTIALLY THE ENTIRE MONTH AS A RESULT OF MAINTENANCE BEING PERFORMED.

THE "G" MODULE REMAINED UNAVAILABLE DURING THE MONTH AS A RESULT OF THE FIRE DAMAGE INCURRED ON MARCH 24.

11/80	E	97.6	85.8		55.3				
	F	90.0	73.3		47.2				
	G	0.0	0.0		0.0				
	H	57.2	20.7		13.3				
	SYSTEM	81.8	59.5	60.4	38.3	720	464	276	57.0

** PROBLEMS/SOLUTIONS/COMMENTS

UNIT 2 WAS DOWN FROM NOVEMBER 13 TO 18 TO REPAIR A WATERWALL TUBE LEAK AND FROM NOVEMBER 19 TO 23 AS A RESULT OF THE FAILURE OF A START-UP TRANSFORMER.

THE "H" MODULE WAS OUT OF SERVICE FROM NOVEMBER 1 TO 12 TO BALANCE THE ROTOR IN THE BOOSTER BLOWER AND TO REPAIR THE ABSORBER RECIRCULATING PUMP.

12/80	E	95.3	42.4		34.3				
	F	95.6	59.9		48.4				
	G	0.0	0.0		0.0				
	H	69.4	51.7		41.8				
	SYSTEM	85.8	51.6	100.0	41.7	744	601	310	73.9

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM DECEMBER 6 TO 7 TO REPAIR A TUBE LEAK, BUT THEN REMAINED DOWN UNTIL DECEMBER 11 FOR A TRANSFORMER TIE-IN.

THE "H" MODULE WAS DOWN FROM DECEMBER 11 TO 19 TO REPAIR A LEAK THAT HAD DEVELOPED AT THE SUCTION SIDE OF THE ABSORBER RECIRCULATING PUMP.

THE UNIT 2 FGD SYSTEM EXPERIENCED A LOSS OF POWER ON DECEMBER 24 AND DID NOT RETURN TO SERVICE UNTIL DECEMBER 26 AS A RESULT OF COMPUTER PROBLEMS THAT DEVELOPED.

THE "G" MODULE REMAINED OUT OF SERVICE THROUGH THE END OF THE FOURTH QUARTER AS A RESULT OF THE FIRE DAMAGE INCURRED IN MARCH.

1/81	E	98.5	84.1		84.1				
	F	97.7	79.2		79.2				
	G	0.0	0.0		0.0				
	H	97.6	89.8		89.8				
	SYSTEM	97.0	76.0	98.0	76.0	744	744	563	98.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JANUARY MODULE F WAS OUT OF SERVICE APPROXIMATELY 17 HOURS DUE TO BOILER LOAD CURTAILMENT.

THE FGD SYSTEM OPERATED ERRATICALLY DURING JANUARY DUE TO PRECIPITATOR PROBLEMS AND HIGH SOLIDS IN THE SCRUBBER SUMPS.

MODULE G REMAINED OUT OF SERVICE DUE TO REPAIRS ON THE INTERNALS DAMAGED

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

BY A FIRE ON MARCH 24, 1980.

2/81	E	96.6	43.2		34.4				
	F	99.1	54.0		43.0				
	G	0.0	0.0		0.0				
	H	93.0	69.7		55.5				
	SYSTEM	96.0	31.0	99.0	25.0	672	535	166	68.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING FEBRUARY MODULE E WAS OUT OF SERVICE APPROXIMATELY 72 HOURS DUE TO LACK OF DEMAND. THE TOTAL SYSTEM OPERATED INTERMITTENTLY FROM MARCH 2 THROUGH MARCH 10, 1981 DUE TO PRECIPITATOR REPAIRS.

THE BOILER WAS OUT OF SERVICE APPROXIMATELY 48 HOURS TO REPAIR A WATER-WALL TUBE LEAK AND APPROXIMATELY 96 HOURS TO REPAIR AN ECONOMIZER TUBE LEAK.

3/81	E	98.1	81.2		63.2				
	F	95.4	79.8		62.1				
	G	0.0	0.0		0.0				
	H	94.5	86.2		67.1				
	SYSTEM	94.0	82.0	94.0	64.0	744	579	476	69.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MARCH THE BOILER WAS OUT OF SERVICE APPROXIMATELY 165 HOURS DUE TO A SCHEDULED MAINTENANCE OUTAGE.

MODULE E WAS OUT OF SERVICE APPROXIMATELY 72 HOURS AND MODULE F FOR APPROXIMATELY 48 HOURS DUE TO LOW STACK GAS TEMPERATURE.

4/81	E	40.3	6.9		5.3				
	F	97.8	88.2		67.6				
	G	0.0	0.0		0.0				
	H	96.9	90.8		69.6				
	SYSTEM	78.0	62.0	66.0	47.0	720	552	340	70.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING APRIL THE BOILER WAS OUT OF SERVICE APPROXIMATELY 168 HOURS DUE TO A SCHEDULED OUTAGE.

MODULE E WAS OUT OF SERVICE UNTIL APRIL 20, DUE TO HIGH BOOSTER BLOWER VIBRATIONS AND TO CLEAR PLUGGED TRAY RECIRCULATION PUMP LINES AND VALVES.

5/81	E	95.4	86.8		66.5				
	F	98.2	81.1		62.1				
	G	4.3	5.6		4.3				
	H	95.7	77.2		59.1				
	SYSTEM	97.8	83.5	95.8	64.0	744	570	476	71.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MAY THE BOILER WAS OUT OF SERVICE APPROXIMATELY 144 HOURS TO REMOVE CLINKERS FROM THE BOTTOM ASH AREA IN THE BOILER.

ADDITIONAL BOILER OUTAGE TIME WAS NEEDED TO REPAIR A BROKEN OIL LINE AT THE TURBINE.

ADDITIONAL OUTAGE TIME WAS DUE TO THE BOTTOM COLLECTOR TRAY LEAKING AT ALL FOUR WALLS.

6/81	E	62.4	49.7		49.7				

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR
	F	60.8	45.4		45.4				
	G	27.4	18.8		18.8				
	H	42.1	12.5		12.5				
	SYSTEM	62.5	41.8	47.4	41.8		720	720	301 91.0

** PROBLEMS/SOLUTIONS/COMMENTS

ALL THE ABSORBER MODULES WERE DOWN DURING PART OF THE MONTH FOR AN INSTRUMENT TIE-IN AT THE FLYASH FILTERS, TO MAKE ELECTRICAL CONNECTIONS TO NEW BUS BARS AND BECAUSE OF MULTIPLEXER PROBLEMS.

MODULE H WAS UNAVAILABLE PART OF JUNE DUE TO INLET DAMPER PROBLEMS.

MODULE G NEEDED INTERNAL REPAIRS DURING THE MONTH.

7/81	E	99.1	70.7		70.7				
	F	98.9	87.5		87.5				
	G	51.5	30.5		30.5				
	H	59.9	19.1		19.1				
	SYSTEM	93.0	80.0	86.0	80.0		744	744	594 74.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE H WAS DOWN FOR THE FIRST THIRTEEN DAYS OF THE MONTH FOR REPAIRS TO THE INLET ISOLATION DAMPER.

OPERATION OF THE FGD SYSTEM WAS LIMITED TO TWO ABSORBERS DURING THE LATTER HALF OF THE MONTH DUE TO A LACK OF STACK REHEAT.

8/81	E	100.0	52.5		42.5				
	F	100.0	61.3		49.6				
	G	10.8	13.3		10.8				
	H	100.0	0.0		0.0				
	SYSTEM	100.0	54.0	100.0	43.0		744	602	323 85.0

** PROBLEMS/SOLUTIONS/COMMENTS

OUTAGE TIME DURING THE MONTH FOR THE E AND F MODULES WAS ATTRIBUTED TO PROBLEMS WITH THE ELECTROSTATIC PRECIPITATORS. AS A RESULT, THE UNIT WAS DOWN FROM AUGUST 14 TO AUGUST 28 FOR PRECIPITATOR REPAIRS.

THE H MODULE WAS ON STANDBY THE ENTIRE MONTH SINCE ONLY TWO MODULES CAN BE OPERATED WITHOUT STACK GAS REHEAT.

THE G MODULE WAS DOWN MOST OF THE MONTH AS A RESULT OF MIST ELIMINATOR PAD DAMAGE AND HIGH SOLUTION LOSSES INTO THE SUMP.

9/81	E	11.9	5.5		5.4				
	F	25.4	17.9		17.6				
	G	75.0	10.4		10.3				
	H	93.9	23.4		23.1				
	SYSTEM	69.0	19.0	19.0	19.0		720	710	137 86.0

** PROBLEMS/SOLUTIONS/COMMENTS

ALL FGD SYSTEM MODULES WERE DOWN FROM SEPTEMBER 11 TO SEPTEMBER 30 AS A RESULT OF A SCHEDULED CHEMICAL PLANT OUTAGE.

THE G MODULE RESTARTED ON SEPTEMBER 8 AFTER COMPLETION OF MIST ELIMINATOR AND TRAY REPAIRS.

THE LACK OF STACK REHEAT KEPT MODULE F OFF-LINE THE MAJORITY OF THE MONTH.

THE H MODULE WAS DOWN FOR TWO DAYS DURING THE MONTH BECAUSE OF HIGH

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

VIBRATION ON THE BOOSTER FAN.

10/81	E	0.0	0.0		0.0				
	F	6.4	0.0		0.0				
	G	95.2	93.4		68.1				
	H	95.2	92.8		67.7				
	SYSTEM	64.9	62.1	66.5	45.3	744	543	337	65.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING OCTOBER THE BOTTOM PADS IN THE MIST ELIMINATOR OF MODULE F WERE REPLACED CAUSING THE MODULE TO REMAIN OFF-LINE UNTIL OCTOBER 30. THE SYSTEM WAS PRIMARILY DOWN BECAUSE OF PROBLEMS WITH THE STACK REHEAT.

11/81	E	0.0	0.0		0.0				
	F	98.6	80.6		66.2				
	G	98.6	79.2		65.1				
	H	81.2	59.1		48.6				
	SYSTEM	93.0	71.0	90.0	59.0	720	592	422	72.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING NOVEMBER THE UNIT DOWN TIME WAS CAUSED BY ESP PROBLEMS.

MODULE E WAS OFF-LINE DURING THE MONTH TO REPLACE THE BOTTOM MIST ELIMINATOR AND THE BALLAST TRAY.

OUTAGE TIME FOR MODULE G WAS DUE TO A LACK OF STACK REHEAT.

12/81	E	87.2	51.3		51.3				
	F	98.9	80.5		80.5				
	G	98.9	92.2		92.2				
	H	25.7	10.7		10.7				
	SYSTEM	95.0	88.8	94.5	88.8	744	744	661	71.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE E WAS RESTARTED ON DECEMBER 4 AFTER THE PROLONGED OUTAGE TO REPAIR THE MIST ELIMINATOR PADS AND THE BOTTOM BALLAST TRAY.

ABSORBER OPERATIONS DURING THE MONTH WERE CURTAILED DUE TO ESP PROBLEMS, HIGH OPACITY IN THE STACK AND HIGH SOLIDS IN THE SUMPS.

MODULE H WAS OFF-LINE MOST OF THE MONTH DUE TO A BURNED OUT BOOSTER BLOWER MOTOR.

TWO MODULES WERE TAKEN OFF-LINE APPROXIMATELY NINE DAYS DUE TO A LACK OF STACK REHEAT.

1/82	E	95.0	63.3		61.1				
	F	97.6	66.1		63.8				
	G	98.2	63.1		61.0				
	H	63.2	51.7		50.0				
	SYSTEM	99.0	85.0	97.0	82.0	744	719	611	79.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JANUARY ALL MODULES WERE OFF-LINE FOR THREE DAYS DUE TO ESP PROBLEMS.

MODULE H WAS SHUT DOWN PART OF THE MONTH BECAUSE OF LOW OIL TEMPERATURE AND HIGH VIBRATION ON THE BOOSTER BLOWER.

THE UNIT WAS OFF-LINE AT THE END OF THE MONTH TO REPAIR THE PRIMARY AIR

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

DAMPER ON THE COAL MILL.

2/82	E	100.0	75.0		0.9				
	F	100.0	75.0		0.9				
	G	100.0	75.0		0.9				
	H	0.0	0.0		0.0				
	SYSTEM	100.0	75.0	100.0	1.0	672	8	6	1.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS SHUT DOWN ON FEBRUARY 1 FOR EXTENSIVE TRUBINE REPAIRS.

MODULE H WAS DOWN THE ENTIRE MONTH FOR INLET DAMPER REPAIRS.

3/82	E	100.0			0.0				
	F	100.0			0.0				
	G	100.0			0.0				
	H	0.0			0.0				
	SYSTEM	100.0			0.0	744	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN THE ENTIRE MONTH OF MARCH FOR AN OVERHAUL AND TURBINE REPAIRS.

MODULE H WAS OUT OF SERVICE FOR REPAIR OF THE INLET DAMPERS AND THE ABSORBER WALLS.

4/82	E	100.0			0.0				
	F	100.0			0.0				
	G	100.0			0.0				
	H	0.0			0.0				
	SYSTEM	100.0			0.0	720	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING APRIL THE UNIT WAS DOWN FOR TURBINE REPAIRS AND AN OVERHAUL. THE FGD SYSTEM WAS AVAILABLE DURING THE ENTIRE MONTH.

5/82	E	100.0			0.0				
	F	100.0			0.0				
	G	100.0			0.0				
	H	0.0			0.0				
	SYSTEM	100.0			0.0	744	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MAY THE UNIT WAS DOWN FOR AN OVERHAUL AND TURBINE REPAIR WORK.

MODULE H WAS UNAVAILABLE DURING APRIL AND MAY WHILE THE INLET DAMPERS WERE BEING REPLACED AND THE ABSORBER WALLS WERE BEING REPAIRED.

6/82	E	45.8	14.4		10.6				
	F	46.0	18.1		13.3				
	G	44.9	21.2		15.6				
	H								
	SYSTEM	45.6	17.9		13.1	720	529	95	57.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM JUNE 1 TO JUNE 8 FOR TURBINE REPAIR AND OVERHAUL.

ALL ABSORBERS WERE OUT OF SERVICE FROM JUNE 9 TO JUNE 25 DUE TO COMPUTER PROBLEMS.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

MODULE H WAS UNAVAILABLE FROM JUNE 1 TO JUNE 30 DUE TO REPAIR OF THE
 ABSORBER CELL WALLS.

7/82	E	69.1	43.0	30.1				
	F	92.9	80.8	56.6				
	G	51.7	71.2	49.9				
	H							
	SYSTEM	71.2	65.0	45.5	744	521	339	61.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE G WAS DOWN FROM JULY 14 TO JULY 28 FOR REPAIRS ON A SCRUBBER
 RECIRCULATION PUMP.

THE UNIT WAS DOWN FROM JULY 16 TO JULY 25 TO REPAIR A BOILER TUBE LEAK.

MODULE E WAS DOWN FROM JULY 1 TO JULY 6 FOR MAINTENANCE ON A BOOSTER FAN
 LUBE OIL SYSTEM.

MODULE H WAS DOWN FROM JULY 1 TO JULY 31 FOR ABSORBER CELL WALL REPAIRS.

A TURBINE BALANCING ALSO CONTRIBUTED TO THE UNIT DOWN TIME FROM JULY 16 TO
 JULY 25.

8/82	E	88.7	70.2	68.7				
	F	98.1	89.0	87.1				
	G	96.6	86.4	84.5				
	H	5.6	5.8	5.6				
	SYSTEM	96.4	83.8	82.0	744	728	610	64.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE ABSORBER OPERATION WAS RESTRICTED TO TWO MODULES AT VARIOUS TIMES
 DURING AUGUST DUE TO A LACK OF STACK REHEAT.

MODULE E WAS DOWN FROM AUGUST 16 TO AUGUST 18 TO REPAIR A BOOSTER FAN LUBE
 OIL SYSTEM.

MODULE H WAS DOWN FROM AUGUST 1 TO AUGUST 14 PARTLY FOR REPAIRS TO THE
 ABSORBER CELL WALLS.

A BOOSTER FAN ROTOR BALANCE ALSO CONTRIBUTED TO THE DOWN TIME DURING AUGUS
 FOR MODULE H.

MODULE H WAS DOWN FROM AUGUST 16 TO AUGUST 31 FOR REPAIRS ON A BOOSTER FAN
 MOTOR.

9/82	E	56.7	88.0	48.8				
	F	56.7	86.7	48.1				
	G	56.5	82.0	45.4				
	H							
	SYSTEM	56.6	85.5	47.4	720	399	341	

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE H WAS DOWN DURING SEPTEMBER TO REPAIR A BOOSTER FAN MOTOR.

THE UNIT WAS DOWN DURING PART OF SEPTEMBER DUE TO A CHEMICAL PLANT OUTAGE.

10/82	E	47.0	33.5	32.8				
	F	16.7	11.8	11.6				
	G	47.4	47.2	46.2				
	H							
	SYSTEM	37.1	30.8	30.2	744	729	225	89.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM RESUMED OPERATION ON OCTOBER 16 FOLLOWING A CHEMICAL PLANT OUTAGE.

11/82	E	80.1	79.3	79.3				
	F	98.2	96.4	96.4				
	G	98.2	90.6	90.6				
	H							
	SYSTEM	92.2	88.8	88.8	720	720	639	96.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE E WAS DOWN FROM NOVEMBER 25 TO NOVEMBER 30 TO REPAIR LEAKS ON A BOTTOM COLLECTOR TRAY.

MODULE H WAS DOWN FOR THE ENTIRE MONTH TO REPAIR A BOOSTER FAN MOTOR.

12/82	E	73.9	59.0	57.5				
	F	91.3	75.2	73.4				
	G	96.4	89.9	87.8				
	H							
	SYSTEM	87.2	74.7	72.9	744	726	542	81.0

** PROBLEMS/SOLUTIONS/COMMENTS

A UNIT TRIP OCCURRED BETWEEN DECEMBER 17 AND 18.

MODULE E WAS DOWN FROM DECEMBER 1 TO DECEMBER 5 AND AGAIN FROM DECEMBER 29 TO DECEMBER 31 TO REPAIR LEAKS ON A BOTTOM COLLECTOR TRAY.

MODULE F WAS DOWN FROM DECEMBER 26 TO DECEMBER 28 TO REPAIR A SCRUBBER RECIRCULATING PUMP.

MODULE H WAS DOWN DURING THE ENTIRE MONTH TO REPAIR A BOOSTER FAN MOTOR.

ONLY TWO MODULES OPERATED DURING PART OF THE PERIOD DUE TO A LACK OF STACK REHEAT.

1/83	E	45.4	33.4	29.6				
	F	78.8	70.8	62.6				
	G	90.6	84.5	74.7				
	H							
	SYSTEM	71.6	62.9	55.6	744	658	414	78.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM JANUARY 24 TO JANUARY 28 TO REPAIR AN ECONOMIZER TUBE LEAK.

THE UNIT WAS DOWN ON JANUARY 28 TO CLOSE A DOOR ON THE 2A PRECIPITATOR.

2/83	E							
	F	68.0	67.7	60.0				
	G	94.9	100.0	89.0				
	H							
	SYSTEM	81.5	83.9	74.5	672	595	501	61.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN ON FEBRUARY 8 AND FROM FEBRUARY 15 TO FEBRUARY 18 DUE TO BOILER-RELATED PROBLEMS.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

MODULES E AND F WERE DOWN FROM FEBRUARY 15 TO FEBRUARY 18 TO SEAL THE ABSORBER TRAYS.

BOOSTER FAN PROBLEMS ALSO CONTRIBUTED TO THE OUTAGE FOR MODULE F DURING FEBRUARY.

MODULE H WAS DOWN FROM FEBRUARY 15 TO FEBRUARY 18 TO REPAIR A BOOSTER FAN MOTOR.

3/83	E	39.0	39.0	39.0				
	F	97.0	96.0	96.0				
	G	98.0	98.0	98.0				
	H							
	SYSTEM	78.0	77.6	77.6	744	744	578	71.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULES E AND H WERE DOWN DURING MARCH TO REPAIR THE BOOSTER FAN MOTORS.

4/83	E	93.1	100.0	93.1				
	F	96.0	100.0	96.0				
	G	98.1	100.0	98.1				
	H	0.0	0.0	0.0				
	SYSTEM	95.7	100.0	95.7	720	578	689	62.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN DURING PART OF APRIL FOR A SPRING OUTAGE.

THE MODULE H BOOSTER FAN WAS OUT OF SERVICE DURING PART OF THE MONTH TO REPAIR A MOTOR.

5/83	E	30.0	45.5	30.0				
	F	98.9	100.0	89.0				
	G	98.9	100.0	89.7				
	H	0.0	0.0	0.0				
	SYSTEM	75.9	81.8	69.5	744	490	517	50.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM MAY 1 TO MAY 11 FOR A SCHEDULED OUTAGE.

A UNIT TRIP OCCURRED ON MAY 11 DUE TO PROBLEMS WITH AN AUXILIARY POWER SUPPLY.

A UNIT TRIP OCCURRED ON MAY 23 DUE TO BOILER FEED PUMP CONTROL PROBLEMS.

MODULE E WAS DOWN DURING PART OF MAY TO REPAIR ABSORBER TRAY LEAKS.

MODULE H WAS DOWN DURING THE MONTH TO REPAIR A BOOSTER FAN MOTOR.

6/83	E	90.0	86.0	86.0				
	F	96.9	96.0	96.0				
	G	95.0	93.1	93.1				
	H	5.0	5.0	5.0				
	SYSTEM	95.6	93.3	93.3	720	720	672	78.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULES E AND H WERE DOWN DURING PART OF JUNE TO INSTALL SUMP LEVEL DETECTORS.

THE UTILITY REPORTED THAT NO MAJOR OUTAGES OCCURRED DURING JUNE.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
7/83	E	41.0	41.0		41.0						
	F	98.0	98.0		98.0						
	G	34.0	34.0		34.0						
	H	98.9	97.0		97.0						
	SYSTEM	90.6	90.0		90.0			744	744	670	87.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE E WAS DOWN DURING PART OF JULY FOR ABSORBER TRAY REPAIRS.

MODULE E WAS DOWN DURING PART OF THE MONTH TO BALANCE A BOOSTER FAN.

MODULE G WAS DOWN DURING PART OF JULY TO REWIND THE BOOSTER FAN MOTOR.

8/83	E	41.0	40.1		40.1						
	F	97.0	91.9		91.9						
	G	28.0	26.9		26.9						
	H	84.0	78.0		78.0						
	SYSTEM	83.3	78.9		78.9			744	744	587	87.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE E WAS DOWN DURING PART OF AUGUST TO REPLACE ABSORBER TRAY CAPS.

MODULES G AND H WERE DOWN DURING PART OF THE MONTH TO REWIND THE BOOSTER FAN MOTOR.

9/83	E	0.0	0.0	0.0	0.0						
	F	98.1	90.9	100.0	64.0						
	G	99.0	89.9	78.1	63.3						
	H	99.0	93.9	100.0	66.1						
	SYSTEM	98.7	91.6	92.7	64.5			720	507	464	58.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM SEPTEMBER 14 TO 18 AND AGAIN FROM SEPTEMBER 19 TO 2 DUE TO REHEATER TUBE LEAKS.

MODULE E WAS DOWN DURING PART OF SEPTEMBER DUE TO DISTORTED ABSORBER TRAYS

10/83	E	0.0	0.0		0.0						
	F	98.0	93.0	93.0	93.0						
	G	98.9	4.0	4.0	4.0						
	H	77.0	73.9	73.9	73.9						
	SYSTEM	91.3	57.0	57.0	57.0			744	744	424	84.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE E WAS DOWN DURING OCTOBER DUE TO BRICK WALL LINER FAILURE.

11/83	E	0.0	0.0		0.0						
	F	95.0	93.0	93.0	73.3						
	G	96.9	87.0	87.0	68.6						
	H	96.9	82.0	82.0	64.7						
	SYSTEM	96.3	87.3	87.3	68.9			720	568	496	66.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING NOVEMBER 1983.

12/83	E	0.0	0.0		0.0						

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR
	F	98.9	84.0	84.0	83.7				
	G	98.9	86.0	86.0	85.8				
	H	98.9	80.1	80.1	79.8				
	SYSTEM	98.9	83.3	83.3	83.1		744	742	618 83.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE E WAS DOWN DURING DECEMBER FOR ABSORBER TRAY REPAIRS.

1/84	E	51.9	14.0	18.8	14.0				
	F	89.8	57.9	100.0	57.8				
	G	98.8	84.9	100.0	84.8				
	H	97.7	82.9	100.0	82.8				
	SYSTEM	100.0	79.9	100.0	79.8		744	743	594 83.5

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE E WAS DOWN DURING JANUARY AND FEBRUARY TO REPAIR A BENT ABSORBER TRAY.

2/84	E	90.9	26.0	47.4	23.9				
	F	90.9	90.9	100.0	83.5				
	G	72.6	62.0	97.8	56.9				
	H	72.6	69.0	75.9	63.4				
	SYSTEM	100.0	82.6	100.0	75.9		696	639	528 82.7

** PROBLEMS/SOLUTIONS/COMMENTS

A LACK OF REHEAT RESTRICTED FGD SYSTEM OPERATION AT MODULE E DURING THE MONTH.

3/84	E	28.6	86.7	100.0	24.9				
	F	28.6	93.8	100.0	26.9				
	G	28.6	45.0	100.0	12.9				
	H	13.4	0.0	0.0	0.0				
	SYSTEM	33.1	75.2	100.0	21.6		744	213	160 25.5

** PROBLEMS/SOLUTIONS/COMMENTS

A LACK OF REHEAT RESTRICTED FGD SYSTEM OPERATIONS DURING MARCH.

4/84	E	86.9	71.0	100.0	70.1				
	F	83.9	15.0	100.0	14.9				
	G	90.8	83.0	100.0	81.9				
	H	90.8	76.9	100.0	76.0				
	SYSTEM	100.0	82.0	100.0	81.0		720	711	583 87.7

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE F WAS DOWN DURING APRIL FOR ABSORBER TRAY SEAL REPAIRS.

5/84	E	0.0	0.0		0.0				
	F	91.9	88.0	88.0	88.0				
	G	95.0	91.9	91.9	91.9				
	H	95.0	86.0	86.0	86.0				
	SYSTEM	94.0	88.7	88.7	88.7		744	744	660 94.3
6/84	E	31.5	6.0	9.5	4.7				
	F	68.5	45.0	51.7	35.4				
	G	36.9	33.0	52.2	26.0				
	H	68.5	36.0	41.4	28.3				
	SYSTEM	68.5	40.0	51.6	31.5		720	567	227 71.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE E WAS DOWN DURING MAY AND JUNE FOR ABSORBER TRAY REPAIRS.

NEW BEAMS WERE INSTALLED AT MODULE E DURING THE MONTH.

ABSORBER TRAY SEALS WERE REPAIRED ON MODULE G DURING JUNE.

7/84	E	87.5	88.9	96.8	84.7				
	F	89.5	86.9	92.5	82.8				
	G	13.3	13.0	29.8	12.4				
	H	49.5	42.9	60.7	40.9				
	SYSTEM	79.9	77.2	93.2	73.6	744	709	547	90.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE REASON FOR THE POOR PERFORMANCE OF THE FGD SYSTEM DURING THE MONTH OF JULY WAS DUE TO POOR OPERATION OF THE ELECTROSTATIC PRECIPITATOR WHICH OVERLOADED THE ABSORBERS WITH PARTICULATE MATTER.

IN ADDITION TO THE ESP PROBLEMS, UTILITY ALSO STATED THAT THEY EXPERIENCED MULTIPLEXER FAILURES AND FAILURES ON G & H BOOSTER FAN MOTORS.

8/84	E	72.0	84.0	84.0	63.7				
	F	72.0	84.9	84.9	64.4				
	G	0.0	0.0		0.0				
	H	56.0	62.1	62.1	47.0				
	SYSTEM	66.7	77.0	77.0	58.4	744	564	434	71.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT REPAIRS CONTINUED INTO AUGUST ON THE BOOSTER FAN MOTORS AND THAT THE ESP'S WERE ALSO OUT OF SERVICE MUCH OF THE TIME.

9/84	E	61.7	68.3	68.3	55.6				
	F	61.7	69.6	69.6	56.7				
	G	0.0	0.0		0.0				
	H	58.6	66.7	66.7	54.3				
	SYSTEM	60.6	68.2	68.2	55.5	720	586	390	77.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD SYSTEM WAS DOWN FROM SEPTEMBER 22 THROUGH THE END OF THE MONTH FOR THE ANNUAL FLUE GAS DESULFURIZATION PLANT OUTAGE.

MODULE G WAS DOWN ALL OF SEPTEMBER FOR BOOSTER FAN MOTOR REPAIRS.

10/84	E	7.5	9.1	9.1	7.5				
	F	59.0	52.0	52.0	43.1				
	G	0.0	0.0		0.0				
	H	56.2	42.9	42.9	35.6				
	SYSTEM	40.9	34.7	34.7	28.8	744	617	214	81.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT MODULE E WAS DOWN MOST OF OCTOBER FOR ABSORBER SUMP WALL REPAIRS.

MODULE G CONTINUED TO BE DOWN DUE TO FAN MOTOR REPAIRS.

11/84	E	88.6	95.8	95.8	85.8				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD CAP. HOURS FACTOR
	F	0.0	0.0		0.0				
	G	87.6	92.9	92.9	83.2				
	H	88.6	94.9	94.9	85.0				
	SYSTEM	88.3	94.5	94.5	84.7		720	645	600 86.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT MODULE F WAS DOWN ALL OF NOVEMBER DUE TO SUMP WALL REPAIRS.

12/84	E	94.2	97.9	97.9	92.3				
	F	17.9	0.0		0.0				
	G	93.3	90.9	90.9	85.8				
	H	93.3	94.9	94.9	89.5				
	SYSTEM	99.6	94.5	94.5	89.2		744	702	664 90.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE MONTH OF DECEMBER.

1/85	E	85.2	78.0	100.0	70.7				
	F	74.3	66.0	100.0	59.8				
	G	72.4	59.9	76.8	54.3				
	H	58.9	45.0	57.6	40.7				
	SYSTEM	97.0	83.0	100.0	75.2		744	674	559 87.3
2/85	E	73.2	61.1	61.1	55.1				
	F	89.4	41.1	41.1	37.1				
	G	89.4	65.2	65.2	58.8				
	H	32.6	0.0		0.0				
	SYSTEM	94.9	55.8	55.8	50.3		672	606	338 77.5

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS OF JANUARY OR FEBRUARY.

3/85	E	39.2	6.1	6.1	3.0				
	F	45.2	6.1	6.1	3.0				
	G	48.5	6.1	6.1	3.0				
	H	16.9	1.7		0.8				
	SYSTEM	50.0	6.6	6.1	3.2		744	361	24 48.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS OUT OF SERVICE FOR MOST OF THE MONTH BECAUSE THE AMOUNT OF FLYASH PASSING THROUGH THE IMPROPERLY OPERATING ELECTROSTATIC PRECIPITATORS WOULD HAVE OVERWHELMED THE SCRUBBER SOLIDS HANDLING EQUIPMENT.

4/85	E	79.0	90.0	90.0	71.1				
	F	68.8	69.9	69.9	55.3				
	G	68.8	49.9	49.9	39.4				
	H	0.0	0.0		0.0				
	SYSTEM	72.2	69.9	69.9	55.3		720	569	398 48.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE MODULE H ABSORBER WAS OUT OF SERVICE FOR THE ENTIRE MONTH WHILE THE SUMP BRICKWORK WAS REBUILT.

5/85	E	91.9	92.5	92.5	90.1				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	F	89.1	83.1	83.1	80.9					
	G	91.9	91.6	91.6	89.1					
	H	0.0	0.0		0.0					
	SYSTEM	91.0	89.1	89.1	86.7		744	724	645	90.9
6/85	E	89.0	84.0	95.1	84.0					
	F	93.1	86.9	98.4	86.9					
	G	96.0	81.0	91.7	81.0					
	H	35.0	35.0	100.0	35.0					
	SYSTEM	100.0	95.6	100.0	95.6		720	720	689	89.1
7/85	E	93.0	87.0	87.0	86.7					
	F	100.0	88.0	88.0	87.6					
	G	0.0	0.0		0.0					
	H	93.0	86.0	86.0	85.6					
	SYSTEM	95.3	87.0	87.0	86.6		744	741	645	96.0
8/85	E	86.3	81.9	85.5	81.3					
	F	92.2	84.9	88.4	84.3					
	G	11.8	11.9	100.0	11.8					
	H	100.0	89.9	93.7	89.2					
	SYSTEM	96.8	89.6	100.0	88.9		744	738	661	95.2
9/85	E	61.4	51.5	100.0	46.8					
	F	42.9	47.2	100.0	42.9					
	G	94.6	97.6	97.0	88.8					
	H	94.6	97.6	96.8	88.8					
	SYSTEM	97.8	97.9	100.0	89.1		720	655	641	84.9
10/85	E	99.1	95.0	95.0	94.1					
	F	44.6	45.0	88.8	44.6					
	G	89.1	88.1	91.7	87.2					
	H	51.5	49.0	92.1	48.5					
	SYSTEM	94.8	92.4	100.0	91.5		744	737	681	94.9
11/85	E	86.0	99.1	100.0	86.0					
	F	84.2	91.1	94.7	79.0					
	G	69.4	56.0	93.1	48.6					
	H	43.5	39.0	89.1	33.9					
	SYSTEM	94.4	95.1	100.0	82.5		720	625	594	85.6
12/85	E	94.5	97.0	97.2	91.7					
	F	94.5	97.0	97.2	91.7					
	G	1.9	1.0	100.0	1.9					
	H	91.7	93.0	95.1	87.9					
	SYSTEM	94.2	96.4	100.0	91.0		744	703	677	91.7

** PROBLEMS/SOLUTIONS/COMMENTS

 NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS
OF MAY THROUGH DECEMBER.

1/86	E	100.0	89.6	100.0	83.1					
	F	57.9	53.9	100.0	50.0					
	G	37.9	32.3	44.6	30.0					
	H	97.0	84.1	100.0	78.0					
	SYSTEM	97.6	86.6	100.0	80.3		744	690	598	87.2
2/86	E	98.5	92.2	100.0	80.8					
	F	90.8	64.3	100.0	56.4					
	G	78.6	73.2	100.0	64.1					
	H	100.0	100.0	100.0	100.0					
	SYSTEM	100.0	100.0	100.0	100.0		672	589	672	81.9

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

3/86	E	77.0	39.0	100.0	39.0				
	F	77.0	50.9	100.0	50.9				
	G	100.0	82.0	100.0	82.0				
	H	100.0	80.9	100.0	80.9				
	SYSTEM	100.0	84.3	100.0	84.3	744	744	627	89.9

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE FIRST QUARTER OF 1986.

4/86	E	43.8	28.9	55.6	17.4				
	F	55.8	65.0	100.0	39.0				
	G	58.2	88.9	100.0	53.3				
	H	58.2	94.0	100.0	56.4				
	SYSTEM	72.0	92.3	100.0	55.4	720	432	399	53.3

5/86	E	90.1			0.0				
	F	90.1			0.0				
	G	90.1			0.0				
	H	90.1			0.0				
	SYSTEM	100.0			0.0	744	0	0	0.0

6/86	E	39.7	79.5	100.0	32.4				
	F	36.8	8.2	16.9	3.3				
	G	39.7	50.5	55.8	20.6				
	H	39.7	81.6	100.0	33.2				
	SYSTEM	52.0	73.3	90.9	29.8	720	293	215	27.9

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED NO FGD SYSTEM-RELATED PROBLEMS DURING THE SECOND QUARTER OF 1986.

7/86	E	100.0	82.9	83.4	82.9				
	F	97.0	8.1	37.5	8.1				
	G	100.0	75.0	89.7	75.0				
	H	100.0	66.9	71.3	66.9				
	SYSTEM	100.0	77.6	94.0	77.6	744	744	578	77.2

8/86	E	99.1	80.2	100.0	79.3				
	F	83.2	48.1	71.5	47.6				
	G	99.1	58.0	67.6	57.4				
	H	67.3	47.0	70.5	46.5				
	SYSTEM	100.0	77.8	100.0	76.9	744	736	572	77.3

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS OF JULY AND AUGUST.

9/86	E	79.2	64.9	100.0	51.4				
	F	71.3	61.1	67.8	48.3				
	G	79.2	81.9	81.9	64.9				
	H	29.3	21.1	46.7	16.7				
	SYSTEM	86.3	76.3	98.8	60.4	720	570	435	56.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED TRAY LEAKS ON MODULE H ABSORBER DURING THE MONTH OF SEPTEMBER.

10/86	E	76.1	56.2	100.0	52.6				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
11/86	F	73.8	41.5	100.0	38.8					
	G	73.8	60.2	98.6	56.3					
	H	68.4	44.7	100.0	41.8					
	SYSTEM	97.4	67.5	100.0	63.2		744	696	470	55.9
	E	85.0	77.1	100.0	70.4					
	F	91.4	62.9	100.0	57.5					
	G	88.6	64.0	100.0	58.5					
	H	85.0	33.7	100.0	30.8					
	SYSTEM	100.0	79.2	100.0	72.4		720	658	521	60.8
	12/86	E	100.0	43.0	100.0	43.0				
F		100.0	64.0	100.0	64.0					
G		100.0	70.0	100.0	70.0					
H		100.0	55.0	100.0	55.0					
SYSTEM		100.0	77.3	100.0	77.3		744	744	575	58.9

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE FOURTH QUARTER OF 1986.

1/87	E	97.0	61.0	100.0	61.0					
	F	100.0	80.0	100.0	80.0					
	G	100.0	72.0	100.0	72.0					
	H	100.0	41.9	100.0	41.9					
	SYSTEM	100.0	85.0	100.0	85.0		744	744	632	65.7
2/87	E	17.9	9.1	100.0	8.9					
	F	100.0	77.3	100.0	76.0					
	G	100.0	84.4	100.0	83.0					
	H	96.0	79.3	100.0	78.0					
	SYSTEM	100.0	83.4	100.0	82.0		672	661	551	69.6
3/87	E	0.0	0.0		0.0					
	F	100.0	99.1	100.0	99.1					
	G	100.0	99.1	100.0	99.1					
	H	100.0	93.0	100.0	93.0					
	SYSTEM	100.0	97.0	100.0	97.0		744	744	722	85.9
4/87	E	90.0	96.7	100.0	81.9					
	F	20.0	0.0		0.0					
	G	96.9	100.0	100.0	86.0					
	H	100.0	100.0	100.0	86.0					
	SYSTEM	100.0	98.9	100.0	84.6		720	610	609	70.8
5/87	E	97.0	94.1	100.0	81.0					
	F	3.0	0.0		0.0					
	G	97.0	75.5	100.0	65.1					
	H	100.0	89.4	100.0	77.0					
	SYSTEM	99.0	86.3	100.0	74.4		744	641	553	53.7
6/87	E	100.0	75.0	100.0	75.0					
	F	73.1	49.0	100.0	49.0					
	G	100.0	59.0	100.0	59.0					
	H	96.9	54.0	100.0	54.0					
	SYSTEM	100.0	79.0	100.0	79.0		720	720	569	72.4
7/87	E	58.1	30.0	100.0	30.0					
	F	100.0	75.9	100.0	75.9					
	G	100.0	72.0	100.0	72.0					
	H	100.0	63.0	100.0	63.0					
	SYSTEM	100.0	80.3	100.0	80.3		744	744	598	68.4

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

8/87	E	100.0	50.9	100.0	50.9				
	F	100.0	52.0	100.0	52.0				
	G	100.0	49.1	100.0	49.1				
	H	97.0	49.1	100.0	49.1				
	SYSTEM	100.0	67.0	100.0	67.0	744	744	499	69.5

9/87	E	100.0	100.0	100.0	81.9				
	F	100.0	57.4	100.0	21.0				
	G	96.9	100.0	100.0	46.0				
	H	100.0	100.0	100.0	41.9				
	SYSTEM	100.0	100.0	100.0	63.6	720	263	458	21.2

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD JANUARY THROUGH SEPTEMBER.

10/87	E	100.0	18.3	100.0	13.2				
	F	100.0	10.3	100.0	7.4				
	G	32.3	0.0		0.0				
	H	100.0	21.7	100.0	15.6				
	SYSTEM	100.0	16.8	100.0	12.1	744	535	90	46.2

** PROBLEMS/SOLUTIONS/COMMENTS

LOW POWER DEMAND DURING THIS PERIOD RESULTED IN LOW FGD SYSTEM UTILIZATION IN OCTOBER.

11/87	E	100.0	88.9	100.0	81.4				
	F	100.0	81.2	100.0	74.3				
	G	3.3	3.6	68.6	3.3				
	H	100.0	86.9	100.0	79.6				
	SYSTEM	100.0	86.9	100.0	79.5	720	659	573	66.2

12/87	E	100.0	84.5	100.0	84.5				
	F	100.0	88.6	100.0	88.6				
	G	0.0	0.0		0.0				
	H	100.0	94.0	100.0	94.0				
	SYSTEM	100.0	89.0	100.0	89.0	744	744	662	84.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE NOVEMBER-DECEMBER PERIOD A G CELL LEAK OCCURRED AND A SCRUBBER TRAY WAS DAMAGED. POWER DEMAND WAS LOW DURING THIS PERIOD, RESULTING IN THE LOW CAPACITY UTILIZATION FACTOR REPORTED.

**DO NOT MICROFILM
THIS PAGE**

SECTION 13
 DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	PUBLIC SERVICE OF NEW MEXICO
PLANT NAME	SAN JUAN
UNIT NUMBER	3
CITY	WATERFLOW
STATE	NEW MEXICO
REGULATORY CLASSIFICATION	A
PARTICULATE EMISSION LIMITATION - NG/J	9. (0.020 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	146. (0.340 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	***** (***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	1614
GROSS UNIT GENERATING CAPACITY - MW	544
NET UNIT GENERATING CAPACITY W/FGD - MW	488
NET UNIT GENERATING CAPACITY WO/FGD - MW	507
EQUIVALENT SCRUBBED CAPACITY - MW	544
 ** UNIT DATA - BOILER AND STACK	
BOILER SUPPLIER	BABCOCK & WILCOX
BOILER TYPE	PULVERIZED COAL
BOILER SERVICE LOAD	BASE
DESIGN BOILER FLUE GAS FLOW - CU.M/S	963.05 (2040800 ACFM)
BOILER FLUE GAS TEMPERATURE - C	120.6 (249 F)
STACK HEIGHT - M	122. (400 FT)
STACK SHELL	CONCRETE
STACK TOP DIAMETER - M	8.5 (28.0 FT)
 ** FUEL DATA	
FUEL TYPE	COAL
FUEL GRADE	SUBBITUMINOUS
AVERAGE HEAT CONTENT - J/G	20934. (9000 BTU/LB)
RANGE HEAT CONTENT - BTU/LB	8000-11628
AVERAGE ASH CONTENT - %	22.00
RANGE ASH CONTENT - %	12.6-22.5
AVERAGE MOISTURE CONTENT - %	10.50
RANGE MOISTURE CONTENT - %	8.1-15.0
AVERAGE SULFUR CONTENT - %	0.80
RANGE SULFUR CONTENT - %	0.6-1.3
AVERAGE CHLORIDE CONTENT - %	0.03
RANGE CHLORIDE CONTENT - %	0.00-0.09
 *** PARTICLE CONTROL	
** PARTICLE SCRUBBER	
NUMBER	4
NUMBER OF SPARES	1
INITIAL START-UP DATE	1/1982
GENERIC TYPE	VENTURI TOWER
SPECIFIC TYPE	VARIABLE-THROAT/BOTTOM-ENTRY PLUMB BOB
TRADE NAME/COMMON NAME	N/A
SUPPLIER	DAVY MCKEE
DIMENSIONS - FT	14.5 DIA X 32.6
SHELL GENERIC MATERIAL	CARBON STEEL
SHELL SPECIFIC MATERIAL	AISI 1110
LINER GENERIC MATERIAL	INORGANIC
LINER SPECIFIC MATERIAL	PREFIRED BRICK/SHAPES
GAS CONTACTING DEVICE TYPE	STAINLESS STEEL
NUMBER OF CONTACTING ZONES	1
LIQUID RECIRCULATION RATE - LITER/S	315.0 (5000 GPM)
L/G RATIO - LITER/CU.M	1.0 (7.5 GAL/1000ACF)
PRESSURE DROP - KPA	3.1 (12.5 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/S	3.3 (10.8 FT/S)
INLET GAS FLOW RATE - CU.M/S	316.6 (671000 ACFM)
INLET GAS TEMPERATURE - C	133.3 (272 F)
PARTICLE REMOVAL EFFICIENCY - %	75.0
 *** FGD SYSTEM	
** GENERAL DATA	
SALEABLE PRODUCT/THROWAWAY PRODUCT	SALEABLE PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

PROCESS TYPE	WELLMAN LORD
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	DAVY MCKEE
A-E FIRM	DAVY MCKEE
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.50
UNIT DESIGN SO ₂ REMOVAL EFFICIENCY - %	90.00
ENERGY CONSUMPTION - %	3.5
CURRENT STATUS	1
COMMERCIAL START-UP	12/1979
INITIAL START-UP	12/1979
CONTRACT AWARDED	8/1978
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
** QUENCHER/PRESATURATOR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** ABSORBER	
NUMBER	4
NUMBER OF SPARES	1
GENERIC TYPE	TRAY TOWER
SPECIFIC TYPE	VALVE TRAY
TRADE NAME/COMMON TYPE	BUBBLE CAP TRAY TOWER
SUPPLIER	DAVY MCKEE
DIMENSIONS - FT	30.0 X 33.5 X 78.0
SHELL GENERIC MATERIAL	INORGANIC
SHELL SPECIFIC MATERIAL	HYDRAULICALLY-BONDED CONCRETE
SHELL MATERIAL TRADE NAME/COMMON TYPE	PORTLAND CEMENT
LINER GENERIC MATERIAL	STAINLESS STEEL
LINER SPECIFIC MATERIAL	AUSTENITIC
LINER MATERIAL TRADE NAME/COMMON TYPE	TYPE 316L
GAS CONTACTING DEVICE TYPE	VALVE TRAY
NUMBER OF CONTACTING ZONES	5
LIQUID RECIRCULATION RATE - LITER/S	35. (550 GPM)
L/G RATIO - L/CU.M	0.1 (1.1 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	4.2 (17.0 IN-H ₂ O)
SUPERFICIAL GAS VELOCITY - M/SEC	3.3 (10.8 FT/S)
INLET GAS FLOW - CU. M/S	240.67 (510000 ACFM)
INLET GAS TEMPERATURE - C	48.9 (120 F)
SO ₂ REMOVAL EFFICIENCY - %	90.0
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
NUMBER PER SYSTEM	2
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
CONFIGURATION	HORIZONTAL
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
WASH WATER SOURCE	BLENDED
WASH FREQUENCY	CONTINUOUS ON ONE & INTERMITTENT ON THE OTHER
WASH RATE - L/S	10.4 (165 GAL/MIN)
** REHEATER	
GENERIC TYPE	INDIRECT HOT AIR
SPECIFIC TYPE	EXTERNAL HEAT EXCHANGER
TRADE NAME/COMMON TYPE	STEAM TUBE BUNDLE
INLET FLUE GAS FLOW RATE - CU. M/S	866.41 (1836000 ACFM)
INLET FLUE GAS TEMPERATURE - C	52.8 (127 F)
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** FANS	
NUMBER	4
NUMBER OF SPARES	1
DESIGN	CENTRIFUGAL

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

SUPPLIER	BUFFALO FORGE
FUNCTION	BOOSTER
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	328.25 (695600 ACFM)
FLUE GAS TEMPERATURE - C	120.6 (249 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** FANS	
NUMBER	2
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
SUPPLIER	WESTINGHOUSE
FUNCTION	UNIT
APPLICATION	FORCED DRAFT
SERVICE	DRY
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	MIX TANK
DEVICE	N/A
DEVICE TYPE	AGITATED TANK
** TANKS	
SERVICE	NUMBER
-----	-----
ABSORBER RECYCLE	1
** PUMPS	
SERVICE	NUMBER
-----	-----
SCRUBBER RECIRCULATION	1
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	NONE
*** SALEABLE BYPRODUCTS	
NATURE	SULFURIC ACID
FULL LOAD QUANTITY - M T/H	19.05 (21.00 TPH)
DISPOSITION	MARKETED
*** SLUDGE	
** TREATMENT	
METHOD	N/A
DEVICE	N/A
PROPRIETARY PROCESS	N/A
** DISPOSAL	
NATURE	N/A
TYPE	NONE
SITE TREATMENT	N/A

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

** PROCESS CONTROL AND INSTRUMENTATION
 CHEMICAL PARAMETERS PH & DENSITY
 CONTROL LEVELS PH 5.5-6.5; SP.GR. 1.2-1.3
 MONITOR LOCATION ABSORBER BLEED & PRODUCT SOLUTION
 PROCESS CONTROL MANNER MANUAL

** WATER BALANCE
 WATER LOOP TYPE CLOSED

** FGD SPARE CAPACITY INDICES
 ABSORBER - % 33.3

** FGD SPARE COMPONENT INDICES
 ABSORBER 1.0

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

12/79 M 100.0 11.2 5.9
 SYSTEM 100.0 11.2 5.9 744 392 44

** PROBLEMS/SOLUTIONS/COMMENTS

THE SAN JUAN 3 BOILER AND FGD SYSTEM BEGAN OPERATIONS IN DECEMBER 1979. CURRENTLY ONLY ONE MODULE IS OPERATING. THE OTHER THREE MODULES WILL BECOME OPERATIONAL ONE BY ONE UNTIL ALL ARE ON LINE. THE SYSTEM IS NOT EXPECTED TO BE FULLY OPERATIONAL (ALL FOUR MODULES) UNTIL 1982.

DURING DECEMBER THE BOILER EXPERIENCED ERRATIC OPERATIONS. NO FGD SYSTEM PROBLEMS WERE REPORTED.

1/80 M 86.0 54.4 41.5
 SYSTEM 86.0 54.4 41.5 744 568 309

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM FIGURES REFLECT THE OPERATION OF A SINGLE MODULE. ONLY ONE MODULE WILL BE NEEDED UNTIL MAY 1982 TO MEET CURRENT SO2 EMISSION REGULATIONS.

2/80 M 98.0 13.6 1.0
 SYSTEM 98.0 13.6 1.0 696 44 7

3/80 M 85.5 78.3 79.6 56.7
 SYSTEM 85.5 78.3 79.6 56.7 744 539 422 53.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE ONE MODULE CURRENTLY OPERATIONAL AT SAN JUAN 3 OPERATED WITHOUT ANY MAJOR PROBLEMS DURING THE FIRST QUARTER OF 1980. THE BOILER WAS OFF LINE FOR APPROXIMATELY 24 DAYS IN FEBRUARY DUE TO AN ELECTRICAL PROBLEM.

4/80 M 92.1 82.7 90.1 71.8
 SYSTEM 92.1 82.7 90.1 71.8 720 625 517 77.0

** PROBLEMS/SOLUTIONS/COMMENTS

MINOR REPAIR WORK WAS DONE TO THE BOILER THIS MONTH. FGD SYSTEM AVAILABILITY WAS OVER 90%.

5/80 M 100.0 78.1 100.0 32.7
 SYSTEM 100.0 78.1 100.0 32.7 744 311 243 35.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 S02 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER WAS OUT OF SERVICE FOR A SCHEDULED MAINTENANCE OUTAGE.

6/80	M	49.0	43.3	39.2	27.6				
	SYSTEM	49.0	43.3	39.2	27.6	720	460	127	55.0

** PROBLEMS/SOLUTIONS/COMMENTS

MINOR REPAIR AND MAINTENANCE OF THE BOILER CAUSED SYSTEM OUTAGE TIME.

THE FGD SYSTEM DID NOT OPERATE AFTER JUNE 19 DUE TO FAILURE OF THE MIST ELIMINATOR MESH PADS AND BOTTOM BALLAST TRAY.

7/80	M	75.5	89.8	89.8	74.5				
	SYSTEM	75.5	89.8	89.8	74.5	744	617	554	66.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS RETURNED TO SERVICE ON JULY 5 AFTER BOILER AND FGD SYSTEM REPAIRS WERE MADE.

8/80	M	83.2	81.6	82.7	80.2				
	SYSTEM	83.2	81.6	82.7	80.2	744	732	597	81.9

** PROBLEMS/SOLUTIONS/COMMENTS

BEARINGS ON THE CIRCULATING PUMP WERE REPLACED DURING AUGUST.

A PUMP DISCHARGE VALVE WAS REPLACED DUE TO LEAKAGE.

9/80	M	96.7	59.4	59.1	45.7				
	SYSTEM	96.7	59.4	59.1	45.7	720	549	329	61.6

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS DOWN FOR SEVERAL DAYS IN SEPTEMBER BECAUSE OF BOILER TUBE LEAKS.

THE FGD SYSTEM WAS NOT OPERATED DURING A SCHEDULED OUTAGE OF THE CHEMICAL PLANT. THE SYSTEM WAS AVAILABLE DURING THIS TIME.

10/80	M	91.0	65.1	67.2	63.7				
	SYSTEM	91.0	65.1	67.2	63.7	744	728	474	84.2

** PROBLEMS/SOLUTIONS/COMMENTS

DURING OCTOBER THE BOILER WAS OUT OF SERVICE FOR APPROXIMATELY 24 HOURS DUE TO A POWER TRIP CAUSED BY THE FORCED DRAFT FAN.

MODULE M WAS RETURNED TO SERVICE ON OCTOBER 8, 1980 FOLLOWING COMPLETION OF THE CHEMICAL PLANT OUTAGE. HOWEVER, MODULE M WAS SHUT DOWN ON OCTOBER 29, 1980 TO REPLACE THE BADLY DAMAGED BOTTOM COLLECTOR TRAY.

11/80	M	59.0	73.0	86.0	38.0				
	SYSTEM	59.0	73.0	86.0	38.0	720	372	273	38.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING NOVEMBER THE BOILER WAS OUT OF SERVICE APPROXIMATELY 312 HOURS DUE TO A SCHEDULED MAINTENANCE OVERHAUL. DURING THIS TIME REPAIRS WERE MADE TO THE BOTTOM BALLAST TRAY AND SUPPORT BEAMS IN THE M MODULE.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR

MODULE M WAS NOT OPERATED FOR APPROXIMATELY 96 HOURS DUE TO A POWER FAILURE THAT CAUSED AN UPSET IN THE CHEMICAL PLANT AND CONSEQUENT LACK OF ABSORBER FEED SOLUTION.									
12/80	M	90.0	86.0	87.0	65.0				
	SYSTEM	90.0	86.0	87.0	65.0		744	564	484 68.0
** PROBLEMS/SOLUTIONS/COMMENTS									
THE BOILER WAS OUT OF SERVICE APPROXIMATELY 168 HOURS DUE TO TUBE LEAKS IN THE SUPERHEATER SECTION.									
DURING DECEMBER MODULE M WAS OUT OF SERVICE APPROXIMATELY 50 HOURS DUE TO AN INSPECTION FOLLOWING MAJOR REPAIRS COMPLETED IN NOVEMBER.									
1/81	M	99.9	90.0	98.0	55.0				
	SYSTEM	99.9	90.0	98.0	55.0		744	452	409 61.0
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING JANUARY THE BOILER WAS OUT OF SERVICE APPROXIMATELY 264 HOURS TO REMOVE A CLINKER AND TO REPAIR A SUPERHEATER TUBE LEAK.									
A BOILER TRIP CAUSED BY A LOW DRUM LEVEL CAUSED A SHORT OUTAGE.									
2/81	M	81.0	80.0	80.0	75.0				
	SYSTEM	81.0	80.0	80.0	75.0		672	633	504 91.0
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING FEBRUARY THE BOILER WAS OUT OF SERVICE APPROXIMATELY 48 HOURS DUE TO THE REPAIRS OF THE SUPERHEATER TUBE LEAK.									
MODULE M WAS OUT OF SERVICE APPROXIMATELY 24 HOURS DUE TO A MAINTENANCE INSPECTION.									
3/81	M	98.3	97.2	97.8	96.5				
	SYSTEM	98.3	97.2	97.8	96.5		744	739	718 90.3
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING MARCH THE BOILER WAS OUT OF SERVICE FOR APPROXIMATELY AN HOUR DUE TO THE FAILURE OF THE STEAM FLOW TRANSMITTER.									
4/81	M	20.0	74.0	100.0	20.0				
	SYSTEM	20.0	74.0	100.0	20.0		720	195	145 24.0
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING APRIL THE BOILER WAS OUT OF SERVICE APPROXIMATELY 525 HOURS DUE TO A SCHEDULED MAINTENANCE OVERHAUL.									
MODULE M WAS OUT OF SERVICE APPROXIMATELY 50 HOURS DUE THE REPLACEMENT OF THE MIST ELIMINATOR BEAMS AND REPAIRING OF BRICKWORK IN THE VENTURI.									
5/81	M	7.5	36.8	36.8	5.8				
	SYSTEM	7.5	36.8	36.8	5.8		744	117	43 11.0
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING MAY THE BOILER WAS OUT OF SERVICE APPROXIMATELY 600 HOURS DUE TO A SCHEDULED MAINTENANCE OVERHAUL.									
DURING THE BOILER OUTAGE TIME THE UPPER AND LOWER MIST ELIMINATOR BEAMS IN									

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

MODULE M WERE REPLACED.

A PORTION OF THE ABRASION RESISTANT TILES IN THE VENTURI SCRUBBER WERE ALSO REPLACED DURING MAY.

THE BOILER WAS OUT OF SERVICE APPROXIMATELY 24 HOURS DUE TO A TUBE LEAK.

6/81	M	70.8	55.9	55.9	27.8				
	SYSTEM	70.8	55.9	55.9	27.8	720	358	200	35.0

** PROBLEMS/SOLUTIONS/COMMENTS

TWO BOILER OUTAGES IN JUNE WERE CAUSED BY SUPERHEATER TUBE LEAKS.

MODULE M WAS DOWN FROM JUNE 4 THROUGH JUNE 11 TO BALANCE THE BOOSTER BLOWER ROTOR.

7/81	M	98.1	96.5	97.3	96.7				
	SYSTEM	98.0	96.0	97.0	96.0	744	738	712	93.0

** PROBLEMS/SOLUTIONS/COMMENTS

UNIT 3 HAD TWO ONE-DAY OUTAGES DURING THE MONTH THAT RESULTED FROM FAILURE OF THE BOILER FEED PUMP CONTROLLER.

8/81	M	85.5	85.5	85.5	85.5				
	SYSTEM	85.5	85.5	85.5	85.5	744	744	636	97.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE M WAS DOWN FOR FOUR DAYS DURING THE MONTH FOR INSPECTION OF THE INTERNALS.

9/81	M	96.8	31.8	31.8	31.0				
	SYSTEM	96.8	31.8	31.8	31.0	720	701	223	82.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE M WAS DOWN FOR TWO DAYS DURING THE FIRST HALF OF THE MONTH FOR BALANCING OF THE BOOSTER BLOWER ROTOR.

A SCHEDULED CHEMICAL PLANT OUTAGE KEPT MODULE M OFF-LINE FROM SEPTEMBER 11 TO SEPTEMBER 30.

10/81	K	8.5	11.4		8.5				
	M	98.2	84.4	97.3	62.4				
	SYSTEM	98.2	84.4	97.3	62.4	744	550	464	63.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING OCTOBER THE K MODULE WAS STARTED UP FOR THE FIRST TIME.

11/81	J	19.6	19.6		19.4				
	K	96.1	91.7		91.0				
	M	91.5	69.0		68.5				
	SYSTEM	94.0	90.0	93.0	89.0	720	714	644	90.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING NOVEMBER MODULE K BECAME AVAILABLE FOR THE FIRST TIME.

DURING NOVEMBER, OPERATION OF 2 MODULES (K AND M) WAS CONSIDERED NECESSARY TO KEEP THE UNIT IN COMPLIANCE.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
12/81	J	0.0	0.0		0.0					
	K	98.9	91.1		88.3					
	L	34.5	31.3		30.4					
	M	91.8	61.4		59.5					
	SYSTEM	99.5	92.2	98.4	89.4		744	721	665	91.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE J WAS DOWN THE ENTIRE MONTH OF DECEMBER DUE TO A BURNED OUT BOOSTER BLOWER MOTOR.

MODULE L WAS IN THE START-UP MODE AND WAS INOPERATIVE UNTIL DECEMBER 21.

1/82	J	0.0	0.0		0.0					
	K	41.3	39.7		38.3					
	L	41.3	39.6		38.2					
	M	62.6	57.7		55.6					
	SYSTEM	99.0	97.0	99.0	93.0		744	718	695	94.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JANUARY MODULE J WAS OUT OF SERVICE FOR THIRTEEN HOURS DUE TO FAILURE OF THE BOOSTER BLOWER MOTOR.

MODULE M WAS OUT OF SERVICE PART OF THE MONTH DUE TO REPAIRS TO THE CIRCULATING PUMPS.

ON JANUARY 14 MODULES J, K, L RETURNED TO CONSTRUCTION TO RESOLVE DEFICIENCIES. BEGINNING ON THIS DATE, UNTIL CONSTRUCTION IS COMPLETED, THE TOTAL SYSTEM CONSISTS OF THE M MODULE ONLY.

THE UNIT WAS SHUT DOWN OF JANUARY 31 DUE TO TUBE LEAKS.

2/82	J	0.0			0.0					
	K	0.0			0.0					
	L	0.0			0.0					
	M	88.1	78.9	87.0	62.5					
	SYSTEM	88.1	78.9	87.0	62.5		672	532	420	74.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER REMAINED OFF-LINE UNTIL FEBRUARY 5 DUE TO THE TUBE LEAKS EXPERIENCED DURING FEBRUARY AND TO REPLACE A BEARING.

MODULES J, K, L REMAINED OUT OF SERVICE IN FEBRUARY DUE TO CONTINUING CONSTRUCTION WORK.

THE M MODULE START-UP WAS DELAYED UNTIL FEBRUARY 10 DUE TO FROZEN FEED LINES AND BECAUSE OF A 440 VOLT TIE IN MODIFICATION.

3/82	J	0.0			0.0					
	K	0.0			0.0					
	L	0.0			0.0					
	M	98.2	79.7	98.0	79.6					
	SYSTEM	98.2	79.7	98.0	79.6		744	743	592	97.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE M WAS SHUT DOWN FROM MARCH 19 THRU MARCH 24 BECAUSE OF A CHEMICAL PLANT OUTAGE WHEN NO FEED WAS AVAILABLE.

4/82	J	0.0	0.0		0.0					

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD HOURS	CAP. FACTOR
	K	0.0	0.0		0.0					
	L	2.1	1.8		0.7					
	M	100.0	65.0		25.0					
	SYSTEM	100.0	65.0	88.0	25.0		720	277	180	31.0

** PROBLEMS/SOLUTIONS/COMMENTS

ON APRIL 9 THROUGH APRIL 28 THE UNIT WAS DOWN FOR A SCHEDULED UNIT OUTAGE.

MODULES J, K AND L REMAINED UNDER CONSTRUCTION DURING APRIL.

5/82	J	66.3	59.1		40.2					
	K	59.8	48.6		33.1					
	L	38.7	39.7		27.0					
	M	0.0	0.0		0.0					
	SYSTEM	99.0	95.0	98.0	64.0		744	506	479	53.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF-LINE FROM MAY 3 TO MAY 7 DUE TO HIGH VIBRATION ON THE EXCITER BEARING AND FROM MAY 16 TO MAY 23 TO REPAIR A SUPERHEATER TUBE LEAK.

MODULE J WAS OUT OF SERVICE FROM MAY 1 THRU MAY 11 TO PERFORM REPAIRS ON THE ABSORBER WALLS AND MODULE K WAS DOWN FROM MAY 1 THRU MAY 13 TO PERFORM THE SAME REPAIRS.

MODULE L AND M WERE OUT OF SERVICE PART OF THE MONTH TO REPAIR THE BOOSTER BLOWER MOTOR.

6/82	J	83.8	80.1		80.1					
	K	29.0	29.0		29.0					
	L	0.0	0.0		0.0					
	M	0.0	0.0		0.0					
	SYSTEM	56.4	54.6		54.6		720	720	393	90.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE J WAS DOWN FROM JUNE 4 TO JUNE 8 TO REPAIR A BOOSTER FAN MOTOR. MODULES L AND M WERE DOWN FROM JUNE 1 TO JUNE 30, ALSO FOR BOOSTER FAN MOTOR REPAIRS.

MODULE K WAS DOWN FROM JUNE 9 TO JUNE 30 TO REPAIR AN INLET ISOLATION DAMPER.

7/82	J	99.7	93.0		62.9					
	K	0.0	0.0		0.0					
	L	36.2	47.5		32.1					
	M	0.0	0.0		0.0					
	SYSTEM	67.9	70.3		47.5		744	503	354	63.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULES K, L AND M WERE DOWN DURING JULY TO REPAIR BOOSTER FAN MOTORS.

THE UNIT WAS DOWN FROM JULY 7 TO JULY 16 TO REPAIR A BOILER TUBE LEAK.

8/82	J	100.0	78.1		78.1					
	K	64.5	61.0		61.0					
	L	77.6	72.3		72.3					
	M	0.0	0.0		0.0					
	SYSTEM	100.0	100.0		100.0		744	744	744	86.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

MODULES K, L AND M WERE DOWN AT VARIOUS TIMES DURING AUGUST TO REPAIR
 BOOSTER FAN MOTORS.

9/82	J	0.0	0.0	0.0				
	K	56.4	95.0	53.1				
	L	53.2	91.0	50.8				
	M	0.0	0.0	0.0				
	SYSTEM	54.8	93.0	51.9	720	402	374	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN DURING PART OF SEPTEMBER DUE TO A CHEMICAL PLANT OUTAGE.

MODULE J WAS DOWN DURING SEPTEMBER TO REPLACE A BOTTOM DEMISTER.

MODULE M WAS DOWN DURING SEPTEMBER TO REPAIR A BOOSTER FAN MOTOR.

10/82	J	17.3	5.7	5.6				
	K	36.4	36.4	36.3				
	L	61.3	36.5	36.4				
	M	0.9	0.9	0.9				
	SYSTEM	58.0	39.8	39.7	744	742	295	94.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM RESUMED OPERATION ON OCTOBER 20 AFTER A CHEMICAL PLANT
 OUTAGE.

11/82	J	98.2	24.6	24.6				
	K	100.0	100.0	100.0				
	L	95.4	79.9	79.9				
	M	93.3	42.9	42.9				
	SYSTEM	100.0	100.0	100.0	720	720	720	93.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE M WAS DOWN FROM NOVEMBER 1 TO NOVEMBER 3 TO BALANCE A BOOSTER FAN.

MODULES J AND M WERE ON STANDBY AT VARIOUS TIMES DURING THE MONTH DUE TO
 LOW DEMAND.

12/82	J	99.6	87.1	56.5				
	K	94.5	62.9	40.7				
	L	66.8	48.5	31.5				
	M	83.2	68.7	44.5				
	SYSTEM	100.0	100.0	86.6	744	482	644	53.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM DECEMBER 4 TO DECEMBER 10 FOR A BOILER INSPECTION.

THE UNIT WAS DOWN FROM DECEMBER 12 TO DECEMBER 18 TO REPAIR A BOILER TUBE
 LEAK.

MODULES L AND M WERE UNAVAILABLE FROM DECEMBER 13 TO DECEMBER 17 DUE TO AN
 INSPECTION OF THE BOTTOM COLLECTOR TRAYS AND MIST ELIMINATOR SUPPORT BEAMS

MODULE L WAS DOWN FROM DECEMBER 23 TO DECEMBER 27 DUE TO ELECTRICAL
 PROBLEMS WITH A BOOSTER FAN.

1/83	J	42.9	42.9	42.9				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	K	89.4	68.7		68.7					
	L	97.3	93.3		93.3					
	M	99.3	87.2		87.2					
	SYSTEM	100.0	97.4		97.4		744	744	724	89.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING JANUARY.

AS OF JANUARY 1, 1983 THE NUMBER OF MODULES COMPRISING THE TOTAL FGD SYSTEM CHANGED FROM TWO TO THREE.

2/83	J									
	K	97.0	100.0		93.0					
	L	78.0	86.1		68.9					
	M	40.0	28.6		22.9					
	SYSTEM	71.7	71.6		61.6		672	538	414	73.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN AT VARIOUS TIMES DURING FEBRUARY DUE TO BOILER-RELATED PROBLEMS.

MODULES J, L AND M WERE OUT OF SERVICE DURING PART OF FEBRUARY TO REPAIR A BOOSTER FAN MOTOR.

AS OF JANUARY 1, 1983 THE NUMBER OF MODULES COMPRISING THE TOTAL FGD SYSTEM CHANGED FROM TWO TO THREE.

3/83	J	68.0	73.1		57.0					
	K	94.0	100.0		91.0					
	L	98.0	100.0		97.0					
	M									
	SYSTEM	86.6	91.0		81.7		744	580	608	74.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM MARCH 18 TO MARCH 20 DUE TO BOILER-RELATED PROBLEMS

MODULES J AND M WERE OUT OF SERVICE DURING MARCH FOR REPAIRS ON THE BOOSTER FAN MOTORS.

AS OF JANUARY 1, 1983 THE NUMBER OF MODULES COMPRISING THE TOTAL FGD SYSTEM CHANGED FROM TWO TO THREE.

4/83	J	13.9	34.1		13.1					
	K	95.0	100.0		91.9					
	L	94.0	100.0		84.0					
	M	0.0	0.0		0.0					
	SYSTEM	67.6	78.0		63.0		720	276	681	21.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN DURING PART OF APRIL FOR A SCHEDULED OUTAGE.

THE BOOSTER FANS ON MODULES J AND M WERE DOWN FOR MOTOR REPAIRS DURING APRIL.

5/83	J	48.9	45.4		44.9					
	K	98.9	98.0		96.9					
	L	98.9	96.1		95.0					
	M	0.0	0.0		0.0					
	SYSTEM	82.2	79.8		78.9		744	736	744	62.0

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

A UNIT TRIP OCCURRED ON MAY 16 DUE TO AN ELECTRICAL MAINTENANCE ERROR.

A CONDENSER CIRCULATION PUMP TRIPPED ON MAY 25 CAUSING A UNIT TRIP.

MODULE J WAS DOWN DURING MAY TO REPAIR A BOOSTER FAN MOTOR.

MODULE M WAS OUT OF SERVICE DURING PART OF MAY FOR BOOSTER FAN MOTOR REPAIRS.

6/83	J	100.0	100.0		95.0				
	K	100.0	100.0		94.0				
	L	100.0	100.0		94.0				
	M	0.0	0.0		0.0				
	SYSTEM	100.0	100.0		94.3	720	385	720	71.0

** PROBLEMS/SOLUTIONS/COMMENTS

MECHANICAL PROBLEMS WERE ENCOUNTERED WITH A PRIMARY AIR HEATER GEAR BOX ON JUNE 8. THE UNIT WAS DOWN ON JUNE 9 AND 10 TO REPAIR THE AIR HEATER GEAR BOX.

THE UNIT WAS DOWN FROM JUNE 11 TO JUNE 18 AND AGAIN FROM JUNE 20 TO JUNE 26 DUE TO A BOILER TUBE LEAK.

A UNIT TRIP OCCURRED ON JUNE 18 DUE TO LOW VACUUM.

7/83	J	84.0	74.0	74.0	66.4				
	K	98.9	95.1	95.1	85.3				
	L	97.0	90.0	90.0	80.8				
	M	0.0	0.0	0.0	0.0				
	SYSTEM	93.3	86.3	86.3	77.5	744	668	577	72.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN APPROXIMATELY 5 DAYS DURING JULY DUE TO BOILER-RELATED PROBLEMS.

MODULES J AND M WERE DOWN DURING JULY TO REWIND THE BOOSTER FAN MOTOR.

8/83	J	100.0	87.8	87.8	42.7				
	K	100.0	85.1	85.1	41.4				
	L	100.0	87.0	87.0	42.3				
	M	0.0	0.0	0.0	0.0				
	SYSTEM	100.0	86.6	86.6	42.2	744	362	314	34.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN APPROXIMATELY 18 DAYS DURING AUGUST DUE TO BOILER-RELATED PROBLEMS.

MODULE M WAS DOWN DURING PART OF AUGUST TO REWIND A BOOSTER FAN MOTOR.

9/83	J	96.9	96.0	92.2	76.8				
	K	98.1	97.9	100.0	78.3				
	L	98.1	97.9	100.0	78.3				
	M	0.0	0.0	0.0	0.0				
	SYSTEM	97.7	97.3	97.4	77.8	720	576	560	67.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN APPROXIMATELY 6 DAYS DURING SEPTEMBER DUE TO BOOSTER-RELATED PROBLEMS.

MODULE M WAS DOWN DURING PART OF SEPTEMBER TO REPAIR A BOOSTER FAN MOTOR.

10/83	J	100.0	97.1	92.9	92.9				
	K	100.0	98.0	93.8	93.8				
	L	87.0	85.0	93.5	81.3				
	M	0.0	0.0		0.0				
	SYSTEM	95.7	93.4	93.4	89.3	744	712	665	77.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE M WAS DOWN DURING OCTOBER DUE TO A FAULTY BOOSTER FAN MOTOR.

11/83	J	100.0	97.9	100.0	96.9				
	K	100.0	98.9	100.0	97.9				
	L	100.0	92.8	100.0	91.9				
	M	21.9	10.4	100.0	10.3				
	SYSTEM	100.0	100.0	100.0	99.0	720	713	713	86.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING NOVEMBER 1983.

12/83	J	84.9	85.0	85.0	70.0				
	K	100.0	97.1	97.1	80.0				
	L	91.0	86.0	90.5	70.8				
	M	5.0	5.1	100.0	4.2				
	SYSTEM	93.6	91.0	100.0	75.0	744	613	558	67.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE M WAS DOWN DURING DECEMBER FOR BOOSTER FAN MOTOR REPAIRS.

1/84	J	99.1	99.1	99.1	99.1				
	K	100.0	83.1	100.0	83.1				
	L	99.1	99.1	99.1	99.1				
	M	20.0	18.0	100.0	18.0				
	SYSTEM	100.0	99.7	100.0	99.7	744	744	742	84.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE M WAS DOWN DURING THE MONTH TO REPAIR A BOOSTER FAN.

2/84	J	100.0	100.0	100.0	100.0				
	K	99.0	99.0	99.0	99.0				
	L	100.0	100.0	100.0	100.0				
	M	0.0	0.0		0.0				
	SYSTEM	99.7	99.7	99.7	99.7	696	696	694	92.6
3/84	J	98.5	94.0	100.0	93.5				
	K	98.5	82.0	100.0	81.6				
	L	93.5	65.0	100.0	64.7				
	M	22.8	20.0	33.9	19.9				
	SYSTEM	100.0	87.0	100.0	86.6	744	740	644	83.4

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE M OUTAGE TIME DURING THE FIRST QUARTER OF 1984 WAS DUE, IN PART,
 TO COLLAPSED MIST ELIMINATOR PADS.

4/84	J	99.0	99.0	100.0	99.0				
	K	6.9	6.0	86.0	6.0				
	L	99.0	99.0	100.0	99.0				
	M	96.9	93.9	98.8	93.9				
	SYSTEM	100.0	99.3	100.0	99.3	720	720	715	90.6
5/84	J	94.0	93.0	100.0	93.0				
	K	32.0	31.0	88.8	31.0				
	L	97.0	93.0	100.0	93.0				
	M	96.0	79.0	100.0	79.0				
	SYSTEM	100.0	98.7	100.0	98.7	744	744	734	92.8

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE K WAS DOWN DURING PART OF APRIL AND MAY FOR ABSORBER WALL REPAIRS.

6/84	J	21.9	9.1	98.0	6.7				
	K	73.5	86.9	86.9	63.8				
	L	73.3	90.0	90.0	66.0				
	M	72.6	89.0	98.1	65.3				
	SYSTEM	80.5	91.7	100.0	67.2	720	528	484	67.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE J WAS DOWN DURING PART OF JUNE FOR ABSORBER WALL REPAIRS.

7/84	J	95.2	86.9	86.9	86.2				
	K	96.1	94.9	94.9	94.1				
	L	0.0	0.0		0.0				
	M	96.1	95.9	95.9	95.2				
	SYSTEM	95.8	92.5	92.5	91.8	744	738	683	93.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED MAKING REPAIRS TO THE ABSORBER WALLS ON MODULES L AND
 M DURING JULY AND AUGUST, RESPECTIVELY.

8/84	J	78.9	87.1	87.1	72.3				
	K	79.7	85.9	85.9	71.4				
	L	54.8	64.1	80.2	53.2				
	M	23.3	20.1	100.0	16.7				
	SYSTEM	78.9	85.7	100.0	71.2	744	618	520	80.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS DOWN PART OF AUGUST DUE TO AN ESP TRIP. THE TRIP WAS
 DUE TO HIGH ASH HOPPER LEVELS.

9/84	J	86.0	67.6	67.6	61.5				
	K	86.0	89.9	89.9	81.8				
	L	86.0	89.6	89.6	81.5				
	M	0.0	0.0		0.0				
	SYSTEM	86.0	82.4	82.4	75.0	720	655	530	89.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD SYSTEM WAS DOWN MUCH OF SEPTEMBER FOR THE ANNUAL FLUE GAS DESULFURIZATION PLANT OUTAGE.

MODULE M WAS DOWN ALL OF SEPTEMBER FOR WALL REPAIRS.

10/84	J	60.3	58.6	58.6	36.0				
	K	64.2	65.9	65.9	40.5				
	L	62.6	61.7	61.7	37.9				
	M	0.0	0.0		0.0				
	SYSTEM	62.4	62.1	62.1	38.1	744	457	284	61.0

** PROBLEMS/SOLUTIONS/COMMENTS

WORK CONTINUED ON REPAIRING SUMP WALLS ON MODULE M. THE UNIT WAS DOWN PART OF OCTOBER FOR A PLANNED OUTAGE.

11/84	J	100.0			0.0				
	K	100.0			0.0				
	L	100.0			0.0				
	M	100.0			0.0				
	SYSTEM	100.0			0.0	720	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT REMAINED DOWN ALL OF NOVEMBER DUE TO PLANNED ANNUAL OUTAGE.

12/84	J	69.9	87.5	91.7	64.1				
	K	70.8	72.7	75.1	53.2				
	L	16.0	11.9	95.6	8.7				
	M	57.5	61.7	64.6	45.2				
	SYSTEM	71.4	77.9	100.0	57.1	744	545	425	64.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD WAS DOWN MORE THAN DESIRED DURING THE MONTH OF DECEMBER BECAUSE OF PROBLEMS WITH ABSORBER TRAY TIE DOWNS.

1/85	J	100.0	72.0	100.0	72.0				
	K	98.9	96.0	100.0	96.0				
	L	100.0	98.9	100.0	98.9				
	M	100.0	28.0	84.6	28.0				
	SYSTEM	100.0	98.3	100.0	98.3	744	744	731	99.5

2/85	J	88.2	91.0	100.0	82.7				
	K	89.1	93.0	100.0	84.5				
	L	89.1	93.9	100.0	85.4				
	M	45.4	1.0	4.4	0.9				
	SYSTEM	100.0	93.0	100.0	84.5	672	611	568	87.7

3/85	J	99.1	75.0	92.0	74.3				
	K	99.1	87.0	100.0	86.2				
	L	99.1	89.0	100.0	88.2				
	M	47.6	36.0	84.7	35.6				
	SYSTEM	100.0	95.7	100.0	94.8	744	737	705	98.6

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS OF JANUARY THROUGH MARCH.

4/85	J	90.1	97.1	97.1	87.5				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	K	90.1	97.1	97.1	87.5						
	L	90.1	97.1	97.1	87.5						
	M	0.0	0.0		0.0						
	SYSTEM	90.1	97.1	97.1	87.5			720	649	630	84.5

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE M WAS OUT OF SERVICE THE ENTIRE MONTH FOR BOOSTER BLOWER MOTOR REPAIR WORK.

5/85	J	99.5	96.9	96.9	96.4					
	K	99.5	97.8	97.8	97.3					
	L	99.5	97.8	97.8	97.3					
	M	0.0	0.0		0.0					
	SYSTEM	99.5	97.5	97.5	97.0		744	740	722	94.3
6/85	J	98.8	98.0	98.0	96.8					
	K	84.9	82.0	82.0	81.0					
	L	98.8	97.0	97.0	95.8					
	M	0.0	0.0		0.0					
	SYSTEM	94.1	92.4	92.4	91.2		720	711	657	94.9

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS OF MAY OR JUNE.

7/85	J	67.7	80.8	100.0	67.7					
	K	100.0	94.9	100.0	79.6					
	L	72.8	86.9	100.0	72.8					
	M	26.7	16.0	100.0	13.4					
	SYSTEM	89.1	92.9	100.0	77.9		744	624	579	80.5

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE M WAS DOWN FOR PART OF THE MONTH FOR BOOSTER BLOWER MOTOR REPAIRS.

THE J AND L MODULES WERE OUT OF SERVICE FOR A PERIOD SO THAT MIST ELIMINATOR PADS PLUGGED WITH COAL AND ASH COULD BE REPLACED.

8/85	J	100.0	99.1	99.1	85.5					
	K	100.0	99.1	99.1	85.5					
	L	0.0	0.0		0.0					
	M	100.0	99.1	99.1	85.5					
	SYSTEM	100.0	99.1	99.1	85.5		744	642	636	83.2
9/85	J	95.6	98.1	99.1	95.6					
	K	45.8	43.1	100.0	41.9					
	L	52.6	47.0	100.0	45.8					
	M	95.6	97.1	98.3	94.6					
	SYSTEM	96.5	95.1	100.0	92.6		720	702	667	93.4
10/85	J	100.0	99.1	99.1	99.1					
	K	0.0	0.0		0.0					
	L	84.0	84.0	84.0	84.0					
	M	100.0	98.0	98.0	98.0					
	SYSTEM	94.7	93.7	93.7	93.7		744	744	697	94.8
11/85	J	96.9	96.9	96.9	96.9					
	K	0.0	0.0		0.0					
	L	96.9	96.9	96.9	96.9					
	M	96.9	96.9	96.9	96.9					
	SYSTEM	96.9	96.9	96.9	96.9		720	720	698	95.4

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
12/85	J	91.3	98.0	98.1	89.4					
	K	0.0	0.0		0.0					
	L	91.3	98.0	98.1	89.4					
	M	91.3	98.0	98.1	89.4					
	SYSTEM	91.3	98.0	98.1	89.4		744	679	665	87.7

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS OF AUGUST THROUGH DECEMBER.

1/86	J	100.0	96.0	96.0	96.0					
	K	32.0	31.0	91.3	31.0					
	L	100.0	96.0	96.0	96.0					
	M	71.0	66.0	100.0	66.0					
	SYSTEM	100.0	96.3	100.0	96.3		744	744	717	95.7
2/86	J	32.7	91.5	100.0	32.1					
	K	32.7	100.0	100.0	89.7					
	L	14.7	5.1	100.0	1.8					
	M	31.7	88.1	100.0	31.0					
	SYSTEM	37.3	94.9	100.0	51.5		672	236	346	31.3

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED UNIT OUTAGE OCCURRED DURING THE MONTH OF FEBRUARY.

3/86	J	97.0	32.6	32.4	31.0					
	K	97.0	91.4	93.8	87.0					
	L	0.0	0.0		0.0					
	M	100.0	100.0	100.0	97.0					
	SYSTEM	98.0	74.7	75.4	71.7		744	708	533	62.1
4/86	J	96.9	59.0	100.0	59.0					
	K	96.9	59.0	100.0	59.0					
	L	15.0	0.0		0.0					
	M	96.9	59.0	100.0	59.0					
	SYSTEM	100.0	59.0	100.0	59.0		720	720	425	94.4
5/86	J	88.8	53.0	100.0	52.3					
	K	75.9	51.0	100.0	50.3					
	L	51.3	52.0	100.0	51.3					
	M	88.8	64.0	100.0	63.2					
	SYSTEM	100.0	73.3	100.0	72.4		744	734	538	81.8
6/86	J	94.7	83.9	100.0	81.9					
	K	97.6	51.9	100.0	50.7					
	L	94.7	77.0	100.0	75.1					
	M	94.7	65.0	100.0	63.5					
	SYSTEM	100.0	92.6	100.0	90.4		720	703	651	79.7

** PROBLEMS/SOLUTIONS/COMMENTS

THERE WERE NO FGD SYSTEM-RELATED PROBLEMS REPORTED BY THE UTILITY DURING THE PERIOD OF JANUARY THROUGH JUNE.

7/86	J	100.0	69.0	100.0	69.0					
	K	100.0	86.0	100.0	86.0					
	L	97.0	45.0	78.1	45.0					
	M	100.0	87.0	99.5	87.0					
	SYSTEM	100.0	95.7	100.0	95.7		744	744	712	82.1
8/86	J	93.0	38.0	44.7	38.0					

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	K	100.0	75.9	100.0	75.9					
	L	100.0	64.0	100.0	64.0					
	M	100.0	75.0	100.0	75.0					
	SYSTEM	100.0	84.3	100.0	84.3		744	744	627	75.1
9/86	J	100.0	63.1	75.5	63.1					
	K	100.0	84.0	100.0	84.0					
	L	53.1	41.9	75.1	41.9					
	M	76.9	61.0	79.5	61.0					
	SYSTEM	100.0	83.3	100.0	83.3		720	720	600	66.3
10/86	J	100.0	94.0	100.0	94.0					
	K	87.0	72.0	100.0	72.0					
	L	25.9	21.0	100.0	21.0					
	M	100.0	93.0	100.0	93.0					
	SYSTEM	100.0	93.3	100.0	93.3		744	744	694	64.2
11/86	J	100.0	97.1	100.0	97.1					
	K	0.0	0.0		0.0					
	L	100.0	67.2	100.0	67.2					
	M	100.0	78.5	100.0	78.5					
	SYSTEM	100.0	80.9	100.0	80.9		720	720	583	58.8
12/86	J	100.0	89.0	100.0	89.0					
	K	0.0	0.0		0.0					
	L	94.0	38.0	100.0	38.0					
	M	100.0	86.0	100.0	86.0					
	SYSTEM	98.0	71.0	100.0	71.0		744	744	528	52.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED NO FGD SYSTEM-RELATED PROBLEMS OCCURRED DURING
THE PERIOD OF JULY THROUGH DECEMBER 1986.

1/87	J	100.0	80.0	100.0	80.0					
	K	68.0	28.0	100.0	28.0					
	L	100.0	58.9	100.0	58.9					
	M	97.0	90.1	100.0	90.1					
	SYSTEM	100.0	85.6	100.0	85.6		744	744	637	60.6
2/87	J	57.0	40.0	100.0	40.0					
	K	96.0	76.9	100.0	76.9					
	L	100.0	40.0	100.0	40.0					
	M	100.0	90.0	100.0	90.0					
	SYSTEM	100.0	82.3	100.0	82.3		672	672	553	67.8
3/87	J	55.0	62.2	100.0	55.0					
	K	100.0	48.2	100.0	42.6					
	L	100.0	45.8	100.0	40.5					
	M	61.0	49.7	100.0	44.0					
	SYSTEM	100.0	68.7	100.0	60.7		744	657	451	74.4
4/87	J	100.0	89.0	100.0	89.0					
	K	100.0	86.9	100.0	86.9					
	L	20.0	18.1	100.0	18.1					
	M	90.0	76.9	100.0	76.9					
	SYSTEM	100.0	90.3	100.0	90.3		720	720	650	76.7
5/87	J	100.0	78.0	100.0	78.0					
	K	13.0	9.0	100.0	9.0					
	L	87.0	65.1	100.0	65.1					
	M	100.0	87.0	100.0	87.0					
	SYSTEM	100.0	79.7	100.0	79.7		744	744	593	70.6

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD HOURS	CAP. FACTOR
6/87	J	93.1	76.9	100.0	76.9					
	K	0.0	0.0		0.0					
	L	93.1	61.0	100.0	61.0					
	M	100.0	91.9	100.0	91.9					
	SYSTEM	95.4	76.6	100.0	76.6		720	720	552	66.3
7/87	J	100.0	84.0	100.0	84.0					
	K	0.0	0.0		0.0					
	L	90.1	75.9	100.0	75.9					
	M	100.0	84.0	100.0	84.0					
	SYSTEM	96.7	81.3	100.0	81.3		744	744	605	68.5
8/87	J	100.0	92.4	100.0	87.0					
	K	0.0	0.0		0.0					
	L	97.0	80.7	100.0	75.9					
	M	100.0	88.3	100.0	83.1					
	SYSTEM	99.0	87.1	100.0	82.0		744	700	610	62.7
9/87	J	100.0	86.0	100.0	86.0					
	K	0.0	0.0		0.0					
	L	96.9	53.1	100.0	53.1					
	M	100.0	88.1	100.0	88.1					
	SYSTEM	100.0	75.7	100.0	75.7		720	720	545	61.6

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD JANUARY THROUGH SEPTEMBER 1987.

10/87	J	100.0	40.6	100.0	37.6					
	K	9.7	0.0		0.0					
	L	93.5	38.6	100.0	35.8					
	M	96.8	38.0	100.0	35.2					
	SYSTEM	100.0	39.1	100.0	36.2		744	689	269	65.4
11/87	J	100.0	90.6	100.0	90.6					
	K	0.0	0.0		0.0					
	L	100.0	79.2	100.0	79.2					
	M	96.7	75.6	100.0	75.6					
	SYSTEM	98.9	81.8	100.0	81.8		720	720	589	68.9
12/87	J	93.5	90.3	100.0	67.5					
	K	0.0	0.0		0.0					
	L	90.3	81.5	100.0	60.9					
	M	96.8	99.3	100.0	74.2					
	SYSTEM	93.5	90.3	100.0	67.5		744	556	502	56.8

** PROBLEMS/SOLUTIONS/COMMENTS

PROBLEMS DURING THE OCTOBER-DECEMBER PERIOD INCLUDED H CELL SCRUBBER SUMP WALL FAILURE.

**DO NOT MICROFILM
THIS PAGE**

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	PUBLIC SERVICE OF NEW MEXICO	
PLANT NAME	SAN JUAN	
UNIT NUMBER	4	
CITY	WATERFLOW	
STATE	NEW MEXICO	
REGULATORY CLASSIFICATION	A	
PARTICULATE EMISSION LIMITATION - NG/J	21.	(0.050 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	146.	(0.340 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	1614	
GROSS UNIT GENERATING CAPACITY - MW	544	
NET UNIT GENERATING CAPACITY W/FGD - MW	498	
NET UNIT GENERATING CAPACITY WO/FGD - MW	517	
EQUIVALENT SCRUBBED CAPACITY - MW	544	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	BABCOCK & WILCOX	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	963.05	(2040800 ACFM)
BOILER FLUE GAS TEMPERATURE - C	120.6	(249 F)
STACK HEIGHT - M	122.	(400 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	8.5	(28.0 FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	SUBBITUMINOUS	
AVERAGE HEAT CONTENT - J/G	18841.	(8100 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		8000-11628
AVERAGE ASH CONTENT - %	22.45	
RANGE ASH CONTENT - %	12.6-22.5	
AVERAGE MOISTURE CONTENT - %	14.82	
RANGE MOISTURE CONTENT - %	8.1-15.0	
AVERAGE SULFUR CONTENT - %	0.80	
RANGE SULFUR CONTENT - %	0.6-1.3	
AVERAGE CHLORIDE CONTENT - %	0.07	
RANGE CHLORIDE CONTENT - %	0.00-0.09	
*** PARTICLE CONTROL		
** ESP		
TYPE	HOT SIDE	
SUPPLIER	RESEARCH-COTTRELL	
INLET FLUE GAS CAPACITY - CU.M/S	1932.7	(4095605 ACFM)
INLET FLUE GAS TEMPERATURE - C	382.2	(720 F)
PRESSURE DROP - KPA	0.6	(2. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.9	
** PARTICLE SCRUBBER		
GENERIC TYPE	VENTURI TOWER	
SPECIFIC TYPE	VARIABLE-THROAT/BOTTOM-ENTRY PLUMB BOB	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	CARBON STEEL	
SHELL SPECIFIC MATERIAL	AISI 1110	
LINER GENERIC MATERIAL	INORGANIC	
LINER SPECIFIC MATERIAL	REFIRED BRICK/SHAPES	
*** FGD SYSTEM		
** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	SALEABLE PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	
PROCESS TYPE	WELLMAN LORD	
PROCESS ADDITIVES	NONE	
SYSTEM SUPPLIER	DAVY MCKEE	
A-E FIRM	DAVY MCKEE	
DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	NEW	

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 4 (CONT.)

UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.80	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	90.00	
ENERGY CONSUMPTION - %	3.5	
CURRENT STATUS	1	
COMMERCIAL START-UP	7/1982	
INITIAL START-UP	5/1982	
CONTRACT AWARDED	8/1978	
** DESIGN AND OPERATING PARAMETERS		
DESIGN CHLORIDE CONTENT - %	*****	
** QUENCHER/PRESATURATOR		
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** ABSORBER		
NUMBER	4	
NUMBER OF SPARES	1	
GENERIC TYPE	TRAY TOWER	
SPECIFIC TYPE	VALVE TRAY	
TRADE NAME/COMMON TYPE	BUBBLE CAP TRAY TOWER	
SHELL GENERIC MATERIAL	NR	
SHELL SPECIFIC MATERIAL	NR	
SHELL MATERIAL TRADE NAME/COMMON TYPE	NR	
LINER GENERIC MATERIAL	NR	
LINER SPECIFIC MATERIAL	NR	
LINER MATERIAL TRADE NAME/COMMON TYPE	NR	
GAS CONTACTING DEVICE TYPE	VALVE TRAY	
L/G RATIO - L/CU.M	1.0	(7.5 GAL/1000 ACF)
SO2 REMOVAL EFFICIENCY - %	90.0	
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR	
GENERIC TYPE	IMPINGEMENT	
SPECIFIC TYPE	BAFFLE	
TRADE NAME/COMMON TYPE	CLOSED VANE	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** REHEATER		
GENERIC TYPE	INDIRECT HOT AIR	
SPECIFIC TYPE	EXTERNAL HEAT EXCHANGER	
TRADE NAME/COMMON TYPE	STEAM TUBE BUNDLE	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** FANS		
DESIGN	CENTRIFUGAL	
FUNCTION	BOOSTER	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** FANS		
NUMBER	2	
NUMBER OF SPARES	0	
DESIGN	CENTRIFUGAL	
SUPPLIER	WESTINGHOUSE	
FUNCTION	UNIT	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** DAMPERS		
FUNCTION	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 4 (CONT.)

** DUCTWORK	
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	MIX TANK
DEVICE	N/A
DEVICE TYPE	AGITATED TANK
** PUMPS	
SERVICE	NUMBER
-----	-----
NR	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	NONE
*** SALEABLE BYPRODUCTS	
NATURE	SULFURIC ACID
DISPOSITION	MARKETED
*** SLUDGE	
** TREATMENT	
METHOD	N/A
DEVICE	N/A
PROPRIETARY PROCESS	N/A
** DISPOSAL	
NATURE	N/A
TYPE	NONE
SITE TREATMENT	N/A
** PROCESS CONTROL AND INSTRUMENTATION	
PROCESS STREAM	STACK OUTLET GAS
CHEMICAL PARAMETERS	NOX, SO2, O2, OPACITY
MONITOR TYPE	KVB
MONITOR LOCATION	STACK
PROCESS CONTROL MANNER	AUTOMATIC
PROCESS CHEMISTRY MODE	FEEDBACK
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
** FGD SPARE CAPACITY INDICES	
ABSORBER - %	33.3
** FGD SPARE COMPONENT INDICES	
ABSORBER	1.0

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR
5/82	N	0.0	0.0		0.0					
	P	86.8	54.6		42.3					
	R	71.8	47.7		37.0					
	S	0.0	0.0		0.0					
	SYSTEM	87.0	66.0	87.0	51.0		744	577	383	66.0

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

FGD SYSTEM OPERATION COMMENCED DURING MAY 1982.

MODULES N AND S WERE UNAVAILABLE DURING MAY DUE TO ABSORBER WALL REPAIRS.

MODULE R WAS OFF-LINE FOR FOUR DAYS TO REPAIR THE PLUMB BOB IN THE VENTURI SCRUBBER.

6/82	N	48.6	44.3	41.8				
	P	23.8	24.3	22.9				
	R	53.2	34.6	32.6				
	S	10.0	10.2	9.6				
	SYSTEM	67.8	56.7	53.5	720	679	385	80.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM JUNE 8 TO JUNE 10 DUE TO BOILER RELATED PROBLEMS.

MODULE N WAS DOWN FROM JUNE 1 TO JUNE 16 TO REPAIR THE ABSORBER CELL WALLS
MODULE S WAS DOWN FROM JUNE 1 TO JUNE 4, ALSO FOR ABSORBER CELL WALL REPAIRS.

MODULES P, R AND S WERE DOWN AT VARIOUS TIMES DURING THE PERIOD OF JUNE 6 TO JUNE 30 FOR BOOSTER FAN MOTOR REPAIRS.

7/82	N	99.1	93.5	91.1				
	P	0.0	0.0	0.0				
	R	0.0	0.0	0.0				
	S	0.0	0.0	0.0				
	SYSTEM	49.5	46.8	45.6	744	725	339	91.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULES P, R AND S WERE DOWN DURING JULY FOR BOOSTER FAN MOTOR REPAIRS.

8/82	N	96.6	77.3	68.1				
	P	99.7	88.3	77.8				
	R	0.0	0.0	0.0				
	S	42.2	14.9	13.2				
	SYSTEM	100.0	90.2	79.6	744	656	592	76.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM AUGUST 11 TO AUGUST 13 TO REPAIR A BOILER TUBE LEAK

MODULES R, S AND N WERE DOWN AT VARIOUS TIMES DURING AUGUST TO REPAIR BOOSTER FAN MOTORS.

9/82	N	56.7	51.4	28.1				
	P	56.3	85.0	46.4				
	R	30.0	41.5	22.6				
	S	34.9	3.1	1.7				
	SYSTEM	88.9	90.5	49.4	720	393	356	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN DURING PART OF SEPTEMBER DUE TO A CHEMICAL PLANT OUTAGE.

MODULE R BECAME AVAILABLE AFTER THE BOOSTER FAN REPAIRS ON SEPTEMBER 9.

THE OPERATION OF MODULES N AND S WAS LIMITED DURING THE LATTER PART OF SEPTEMBER BECAUSE THEY WERE NOT NEEDED TO KEEP THE UNIT IN COMPLIANCE.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

10/82	N	0.0	0.0	0.0					
	P	56.3	36.4	34.1					
	R	74.9	54.2	50.8					
	S	67.3	37.3	34.9					
	SYSTEM	99.3	64.0	59.9	744	697	446	87.0	

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM RESUMED OPERATION ON OCTOBER 7 FOLLOWING A CHEMICAL PLANT OUTAGE.

11/82	N	3.3	1.3	0.8					
	P	60.4	87.4	56.0					
	R	0.0	0.0	0.0					
	S	70.0	84.6	54.2					
	SYSTEM	66.9	86.7	55.5	720	461	400	57.0	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM NOVEMBER 1 TO NOVEMBER 12 FOR A SCHEDULED OUTAGE.

BOTTOM DEMISTERS WERE REPLACED IN MODULES N, P AND S DURING NOVEMBER. MODULES P AND S WERE BACK IN SERVICE ON NOVEMBER 13.

MODULE N REMAINED SHUT DOWN TO REPAIR LEAKS ON A PLUMB BOB IN THE VENTURI SCRUBBER.

DURING NOVEMBER MODULE R AWAITED REPLACEMENT OF A BOTTOM DEMISTER.

12/82	N	100.0	90.9	90.3					
	P	99.7	83.4	82.8					
	R	32.7	5.5	5.5					
	S	99.7	91.3	90.7					
	SYSTEM	100.0	100.0	100.0	744	739	744	92.0	

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE R WAS OUT OF SERVICE FROM DECEMBER 1 TO DECEMBER 19 TO REPLACE SECTIONS OF A BOTTOM DEMISTER.

1/83	N	42.6	38.1	37.5					
	P	99.7	82.4	81.2					
	R	97.4	89.2	87.9					
	S	94.9	68.8	67.7					
	SYSTEM	100.0	92.8	91.4	744	733	680	86.0	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN ON JANUARY 1 AND JANUARY 6 DUE TO ELECTRICAL PROBLEMS.

AS OF JANUARY 1, 1983 THE NUMBER OF MODULES COMPRISING THE TOTAL FGD SYSTEM CHANGED FROM TWO TO THREE.

2/83	N		0.9	0.9					
	P	97.9	97.9	97.9					
	R	99.0	99.0	99.0					
	S	97.9	97.9	97.9					
	SYSTEM	98.3	98.6	98.6	672	672	662	90.0	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE N WAS DOWN DURING PART OF FEBRUARY TO REPAIR A BOOSTER FAN MOTOR.

3/83	N								
	P	98.9	99.3		96.0				
	R	98.9	99.3		96.0				
	S	100.0	99.3		96.0				
	SYSTEM	99.3	99.3		96.0	744	719	714	87.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM MARCH 22 TO MARCH 23 DUE TO ELECTRICAL PROBLEMS.

MODULE N WAS DOWN DURING MARCH TO REPAIR A BOOSTER FAN MOTOR.

4/83	N	0.0	0.0		0.0				
	P	99.0	100.0		96.0				
	R	100.0	100.0		96.0				
	S	98.1	100.0		95.0				
	SYSTEM	99.0	100.0		95.7	720	655	720	81.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN DURING PART OF APRIL TO REPAIR A BOILER STEAM LEAK.

THE MODULE N BOOSTER FAN MOTOR WAS BEING REPAIRED DURING THE MONTH OF APRIL.

5/83	N	0.0	0.0		0.0				
	P	98.9	98.9		98.9				
	R	98.9	98.9		98.9				
	S	98.0	98.0		98.0				
	SYSTEM	98.6	98.6		98.6	744	744	744	82.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING MAY.

6/83	N	3.1	1.0		1.0				
	P	100.0	96.2		95.0				
	R	100.0	96.2		95.0				
	S	100.0	96.2		95.0				
	SYSTEM	100.0	96.5		95.3	720	711	720	77.0

** PROBLEMS/SOLUTIONS/COMMENTS

A UNIT TRIP OCCURRED FROM JUNE 5 TO JUNE 6 DUE TO A LOW BOILER DRUM LEVEL.

MODULE N WAS DOWN DURING PART OF JUNE TO REPAIR A FAN.

7/83	N	100.0	79.9	100.0	68.5				
	P	100.0	95.9	100.0	82.3				
	R	100.0	95.0	100.0	81.5				
	S	20.0	0.0	0.0	0.0				
	SYSTEM	100.0	90.3	100.0	77.4	744	638	576	71.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FOR APPROXIMATELY 5 DAYS DURING JULY TO REPLACE EXPANSION JOINTS.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

THE UNIT WAS DOWN FROM JULY 30 TO JULY 31 DUE TO BOILER-RELATED PROBLEMS.

MODULE S WAS DOWN DURING PART OF JULY TO REPAIR AN ABSORBER TRAY SUPPORT BEAM.

8/83	N	84.9	66.6		65.1				
	P	100.0	98.2		96.0				
	R	98.0	63.4		62.0				
	S	98.0	63.4		62.0				
	SYSTEM	100.0	97.2		95.0	744	727	707	85.0

** PROBLEMS/SOLUTIONS/COMMENTS

A UNIT TRIP OCCURRED FROM AUGUST 4 TO AUGUST 5 DUE TO BOILER/TURBINE RELATED PROBLEMS.

MODULE N WAS DOWN DURING PART OF AUGUST FOR BOOSTER FAN MOTOR REWIRING.

MODULES R AND S WERE DOWN DURING PART OF AUGUST TO INSTALL NEW SUMP LEVEL CONTROLS.

9/83	N	99.0	99.0		99.0				
	P	70.0	51.9		51.9				
	R	79.0	46.9		46.9				
	S	99.0	99.0		99.0				
	SYSTEM	100.0	99.0		99.0	720	720	713	85.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE P WAS DOWN DURING PART OF SEPTEMBER TO INSPECT A CHLORIDE PRESCRUBBER SPRAY HEADER.

MODULE R WAS DOWN DURING PART OF SEPTEMBER TO REMOVE A CHLORIDE PRESCRUBBER SPRAY HEADER.

10/83	N	100.0	97.0	97.0	96.5				
	P	79.0	78.6	78.6	78.2				
	R	99.5	97.0	97.0	96.5				
	S	0.0	0.0		0.0				
	SYSTEM	92.8	90.9	90.9	90.4	744	740	673	83.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE S WAS DOWN DURING OCTOBER DUE TO ABSORBER SUMP BRICK WALL LINER FAILURE.

11/83	N	96.0	95.0	95.0	95.0				
	P	26.9	25.0	25.0	25.0				
	R	96.9	96.9	96.9	96.9				
	S	0.0	0.0		0.0				
	SYSTEM	73.3	72.3	72.3	72.3	720	720	521	85.0

12/83	N	98.9	98.9	98.9	98.9				
	P	0.0	0.0	0.0	0.0				
	R	98.9	98.9	98.9	98.9				
	S	0.0	0.0	0.0	0.0				
	SYSTEM	65.9	65.9	65.9	65.9	744	744	491	86.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULES P AND S WERE DOWN DURING NOVEMBER AND DECEMBER DUE TO ABSORBER BRICK WALL LINER FAILURES.

1/84	N	93.0	94.4	95.0	92.1				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 4 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	P	0.0	0.0	0.0	0.0					
	R	93.0	94.4	95.0	92.1					
	S	0.0	0.0		0.0					
	SYSTEM	62.0	63.0	63.3	61.4		744	725	457	83.9
2/84	N	81.3	92.0	92.0	79.6					
	P	0.0	0.0	0.0	0.0					
	R	78.7	88.1	88.0	76.1					
	S	0.0	0.0	0.0	0.0					
	SYSTEM	53.4	60.0	60.0	51.9		696	602	361	73.6
3/84	N	96.2	79.9	100.0	79.3					
	P	0.0	0.0	0.0	0.0					
	R	70.4	57.0	73.9	56.6					
	S	24.7	21.0	86.1	20.8					
	SYSTEM	63.8	52.6	86.7	52.2		744	739	389	86.9
** PROBLEMS/SOLUTIONS/COMMENTS										
MODULES P AND S WERE DOWN DURING THE FIRST QUARTER OF 1984 TO REPAIR ABSORBER SUMP WALLS.										
4/84	N	41.4	80.9	80.9	33.5					
	P	0.0	0.0	0.0	0.0					
	R	0.0	0.0	0.0	0.0					
	S	41.4	70.1	70.1	29.0					
	SYSTEM	27.6	50.3	50.3	20.8		720	298	150	34.4
** PROBLEMS/SOLUTIONS/COMMENTS										
MODULES P AND R WERE DOWN DURING APRIL TO REBUILD ABSORBER WALLS.										
5/84	N	0.0	0.0		0.0					
	P	1.6	30.2	30.0	1.6					
	R	0.9	17.6	17.5	0.9					
	S	1.2	22.6	22.5	1.2					
	SYSTEM	1.3	23.5	23.3	1.3		744	40	9	2.6
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED A UNIT OUTAGE DURING MAY.										
MODULES P, R AND S WERE DOWN DURING MAY FOR ABSORBER WALL REPAIRS.										
6/84	N	48.8	47.9	100.0	38.9					
	P	67.8	38.6	74.1	31.4					
	R	81.8	87.5	87.5	71.1					
	S	81.8	82.4	82.4	66.9					
	SYSTEM	93.4	85.5	100.0	69.4		720	585	500	69.0
** PROBLEMS/SOLUTIONS/COMMENTS										
MODULES N AND P WERE DOWN DURING JUNE FOR ABSORBER WALL REPAIRS.										
7/84	N	92.9	87.9	98.3	83.3					
	P	80.5	51.1	86.5	48.4					
	R	92.9	72.1	100.0	68.3					
	S	91.9	76.0	99.3	72.0					
	SYSTEM	100.0	95.7	100.0	90.7		744	705	675	85.0
8/84	N	100.0	100.0	100.0	100.0					
	P	93.0	80.0	100.0	80.0					
	R	27.0	16.9	84.6	16.9					

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 4 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	S	100.0	100.0	100.0	100.0					
	SYSTEM	100.0	99.0	100.0	99.0		744	744	736	93.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE MONTHS OF JULY AND AUGUST.

9/84	N	61.5	57.2	100.0	56.3					
	P	74.3	70.2	100.0	69.0					
	R	45.0	13.0	100.0	12.8					
	S	74.3	57.2	100.0	56.3					
	SYSTEM	85.0	65.9	100.0	64.8		720	708	466	91.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THE FGD SYSTEM WAS DOWN MUCH OF SEPTEMBER FOR THE ANNUAL FLUE GAS DESULFURIZATION PLANT OUTAGE.

MODULE R WAS DOWN MOST OF SEPTEMBER TO REPLACE MIST ELIMINATOR PODS.

10/84	N	92.9	75.0	75.0	70.4					
	P	0.0	0.0		0.0					
	R	92.9	75.0	75.0	70.4					
	S	92.9	75.8	75.8	71.2					
	SYSTEM	92.9	75.3	75.3	70.7		744	699	526	88.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE P WAS DOWN ALL OF OCTOBER TO CLEAN AND INSPECT ABSORBER TRAYS.

11/84	N	97.4	97.1	99.3	96.5					
	P	97.4	96.9	99.1	96.4					
	R	6.9	7.0	100.0	6.9					
	S	97.4	96.9	99.1	96.4					
	SYSTEM	99.7	99.3	100.0	98.8		720	716	711	93.8

12/84	N	95.0	95.0	95.0	95.0					
	P	95.0	95.0	95.0	95.0					
	R	0.0	0.0		0.0					
	S	95.0	95.0	95.0	95.0					
	SYSTEM	95.0	95.0	95.0	95.0		744	744	707	94.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE MONTHS OF NOVEMBER AND DECEMBER.

1/85	N	98.9	98.9	98.9	98.9					
	P	98.9	98.9	98.9	98.9					
	R	0.0	0.0		0.0					
	S	98.9	98.0	98.0	98.0					
	SYSTEM	98.9	98.6	98.6	98.6		744	744	734	94.9

2/85	N	99.0	99.0	99.0	99.0					
	P	99.0	99.0	99.0	99.0					
	R	0.0	0.0		0.0					
	S	100.0	100.0	100.0	100.0					
	SYSTEM	99.3	99.3	99.3	99.3		672	672	667	95.6

3/85	N	100.0	98.9	98.9	98.9					
	P	100.0	98.9	98.9	98.9					
	R	0.0	0.0		0.0					

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 4 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	S	100.0	98.9	98.9	98.9						
	SYSTEM	100.0	98.9	98.9	98.9			744	744	736	96.4

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MONTHS OF JANUARY THROUGH MARCH.

4/85	N	87.9	97.9	95.5	86.1						
	P	52.8	60.0	100.0	52.8						
	R	37.8	34.9	100.0	30.7						
	S	87.9	96.1	93.7	84.4						
	SYSTEM	88.8	96.3	100.0	84.7			720	633	610	82.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT MODULE P WAS OUT OF SERVICE DURING PART OF APRIL FOR INLET CONTROL DAMPER REPAIR WORK.

MODULE R WAS DOWN FOR BOOSTER BLOWER MOTOR REPAIRS.

5/85	N	100.0	98.0	100.0	98.0						
	P	9.9	9.0	90.5	9.0						
	R	100.0	90.1	95.7	90.1						
	S	100.0	98.0	100.0	98.0						
	SYSTEM	100.0	98.3	100.0	98.3			744	744	732	90.6

6/85	N	77.4	13.5	100.0	13.5						
	P	96.7	96.9	100.0	96.7						
	R	86.9	87.2	93.2	86.9						
	S	96.7	40.3	41.9	40.1						
	SYSTEM	100.0	79.3	100.0	79.1			720	718	569	92.9

7/85	N	96.6	97.0	100.0	96.6						
	P	100.0	100.0	100.0	99.6						
	R	100.0	100.0	100.0	99.6						
	S	76.6	5.0	100.0	5.0						
	SYSTEM	100.0	100.0	100.0	100.0			744	741	744	93.4

8/85	N	0.0	0.0		0.0						
	P	100.0	98.9	98.9	98.9						
	R	100.0	98.9	98.9	98.9						
	S	100.0	98.9	98.9	98.9						
	SYSTEM	100.0	98.9	98.9	98.9			744	744	736	95.1

9/85	N	0.0	0.0		0.0						
	P	96.9	91.9	91.9	91.9						
	R	96.9	91.0	91.0	91.0						
	S	96.9	91.9	91.9	91.9						
	SYSTEM	96.9	91.6	91.6	91.6			720	720	660	91.7

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS OF MAY THROUGH SEPTEMBER.

10/85	N	26.9	23.1	50.8	16.4						
	P	68.0	88.0	91.0	62.4						
	R	43.1	54.1	88.8	38.3						
	S	68.0	86.0	88.8	60.9						
	SYSTEM	68.7	83.7	100.0	59.3			744	527	441	62.2

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE N UNDERWENT MIST ELIMINATOR SUPPORT BEAM REBUILDING DURING THE MONTH. THE POWER PLANT WAS TAKEN OUT OF SERVICE FOR A TUBE LEAK AND CLINKER, THEN A SCHEDULED UNIT OUTAGE BEGAN.

11/85	N	43.8	89.2	89.4	43.3				
	P	43.8	89.2	89.4	43.3				
	R	43.8	64.0	64.2	31.1				
	S	1.5	0.0		0.0				
	SYSTEM	44.3	80.8	81.0	39.3	720	350	283	40.9

** PROBLEMS/SOLUTIONS/COMMENTS

THE SCHEDULED UNIT MAINTENANCE OUTAGE CONTINUED INTO NOVEMBER. THE UTILITY REPORTED THAT MODULE S WAS OUT OF SERVICE THE BALANCE OF THE MONTH FOR MIST ELIMINATOR PAD REPLACEMENT WORK.

12/85	N	99.6	98.0	98.1	97.6				
	P	99.6	99.1	99.2	98.7				
	R	99.6	99.1	99.2	98.7				
	S	16.0	0.0		0.0				
	SYSTEM	100.0	98.7	98.8	98.3	744	741	731	94.2

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY DURING THE MONTH OF DECEMBER.

1/86	N	90.1	73.0	100.0	73.0				
	P	100.0	98.9	100.0	98.9				
	R	84.0	54.0	98.0	54.0				
	S	73.9	73.0	100.0	73.0				
	SYSTEM	100.0	99.6	100.0	99.6	744	744	741	92.1
2/86	N	89.0	84.2	94.3	83.9				
	P	100.0	92.2	95.1	92.0				
	R	79.0	26.1	97.8	26.0				
	S	93.0	85.2	91.4	85.0				
	SYSTEM	100.0	95.9	100.0	95.6	672	670	643	90.8
3/86	N	87.1	46.3	100.0	41.0				
	P	64.0	57.5	100.0	50.9				
	R	100.0	100.0	100.0	91.9				
	S	100.0	100.0	100.0	96.0				
	SYSTEM	100.0	100.0	100.0	93.3	744	659	694	78.3
4/86	N	92.6	46.6	100.0	46.4				
	P	96.5	12.0	90.5	11.9				
	R	96.5	60.0	100.0	59.7				
	S	96.5	96.0	100.0	95.6				
	SYSTEM	100.0	71.5	100.0	71.2	720	717	513	89.7
5/86	N	60.9	33.0	57.6	32.9				
	P	89.9	59.0	100.0	58.9				
	R	86.8	27.1	100.0	27.0				
	S	89.9	70.9	100.0	70.8				
	SYSTEM	100.0	63.3	100.0	63.2	744	743	470	79.4
6/86	N	96.7	73.0	100.0	72.8				
	P	82.8	28.0	81.7	27.9				
	R	99.7	79.9	100.0	79.7				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 4 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	S	99.7	76.0	100.0	75.8					
	SYSTEM	100.0	85.7	100.0	85.4		720	718	615	76.2

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS OCCURRED DURING THE PERIOD JANUARY THROUGH JUNE 1986.

7/86 SYSTEM

774

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTH OF JULY.

8/86	N	99.3	39.0	100.0	38.7					
	P	99.3	79.0	79.0	78.5					
	R	99.3	57.0	69.5	56.6					
	S	76.5	64.0	81.0	63.6					
	SYSTEM	100.0	79.7	100.0	79.1		744	739	589	71.9
9/86	N	100.0	56.0	56.0	56.0					
	P	100.0	73.1	88.4	73.1					
	R	100.0	59.0	100.0	59.0					
	S	50.0	44.0	88.1	44.0					
	SYSTEM	100.0	77.4	100.0	77.4		720	720	557	62.8
10/86	N	64.1	33.9	100.0	28.2					
	P	80.6	75.0	100.0	62.4					
	R	80.6	91.9	100.0	76.5					
	S	53.2	24.1	100.0	20.0					
	SYSTEM	92.9	75.0	100.0	62.4		744	619	464	42.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED NO FGD SYSTEM-RELATED PROBLEMS DURING THE MONTHS OF AUGUST THROUGH OCTOBER.

11/86	N	66.4	64.0	100.0	60.7					
	P	6.7	0.0		0.0					
	R	94.9	94.0	100.0	89.2					
	S	0.0	0.0		0.0					
	SYSTEM	56.0	52.7	100.0	50.0		720	683	360	46.2

** PROBLEMS/SOLUTIONS/COMMENTS

A SCRUBBER SUMP WALL ACID BRICK FAILURE WAS DISCOVERED IN NOVEMBER.

MIST ELIMINATOR PLUGGING WAS REPORTED ON S AND P CELLS.

12/86	N	82.4	99.0	100.0	81.6					
	P	0.0	0.0		0.0					
	R	76.6	92.0	100.0	75.8					
	S	0.0	0.0		0.0					
	SYSTEM	53.0	63.7	100.0	52.5		744	613	390	40.0

** PROBLEMS/SOLUTIONS/COMMENTS

AN S-CELL SCRUBBER SUMP BRICK FAILURE WAS REPORTED IN DECEMBER.

P-CELL MIST ELIMINATOR PAD PLUGGING OCCURRED DURING THE MONTH. NEW PADS ARE ON ORDER.

1/87	N	98.0	97.0	100.0	97.0					

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 4 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	P	0.0	0.0		0.0					
	R	99.5	97.0	100.0	97.0					
	S	0.0	0.0		0.0					
	SYSTEM	65.8	64.7	100.0	64.7		744	744	481	67.0
2/87	N	100.0	100.0	100.0	97.9					
	P	0.0	0.0		0.0					
	R	100.0	100.0	100.0	100.0					
	S	0.0	0.0		0.0					
	SYSTEM	73.8	66.7	100.0	69.1		672	504	465	56.5

** PROBLEMS/SOLUTIONS/COMMENTS

S CELL SCRUBBER SUMP WALL WAS BEING REBUILT DURING JANUARY AND FEBRUARY.

P CELL DEMISTERS WERE BEING REPLACED DURING THIS PERIOD.

3/87	N	0.0			0.0					
	P	0.0			0.0					
	R	0.0			0.0					
	S	0.0			0.0					
	SYSTEM	0.0			0.0		744	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

UNIT WAS OUT OF OPERATION FOR THE ENTIRE MONTH. NO INFORMATION WAS PROVIDED REGARDING THE CAUSE OF THE OUTAGE.

4/87	N	100.0	100.0	100.0	90.0					
	P	96.9	91.8	100.0	78.1					
	R	46.9	55.2	100.0	46.9					
	S	0.0	0.0		0.0					
	SYSTEM	81.3	82.4	100.0	71.7		720	612	516	61.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE S CELL WAS OUT OF OPERATION DUE TO PROBLEMS WITH SCRUBBER WALL. THE NATURE OF THE PROBLEM AND THE PERIOD OF NON-OPERATION HAS NOT BEEN SPECIFIED.

THE R CELL SECTION WAS TAKEN OFF-LINE TO REPLACE PLUGGED MIST ELIMINATOR PADS.

MIST ELIMINATOR REPAIRS WERE REPORTED DURING THE MONTH. DETAILS OF THE REPAIRS WERE UNAVAILABLE.

5/87	N	100.0	59.2	100.0	55.0					
	P	100.0	95.8	100.0	89.0					
	R	98.0	92.6	100.0	86.0					
	S	0.0	0.0		0.0					
	SYSTEM	99.3	82.5	100.0	76.7		744	691	570	60.9
6/87	N	96.9	63.3	100.0	51.9					
	P	86.9	100.0	100.0	85.0					
	R	100.0	96.3	100.0	79.0					
	S	0.0	0.0		0.0					
	SYSTEM	94.6	86.5	100.0	72.0		720	591	518	47.2
7/87	N	97.0	83.5	100.0	83.1					
	P	100.0	91.5	100.0	91.0					
	R	100.0	74.5	100.0	74.1					
	S	0.0	0.0		0.0					
	SYSTEM	99.0	83.2	100.0	82.7		744	740	615	67.8

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

PUBLIC SERVICE OF NEW MEXICO: SAN JUAN 4 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

8/87	N	100.0	68.2	100.0	63.0						
	P	100.0	82.2	100.0	75.9						
	R	100.0	88.7	100.0	82.0						
	S	0.0	0.0		0.0						
	SYSTEM	100.0	79.7	100.0	73.7			744	687	548	54.4
9/87	N	100.0	94.0	100.0	94.0						
	P	70.0	60.0	100.0	60.0						
	R	100.0	89.0	100.0	89.0						
	S	0.0	0.0		0.0						
	SYSTEM	90.0	81.0	100.0	81.0			720	720	583	67.0

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD MAY
THROUGH SEPTEMBER 1987.

10/87	N	100.0	33.3	100.0	33.2					
	P	100.0	35.1	100.0	34.9					
	R	93.5	31.8	100.0	31.7					
	S	3.2	0.0		0.0					
	SYSTEM	98.9	33.4	100.0	33.3		744	741	248	76.0
11/87	N	96.7	78.1	100.0	78.1					
	P	100.0	91.9	100.0	91.9					
	R	100.0	94.2	100.0	94.2					
	S	0.0	0.0		0.0					
	SYSTEM	98.9	88.1	100.0	88.1		720	720	634	74.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE S CELL EXPERIENCED PLUGGED MIST ELIMINATORS DURING THE OCTOBER-
NOVEMBER PERIOD. LOW POWER DEMAND DURING THE PERIOD ACCOUNTS FOR THE
LOW FGD SYSTEM USE.

12/87	N	98.1	98.1	100.0	98.1					
	P	96.8	96.8	100.0	96.8					
	R	97.8	97.8	100.0	97.8					
	S	3.2	0.3	20.0	0.3					
	SYSTEM	98.7	97.7	100.0	97.7		744	744	727	85.7

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MONTH OF
DECEMBER.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SALT RIVER PROJECT	
PLANT NAME	CORONADO	
UNIT NUMBER	1	
CITY	ST. JOHNS	
STATE	ARIZONA	
REGULATORY CLASSIFICATION	C	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO ₂ EMISSION LIMITATION - NG/J	344.	(0.800 LB/MMBTU)
NO _x EMISSION LIMITATION - NG/J	301.	(0.700 LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	700	
GROSS UNIT GENERATING CAPACITY - MW	400	
NET UNIT GENERATING CAPACITY W/FGD - MW	350	
NET UNIT GENERATING CAPACITY WO/FGD - MW	355	
EQUIVALENT SCRUBBED CAPACITY - MW	320	

*** UNIT DATA - BOILER AND STACK

BOILER SUPPLIER	RILEY STOKER	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	1226.94	(2600000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	387.8	(730 F)
STACK HEIGHT - M	152.	(500 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	5.8	(19.0 FT)

*** FUEL DATA

FUEL TYPE	COAL	
FUEL GRADE	SUBBITUMINOUS	
AVERAGE HEAT CONTENT - J/G	25121.	(10800 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		8000-12000
AVERAGE ASH CONTENT - %	15.00	
RANGE ASH CONTENT - %	****	
AVERAGE MOISTURE CONTENT - %	16.00	
RANGE MOISTURE CONTENT - %	12.0-20.0	
AVERAGE SULFUR CONTENT - %	0.55	
RANGE SULFUR CONTENT - %	0.4-1.0	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	

*** PARTICLE CONTROL

*** MECHANICAL COLLECTOR

NUMBER	0
TYPE	NONE

*** ESP

NUMBER	2	
NUMBER OF SPARES	0	
TYPE	HOT SIDE	
SUPPLIER	WESTERN PREC. DIVISION, JOY	
INLET FLUE GAS CAPACITY - CU.M/S	1321.3	(2800000 ACFM)
INLET FLUE GAS TEMPERATURE - C	404.4	(760 F)
PRESSURE DROP - KPA	0.8	(3. IN-H ₂ O)
PARTICLE REMOVAL EFFICIENCY - %	99.8	

*** PARTICLE SCRUBBER

NUMBER	0
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON NAME	N/A
SHELL GENERIC MATERIAL	N/A
SHELL SPECIFIC MATERIAL	N/A
LINER GENERIC MATERIAL	N/A
LINER SPECIFIC MATERIAL	N/A
GAS CONTACTING DEVICE TYPE	N/A

*** FGD SYSTEM

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SALT RIVER PROJECT: CORONADO 1 (CONT.)

** GENERAL DATA	
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	M.W. KELLOGG
A-E FIRM	BECHTEL, SALT RIVER PROJECT
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.87
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	82.00
ENERGY CONSUMPTION - %	1.3
CURRENT STATUS	1
COMMERCIAL START-UP	12/1979
INITIAL START-UP	11/1979
CONTRACT AWARDED	6/1976
** DESIGN AND OPERATING PARAMETERS	
DESIGN COAL SULFUR CONTENT - %	1.00
DESIGN COAL HEAT CONTENT - J/G	19305.8 (8300 BTU/LB)
DESIGN CHLORIDE CONTENT - %	*****
SPACE REQUIREMENTS - SQ M	6066.4 (65300 SQ FT)
OPER. & MAINT. REQUIREMENT - MANHR/DAY	164.0
** QUENCHER/PRESATURATOR	
NUMBER	2
TYPE	QUENCH DUCT
SUPPLIER	PULLMAN KELLOGG
INLET GAS FLOW - CU. M/S	260.02 (551000 ACFM)
INLET GAS TEMPERATURE - C	148.9 (300 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
** ABSORBER	
NUMBER	2
NUMBER OF SPARES	0
GENERIC TYPE	SPRAY TOWER
SPECIFIC TYPE	OPEN CROSSCURRENT SPRAY
TRADE NAME/COMMON TYPE	HORIZONTAL SPRAY CHAMBER
SUPPLIER	PULLMAN KELLOGG
DIMENSIONS - FT	120.0 X 28.0 X 17.0
SHELL GENERIC MATERIAL	CARBON STEEL
SHELL SPECIFIC MATERIAL	AISI 1110
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A
LINER GENERIC MATERIAL	ORGANIC
LINER SPECIFIC MATERIAL	GLASS FLAKE-FILLED POLYESTER
LINER MATERIAL TRADE NAME/COMMON TYPE	DUDICK
GAS CONTACTING DEVICE TYPE	NONE
NUMBER OF CONTACTING ZONES	4
LIQUID RECIRCULATION RATE - LITER/S	2520. (40000 GPM)
L/G RATIO - L/CU.M	9.7 (72.6 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	0.4 (1.5 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/SEC	6.6 (21.6 FT/S)
INLET GAS FLOW - CU. M/S	260.02 (551000 ACFM)
INLET GAS TEMPERATURE - C	148.9 (300 F)
SO2 REMOVAL EFFICIENCY - %	98.0
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
NUMBER PER SYSTEM	2
NUMBER OF SPARES PER SYSTEM	0
NUMBER PER MODULE	1
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
MANUFACTURER	HEIL
CONFIGURATION	VERTICAL
NUMBER OF STAGES	1
NUMBER OF PASSES PER STAGE	3
FREEBOARD DISTANCE - M	8.84 (29.0 FT)

SALT RIVER PROJECT: CORONADO 1 (CONT.)

DISTANCE BETWEEN STAGES - CM	1.78	(0.7 IN)
DISTANCE BETWEEN VANES - CM	3.0	(1.20 IN)
PRESSURE DROP - KPA	0.1	(0.5 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/S	4.6	(15.0 FT/S)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC	
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPHENYLENE	
WASH WATER SOURCE	COOLING TOWER BLOWDOWN	
WASH RATE - L/S	39.4	(625 GAL/MIN)
** REHEATER		
GENERIC TYPE	BYPASS	
SPECIFIC TYPE	COLD SIDE	
TRADE NAME/COMMON TYPE	N/A	
LOCATION	OUTLET DUCT	
PERCENT GAS BYPASSED - AVG	20.0	
TEMPERATURE INCREASE - C	27.8	(50 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL; INORGANIC 'LINED!	
CONSTRUCTION MATERIAL SPECIFIC TYPE	HYDRAULICALLY-BONDED MORTAR	
** FANS		
NUMBER	2	
NUMBER OF SPARES	0	
DESIGN	CENTRIFUGAL	
SUPPLIER	GREEN FAN	
FUNCTION	BOOSTER	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
FLUE GAS FLOW RATE - CU.M/S	304.32	(644880 ACFM)
FLUE GAS TEMPERATURE - C	127.2	(261 F)
PRESSURE DROP - KPA	1.9	(6.2 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** DAMPERS		
GENERIC TYPE	LOUVER	
SPECIFIC TYPE	NR	
MANUFACTURER	ANDCO	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110	
LINER GENERIC MATERIAL TYPE	NONE	
LINER SPECIFIC MATERIAL TYPE	N/A	
** DAMPERS		
GENERIC TYPE	GUILLOTINE	
SPECIFIC TYPE	NR	
MANUFACTURER	MOSSER	
CONSTRUCTION MATERIAL GENERIC TYPE	STAINLESS STEEL	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NONE	
LINER SPECIFIC MATERIAL TYPE	N/A	
** DUCTWORK		
LOCATION	SCRUBBER INLET	
CONFIGURATION	RECTANGULAR	
DIMENSIONS	15.6 X 13.0	
SHELL GENERIC MATERIAL TYPE	CARBON STEEL	
SHELL SPECIFIC MATERIAL TYPE	AISI 1110	
LINER GENERIC MATERIAL TYPE	NONE	
LINER SPECIFIC MATERIAL TYPE	N/A	
** DUCTWORK		
LOCATION	SCRUBBER OUTLET	
CONFIGURATION	RECTANGULAR	
DIMENSIONS	33.0 X 18.0	
SHELL GENERIC MATERIAL TYPE	CARBON STEEL	
SHELL SPECIFIC MATERIAL TYPE	AISI 1110	
LINER GENERIC MATERIAL TYPE	ORGANIC	
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER	
** REAGENT PREPARATION EQUIPMENT		
FUNCTION	WET BALL MILL	
DEVICE	COMPARTMENTED	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SALT RIVER PROJECT: CORONADO 1 (CONT.)

DEVICE TYPE	NR
MANUFACTURER	MINE & SMELTER CORP.
NUMBER	2
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	11.8 (13 TPH)
PRODUCT QUALITY - % SOLIDS	20.0
** TANKS	
SERVICE	NUMBER
-----	-----
ABSORBER RECYCLE	2
MAKEUP WATER	1
MIST ELIMINATOR WASH	2
SEAL WATER	1
REAGENT PREP PRODUCT	1
WASTE SLURRY BLEED	1
** PUMPS	
SERVICE	NUMBER
-----	-----
SLURRY RECIRCULATION	10
SLUDGE DISPOSAL	4
SLURRY PURGE	4
ALKALI MAKEUP	1
PROCESS WATER	2
SEAL WATER	1
HIGH PRESSURE SEAL WATER	2
MIST ELIMINATOR WASH	2
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	1
NUMBER OF SPARES	0
DIMENSIONS - FT	105.0 DIA X 12.0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	POLYVINYL CHLORIDE
FEED STREAM SOURCE	ABSORBER BLEED
FEED STREAM CHARACTERISTICS	10% SOLIDS
OUTLET STREAM CHARACTERISTICS	30 PERCENT SOLIDS, PH 7.0
OUTLET STREAM DISPOSITION	TO UNDERFLOW TANKS & REACTION MIX TANKS
OVERFLOW STREAM DISPOSITION	TO QUENCHER, BALL MILLS, REACTION MIX TANK & PUM
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	DEWATERED
DEVICE	N/A
PROPRIETARY PROCESS	N/A
** DISPOSAL	
NATURE	FINAL
TYPE	POND
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	PIPELINE
SITE TREATMENT	CLAY LINING
SITE DIMENSIONS	300 ACRES
SITE SERVICE LIFE - YRS	35
** PROCESS CONTROL AND INSTRUMENTATION	
CHEMICAL PARAMETERS	SO2 INLET CONCENTRATION GAS FLOW, PH
PHYSICAL VARIABLES	INLET GAS FLOW
CONTROL LEVELS	PH 6.2 AT ABSORBER OUTLET

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SALT RIVER PROJECT: CORONADO 1 (CONT.)

MONITOR TYPE	UNILOC FLOW-THROUGH PH PROBES; LEAR SIEGLER FM-1
MONITOR LOCATION	INLET DUCT, 1ST & 4TH STAGES 'PH!
PROCESS CONTROL MANNER	MANUAL 'PH!, AUTOMATIC 'SO2!
PROCESS CHEMISTRY MODE	FEEDBACK

** WATER BALANCE	
WATER LOOP TYPE	OPEN
EVAPORATION WATER LOSS - LITER/S	13.2 (210 GPM)
POND SEEPAGE/RUNOFF WATER LOSS - LITERS/S	0
MAKEUP WATER ADDITION - LITERS/S	17.0 (270 GPM)
SOURCE OF MAKEUP WATER	COOLING TOWER BLOWDOWN

** CHEMICALS AND CONSUMPTION	
FUNCTION	ABSORBENT
NAME	LIMESTONE
PRINCIPAL CONSTITUENT	91% CaCO3
UTILIZATION - %	87.0
POINT OF ADDITION	BALL MILL

** FGD SPARE CAPACITY INDICES	
ABSORBER - %	0.0
MIST ELIMINATOR - %	0.0
FAN - %	0.0
THICKENER - %	0.0

** FGD SPARE COMPONENT INDICES	
ABSORBER	0.0
MIST ELIMINATOR	0.0
FAN	0.0
THICKENER	0.0

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
4/80	SYSTEM								720	
5/80	SYSTEM								744	
6/80	SYSTEM								720	

** PROBLEMS/SOLUTIONS/COMMENTS

ALTHOUGH FGD SYSTEM PERFORMANCE DATA ARE BEING LOGGED, THE UTILITY REPORTED THAT THE INFORMATION IS UNAVAILABLE FOR RELEASE AT THIS TIME.

7/80	SYSTEM	744
8/80	SYSTEM	744
9/80	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY WILL NOT AUTHORIZE THE RELEASE OF FGD PERFORMANCE DATA AT THIS TIME, BUT NOTED THAT THE SYSTEM IS TO SHUT DOWN ON NOVEMBER 1, 1980 FOR A MAJOR OVERHAUL.

10/80	SYSTEM	744
11/80	SYSTEM	720
12/80	SYSTEM	744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SALT RIVER PROJECT: CORONADO 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

ON NOVEMBER 8, 1980 THE UNIT WAS TAKEN OFF LINE FOR A MAJOR OVERALL THAT IS EXPECTED TO LAST FOR APPROXIMATELY 45 DAYS.

THE PERFORMANCE DATA ARE NOT YET AVAILABLE FOR RELEASE.

1/81	SYSTEM						744		
2/81	SYSTEM						672		
3/81	SYSTEM						744		

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE FIRST QUARTER 1981 A FEW MINOR PROBLEMS WERE ENCOUNTERED DUE TO A LINING FAILURE.

THE PERFORMANCE NUMBERS ARE NOT AVAILABLE FOR PUBLICATION AT THIS TIME.

4/81	SYSTEM						720		
5/81	SYSTEM						744		
6/81	SYSTEM						720		

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION FOR THE SECOND QUARTER 1981 WAS NOT AVAILABLE.

7/81	SYSTEM						744		
8/81	SYSTEM						744		
9/81	SYSTEM						720		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY HAS REPORTED PROBLEMS WITH THE PREKRETE LINERS IN THE PRE-SATURATORS AND BYPASS DUCTS OF BOTH UNITS 1 AND 2. THE STRUCTURAL SUPPORT UPON WHICH THE MATERIAL IS APPLIED IS INADEQUATE. PIECES OF MATERIAL FROM THE TOP AND SIDES OF THE DUCTWORK DROP AWAY. SPARE FGD SYSTEM CAPACITY HAS KEPT THIS FROM LIMITING BOILER AVAILABILITY.

THERE HAVE BEEN CONTINUING PROBLEMS WITH THE PVC LINERS IN THE THICKENERS. THICKENER SPARE CAPACITY HAS KEPT THIS FROM AFFECTING AVAILABILITY OF THE FGD SYSTEM. THE LINERS ARE PATCHED AS NEEDED.

10/81	SYSTEM						744		
11/81	SYSTEM						720		

** PROBLEMS/SOLUTIONS/COMMENTS

DURING OCTOBER AND NOVEMBER THE SYSTEM WAS OFF-LINE FOR A SCHEDULED MAINTENANCE OUTAGE.

12/81	SYSTEM						744		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SALT RIVER PROJECT: CORONADO 1 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE PREKRETE LINE PROBLEMS CONTINUED THROUGHOUT THE QUARTER.

1/82	SYSTEM						744
2/82	SYSTEM						672
3/82	SYSTEM						744
4/82	SYSTEM						720
5/82	SYSTEM						744
6/82	SYSTEM						720
7/82	SYSTEM						744
8/82	SYSTEM						744
9/82	SYSTEM						720
10/82	SYSTEM						744
11/82	SYSTEM						720
12/82	SYSTEM						744
1/83	SYSTEM						744
2/83	SYSTEM						672
3/83	SYSTEM						744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE PERIOD OF JANUARY 1982 TO MARCH 1983.

4/83	SYSTEM						720
5/83	SYSTEM						744
6/83	SYSTEM						720

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE PERIOD OF JANUARY 1982 TO JUNE 1983.

7/83	SYSTEM						744
8/83	SYSTEM						744
9/83	SYSTEM						720

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE THIRD QUARTER OF 1983.

10/83	SYSTEM						744
11/83	SYSTEM						720
12/83	SYSTEM						744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SALT RIVER PROJECT: CORONADO 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD CAP. HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER OF 1983.

1/84	SYSTEM								744
2/84	SYSTEM								696
3/84	SYSTEM								744
4/84	SYSTEM								720
5/84	SYSTEM								744
6/84	SYSTEM								720
7/84	SYSTEM								744
8/84	SYSTEM								744
9/84	SYSTEM								720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FIRST THREE QUARTERS OF 1984.

10/84	SYSTEM								744
11/84	SYSTEM								720
12/84	SYSTEM								744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT WAS OFF-LINE 3 WEEKS IN DECEMBER FOR SCHEDULED MAINTENANCE. NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE PERIOD.

1/85	SYSTEM								744
2/85	SYSTEM								672
3/85	SYSTEM								744
4/85	SYSTEM								720
5/85	SYSTEM								744
6/85	SYSTEM								720
7/85	SYSTEM								744
8/85	SYSTEM								744
9/85	SYSTEM								720
10/85	SYSTEM								744
11/85	SYSTEM								720
12/85	SYSTEM								744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SALT RIVER PROJECT: CORONADO 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTHS OF
 JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM	774
2/86	SYSTEM	672
3/86	SYSTEM	774
4/86	SYSTEM	720
5/86	SYSTEM	774
6/86	SYSTEM	720
7/86	SYSTEM	774
8/86	SYSTEM	774
9/86	SYSTEM	720
10/86	SYSTEM	774
11/86	SYSTEM	720
12/86	SYSTEM	774

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTHS OF JANUARY
 THROUGH DECEMBER 1986.

1/87	SYSTEM	744
2/87	SYSTEM	672
3/87	SYSTEM	744
4/87	SYSTEM	720
5/87	SYSTEM	744
6/87	SYSTEM	720
7/87	SYSTEM	744
8/87	SYSTEM	744
9/87	SYSTEM	720
10/87	SYSTEM	744
11/87	SYSTEM	720
12/87	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO FGD-RELATED UNIT OUTAGES WERE ENCOUNTERED
 DURING 1987. THE UTILITY STATED THAT THIS IS LARGELY DUE TO THE
 AVAILABILITY OF SPARE SCRUBBING CAPACITY AND THE USE OF COAL HAVING A

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SALT RIVER PROJECT: CORONADO 1 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR

LOWER THAN DESIGN SULFUR CONTENT. THE UNIT WAS OFF-LINE FOR
APPROXIMATELY 8 WEEKS BEGINNING IN NOVEMBER FOR A SCHEDULED MAJOR
TURBINE/BOILER MAINTENANCE OUTAGE.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SALT RIVER PROJECT	
PLANT NAME	CORONADO	
UNIT NUMBER	2	
CITY	ST. JOHNS	
STATE	ARIZONA	
REGULATORY CLASSIFICATION	C	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	344.	(0.800 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	301.	(0.700 LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	700	
GROSS UNIT GENERATING CAPACITY - MW	400	
NET UNIT GENERATING CAPACITY W/FGD - MW	350	
NET UNIT GENERATING CAPACITY WO/FGD - MW	355	
EQUIVALENT SCRUBBED CAPACITY - MW	320	
 ** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	RILEY STOKER	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	1226.94	(2600000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	387.8	(730 F)
STACK HEIGHT - M	152.	(500 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	5.8	(19.0 FT)
 ** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	SUBBITUMINOUS	
AVERAGE HEAT CONTENT - J/G	25121.	(10800 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		8000-12000
AVERAGE ASH CONTENT - %	15.00	
RANGE ASH CONTENT - %	****	
AVERAGE MOISTURE CONTENT - %	16.00	
RANGE MOISTURE CONTENT - %	12.0-20.0	
AVERAGE SULFUR CONTENT - %	0.55	
RANGE SULFUR CONTENT - %	0.4-1.0	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	
 *** PARTICLE CONTROL		
 ** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
 ** ESP		
NUMBER	2	
NUMBER OF SPARES	0	
TYPE	HOT SIDE	
SUPPLIER	WESTERN PREC. DIVISION, JOY	
INLET FLUE GAS CAPACITY - CU.M/S	1321.3	(2800000 ACFM)
INLET FLUE GAS TEMPERATURE - C	404.4	(760 F)
PRESSURE DROP - KPA	0.8	(3. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.8	
 ** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
 *** FGD SYSTEM		

SALT RIVER PROJECT: CORONADO 2 (CONT.)

** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	
PROCESS TYPE	LIMESTONE	
PROCESS ADDITIVES	NONE	
SYSTEM SUPPLIER	M.W. KELLOGG	
A-E FIRM	BECHTEL, SALT RIVER PROJECT	
DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	NEW	
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.87	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	82.00	
ENERGY CONSUMPTION - %	1.3	
CURRENT STATUS	1	
COMMERCIAL START-UP	10/1981	
INITIAL START-UP	7/1980	
CONTRACT AWARDED	6/1976	
** DESIGN AND OPERATING PARAMETERS		
DESIGN COAL SULFUR CONTENT - %	1.00	
DESIGN COAL HEAT CONTENT - J/G	19305.8	(8300 BTU/LB)
DESIGN CHLORIDE CONTENT - %	*****	
SPACE REQUIREMENTS - SQ M	6066.4	(65300 SQ FT)
OPER. & MAINT. REQUIREMENT - MANHR/DAY	164.0	
** QUENCHER/PRESATURATOR		
NUMBER	2	
TYPE	QUENCH DUCT	
SUPPLIER	PULLMAN KELLOGG	
INLET GAS FLOW - CU. M/S	260.02	(551000 ACFM)
INLET GAS TEMPERATURE - C	148.9	(300 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110	
** ABSORBER		
NUMBER	2	
NUMBER OF SPARES	0	
GENERIC TYPE	SPRAY TOWER	
SPECIFIC TYPE	OPEN CROSSCURRENT SPRAY	
TRADE NAME/COMMON TYPE	HORIZONTAL SPRAY CHAMBER	
SUPPLIER	PULLMAN KELLOGG	
DIMENSIONS - FT	120.0 X 28.0 X 17.0	
SHELL GENERIC MATERIAL	CARBON STEEL	
SHELL SPECIFIC MATERIAL	AISI 1110	
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A	
LINER GENERIC MATERIAL	ORGANIC	
LINER SPECIFIC MATERIAL	GLASS FLAKE-FILLED POLYESTER	
LINER MATERIAL TRADE NAME/COMMON TYPE	DUDICK	
GAS CONTACTING DEVICE TYPE	NONE	
NUMBER OF CONTACTING ZONES	4	
LIQUID RECIRCULATION RATE - LITER/S	2520.	(40000 GPM)
L/G RATIO - L/CU.M	9.7	(72.6 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	0.4	(1.5 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/SEC	6.6	(21.6 FT/S)
INLET GAS FLOW - CU. M/S	260.02	(551000 ACFM)
INLET GAS TEMPERATURE - C	148.9	(300 F)
SO2 REMOVAL EFFICIENCY - %	98.0	
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR	
NUMBER PER SYSTEM	2	
NUMBER OF SPARES PER SYSTEM	0	
NUMBER PER MODULE	1	
GENERIC TYPE	IMPINGEMENT	
SPECIFIC TYPE	BAFFLE	
TRADE NAME/COMMON TYPE	CLOSED VANE	
MANUFACTURER	HEIL	
CONFIGURATION	VERTICAL	
NUMBER OF STAGES	1	
NUMBER OF PASSES PER STAGE	3	
FREEBOARD DISTANCE - M	8.84	(29.0 FT)

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SALT RIVER PROJECT: CORONADO 2 (CONT.)

DISTANCE BETWEEN STAGES - CM	1.78	(0.7 IN)
DISTANCE BETWEEN VANES - CM	3.0	(1.20 IN)
PRESSURE DROP - KPA	0.1	(0.5 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/S	4.6	(15.0 FT/S)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC	
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPHENYLENE	
WASH WATER SOURCE	COOLING TOWER BLOWDOWN	
WASH RATE - L/S	39.4	(625 GAL/MIN)
** REHEATER		
GENERIC TYPE	BYPASS	
SPECIFIC TYPE	COLD SIDE	
TRADE NAME/COMMON TYPE	N/A	
LOCATION	OUTLET DUCT	
PERCENT GAS BYPASSED - AVG	20.0	
TEMPERATURE INCREASE - C	27.8	(50 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL; INORGANIC 'LINED'	
CONSTRUCTION MATERIAL SPECIFIC TYPE	HYDRAULICALLY-BONDED MORTAR	
** FANS		
NUMBER	2	
NUMBER OF SPARES	0	
DESIGN	CENTRIFUGAL	
SUPPLIER	GREEN FAN	
FUNCTION	BOOSTER	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
FLUE GAS FLOW RATE - CU.M/S	304.32	(644880 ACFM)
FLUE GAS TEMPERATURE - C	127.2	(261 F)
PRESSURE DROP - KPA	1.9	(6.2 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** DAMPERS		
GENERIC TYPE	LOUVER	
SPECIFIC TYPE	NR	
MANUFACTURER	ANDCO	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110	
LINER GENERIC MATERIAL TYPE	NONE	
LINER SPECIFIC MATERIAL TYPE	N/A	
** DAMPERS		
GENERIC TYPE	GUILLOTINE	
SPECIFIC TYPE	NR	
MANUFACTURER	MOSSER	
CONSTRUCTION MATERIAL GENERIC TYPE	STAINLESS STEEL	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NONE	
LINER SPECIFIC MATERIAL TYPE	N/A	
** DUCTWORK		
LOCATION	SCRUBBER INLET	
CONFIGURATION	RECTANGULAR	
DIMENSIONS	15.6 X 13.0	
SHELL GENERIC MATERIAL TYPE	CARBON STEEL	
SHELL SPECIFIC MATERIAL TYPE	AISI 1110	
LINER GENERIC MATERIAL TYPE	NONE	
LINER SPECIFIC MATERIAL TYPE	N/A	
** DUCTWORK		
LOCATION	SCRUBBER OUTLET	
CONFIGURATION	RECTANGULAR	
DIMENSIONS	33.0 X 18.0	
SHELL GENERIC MATERIAL TYPE	CARBON STEEL	
SHELL SPECIFIC MATERIAL TYPE	AISI 1110	
LINER GENERIC MATERIAL TYPE	ORGANIC	
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER	
** REAGENT PREPARATION EQUIPMENT		
FUNCTION	WET BALL MILL	
DEVICE	COMPARTMENTED	
DEVICE	COMPARTMENTED	

SALT RIVER PROJECT: CORONADO 2 (CONT.)

DEVICE TYPE	NR
MANUFACTURER	MINE & SMELTER CORP.
NUMBER	2
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	11.8 (13 TPH)
PRODUCT QUALITY - % SOLIDS	20.0
** TANKS	
SERVICE	NUMBER
-----	-----
ABSORBER RECYCLE	2
MAKEUP WATER	1
MIST ELIMINATOR WASH	2
SEAL WATER	1
REAGENT PREP PRODUCT	1
WASTE SLURRY BLEED	1
** PUMPS	
SERVICE	NUMBER
-----	-----
SLURRY RECIRCULATION	10
SLUDGE DISPOSAL	4
SLURRY PURGE	4
ALKALI MAKEUP	1
PROCESS WATER	2
SEAL WATER	1
HIGH PRESSURE SEAL WATER	2
MIST ELIMINATOR WASH	2
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	1
NUMBER OF SPARES	0
DIMENSIONS - FT	105.0 DIA X 12.0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	POLYVINYL CHLORIDE
FEED STREAM SOURCE	ABSORBER BLEED
FEED STREAM CHARACTERISTICS	10% SOLIDS
OUTLET STREAM CHARACTERISTICS	30 PERCENT SOLIDS, PH 7.0
OUTLET STREAM DISPOSITION	TO UNDERFLOW TANKS & REACTION MIX TANKS
OVERFLOW STREAM DISPOSITION	TO QUENCHER, BALL MILLS, REACTION MIX TANK & PUM
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	DEWATERED
DEVICE	N/A
PROPRIETARY PROCESS	N/A
** DISPOSAL	
NATURE	FINAL
TYPE	POND
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	PIPELINE
SITE TREATMENT	CLAY LINING
SITE DIMENSIONS	300 ACRES
SITE SERVICE LIFE - YRS	35
** PROCESS CONTROL AND INSTRUMENTATION	
CHEMICAL PARAMETERS	SO2 INLET CONCENTRATION GAS FLOW, PH
PHYSICAL VARIABLES	INLET GAS FLOW
CONTROL LEVELS	PH 6.2 AT ABSORBER OUTLET

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SALT RIVER PROJECT: CORONADO 2 (CONT.)

MONITOR TYPE	UNILOC FLOW-THROUGH PH PROBES; LEAR SIEGLER FM-1
MONITOR LOCATION	INLET DUCT, 1ST & 4TH STAGES 'PH'
PROCESS CONTROL MANNER	MANUAL 'PH!', AUTOMATIC 'SO2'
PROCESS CHEMISTRY MODE	FEEDBACK

** WATER BALANCE

WATER LOOP TYPE	OPEN
EVAPORATION WATER LOSS - LITER/S	13.2 (210 GPM)
POND SEEPAGE/RUNOFF WATER LOSS - LITERS/S	0
MAKEUP WATER ADDITION - LITERS/S	17.0 (270 GPM)
SOURCE OF MAKEUP WATER	COOLING TOWER BLOWDOWN

** CHEMICALS AND CONSUMPTION

FUNCTION	ABSORBENT
NAME	LIMESTONE
PRINCIPAL CONSTITUENT	91% CaCO3
UTILIZATION - %	87.0
POINT OF ADDITION	BALL MILL

** FGD SPARE CAPACITY INDICES

ABSORBER - %	0.0
MIST ELIMINATOR - %	0.0
FAN - %	0.0
THICKENER - %	0.0

** FGD SPARE COMPONENT INDICES

ABSORBER	0.0
MIST ELIMINATOR	0.0
FAN	0.0
THICKENER	0.0

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

8/80	SYSTEM						744			
9/80	SYSTEM						720			

** PROBLEMS/SOLUTIONS/COMMENTS

INITIAL OPERATION OF THE FGD SYSTEM AT THE CORONADO 2 STATION COMMENCED IN JULY 1980.

DURING THE THIRD QUARTER 1980 A BEARING INSPECTION WAS CONDUCTED. THE UNIT IS PRESENTLY IN THE PROCESS OF BEGINNING COMMERCIAL OPERATION.

10/80	SYSTEM						744			
11/80	SYSTEM						720			
12/80	SYSTEM						744			

** PROBLEMS/SOLUTIONS/COMMENTS

THE PERFORMANCE DATA ARE NOT YET AVAILABLE FOR RELEASE.

1/81	SYSTEM						744			
2/81	SYSTEM						672			
3/81	SYSTEM						744			

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE FIRST QUARTER 1981 THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED.

SALT RIVER PROJECT: CORONADO 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

THE PERFORMANCE DATA ARE NOT YET AVAILABLE FOR RELEASE AT THIS TIME.

4/81	SYSTEM	720
5/81	SYSTEM	744
6/81	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION FOR THE SECOND QUARTER 1981 WAS NOT AVAILABLE.

7/81	SYSTEM	744
8/81	SYSTEM	744
9/81	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY HAS REPORTED PROBLEMS WITH THE PREKRETE LINERS IN THE PRE-SATURATORS AND BYPASS DUCTS OF BOTH UNITS 1 AND 2. THE STRUCTURAL SUPPORT UPON WHICH THE MATERIAL IS APPLIED IS INADEQUATE. PIECES OF MATERIAL FROM THE TOP AND SIDES OF THE DUCTWORK DROP AWAY. SPARE FGD SYSTEM CAPACITY HAS KEPT THIS FROM LIMITING BOILER AVAILABILITY.

THERE HAVE BEEN CONTINUING PROBLEMS WITH THE PVC LINERS IN THE THICKENERS. THICKENER SPARE CAPACITY HAS KEPT THIS FROM AFFECTING AVAILABILITY OF THE FGD SYSTEM. THE LINERS ARE PATCHED AS NEEDED.

10/81	SYSTEM	744
11/81	SYSTEM	720
12/81	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

DURING NOVEMBER AND DECEMBER THE SYSTEM WAS TAKEN OFF-LINE FOR A SCHEDULED MAINTENANCE OUTAGE.

DURING THE FOURTH QUARTER THE PREKRETE LINER PROBLEMS CONTINUED.

1/82	SYSTEM	744
2/82	SYSTEM	672
3/82	SYSTEM	744
4/82	SYSTEM	720
5/82	SYSTEM	744
6/82	SYSTEM	720
7/82	SYSTEM	744
8/82	SYSTEM	744
9/82	SYSTEM	720
10/82	SYSTEM	744
11/82	SYSTEM	720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SALT RIVER PROJECT: CORONADO 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
12/82	SYSTEM						744			
1/83	SYSTEM						744			
2/83	SYSTEM						672			
3/83	SYSTEM						744			
** PROBLEMS/SOLUTIONS/COMMENTS										
INFORMATION WAS UNAVAILABLE FOR THE PERIOD OF JANUARY 1982 TO MARCH 1983.										
4/83	SYSTEM						720			
5/83	SYSTEM						744			
6/83	SYSTEM						720			
** PROBLEMS/SOLUTIONS/COMMENTS										
INFORMATION WAS UNAVAILABLE FOR THE PERIOD OF JANUARY 1982 TO JUNE 1983.										
7/83	SYSTEM						744			
8/83	SYSTEM						744			
9/83	SYSTEM						720			
** PROBLEMS/SOLUTIONS/COMMENTS										
INFORMATION WAS UNAVAILABLE FOR THE THIRD QUARTER OF 1983.										
10/83	SYSTEM						744			
11/83	SYSTEM						720			
12/83	SYSTEM						744			
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER OF 1983.										
1/84	SYSTEM						744			
2/84	SYSTEM						696			
3/84	SYSTEM						744			
4/84	SYSTEM						720			
5/84	SYSTEM						744			
6/84	SYSTEM						720			
7/84	SYSTEM						744			
8/84	SYSTEM						744			
9/84	SYSTEM						720			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SALT RIVER PROJECT: CORONADO 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING THE FIRST THREE QUARTERS OF 1984.

10/84	SYSTEM	744
11/84	SYSTEM	720
12/84	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

UTILITY REPORTED THAT THIS FGD SYSTEM IS NORMALLY AVAILABLE AND ALWAYS IN
 COMPLIANCE 100 PERCENT OF THE TIME DUE TO SPARE CAPACITY AND BETTER THAN
 DESIGNED COAL CHARACTERISTICS (SULFUR CONTENT IS ACTUALLY ONE HALF OF
 WHAT DESIGN CALLED FOR). THE UTILITY STATED THAT THE UNIT CAN MEET
 COMPLIANCE WITHOUT THE USE OF THE FGD SYSTEM.

1/85	SYSTEM	744
2/85	SYSTEM	672
3/85	SYSTEM	744
4/85	SYSTEM	720
5/85	SYSTEM	744
6/85	SYSTEM	720
7/85	SYSTEM	744
8/85	SYSTEM	744
9/85	SYSTEM	720
10/85	SYSTEM	744
11/85	SYSTEM	720
12/85	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS JANUARY THROUGH DECEMBER
 1985.

1/86	SYSTEM	774
2/86	SYSTEM	672
3/86	SYSTEM	774
4/86	SYSTEM	720
5/86	SYSTEM	774
6/86	SYSTEM	720
7/86	SYSTEM	774
8/86	SYSTEM	774

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SALT RIVER PROJECT: CORONADO 2 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

9/86	SYSTEM									720	
10/86	SYSTEM									774	
11/86	SYSTEM									720	
12/86	SYSTEM									774	

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTHS OF JANUARY THROUGH DECEMBER, 1986.

1/87	SYSTEM									744	
2/87	SYSTEM									672	
3/87	SYSTEM									744	
4/87	SYSTEM									720	
5/87	SYSTEM									744	
6/87	SYSTEM									720	
7/87	SYSTEM									744	
8/87	SYSTEM									744	
9/87	SYSTEM									720	
10/87	SYSTEM									744	
11/87	SYSTEM									720	
12/87	SYSTEM									744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO FGD-RELATED UNIT OUTAGES WERE ENCOUNTERED DURING 1987. THE UTILITY STATED THAT THIS IS LARGELY DUE TO THE AVAILABILITY OF SPARE SCRUBBING CAPACITY AND THE USE OF COAL HAVING A LOWER THAN DESIGN SULFUR CONTENT. THE UNIT WAS OFF-LINE FOR APPROXIMATELY 3 WEEKS IN THE SPRING OF 1987 FOR A SCHEDULED MINOR BOILER/TURBINE MAINTENANCE OUTAGE.

**DO NOT MICROFILM
THIS PAGE**

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SAN MIGUEL ELECTRIC	
PLANT NAME	SAN MIGUEL	
UNIT NUMBER	1	
CITY	SAN MIGUEL	
STATE	TEXAS	
REGULATORY CLASSIFICATION	D	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	400	
GROSS UNIT GENERATING CAPACITY - MW	410	
NET UNIT GENERATING CAPACITY W/FGD - MW	391	
NET UNIT GENERATING CAPACITY WO/FGD - MW	404	
EQUIVALENT SCRUBBED CAPACITY - MW	410	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	BABCOCK & WILCOX	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	943.80	(2000000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	151.7	(305 F)
STACK HEIGHT - M	137.	(450 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	*****	(***** FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	LIGNITE	
AVERAGE HEAT CONTENT - J/G	11630.	(5000 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		4200-6350
AVERAGE ASH CONTENT - %	28.00	
RANGE ASH CONTENT - %	25.0-45.0	
AVERAGE MOISTURE CONTENT - %	30.00	
RANGE MOISTURE CONTENT - %	****	
AVERAGE SULFUR CONTENT - %	2.39	
RANGE SULFUR CONTENT - %	1.5-3.0	
AVERAGE CHLORIDE CONTENT - %	0.06	
RANGE CHLORIDE CONTENT - %	0.01-0.25	
*** PARTICLE CONTROL		
** ESP		
NUMBER	1	
TYPE	COLD SIDE	
SUPPLIER	BABCOCK & WILCOX	
INLET FLUE GAS CAPACITY - CU.M/S	943.8	(2000000 ACFM)
INLET FLUE GAS TEMPERATURE - C	151.7	(305 F)
PRESSURE DROP - KPA	0.2	(1. IN-H2O)
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
*** FGD SYSTEM		
** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	
PROCESS TYPE	LIMESTONE	
PROCESS ADDITIVES	DIBASIC ACID	
SYSTEM SUPPLIER	BABCOCK & WILCOX	
A-E FIRM	TIPPETT & GEE	

SAN MIGUEL ELECTRIC: SAN MIGUEL 1 (CONT.)

DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	NEW	
UNIT DESIGN SO ₂ REMOVAL EFFICIENCY - %	86.00	
ENERGY CONSUMPTION - %	3.2	
CURRENT STATUS	1	
COMMERCIAL START-UP	10/1981	
INITIAL START-UP	8/1981	
CONTRACT AWARDED	0/1975	
** DESIGN AND OPERATING PARAMETERS	*****	
DESIGN CHLORIDE CONTENT - %		
SPACE REQUIREMENTS - SQ M	18209.8	(196015 SQ FT)
** QUENCHER/PRESATURATOR		
NUMBER	4	
TYPE	ABSORBER INLET	
INLET GAS FLOW - CU. M/S	314.62	(666700 ACFM)
INLET GAS TEMPERATURE - C	151.7	(305 F)
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** ABSORBER		
NUMBER	4	
NUMBER OF SPARES	1	
GENERIC TYPE	TRAY TOWER	
SPECIFIC TYPE	SIEVE TRAY	
TRADE NAME/COMMON TYPE	N/A	
SUPPLIER	BABCOCK & WILCOX	
SHELL GENERIC MATERIAL	CARBON STEEL	
SHELL SPECIFIC MATERIAL	AISI 1110	
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A	
LINER GENERIC MATERIAL	ORGANIC	
LINER SPECIFIC MATERIAL	NR	
LINER MATERIAL TRADE NAME/COMMON TYPE	NR	
GAS CONTACTING DEVICE TYPE	PLASTIC/RUBBER MOBILE BALLS	
NUMBER OF CONTACTING ZONES	2	
LIQUID RECIRCULATION RATE - LITER/S	1250.	(19840 GPM)
L/G RATIO - L/CU.M	6.0	(45.0 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	3.5	(14.0 IN-H ₂ O)
INLET GAS FLOW - CU. M/S	208.06	(440900 ACFM)
INLET GAS TEMPERATURE - C	54.4	(130 F)
SO ₂ REMOVAL EFFICIENCY - %	86.0	
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR	
GENERIC TYPE	IMPINGEMENT	
SPECIFIC TYPE	BAFFLE	
TRADE NAME/COMMON TYPE	CLOSED VANE	
NUMBER OF STAGES	2	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** REHEATER		
GENERIC TYPE	INDIRECT HOT AIR	
SPECIFIC TYPE	EXTERNAL HEAT EXCHANGER	
TRADE NAME/COMMON TYPE	STEAM TUBE BUNDLE	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** FANS		
NUMBER	2	
NUMBER OF SPARES	0	
DESIGN	AXIAL	
FUNCTION	UNIT	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
FLUE GAS FLOW RATE - CU.M/S	1016.47	(2154000 ACFM)
FLUE GAS TEMPERATURE - C	151.7	(305 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SAN MIGUEL ELECTRIC: SAN MIGUEL 1 (CONT.)

** FANS	
NUMBER	2
NUMBER OF SPARES	0
DESIGN	AXIAL
FUNCTION	UNIT
APPLICATION	FORCED DRAFT
SERVICE	DRY
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
NUMBER	4
FUNCTION	SHUT-OFF
GENERIC TYPE	NR
SPECIFIC TYPE	NR
** DAMPERS	
NUMBER	4
FUNCTION	SHUT-OFF
GENERIC TYPE	NR
SPECIFIC TYPE	NR
** DUCTWORK	
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	NR
DEVICE TYPE	NR
** PUMPS	
SERVICE	NUMBER
-----	-----
NR	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
OUTLET STREAM CHARACTERISTICS	30% SOLIDS
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	VACUUM FILTER
FEED STREAM SOURCE	THICKENER
FEED STREAM CHARACTERISTICS	30% SOLIDS
OUTLET STREAM CHARACTERISTICS	60 % SOLIDS
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	STABILIZATION
DEVICE	PUG MILL
PROPRIETARY PROCESS	RESEARCH-COTTRELL
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
LOCATION	OFF-SITE
SITE TREATMENT	NONE

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SAN MIGUEL ELECTRIC: SAN MIGUEL 1 (CONT.)

** PROCESS CONTROL AND INSTRUMENTATION	
CHEMICAL PARAMETERS	PH, SOLIDS
PROCESS CONTROL MANNER	AUTOMATIC
PROCESS CHEMISTRY MODE	FEEDBACK
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
MAKEUP WATER ADDITION - LITERS/S	37.8 (600 GPM)
** CHEMICALS AND CONSUMPTION	
FUNCTION	ABSORBENT
NAME	LIMESTONE
PRINCIPAL CONSTITUENT	95% CaCO ₃
CONSUMPTION	24 TPH

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO ₂	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR

8/81	SYSTEM									744

** PROBLEMS/SOLUTIONS/COMMENTS

THE SAN MIGUEL FGD SYSTEM BEGAN OPERATIONS ON AUGUST 13 WHEN ONE OF THE FOUR MODULES WAS STARTED UP.

THE FGD SYSTEM WAS REMOVED FROM SERVICE FOR ONE WEEK AT THE END OF AUGUST TO CORRECT VALVE PROBLEMS. THE VALVES WERE DESIGNED FOR SINGLE DIRECTIONAL FLOW, HOWEVER, SOME BI-DIRECTIONAL FLOWS WERE OCCURRING WHICH WAS RESULTING IN VALVE FAILURE.

9/81	SYSTEM									720

** PROBLEMS/SOLUTIONS/COMMENTS

SINCE INITIAL STARTUP, TWO OF THE THREE MODULES HAVE BEEN OPERATED ON AN ALTERNATING BASIS. THE LIMITED OPERATION HAS RESULTED FROM BOILER PROBLEM ENCOUNTERED. THE BOILER WILL BE SHUT DOWN ON OCTOBER 16 FOR ONE MONTH SO THAT CORRECTIVE MAINTENANCE CAN BE PERFORMED.

PROBLEMS HAVE BEEN ENCOUNTERED WITH THE LIMESTONE FEED SYSTEM. THE PROBLEMS HAVE BEEN ATTRIBUTED TO EXCESSIVE RAINFALL WHICH HAS CAUSED CLUMPING OF THE MATERIAL.

10/81	SYSTEM									744

11/81	SYSTEM									720

12/81	SYSTEM									744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS SHUTDOWN FROM MID-OCTOBER THRU NOVEMBER DUE TO BOILER-RELATED PROBLEMS. THE UNIT OPERATED APPROXIMATELY 50% DURING DECEMBER.

THE FGD SYSTEM HAS EXPERIENCED ABSORBER PLUGGING PARTICULARLY IN THE MIST ELIMINATOR AND SPRAY NOZZLES.

THE UTILITY HAS EXPERIENCED PROBLEMS WITH THE LIMESTONE SLURRY PREPARATION SYSTEM.

1/82	SYSTEM									744

2/82	SYSTEM									672

3/82	SYSTEM									744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SAN MIGUEL ELECTRIC: SAN MIGUEL 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS	FGD CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY HAS REPORTED PROBLEMS WITH THE SUPPORT BRACING ON ALL FOUR ABSORBER TANKS. VIBRATIONS CAUSED BY THE AGITATORS COUPLED WITH INADEQUATE TANK BRACING HAS CAUSED THE TANKS TO LEAK. EACH TANK MUST NOW BE DRAINED AND REBRACED BY B&W. THE REPAIR PROCESS WILL TAKE APPROXIMATELY 2-4 WEEKS FOR EACH TANK. SPARE FGD SYSTEM CAPACITY HAS KEPT THIS FROM LIMITING BOILER AVAILABILITY. THE UNIT WAS SHUTDOWN FOR 2-WEEKS IN MARCH FOR A SCHEDULED OUTAGE.

THE UTILITY IS ALSO EXPERIENCING PROBLEMS WITH DUCTWORK CORROSION. THE AREA IN QUESTION IS WHERE THE COMMON PLENUM FROM ABSORBERS AND INDIRECT HO AIR REHEAT DUCT MEET (MIXING CHAMBER). THE MICA-FLAKE LINER BECAME DETACHED FROM THE CARBON STEEL DUCTWORK DUE TO TEMPERATURE FLUCTUATIONS. THE REPLACEMENT LINER, SYNTHETIC RUBBER MATERIAL, IS PRESENTLY FAILING DUE TO POOR APPLICATION AROUND CONNECTING AREAS (DUCT JOINTS, BEFORE AND AFTER EXPANSION JOINTS AND DAMPERS).

4/82	SYSTEM	720
5/82	SYSTEM	744
6/82	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY CONTINUES TO EXPERIENCE PROBLEMS WITH DUCTWORK CORROSION. THE TWO CONTRIBUTING FACTORS TO THE PROBLEM ARE THE HORIZONTAL DESIGN OF THE DUCTWORK WHICH ALLOWS POOLS OF MOISTURE TO COLLECT IN CORNERS AND AT THE BOTTOM OF THE DUCTWORK, AND LINEAR CRACKING AT DUCT RISERS AND CONNECTING AREAS WHICH ALLOWS MOISTURE TO SEEP THROUGH AND CORRODE THE DUCTWORK.

UTILITY ALSO REPORTS EXPERIENCING PROBLEMS IN ISOLATING MODULES BECAUSE THE DOUBLE LOUVRE SEAL AIR DAMPERS WILL NOT SEAL DUE TO SCALE AND FLYASH BUILDUP. MAINTENANCE CREWS MUST WEAR BREATHING APPARATUSES WHEN WORKING INSIDE THE MODULES.

THE UTILITY ALSO REPORTED A TWO DAY OUTAGE IN JUNE DUE TO A PROCESS CONTROLLER FAILURE WHICH OPERATES AND CONTROLS THE PUMPS, VALVES, ECT.

THE UTILITY REPORTED THAT FGD SYSTEM AVAILABILITY THROUGHOUT THE SECOND QUARTER WAS APPROXIMATELY 85%. THE UTILITY HAS SCHEDULED A MAJOR OUTAGE PERIOD IN THE FALL TO MAKE ALL REPAIRS.

7/82	SYSTEM	744
8/82	SYSTEM	744
9/82	SYSTEM	720
10/82	SYSTEM	744
11/82	SYSTEM	720
12/82	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE FALL OUTAGE PERIOD, THE UTILITY ALSO REPORTED REPLACING 10 RUBBER EXPANSION JOINTS THAT HAD FAILED. THE REPLACEMENT JOINTS ARE CONSTRUCTED OF STAINLESS STEEL REINFORCED VITON.

THE UTILITY REPORTED THAT THE FGD SYSTEM AVAILABILITY THROUGHOUT THE LAST

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SAN MIGUEL ELECTRIC: SAN MIGUEL 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

SIX MONTHS OF THE YEAR WAS APPROXIMATELY 75%.

THE UTILITY REPORTED THAT THE UNIT WAS DOWN MOST OF THE FALL MONTHS TO REBUILD THE INLET DAMPERS TO THE ABSORBER MODULES. THE UTILITY HAS EXPERIENCED CONTINUAL PROBLEMS WITH THE DAMPERS SEALING DUE TO SCALE AND FLYASH BUILDUP.

1/83	SYSTEM	744
2/83	SYSTEM	672
3/83	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT WAS DOWN ALL OF MARCH TO BEGIN REPAIRS ON ABSORBER OUTLET DAMPERS. THE FRP COATED CARBON STEEL DAMPERS WERE CORRODING AT THE EDGES WHERE THE FRP HAD FLAKED OFF. THE EDGES OF THE BLADES WILL BE REPLACED WITH HASTELLOY C-276 AND RECOATED WITH FRP.

4/83	SYSTEM	720
5/83	SYSTEM	744
6/83	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

REPAIRS TO THE ABSORBER OUTLET DAMPERS CONTINUED THROUGHOUT APRIL AND MAY.

THE UTILITY REPORTED EXPERIENCING SCALING PROBLEMS WITH THE FIRST TRAY OF THE ABSORBERS. ADIPIC ACID TESTS ARE SCHEDULED FOR AUGUST TO SEE IF THE MATERIAL WILL REDUCE SCALING AND ENHANCE SO2 REMOVAL. THE SYSTEM IS PRESENTLY NOT MEETING ITS DESIGNED REMOVAL EFFICIENCY OF 88%.

THE UTILITY PLANS TO REPAIR THE CHEMICAL RESISTANT GROUT IN THE ABSORBER OUTLET DUCTS DURING THE NEXT MAJOR OUTAGE PERIOD.

THE UTILITY REPORTED THAT THE FGD SYSTEM AVAILABILITY DURING THE PERIOD OF JANUARY THROUGH JUNE OF 1983 WAS APPROXIMATELY 60%.

7/83	SYSTEM	744
8/83	SYSTEM	744
9/83	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE THIRD QUARTER. FGD SYSTEM AVAILABILITY DURING THE PERIOD WAS APPROXIMATELY 100%.

THE UTILITY RECEIVED ITS FIRST LOAD OF ADIPIC ACID ON NOVEMBER 16. ALTHOUGH SCHEDULED FOR AUGUST, TESTING WILL COMMENCE IN LATE NOVEMBER OR EARLY DECEMBER.

THE UTILITY REPORTED EXPERIENCING MINOR SOFT SCALING PROBLEMS WITH THE MIST ELIMINATORS. THE UTILITY PLANS TO ADJUST OR MAKE CHANGES TO ITS MIST ELIMINATOR WASH SYSTEM IN ORDER TO CORRECT THE PROBLEM.

10/83	SYSTEM	744
11/83	SYSTEM	720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SAN MIGUEL ELECTRIC: SAN MIGUEL 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD CAP. HOURS	FACTOR

12/83 SYSTEM

744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE PERIOD. THE FGD SYSTEM AVAILABILITY FOR THE PERIOD WAS APPROXIMATELY 100 PERCENT.

ADIPIC ACID TESTING BEGAN IN DECEMBER. PRELIMINARY RESULTS INDICATE THAT THE USE OF A BUFFERING AGENT IS HIGHLY COST EFFECTIVE. SO2 REMOVAL EFFICIENCY IS UP AND SCALE FORMATIONS ARE MINIMAL. TESTING SHOWS LIMESTONE UTILIZATION TO BE 95 PERCENT WITH ITS USE COMPARED TO 85 PERCENT WITHOUT. PRESENT LIMESTONE CONSUMPTION WITHOUT THE USE OF A BUFFERING AGENT IS 700 TONS/DAY. TESTS INDICATE THAT LIMESTONE CONSUMPTION MAY BE DECREASED AS MUCH AS 60 PERCENT. THE UTILITY HAS BEEN TESTING VARIOUS AMOUNTS OF BOTH DIBASIC AND MONOBASIC ACIDS FROM 2 TO 6 TONS/DAY. E. F. DUPONT IS ONE OF TWO PRESENT SUPPLIERS. DUE TO GOOD CRYSTAL GROWTH WITH THE USE OF A BUFFERING AGENT, THE UTILITY ALSO BELIEVES THAT FLOCCULANT CONSUMPTION WILL ALSO BE DECREASED.

THE UNIT WAS DOWN FOR 10 DAYS IN OCTOBER DUE TO A PLUGGED SUPERHEATER. CLINKER, WHICH HAD PLUGGED THE SUPERHEATER, HAD TO BE REMOVED WITH EXPLOSIVES.

1/84 SYSTEM

744

2/84 SYSTEM

696

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FIRST TWO MONTHS OF 1984.

3/84 SYSTEM

744

4/84 SYSTEM

720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT WAS DOWN THE END OF MARCH AND ALL OF APRIL FOR A 6 WEEK SCHEDULED MAINTENANCE OUTAGE. DURING THE OUTAGE, THE FOLLOWING REPAIRS WERE MADE TO THE FGD SYSTEM.

1) RUBBER LINING IN ABSORBER AND REACTION TANKS WERE PATCHED USING A URETHANE MATERIAL FROM PENNWALT (ASPHALT LIKE).

2) FGD OUTLET DAMPERS CONSTRUCTED OF CARBON STEEL AND LINED WITH FLAKEGLASS WERE REPLACED WITH DOUBLE LOUVRE DAMPERS CLADDED WITH HASTELLOY 276. OLD DAMPERS WERE BADLY CORRODED DUE TO FAILED FLAKEGLASS LINER.

3) REPLACED 12000 SQ FT OF DUCT LINING WITH RM8000 (VITON FLUOROELASTOMER) DUE TO FAILED FLAKEGLASS LINER. DUCTWORK REPAIRED WAS LOCATED BETWEEN ABSORBER MIST ELIMINATOR AND COMMON DUCT WHICH FEEDS INTO STACK. COMMON DUCT TO LINER IS STILL HOLDING UP WELL. IT IS CONSTRUCTED OF GUNNITE AND PENNWALT BLOCK MATERIAL.

4) STACK ANNULUS WAS PRESSURIZED TO AVOID POSSIBLE ACID ATTACK TO CONCRETE OUTER SHELL.

5/84 SYSTEM

744

6/84 SYSTEM

720

7/84 SYSTEM

744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SAN MIGUEL ELECTRIC: SAN MIGUEL 1 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR
8/84	SYSTEM						744
9/84	SYSTEM						720
10/84	SYSTEM						744
11/84	SYSTEM						720
12/84	SYSTEM						744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE MONTHS OF MAY THROUGH DECEMBER 1984.

1/85	SYSTEM						744
2/85	SYSTEM						672
3/85	SYSTEM						744
4/85	SYSTEM						720
5/85	SYSTEM						744
6/85	SYSTEM						720
7/85	SYSTEM						744
8/85	SYSTEM						744
9/85	SYSTEM						720
10/85	SYSTEM						744
11/85	SYSTEM						720
12/85	SYSTEM						744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM						774
2/86	SYSTEM						672
3/86	SYSTEM						774
4/86	SYSTEM						720
5/86	SYSTEM						774
6/86	SYSTEM						720
7/86	SYSTEM						774
8/86	SYSTEM						774
9/86	SYSTEM						720
10/86	SYSTEM						774

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SAN MIGUEL ELECTRIC: SAN MIGUEL 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

11/86	SYSTEM						720		
12/86	SYSTEM						774		
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT THE FGD SYSTEM PERFORMED WELL ALL OF 1986 WITH VERY FEW PROBLEMS. THE UTILITY IS STILL USING DIBASIC ACID ADDITIVES TO MAINTAIN HIGH SO2 REMOVAL EFFICIENCIES. THE UTILITY IS CURRENTLY RUNNING SOME INFORMAL TESTS TO FIND THE OPTIMUM LEVEL OF ADDITION. IN ADDITION, THE UTILITY IS PLANNING TO CONDUCT SOME FORCED-OXIDATION R & D WORK.									
1/87	SYSTEM						744		
2/87	SYSTEM						672		
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE MONTHS OF JANUARY AND FEBRUARY 1987.									
3/87	SYSTEM						744		
4/87	SYSTEM						720		
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING THE 8-WEEK SCHEDULED MAINTENANCE OUTAGE THE UTILITY REPLACED RUBBER LINERS IN THE ABSORBER TOWERS.									
DURING THE SCHEDULED 8-WEEK MAINTENANCE OUTAGE THE UTILITY RELINED THE ABSORBER OUTLET DUCTWORK WITH HIGH ALLOY AND A NEW TYPE OF FLAKE GLASS-FILLED VINYL ESTER. THE FLOORS OF THE DUCTWORK WERE REPLACED WITH C-22, C-276, AND H ALLOYS WHEREAS THE WALLS AND CEILINGS WERE RELINED WITH THE NEW TYPE FLAKEGLASS MATERIAL. THE ORIGINAL LINER WAS AN OLDER TYPE OF FLAKE GLASS-FILLED VINYL ESTER COATING MATERIAL HAVING A HIGH CONCENTRATION OF GLASS MATERIAL. THE NEWER MATERIAL HAS A HIGHER EPOXY CONCENTRATION.									
THE UTILITY REPORTED THAT THE UNIT WAS OFF-LINE IN APRIL AND MAY FOR A SCHEDULED 8-WEEK MAINTENANCE OUTAGE.									
5/87	SYSTEM						744		
6/87	SYSTEM						720		
7/87	SYSTEM						744		
8/87	SYSTEM						744		
9/87	SYSTEM						720		
10/87	SYSTEM						744		
11/87	SYSTEM						720		
12/87	SYSTEM						744		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SAN MIGUEL ELECTRIC: SAN MIGUEL 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE REMAINDER OF THE YEAR. THE UNIT WAS, HOWEVER, OFF-LINE FOR APPROXIMATELY 5 DAYS IN OCTOBER FOR A SCHEDULED MAINTENANCE OUTAGE.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SEMINOLE ELECTRIC	
PLANT NAME	SEMINOLE	
UNIT NUMBER	1	
CITY	PALATKA	
STATE	FLORIDA	
REGULATORY CLASSIFICATION	A	
PARTICULATE EMISSION LIMITATION - NG/J	19.	(0.045 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	284.	(0.660 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	1240	
GROSS UNIT GENERATING CAPACITY - MW	650	
NET UNIT GENERATING CAPACITY W/FGD - MW	620	
NET UNIT GENERATING CAPACITY WO/FGD - MW	636	
EQUIVALENT SCRUBBED CAPACITY - MW	650	

** UNIT DATA - BOILER AND STACK

BOILER SUPPLIER	FOSTER WHEELER	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	1006.09	(2132000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	130.6	(267 F)
STACK HEIGHT - M	206.	(675 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	28.3	(92.8 FT)

** FUEL DATA

FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	27214.	(11700 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		11000-12500
AVERAGE ASH CONTENT - %	10.00	
RANGE ASH CONTENT - %	6.0-10.0	
AVERAGE MOISTURE CONTENT - %	10.00	
RANGE MOISTURE CONTENT - %	9.0-11.0	
AVERAGE SULFUR CONTENT - %	3.00	
RANGE SULFUR CONTENT - %	1.5-3.0	
AVERAGE CHLORIDE CONTENT - %	0.30	
RANGE CHLORIDE CONTENT - %	****	

*** PARTICLE CONTROL

** ESP

NUMBER	2	
TYPE	COLD SIDE	
SUPPLIER	RESEARCH-COTTRELL	
INLET FLUE GAS CAPACITY - CU.M/S	1006.1	(2132000 ACFM)
INLET FLUE GAS TEMPERATURE - C	130.6	(267 F)
PRESSURE DROP - KPA	0.6	(3. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.6	

** PARTICLE SCRUBBER

NUMBER	0
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON NAME	N/A
SHELL GENERIC MATERIAL	N/A
SHELL SPECIFIC MATERIAL	N/A
LINER GENERIC MATERIAL	N/A
LINER SPECIFIC MATERIAL	N/A
GAS CONTACTING DEVICE TYPE	N/A

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
PROCESS ADDITIVES	DIBASIC ACID (GLUTARIC A
SYSTEM SUPPLIER	PEABODY PROCESS SYSTEMS

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SEMINOLE ELECTRIC: SEMINOLE 1 (CONT.)

A-E FIRM	BURNS & ROE	
DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	NEW	
UNIT DESIGN SO ₂ REMOVAL EFFICIENCY - %	86.00	
ENERGY CONSUMPTION - %	2.5	
CURRENT STATUS	1	
COMMERCIAL START-UP	2/1984	
INITIAL START-UP	5/1983	
CONTRACT AWARDED	2/1980	
** DESIGN AND OPERATING PARAMETERS		
DESIGN CHLORIDE CONTENT - %	*****	
SPACE REQUIREMENTS - SQ M	2013.6	(21675 SQ FT)
** QUENCHER/PRESATURATOR		
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** ABSORBER		
NUMBER	5	
NUMBER OF SPARES	1	
GENERIC TYPE	SPRAY TOWER	
SPECIFIC TYPE	OPEN COUNTERCURRENT SPRAY	
TRADE NAME/COMMON TYPE	N/A	
SUPPLIER	PEABODY PROCESS SYSTEMS	
DIMENSIONS - FT	27.0 DIA X 89.0	
SHELL GENERIC MATERIAL	CARBON STEEL	
SHELL SPECIFIC MATERIAL	ASTM A-283	
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A	
LINER GENERIC MATERIAL	ORGANIC	
LINER SPECIFIC MATERIAL	GLASS FLAKE-FILLED POLYESTER; NATURAL RUBBER	
LINER MATERIAL TRADE NAME/COMMON TYPE	NR	
GAS CONTACTING DEVICE TYPE	NONE	
NUMBER OF CONTACTING ZONES	5	
L/G RATIO - L/CU.M	7.1	(53.0 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	1.4	(5.6 IN-H ₂ O)
SUPERFICIAL GAS VELOCITY - M/SEC	3.7	(12.2 FT/S)
INLET GAS FLOW - CU. M/S	1006.09	(2132000 ACFM)
INLET GAS TEMPERATURE - C	51.7	(125 F)
SO ₂ REMOVAL EFFICIENCY - %	86.0	
PARTICLE REMOVAL EFFICIENCY - %	0.0	
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
TRADE NAME/COMMON TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** REHEATER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON TYPE	N/A	
CONSTRUCTION MATERIAL GENERIC TYPE	N/A	
CONSTRUCTION MATERIAL SPECIFIC TYPE	N/A	
** FANS		
DESIGN	CENTRIFUGAL	
FUNCTION	NR	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** DAMPERS		
FUNCTION	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	

SEMINOLE ELECTRIC: SEMINOLE 1 (CONT.)

LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	ID FAN OUTLET
DIMENSIONS	13.0 X 12.0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	ASTM A-242
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	FGD OUTLET
DIMENSIONS	13.0 X 12.0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	NR
DEVICE TYPE	NR
** TANKS	
SERVICE	NUMBER
-----	-----
REAGENT PREP PRODUCT	1
ABSORBER RECYCLE	5
NR	****
THICKENER OVERFLOW	****
EMERGENCY DELUGE	1
** PUMPS	
SERVICE	NUMBER
-----	-----
MILL RECYCLE	2
REAGENT SLURRY TRANSFER	2
ABSORBER RECIRCULATION	5
WASH SLURRY	2
WASTE SLURRY	3
SUPERNATANT	2
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	2
*** SALEABLE BYPRODUCTS	
NATURE	GYPSUM
QUALITY - %	96.4
DISPOSITION	MARKETED
*** SLUDGE	
MOISTURE CONTENT - % TOTAL FREE WATER	7.6
** TREATMENT	
METHOD	FORCED OXIDATION/FIXATION
DEVICE	NA
PROPRIETARY PROCESS	CONVERSION SYSTEMS 'POZ-O-TEC'
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
SITE TREATMENT	NR

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SEMINOLE ELECTRIC: SEMINOLE 1 (CONT.)

** PROCESS CONTROL AND INSTRUMENTATION

CHEMICAL PARAMETERS
PROCESS CONTROL MANNER
PROCESS CHEMISTRY MODE

DENSITY, PH
MANUAL-EQUIP. START STOP; AUTO-PROCESS CONTROL
FEEDBACK

-----PERFORMANCE DATA-----
PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
SO2 PART. HOURS HOURS HOURS FACTOR

5/83 SYSTEM 744

6/83 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM COMMENCED OPERATION IN MAY AND IS CURRENTLY IN THE STARTUP
PHASE OF OPERATION.

7/83 SYSTEM 744

8/83 SYSTEM 744

9/83 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD SYSTEM OPERATED APPROXIMATELY 30 TO
40 DAYS SINCE START-UP IN MAY 1983.

OUTAGE TIME DURING THE THIRD QUARTER OF 1983 WAS DUE PRIMARILY TO TURBINE-
RELATED PROBLEMS.

10/83 SYSTEM 744

11/83 SYSTEM 720

12/83 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD SYSTEM OPERATED INEFFICIENTLY DURING THE
FOURTH QUARTER DUE TO MIST ELIMINATOR PLUGGING PROBLEMS.

1/84 SYSTEM 744

2/84 SYSTEM 696

3/84 SYSTEM 744

4/84 SYSTEM 720

5/84 SYSTEM 744

6/84 SYSTEM 720

7/84 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING THE PERIOD OF JANUARY
THROUGH JULY 1984.

8/84 SYSTEM 744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SEMINOLE ELECTRIC: SEMINOLE 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

A MODULE OUTAGE LASTING 11 HOURS OCCURRED DURING AUGUST DUE TO A BROKEN SUPERNATE HEADER.

THE UTILITY REPORTED THAT DURING AUGUST EACH MODULE WAS TAKEN OUT IN ROTATION FOR MIST ELIMINATOR SCALE CLEANING.

THE UTILITY REPORTED THAT THE MODULE "CHARLIE" WAS DOWN PART OF AUGUST DUE TO REPAIRS ON A FIBERGLASS STORAGE TANK.

9/84	SYSTEM							720	

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR SEPTEMBER.

10/84	SYSTEM							744	

11/84	SYSTEM							720	

12/84	SYSTEM							744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER OF 1984.

1/85	SYSTEM							744	

2/85	SYSTEM							672	

3/85	SYSTEM							744	

4/85	SYSTEM							720	

5/85	SYSTEM							744	

6/85	SYSTEM							720	

7/85	SYSTEM							744	

8/85	SYSTEM							744	

9/85	SYSTEM							720	

10/85	SYSTEM							744	

11/85	SYSTEM							720	

12/85	SYSTEM							744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE YEAR 1985. FGD AVAILABILITY FOR THE YEAR WAS REPORTEDLY 100%. MIST ELIMINATOR PLUGGING AND PUMP SEAL FAILURES WERE THE ONLY PROBLEMS ENCOUNTERED WITH THE FGD SYSTEM. THE BOILER OPERATED APPROXIMATELY 608 HOURS WITH A CAPACITY FACTOR OF 66%. THE LOWER CAPACITY FACTOR WAS REPORTEDLY DUE TO HIGH PRESSURE TURBINE REPAIRS WHICH TOOK PLACE DURING THE SPRING AND FALL OUTAGES.

1/86	SYSTEM							774	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SEMINOLE ELECTRIC: SEMINOLE 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER BOILER HOURS	FGD CAP. HOURS FACTOR
2/86	SYSTEM							672	
3/86	SYSTEM							774	
4/86	SYSTEM							720	
5/86	SYSTEM							774	
6/86	SYSTEM							720	
7/86	SYSTEM							774	
8/86	SYSTEM							774	
9/86	SYSTEM							720	
10/86	SYSTEM							774	
11/86	SYSTEM							720	
12/86	SYSTEM							774	

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTHS OF JANUARY THROUGH DECEMBER, 1986.

1/87	SYSTEM							744	
2/87	SYSTEM							672	
3/87	SYSTEM							744	
4/87	SYSTEM							720	
5/87	SYSTEM							744	
6/87	SYSTEM							720	
7/87	SYSTEM							744	
8/87	SYSTEM							744	
9/87	SYSTEM							720	
10/87	SYSTEM							744	
11/87	SYSTEM							720	
12/87	SYSTEM							744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED IN 1987. THE FGD SYSTEM HAS BEEN USING BOTH DIBASIC ACID AND SODIUM THIOSULFATE TO IMPROVE SYSTEM OPERATION. THE UTILITY REPORTED THAT THE FGD SYSTEM HYDROCLONES WERE BYPASSED BECAUSE OF CONTINUED MAINTENANCE PROBLEMS.

DO NOT MICROFILM
THIS PART

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SEMINOLE ELECTRIC
PLANT NAME	SEMINOLE
UNIT NUMBER	2
CITY	PALATKA
STATE	FLORIDA
REGULATORY CLASSIFICATION	A
PARTICULATE EMISSION LIMITATION - NG/J	19. (0.045 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	284. (0.660 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	***** (***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	1240
GROSS UNIT GENERATING CAPACITY - MW	650
NET UNIT GENERATING CAPACITY W/FGD - MW	620
NET UNIT GENERATING CAPACITY WO/FGD - MW	636
EQUIVALENT SCRUBBED CAPACITY - MW	650
 ** UNIT DATA - BOILER AND STACK	
BOILER SUPPLIER	FOSTER WHEELER
BOILER TYPE	PULVERIZED COAL
BOILER SERVICE LOAD	BASE
DESIGN BOILER FLUE GAS FLOW - CU.M/S	1006.09 (2132000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	130.6 (267 F)
STACK HEIGHT - M	206. (675 FT)
STACK SHELL	CONCRETE
STACK TOP DIAMETER - M	28.3 (92.8 FT)
 ** FUEL DATA	
FUEL TYPE	COAL
FUEL GRADE	BITUMINOUS
AVERAGE HEAT CONTENT - J/G	27214. (11700 BTU/LB)
RANGE HEAT CONTENT - BTU/LB	11000-12500
AVERAGE ASH CONTENT - %	8.50
RANGE ASH CONTENT - %	6.0-10.0
AVERAGE MOISTURE CONTENT - %	10.00
RANGE MOISTURE CONTENT - %	9.0-11.0
AVERAGE SULFUR CONTENT - %	3.00
RANGE SULFUR CONTENT - %	1.5-3.0
AVERAGE CHLORIDE CONTENT - %	0.30
RANGE CHLORIDE CONTENT - %	****
 *** PARTICLE CONTROL	
 ** ESP	
NUMBER	2
TYPE	COLD SIDE
SUPPLIER	RESEARCH-COTTRELL
INLET FLUE GAS CAPACITY - CU.M/S	1006.1 (2132000 ACFM)
INLET FLUE GAS TEMPERATURE - C	130.6 (267 F)
PRESSURE DROP - KPA	0.6 (3. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.6
 *** FGD SYSTEM	
 ** GENERAL DATA	
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
PROCESS ADDITIVES	DIBASIC ACID (GLUTARIC A
SYSTEM SUPPLIER	PEABODY PROCESS SYSTEMS
A-E FIRM	BURNS & ROE
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	86.00
ENERGY CONSUMPTION - %	2.5
CURRENT STATUS	1
COMMERCIAL START-UP	1/1985
INITIAL START-UP	9/1984
CONTRACT AWARDED	2/1980

SEMINOLE ELECTRIC: SEMINOLE 2 (CONT.)

** DESIGN AND OPERATING PARAMETERS		
DESIGN CHLORIDE CONTENT - %	*****	
SPACE REQUIREMENTS - SQ M	2013.6	(21675 SQ FT)
** QUENCHER/PRESATURATOR		
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** ABSORBER		
NUMBER	5	
NUMBER OF SPARES	1	
GENERIC TYPE	SPRAY TOWER	
SPECIFIC TYPE	OPEN COUNTERCURRENT SPRAY	
TRADE NAME/COMMON TYPE	N/A	
SUPPLIER	PEABODY PROCESS SYSTEMS	
DIMENSIONS - FT	27.0 DIA X 89.0	
SHELL GENERIC MATERIAL	CARBON STEEL	
SHELL SPECIFIC MATERIAL	ASTM A-283	
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A	
LINER GENERIC MATERIAL	ORGANIC	
LINER SPECIFIC MATERIAL	GLASS FLAKE-FILLED POLYESTER; NATURAL RUBBER	
LINER MATERIAL TRADE NAME/COMMON TYPE	NR; BLACK NATURAL RUBBER	
GAS CONTACTING DEVICE TYPE	NONE	
NUMBER OF CONTACTING ZONES	5	
L/G RATIO - L/CU.M	7.1	(53.0 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	1.4	(5.6 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/SEC	3.7	(12.2 FT/S)
INLET GAS FLOW - CU. M/S	1006.09	(2132000 ACFM)
INLET GAS TEMPERATURE - C	51.7	(125 F)
SO2 REMOVAL EFFICIENCY - %	86.0	
PARTICLE REMOVAL EFFICIENCY - %	0.0	
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	NR	
NUMBER PER SYSTEM	5	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
TRADE NAME/COMMON TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** REHEATER		
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON TYPE	N/A	
CONSTRUCTION MATERIAL GENERIC TYPE	N/A	
CONSTRUCTION MATERIAL SPECIFIC TYPE	N/A	
** FANS		
DESIGN	CENTRIFUGAL	
FUNCTION	NR	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** DAMPERS		
FUNCTION	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	
** DUCTWORK		
LOCATION	ID FAN OUTLET	
DIMENSIONS	13.0 X 12.0	
SHELL GENERIC MATERIAL TYPE	CARBON STEEL	
SHELL SPECIFIC MATERIAL TYPE	ASTM A-242	
LINER GENERIC MATERIAL TYPE	NONE	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SEMINOLE ELECTRIC: SEMINOLE 2 (CONT.)

LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	FGD OUTLET
DIMENSIONS	13.0 X 12.0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	NR
DEVICE TYPE	NR
** TANKS	
SERVICE	NUMBER
-----	-----
REAGENT PREP PRODUCT	1
ABSORBER RECYCLE	5
NR	****
THICKENER OVERFLOW	****
EMERGENCY DELUGE	1
** PUMPS	
SERVICE	NUMBER
-----	-----
MILL RECYCLE	2
REAGENT SLURRY TRANSFER	2
ABSORBER RECIRCULATION	5
WASH SLURRY	2
WASTE SLURRY	3
SUPERNATANT	2
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	2
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	FIXATION
DEVICE	NA
PROPRIETARY PROCESS	CONVERSION SYSTEMS 'POZ-O-TEC'
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
SITE TREATMENT	NR
** PROCESS CONTROL AND INSTRUMENTATION	

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER	BOILER	FGD	CAP.
						SO2	PART.	HOURS	HOURS	HOURS
										FACTOR

9/84	SYSTEM								720	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SEMINOLE ELECTRIC: SEMINOLE 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT INITIAL START UP AT SEMINOLE 2 COMMENCED IN SEPTEMBER 1984.

10/84	SYSTEM								744	
11/84	SYSTEM								720	
12/84	SYSTEM								744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS HAVE BEEN EXPERIENCED DURING START-UP. THEY HAVE ONLY HAD TO MAKE SOME MINOR SEAL WATER PIPING MODIFICATIONS. RECYCLE PUMPS NOW USE SUPERNATANT WATER VERSUS FRESH MAKE-UP.

1/85	SYSTEM								744	
2/85	SYSTEM								672	
3/85	SYSTEM								744	
4/85	SYSTEM								720	
5/85	SYSTEM								744	
6/85	SYSTEM								720	
7/85	SYSTEM								744	
8/85	SYSTEM								744	
9/85	SYSTEM								720	
10/85	SYSTEM								744	
11/85	SYSTEM								720	
12/85	SYSTEM								744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE YEAR 1985. FGD AVAILABILITY FOR THE YEAR WAS REPORTEDLY 100%. PLUGGED SPRAY NOZZLES WAS THE ONLY PROBLEM ENCOUNTERED WITH SYSTEM OPERATION. THE BOILER OPERATED APPROXIMATELY 6552 HOURS WITH A CAPACITY FACTOR OF 72%.

THE UTILITY STATED THAT THEIR SPRAY NOZZLE PLUGGING PROBLEMS HAVE BEEN CAUSED BY PLASTIC CONTAINED IN THEIR LIMESTONE REAGENT. THE PLASTIC GETS INTO THE LIMESTONE WHEN MINED AT THE QUARRY. THE EXPLOSIVES USED BY THEIR SUPPLIER ARE PLACED IN PLASTIC BAGS FOR PROTECTION. THE SUPPLIER STATED JELLY-BASED EXPLOSIVES COULD BE USED BUT WOULD INCREASE THE COST OF THEIR LIMESTONE. CURRENTLY, DUE TO LONG TERM CONTRACT AGREEMENTS, THE UTILITY WILL HAVE TO CONTINUE USING THE CURRENT PLASTIC TAINTED LIMESTONE. THEIR CURRENT CONTRACT ENDS IN APPROXIMATELY A YEAR. AT THAT TIME, THE UTILITY PLANS TO GO WITH ANOTHER SUPPLIER.

1/86	SYSTEM								774	
2/86	SYSTEM								672	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SEMINOLE ELECTRIC: SEMINOLE 2 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

3/86	SYSTEM						774		
4/86	SYSTEM						720		
5/86	SYSTEM						774		
6/86	SYSTEM						720		
7/86	SYSTEM						774		
8/86	SYSTEM						774		
9/86	SYSTEM						720		
10/86	SYSTEM						774		
11/86	SYSTEM						720		
12/86	SYSTEM						774		

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTHS OF JANUARY THROUGH DECEMBER, 1986.

1/87	SYSTEM						744		
2/87	SYSTEM						672		
3/87	SYSTEM						744		
4/87	SYSTEM						720		
5/87	SYSTEM						744		
6/87	SYSTEM						720		
7/87	SYSTEM						744		
8/87	SYSTEM						744		
9/87	SYSTEM						720		
10/87	SYSTEM						744		
11/87	SYSTEM						720		
12/87	SYSTEM						744		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED IN 1987. THE FGD SYSTEM HAS BEEN USING BOTH DIBASIC ACID AND SODIUM THIOSULFATE TO IMPROVE SYSTEM OPERATION. THE UTILITY ALSO REPORTED THAT THE FGD SYSTEM HYDROCLONES WERE BYPASSED BECAUSE OF CONTINUED MAINTENANCE PROBLEMS.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SIERRA PACIFIC POWER	
PLANT NAME	NORTH VALMY	
UNIT NUMBER	2	
CITY	VALMY	
STATE	NEVADA	
REGULATORY CLASSIFICATION	B	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	532	
GROSS UNIT GENERATING CAPACITY - MW	288	
NET UNIT GENERATING CAPACITY W/FGD - MW	274	
NET UNIT GENERATING CAPACITY WO/FGD - MW	275	
EQUIVALENT SCRUBBED CAPACITY - MW	288	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	FOSTER WHEELER	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	*****	(***** ACFM)
BOILER FLUE GAS TEMPERATURE - C	137.8	(280 F)
STACK HEIGHT - M	152.	(500 FT)
STACK SHELL	NA	
STACK TOP DIAMETER - M	*****	(***** FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	****	
AVERAGE HEAT CONTENT - J/G	*****	(***** BTU/LB)
RANGE HEAT CONTENT - BTU/LB	****	
AVERAGE ASH CONTENT - %	*****	
RANGE ASH CONTENT - %	****	
AVERAGE MOISTURE CONTENT - %	*****	
RANGE MOISTURE CONTENT - %	****	
AVERAGE SULFUR CONTENT - %	0.50	
RANGE SULFUR CONTENT - %	****	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** FABRIC FILTER		
NUMBER	1	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
*** FGD SYSTEM		
** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT	
SO2 REMOVAL MODE	SPRAY DRYING	
PROCESS TYPE	LIME/SPRAY DRYING	
SYSTEM SUPPLIER	ROCKWELL INTERNATIONAL	
A-E FIRM	STONE & WEBSTER	
DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	NEW	
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.97	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	70.00	
ENERGY CONSUMPTION - %	0.3	
CURRENT STATUS	1	
COMMERCIAL START-UP	8/1985	

SIERRA PACIFIC POWER: NORTH VALMY 2 (CONT.)

INITIAL START-UP	5/1985
CONTRACT AWARDED	0/1981
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
** QUENCHER/PRESATURATOR	
CONSTRUCTION MATERIAL GENERIC TYPE	NA
CONSTRUCTION MATERIAL SPECIFIC TYPE	NA
** ABSORBER	
GENERIC TYPE	SPRAY DRYER
SPECIFIC TYPE	NA
TRADE NAME/COMMON TYPE	NA
SHELL GENERIC MATERIAL	NA
SHELL SPECIFIC MATERIAL	NA
SHELL MATERIAL TRADE NAME/COMMON TYPE	NA
LINER GENERIC MATERIAL	NONE
LINER SPECIFIC MATERIAL	N/A
LINER MATERIAL TRADE NAME/COMMON TYPE	N/A
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	NONE
GENERIC TYPE	N/A
SPECIFIC TYPE	N/A
TRADE NAME/COMMON TYPE	N/A
CONSTRUCTION MATERIAL GENERIC TYPE	NA
CONSTRUCTION MATERIAL SPECIFIC TYPE	NA
** REHEATER	
GENERIC TYPE	NA
SPECIFIC TYPE	NA
TRADE NAME/COMMON TYPE	NA
CONSTRUCTION MATERIAL GENERIC TYPE	NA
CONSTRUCTION MATERIAL SPECIFIC TYPE	NA
** DAMPERS	
FUNCTION	NA
GENERIC TYPE	NA
SPECIFIC TYPE	NA
CONSTRUCTION MATERIAL GENERIC TYPE	NA
CONSTRUCTION MATERIAL SPECIFIC TYPE	NA
LINER GENERIC MATERIAL TYPE	NA
LINER SPECIFIC MATERIAL TYPE	NA
** DUCTWORK	
SHELL GENERIC MATERIAL TYPE	NA
SHELL SPECIFIC MATERIAL TYPE	NA
LINER GENERIC MATERIAL TYPE	NA
LINER SPECIFIC MATERIAL TYPE	NA
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	SLAKER
DEVICE	NR
DEVICE TYPE	NR
** PUMPS	
SERVICE	NUMBER
-----	-----
NA	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	NONE
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SIERRA PACIFIC POWER: NORTH VALMY 2 (CONT.)

*** SLUDGE

** TREATMENT	
METHOD	UNSTABILIZED
DEVICE	N/A
PROPRIETARY PROCESS	N/A

** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
SITE TREATMENT	NONE

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

5/85	SYSTEM						744		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY ANNOUNCED THE UNIT AND FGD SYSTEM WERE DECLARED COMMERCIAL AS OF MAY, 1985. THE PROJECT WAS COMPLETED 15 MILLION DOLLARS UNDER BUDGET AND PROMPTED THE ISSUING OF AN ACHIEVEMENT AWARD FROM THE NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS (NSPE).

6/85	SYSTEM						720		
7/85	SYSTEM						744		
8/85	SYSTEM						744		
9/85	SYSTEM						720		
10/85	SYSTEM						744		
11/85	SYSTEM						720		
12/85	SYSTEM						744		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE MONTHS OF JUNE THROUGH DECEMBER. THE SYSTEM IS REPORTED TO BE OPERATING VERY SMOOTHLY.

1/86	SYSTEM						774		
2/86	SYSTEM						672		
3/86	SYSTEM						774		
4/86	SYSTEM						720		
5/86	SYSTEM						774		
6/86	SYSTEM						720		
7/86	SYSTEM						774		
8/86	SYSTEM						774		
9/86	SYSTEM						720		
10/86	SYSTEM						774		
11/86	SYSTEM						720		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SIERRA PACIFIC POWER: NORTH VALMY 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

12/86	SYSTEM								774	

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTHS OF JANUARY THROUGH DECEMBER, 1986.

1/87	SYSTEM								744	
2/87	SYSTEM								672	
3/87	SYSTEM								744	
4/87	SYSTEM								720	
5/87	SYSTEM								744	
6/87	SYSTEM								720	
7/87	SYSTEM								744	
8/87	SYSTEM								744	
9/87	SYSTEM								720	
10/87	SYSTEM								744	
11/87	SYSTEM								720	
12/87	SYSTEM								744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED CONTINUED PROBLEMS WITH EROSION AND SUBSEQUENT IMBALANCING OF ROTARY ATOMIZER WHEELS. COMBUSTION ENGINEERING IS CURRENTLY INVESTIGATING WHETHER THEY WILL HAVE TO RE-DESIGN THE ATOMIZER WHEELS. THE UTILITY IS CURRENTLY SPENDING \$500,000 PER YEAR FOR SPARE PARTS (PRIMARILY NOZZLES) TO KEEP THE SPRAY DRYERS OPERATING.

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED IN 1987. THE UNIT WAS OFF-LINE IN THE SPRING FOR APPROXIMATELY 2 WEEKS FOR SCHEDULED BOILER/TURBINE MAINTENANCE.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SIKESTON BRD OF MUNICIPAL UTIL
PLANT NAME	SIKESTON
UNIT NUMBER	1
CITY	SIKESTON
STATE	MISSOURI
REGULATORY CLASSIFICATION	D
PARTICULATE EMISSION LIMITATION - NG/J	***** (***** LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	***** (***** LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	***** (***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	207
GROSS UNIT GENERATING CAPACITY - MW	235
NET UNIT GENERATING CAPACITY W/FGD - MW	212
NET UNIT GENERATING CAPACITY WO/FGD - MW	216
EQUIVALENT SCRUBBED CAPACITY - MW	235
 ** UNIT DATA - BOILER AND STACK	
BOILER SUPPLIER	BABCOCK & WILCOX
BOILER TYPE	PULVERIZED COAL
BOILER SERVICE LOAD	BASE
DESIGN BOILER FLUE GAS FLOW - CU.M/S	353.17 (748390 ACFM)
BOILER FLUE GAS TEMPERATURE - C	142.2 (288 F)
STACK HEIGHT - M	137. (450 FT)
STACK SHELL	CARBON STEEL
STACK TOP DIAMETER - M	***** (***** FT)
 ** FUEL DATA	
FUEL TYPE	COAL
FUEL GRADE	BITUMINOUS
AVERAGE HEAT CONTENT - J/G	26377. (11340 BTU/LB)
RANGE HEAT CONTENT - BTU/LB	9435-11692
AVERAGE ASH CONTENT - %	11.20
RANGE ASH CONTENT - %	9.9-15.2
AVERAGE MOISTURE CONTENT - %	9.50
RANGE MOISTURE CONTENT - %	8.7-19.5
AVERAGE SULFUR CONTENT - %	2.80
RANGE SULFUR CONTENT - %	2.3-3.3
AVERAGE CHLORIDE CONTENT - %	0.08
RANGE CHLORIDE CONTENT - %	0.06-0.12
 *** PARTICLE CONTROL	
** ESP	
NUMBER	2
TYPE	COLD SIDE
SUPPLIER	BABCOCK & WILCOX
INLET FLUE GAS CAPACITY - CU.M/S	398.7 (844824 ACFM)
INLET FLUE GAS TEMPERATURE - C	153.9 (309 F)
PRESSURE DROP - KPA	0.2 (1. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.6
 ** PARTICLE SCRUBBER	
GENERIC TYPE	VENTURI TOWER
SPECIFIC TYPE	VARIABLE-THROAT/SIDE-MOVABLE BLOCKS
TRADE NAME/COMMON NAME	N/A
SHELL GENERIC MATERIAL	NR
SHELL SPECIFIC MATERIAL	NR
LINER GENERIC MATERIAL	NR
LINER SPECIFIC MATERIAL	NR
GAS CONTACTING DEVICE TYPE	NONE
 *** FGD SYSTEM	
** GENERAL DATA	
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
SYSTEM SUPPLIER	BABCOCK & WILCOX
A-E FIRM	PHIPS-HOGLAND, PHILLIPS, BURNS & MCD
DEVELOPMENT LEVEL	FULL SCALE

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SIKESTON BRD OF MUNICIPAL UTIL: SIKESTON 1 (CONT.)

NEW/RETROFIT	NEW	
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.17	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	80.00	
ENERGY CONSUMPTION - %	1.7	
CURRENT STATUS	1	
COMMERCIAL START-UP	9/1981	
INITIAL START-UP	6/1981	
CONTRACT AWARDED	11/1977	
** DESIGN AND OPERATING PARAMETERS		
DESIGN CHLORIDE CONTENT - %	*****	
** QUENCHER/PRESATURATOR		
NUMBER	3	
INLET GAS TEMPERATURE - C	153.9	(309 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** ABSORBER		
NUMBER	3	
NUMBER OF SPARES	1	
GENERIC TYPE	VENTURI TOWER	
SPECIFIC TYPE	NR	
TRADE NAME/COMMON TYPE	NR	
SUPPLIER	BABCOCK & WILCOX	
SHELL GENERIC MATERIAL	CARBON STEEL	
SHELL SPECIFIC MATERIAL	AISI 1110	
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A	
LINER GENERIC MATERIAL	ORGANIC	
LINER SPECIFIC MATERIAL	SYNTHETIC RUBBER	
LINER MATERIAL TRADE NAME/COMMON TYPE	NEOPRENE LS-561	
L/G RATIO - L/CU.M	8.0	(60.0 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	2.7	(11.0 IN-H2O)
INLET GAS FLOW - CU. M/S	437.45	(927000 ACFM)
INLET GAS TEMPERATURE - C	142.8	(289 F)
SO2 REMOVAL EFFICIENCY - %	80.0	
PARTICLE REMOVAL EFFICIENCY - %	99.6	
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR	
GENERIC TYPE	IMPINGEMENT	
SPECIFIC TYPE	BAFFLE	
TRADE NAME/COMMON TYPE	CLOSED VANE	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** REHEATER		
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON TYPE	N/A	
CONSTRUCTION MATERIAL GENERIC TYPE	N/A	
CONSTRUCTION MATERIAL SPECIFIC TYPE	N/A	
** FANS		
NUMBER	4	
DESIGN	AXIAL	
SUPPLIER	BABCOCK & WILCOX	
FUNCTION	NR	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
FLUE GAS FLOW RATE - CU.M/S	389.32	(825000 ACFM)
FLUE GAS TEMPERATURE - C	142.2	(288 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** DAMPERS		
FUNCTION	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	

SIKESTON BRD OF MUNICIPAL UTIL: SIKESTON 1 (CONT.)

LINER SPECIFIC MATERIAL TYPE	NR	
** DUCTWORK		
LOCATION	VENTURI OUTLET	
SHELL GENERIC MATERIAL TYPE	CARBON STEEL	
SHELL SPECIFIC MATERIAL TYPE	NR	
LINER GENERIC MATERIAL TYPE	ORGANIC	
LINER SPECIFIC MATERIAL TYPE	ORGANIC	
** REAGENT PREPARATION EQUIPMENT		
FUNCTION	WET BALL MILL	
DEVICE	NR	
DEVICE TYPE	NR	
MANUFACTURER	KOPPERS	
** TANKS		
SERVICE	NUMBER	
-----	-----	
NR	****	
** PUMPS		
SERVICE	NUMBER	
-----	-----	
NA	****	
** SOLIDS CONCENTRATING/DEWATERING		
DEVICE	NONE	
*** SALEABLE BYPRODUCTS		
NATURE	NONE	
DISPOSITION	N/A	
*** SLUDGE		
** TREATMENT		
METHOD	BLEED	
DEVICE	N/A	
PROPRIETARY PROCESS	N/A	
** DISPOSAL		
NATURE	FINAL	
TYPE	POND	
SITE TREATMENT	NONE	
SITE DIMENSIONS	54 ACRES	
SITE SERVICE LIFE - YRS	8	
** PROCESS CONTROL AND INSTRUMENTATION		
PROCESS CONTROL MANNER	AUTOMATIC & MANUAL	
PROCESS CHEMISTRY MODE	FEED FORWARD	
** WATER BALANCE		
WATER LOOP TYPE	OPEN	
MAKEUP WATER ADDITION - LITERS/S	11.7	(186 GPM)
** FGD SPARE CAPACITY INDICES		
ABSORBER - %	50.0	
** FGD SPARE COMPONENT INDICES		
ABSORBER	1.0	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SIKESTON BRD OF MUNICIPAL UTIL: SIKESTON 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BCILER HOURS	FGD HOURS	CAP. FACTOR
6/81	SYSTEM						720			
	** PROBLEMS/SOLUTIONS/COMMENTS									
	THE FGD OPERATION COMMENCED ON JUNE 30, 1981. THE SYSTEM IS IN THE STARTU PHASE OF OPERATION.									
7/81	SYSTEM						744			
8/81	SYSTEM						744			
9/81	SYSTEM						720			
	** PROBLEMS/SOLUTIONS/COMMENTS									
	THE SIKESTON 1 FGD SYSTEM DID NOT OPERATE DURING THE THIRD QUARTER 1981. THE BOILER WAS OPERATIONAL; HOWEVER, FULL SCALE OPERATION OF THE FGD SYSTEM IS NOT EXPECTED UNTIL JANUARY 1982.									
10/81	SYSTEM						744			
11/81	SYSTEM						720			
12/81	SYSTEM						744			
	** PROBLEMS/SOLUTIONS/COMMENTS									
	THE FGD SYSTEM OPERATED IN A START-UP PHASE DURING DECEMBER. COMPLIANCE TESTING IS SCHEDULED FOR MID-JANUARY.									
1/82	SYSTEM						744			
2/82	SYSTEM						672			
3/82	SYSTEM						744			
	** PROBLEMS/SOLUTIONS/COMMENTS									
	THE FGD SYSTEM TESTED OUT WELL DURING TWO SEPARATE COMPLIANCE TESTS WHICH WERE CONDUCTED DURING THE FIRST QUARTER OF 1982.									
4/82	SYSTEM						720			
5/82	SYSTEM						744			
6/82	SYSTEM						720			
	** PROBLEMS/SOLUTIONS/COMMENTS									
	THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE SECOND QUARTER EXCEPT FOR A BROKEN PVC MAKEUP WATER PIPELINE THAT FORCED THE UNIT OFF-LINE FOR APPROXIMATELY 1 WEEK IN JUNE. THE FGD AVAILABILITY FOR THE PERIOD WAS APPROXIMATELY 95%.									
7/82	SYSTEM						744			
8/82	SYSTEM						744			
9/82	SYSTEM						720			
10/82	SYSTEM						744			
11/82	SYSTEM						720			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SIKESTON BRD OF MUNICIPAL UTIL: SIKESTON 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD CAP. HOURS FACTOR
12/82	SYSTEM							744	
1/83	SYSTEM							744	
2/83	SYSTEM							672	
3/83	SYSTEM							744	
** PROBLEMS/SOLUTIONS/COMMENTS									
INFORMATION WAS UNAVAILABLE FOR THE PERIOD OF JULY 1982 THROUGH MARCH 1983									
4/83	SYSTEM							720	
5/83	SYSTEM							744	
** PROBLEMS/SOLUTIONS/COMMENTS									
INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF APRIL AND MAY, 1983.									
6/83	A	79.4	65.6	65.6	65.6				
	B	85.9	81.5	81.5	81.5				
	C	79.5	20.1	20.1	20.1				
	SYSTEM	100.0	83.6	83.6	83.6		720	720	602 100.0
** PROBLEMS/SOLUTIONS/COMMENTS									
OUTAGE TIME DURING THE MONTH OF JUNE WAS DUE IN PART TO MAINTENANCE AND REPAIR OF DUCTWORK.									
A BEARING FAILURE IN THE SLUDGE SUMP PUMP ALSO CONTRIBUTED TO DOWN TIME DURING JUNE.									
THE ABSORBER LINER WAS REPLACED DURING JUNE FORCING THE FGD SYSTEM OUT OF SERVICE.									
A PLUGGED SUMP DRAIN SCREEN CAUSED ADDITIONAL OUTAGE TIME DURING THE MONTH.									
7/83	SYSTEM							744	
8/83	SYSTEM							744	
9/83	SYSTEM							720	
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED EXPERIENCING SEVERAL SMALL OUTAGES DURING THE THIRD QUARTER DUE TO DUCTWORK LINER FAILURE AND RELATED CORROSION.									
EXPANSION JOINT FAILURES WERE REPORTED DURING THE PERIOD AT THE MODULE OUT LET TO THE STACK.									
THE UTILITY REPORTED A DRAIN LINE CORROSION PROBLEM AT THE BOTTOM OF THE WET STACK.									
THE FGD SYSTEM WAS DOWN FOR 2 WEEKS DURING THE THIRD QUARTER TO REPLACE TH LINER ON A SPENT SLURRY SUMP PUMP. A RUBBER LINER WAS REPLACED WITH URETHANE.									
10/83	SYSTEM							744	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SIKESTON BRD OF MUNICIPAL UTIL: SIKESTON 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE SYSTEM WAS DOWN FROM OCTOBER 17 TO OCTOBER 18 DUE TO PROBLEMS WITH THE WET STACK DRAIN.

11/83 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED A MAJOR OUTAGE FROM OCTOBER 8 TO NOVEMBER 13 FOR REPAIR OF EXPANSION JOINTS IN THE WET STACK DUCTWORK.

12/83 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED A 4 HOUR OUTAGE ON DECEMBER 25 DUE TO ESP PROBLEMS. THE EXTREME COLD WEATHER CAUSED LOW OIL LEVELS IN THE ESP TRANSFORMERS FORCING THEM TO BE JUMPED.

A 4 HOUR OUTAGE OCCURRED ON DECEMBER 14 DUE TO PROBLEMS WITH THE DRIVE LINKAGE ON A DAMPER.

ON DECEMBER 26, THE WET STACK DRAIN FROZE AND BROKE DUE TO EXTREME LOW TEMPERATURES.

THE UTILITY REPORTED PROBLEMS WITH FROZEN AND RUPTURED MIST ELIMINATOR FLANGES ON DECEMBER 26.

A BROKEN SHEAR PIN WAS REPORTED ON MODULE B DURING DECEMBER.

1/84 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS DOWN FROM DECEMBER 31 1983 TO JANUARY 3 1984 DUE TO OVE HEATED BEARINGS IN A LIMESTONE SILO BIN DISCHARGER. THE BEARINGS WERE REPLACED AND GREASED.

MODULE B WAS NOT AVAILABLE ON JANUARY 20 DUE TO TANKS BEING DRAINED FOLLOWING CLEANING.

MODULE C WAS DOWN SEVEN HOURS ON JANUARY 20 DUE TO VIBRATION PROBLEMS WITH AN ABSORBER MIXER. VIBRATIONS HAD LOOSEMED THE MOUNTING BOLTS.

A SEAL WATER LINE ON THE MODULE B SLUDGE PUMP WAS REPLACED AND RE-SUPPORTED DURING A UNIT OUTAGE FROM JANUARY 25 TO 30.

A BROKEN CHAIN AND BEARINGS WERE REPLACED ON THE LIMESTONE FEEDER DURING THE FIVE DAY UNIT OUTAGE IN JANUARY.

A VENT STACK DRAIN LINE WAS REPLACED WITH A LARGER PVC LINE DURING THE JANUARY UNIT OUTAGE.

2/84 SYSTEM 696

** PROBLEMS/SOLUTIONS/COMMENTS

AN EIGHT HOUR OUTAGE WAS REPORTED ON FEBRUARY 8 DUE TO BAD BEARINGS ON THE LIMESTONE SILO BIN DISCHARGER. NEW BEARINGS AND GREASE WERE INSTALLED.

3/84 SYSTEM 744

4/84 SYSTEM 720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SIKESTON BRD OF MUNICIPAL UTIL: SIKESTON 1 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

QUENCHER PUMP VIBRATION PROBLEMS WERE REPORTED ON APRIL 30. ONLY ONE MODULE WAS KEPT IN SERVICE FOR FOUR HOURS.

ON APRIL 30, AN INLET DAMPER SHEAR PIN AT MODULE A BROKE AND WAS REPLACED.

5/84	SYSTEM						744

** PROBLEMS/SOLUTIONS/COMMENTS

VIBRATION PROBLEMS WERE REPORTED AT THE MODULE C QUENCHER PUMP ON MAY 15. THE MANUFACTURER SUGGESTED RE-GREASING THE PUMP MOTOR. QUENCHER PUMPS ARE NOW BEING INSPECTED REGULARLY.

6/84	SYSTEM						720
7/84	SYSTEM						744
8/84	SYSTEM						744
9/84	SYSTEM						720

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS DOWN APPROXIMATELY ONE WEEK DURING THE THIRD QUARTER TO REPLACE BEARINGS ON A SLUDGE PUMP. THE UTILITY HAS MADE MODIFICATIONS TO ALLOW THE REPAIR OF ONE PUMP WITHOUT TAKING THE SCRUBBER DOWN.

THE UTILITY REPORTED PROBLEMS WITH CONTINUOUS EMISSION MONITORS DURING THE FIRST THREE QUARTERS OF 1984. THE FAILURE OF A COMPUTER COOLING FAN AND A SHORT IN A SAMPLING HEAT TRACE LINE WERE THE SPECIFIC PROBLEMS.

10/84	SYSTEM						744
11/84	SYSTEM						720
12/84	SYSTEM						744

** PROBLEMS/SOLUTIONS/COMMENTS

UTILITY REPORTED CONTINUED PROBLEMS WITH DINATRON 1100 OPACITY MONITORS. NO OTHER FGD-RELATED PROBLEMS WERE ENCOUNTERED FOR THE PERIOD. FGD SYSTEM AVAILABILITY WAS ESTIMATED TO BE IN THE HIGH 80% RANGE.

1/85	SYSTEM						744
2/85	SYSTEM						672
3/85	SYSTEM						744
4/85	SYSTEM						720
5/85	SYSTEM						744
6/85	SYSTEM						720
7/85	SYSTEM						744
8/85	SYSTEM						744
9/85	SYSTEM						720
10/85	SYSTEM						744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SIKESTON BRD OF MUNICIPAL UTIL: SIKESTON 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

11/85	SYSTEM					720
12/85	SYSTEM					744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM					774
2/86	SYSTEM					672
3/86	SYSTEM					774
4/86	SYSTEM					720
5/86	SYSTEM					774
6/86	SYSTEM					720
7/86	SYSTEM					774
8/86	SYSTEM					774
9/86	SYSTEM					720
10/86	SYSTEM					774
11/86	SYSTEM					720
12/86	SYSTEM					774

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING 1986. THERE WAS A ONE WEEK SCHEDULED OUTAGE IN THE FALL FOR WET DUCTWORK BREECH REPAIRS TO THE FLAKEGLASS LINING. THE FGD SYSTEM WAS REPORTED TO HAVE OPERATED 95% OF THE TIME WHEN THE BOILER WAS IN SERVICE.

1/87	SYSTEM					744
2/87	SYSTEM					672
3/87	SYSTEM					744
4/87	SYSTEM					720
5/87	SYSTEM					744
6/87	SYSTEM					720
7/87	SYSTEM					744
8/87	SYSTEM					744
9/87	SYSTEM					720
10/87	SYSTEM					744
11/87	SYSTEM					720
12/87	SYSTEM					744

SIKESTON BRD OF MUNICIPAL UTIL: SIKESTON 1 (CONT.)

-----PERFORMANCE DATA-----
PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING A ROUTINE MODULE INSPECTION IN MAY 1987, THE UTILITY REPORTED THAT THE RUBBER LINER IN THE MIST ELIMINATOR SECTION OF THE OUTLET DUCTWORK WAS FAILING. THE MATERIAL WAS REPORTED TO BE CRACKING AND PEELING AFTER 6 YEARS OF USAGE. THE UTILITY WILL WAIT UNTIL THE MATERIAL TOTALLY FAILS BEFORE REPLACING IT WITH A FLAKEGLASS MATERIAL. DUE TO SPARE FGD CAPACITY, REPLACEMENTS OF THE LINER CAN BE MADE AT ANY TIME WITHOUT HAVING TO TAKE THE UNIT OUT OF SERVICE.

THE UTILITY REPORTED THAT NO MAJOR FORCED OR SCHEDULED UNIT OUTAGES WERE ENCOUNTERED DURING 1987. THE FGD SYSTEM RELIABILITY FOR THE YEAR WAS REPORTED TO BE APPROXIMATELY 98 TO 99 PERCENT.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SOUTH CAROLINA PUBLIC SERVICE	
PLANT NAME	CROSS	
UNIT NUMBER	2	
CITY	CROSS	
STATE	SOUTH CAROLINA	
REGULATORY CLASSIFICATION	A	
PARTICULATE EMISSION LIMITATION - NG/J	13.	(0.030 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	258.	(0.600 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	499	
GROSS UNIT GENERATING CAPACITY - MW	510	
NET UNIT GENERATING CAPACITY W/FGD - MW	499	
NET UNIT GENERATING CAPACITY WO/FGD - MW	511	
EQUIVALENT SCRUBBED CAPACITY - MW	510	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	915.49	(1940000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	135.0	(275 F)
STACK HEIGHT - M	183.	(600 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	6.7	(22.0 FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	26051.	(11200 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		10800-12000
AVERAGE ASH CONTENT - %	16.50	
RANGE ASH CONTENT - %	12.0-20.0	
AVERAGE MOISTURE CONTENT - %	7.50	
RANGE MOISTURE CONTENT - %	6.0-10.0	
AVERAGE SULFUR CONTENT - %	1.80	
RANGE SULFUR CONTENT - %	1.0-2.3	
AVERAGE CHLORIDE CONTENT - %	0.13	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
** FABRIC FILTER		
NUMBER	0	
TYPE	NONE	
** ESP		
NUMBER	1	
TYPE	COLD SIDE	
PARTICLE REMOVAL EFFICENCY - %	99.0	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
*** FGD SYSTEM		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: CROSS 2 (CONT.)

** GENERAL DATA	
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
SYSTEM SUPPLIER	PEABODY PROCESS SYSTEMS
A-E FIRM	BURNS & ROE
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.83
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	85.80
ENERGY CONSUMPTION - %	2.4
CURRENT STATUS	1
COMMERCIAL START-UP	5/1984
INITIAL START-UP	10/1983
CONTRACT AWARDED	1/1980
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
** QUENCHER/PRESATURATOR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** ABSORBER	
GENERIC TYPE	SPRAY TOWER
SPECIFIC TYPE	OPEN COUNTERCURRENT SPRAY
TRADE NAME/COMMON TYPE	N/A
SHELL GENERIC MATERIAL	NR
SHELL SPECIFIC MATERIAL	NR
SHELL MATERIAL TRADE NAME/COMMON TYPE	NR
LINER GENERIC MATERIAL	NR
LINER SPECIFIC MATERIAL	NR
LINER MATERIAL TRADE NAME/COMMON TYPE	NR
GAS CONTACTING DEVICE TYPE	NONE
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** REHEATER	
GENERIC TYPE	INDIRECT HOT AIR
SPECIFIC TYPE	EXTERNAL HEAT EXCHANGER
TRADE NAME/COMMON TYPE	STEAM TUBE BUNDLE
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** FANS	
DESIGN	NR
FUNCTION	NR
APPLICATION	NR
SERVICE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR

SOUTH CAROLINA PUBLIC SERVICE: CROSS 2 (CONT.)

LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	NR
DEVICE TYPE	NR
** PUMPS	
SERVICE	NUMBER
-----	-----
NA	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	NA
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	FIXATION
DEVICE	NR
PROPRIETARY PROCESS	CONVERSION SYSTEMS 'POZ-O-TEC'
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
SITE TREATMENT	NONE
** WATER BALANCE	
WATER LOOP TYPE	CLOSED

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

10/83	SYSTEM							744			
11/83	SYSTEM							720			
12/83	SYSTEM							744			

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD SYSTEM AT CROSS 2 BECAME OPERATIONAL IN OCTOBER 1983. COMMERCIAL START-UP IS SCHEDULED FOR MAY 1984. DURING THE FOURTH QUARTER, THE SYSTEM WAS IN THE SHAKEDOWN/DEBUGGING PHASE OF OPERATION.

1/84	SYSTEM							744			
2/84	SYSTEM							696			
3/84	SYSTEM							744			

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD SYSTEM WAS STILL IN THE START UP PHASE OF OPERATION DURING THE FIRST QUARTER OF 1984. CERTIFICATION TESTING WAS CONDUCTED AND A LIER SIEGLER IN-LINE MONITOR WAS INSTALLED.

4/84	SYSTEM							720			

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

5/84 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

COMMERCIAL OPERATIONS COMMENCED DURING MAY, 1984.

6/84 SYSTEM 720

7/84	A	95.6	0.0		0.0				
	B	99.9	99.8	99.8	99.2				
	C	99.9	98.9	99.0	98.3				
	SYSTEM	100.0	99.4	99.4	98.7	744	739	735	

8/84 SYSTEM 740

9/84	A	50.6	47.9		45.9				
	B	57.2	57.1		54.7				
	C	24.8	1.6		1.5				
	SYSTEM	66.3	53.3		51.0	720	689	367	71.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT PLUGGED INTERFACE TRAYS AND NOZZLES ALONG WITH OTHER PROBLEMS WERE THE CAUSE OF POOR FGD PERFORMANCE DURING SEPTEMBER.

THE ABSORBERS HAD TO BE SECURED DUE TO THICKENER UPSETS IN SEPTEMBER THIS WAS NECESSARY IN ORDER TO KEEP FROM HAVING CONTAMINATED SUPERNATANT FROM ENTERING THE SYSTEM AS SEAL WATER.

THE UTILITY ALSO MADE MODIFICATIONS TO WASH SLURRY TANKS AND INTERFACE NOZZLES.

9/84 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY HAS BEEN BURNING SMALL AMOUNTS OF OIL ON START UP AND SHUT DOWN DUE TO FLAME SENSING PROBLEMS. SINCE THE SYSTEM SUPPLIER WILL NOT WARRANTY THE ABSORBER LINER DURING THIS ACTIVITY, THE UTILITY IS OPERATING UNDER THE FOLLOWING STIPULATIONS:

- (1) BOTH ESP'S WILL BE ON DURING OIL BURNS.
- (2) OIL BURNING WILL BE MINIMAL TO NONEXISTENT.

THE UTILITY REPORTED THAT MECHANICAL PROBLEMS WITH THE DAMPERS HAVE OCCURRED SINCE START UP.

THE UTILITY REPORTED THAT MIST ELIMINATOR PLUGGAGE HAS BEEN A PROBLEM SINCE COMMERCIAL START UP. THE SYSTEM SUPPLIER IS MODIFYING THE CHEVRON SPACES AND THE WASH SLURRY SYSTEM TO HELP MINIMIZE PLUGGAGE.

10/84	A	76.2	40.7		27.4				
	B	78.0	71.3		48.2				
	C	80.9	83.7		56.5				
	SYSTEM	100.0	97.8		66.0	744	502	491	47.2

11/84	A	69.5	55.6		32.5				
	B	73.7	53.6		31.3				
	C	72.1	72.2		42.2				
	SYSTEM	100.0	90.7		53.0	720	421	382	34.7

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: CROSS 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN PART OF OCTOBER AND NOVEMBER FOR A SCHEDULED
 MAINTENANCE OUTAGE.

12/84	A	93.1	2.2	1.1				
	B	68.4	97.2	51.5				
	C	91.5	98.2	52.0				
	SYSTEM	100.0	98.8	52.3	744	394	389	36.4

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED ANOTHER UNIT OUTAGE WAS INITIATED ON DECEMBER
 18 AND CONTINUED FOR THE REMAINDER OF THE MONTH. THIS ACCOUNTED FOR
 THE LOW SYSTEM UTILIZATION FOR DECEMBER.

1/85	A	73.9	0.0	0.0	0.0			
	B	100.0	94.8	97.2	81.6			
	C	100.0	95.2	97.6	81.9			
	SYSTEM	100.0	95.0	97.4	81.7	744	640	608 55.6

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THIS STATION IS HELD TO SUBPART DA OF CFR 60.40.
 COMPLIANCE LEVELS ARE MAINTAINED ON A 30-DAY ROLLING AVERAGE FOR SO2, NOX
 AND SO2 % REDUCTION. ENDING AVERAGES FOR THE MONTH WERE: SO2, 0.406;
 NOX, 0.489; SO2% REDUCTION, 77.9. NO MAJOR PARTICULATE OR OPACITY
 VIOLATIONS WERE REPORTED.

2/85	A	100.0	2.6	2.6	2.2			
	B	100.0	98.0	99.9	82.1			
	C	100.0	98.0	100.0	82.2			
	SYSTEM	100.0	99.3	100.0	83.2	672	563	559 43.9

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED ENDING EMISSIONS AVERAGES FOR SO2, NOX AND SO2%
 REDUCTION DATA WERE: SO2, 0.406; NOX, 0.466; SO2% REDUCTION, 77.73. NO
 MAJOR PARTICULATE OR OPACITY VIOLATIONS OCCURRED IN FEBRUARY.

3/85	A	100.0	12.5	12.6	12.5			
	B	100.0	87.5	87.7	87.4			
	C	100.0	90.6	90.8	90.5			
	SYSTEM	100.0	95.3	95.5	95.2	744	743	708 62.5

** PROBLEMS/SOLUTIONS/COMMENTS

LOW LOADS DICTATED ONE MODULE OPERATION, THE TIME SHOWN REFLECTS TWO
 MODULE OPERATIONS FOR THE MONTHS OF JANUARY THROUGH MARCH.

END OF THE MONTH EMISSIONS AVERAGES REPORTED BY THE UTILITY FOR SO2, NOX
 AND SO2% REDUCTION WERE: SO2, 0.441; NOX, 0.446; SO2% REDUCTION, 75.21.
 NO MAJOR PARTICULATE OR OPACITY VIOLATIONS OCCURRED DURING THE MONTH.

4/85	A	99.9	74.3	74.3	74.2			
	B	99.9	91.9	91.9	91.7			
	C	99.9	100.0	100.0	99.9			
	SYSTEM	100.0	100.0	100.0	100.0	720	719	720 70.1

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987
SOUTH CAROLINA PUBLIC SERVICE: CROSS 2 (CONT.)

-----PERFORMANCE DATA-----
PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

END OF THE MONTH EMISSIONS AVERAGES REPORTED BY THE UTILITY FOR SO2, NOX, AND SO2% REDUCTION WERE; SO2, 0.459; NOX, 0.451; SO2% REDUCTION, 74.27. NO PARTICULATE OR OPACITY VIOLATIONS OCCURRED IN APRIL.

5/85	A	66.6	84.1	83.8	52.3				
	B	66.6	96.5	96.2	60.0				
	C	66.6	82.2	81.9	51.1				
	SYSTEM	99.9	100.0	100.0	81.7	744	462	608	44.2

** PROBLEMS/SOLUTIONS/COMMENTS

END OF THE MONTH EMISSIONS AVERAGES REPORTED BY THE UTILITY FOR SO2, NOX, AND SO2% REDUCTION WERE; SO2, 0.468; NOX, 0.459; SO2% REDUCTION, 74.0. NO MAJOR PARTICULATE OR OPACITY VIOLATION OCCURRED DURING THE MONTH OF MAY.

THE BOILER HOURS LOGGED WERE LOWER BECAUSE A SPRING MAINTENANCE OUTAGE TOOK PLACE DURING THE MONTH.

6/85	A	100.0	85.9	86.1	85.9				
	B	100.0	90.1	90.3	90.1				
	C	100.0	65.5	65.6	65.4				
	SYSTEM	100.0	100.0	100.0	100.0	720	720	720	64.8

** PROBLEMS/SOLUTIONS/COMMENTS

END OF THE MONTH EMISSIONS AVERAGES REPORTED BY THE UTILITY FOR SO2 AND SO2% REDUCTION WERE; SO2, 0.430; AND SO2% REDUCTION, 75.03. NO MAJOR PARTICULATE OR OPACITY VIOLATION OCCURRED IN JUNE.

7/85	SYSTEM	86.0				744			14.0
8/85	SYSTEM	97.0				744			9.0
9/85	SYSTEM	69.0				720			14.0

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTHS OF JULY THROUGH SEPTEMBER.

10/85	A	87.1	69.5	69.5	58.5				
	B	87.1	90.1	90.2	75.9				
	C	87.1	94.9	94.9	79.9				
	SYSTEM	100.0	100.0	100.0	100.0	744	627	744	63.8

** PROBLEMS/SOLUTIONS/COMMENTS

END OF THE MONTH EMISSIONS AVERAGES REPORTED BY THE UTILITY FOR SO2, NOX, AND SO2% REDUCTIONS WERE: SO2, 0.421; NOX, 0.378; SO2% REDUCTION, 73.44. NO PARTICULATE OR OPACITY VIOLATIONS OCCURRED DURING THE MONTH OF OCTOBER.

11/85	A	100.0	100.0	100.0	100.0				
	B	100.0	99.8	99.8	99.8				
	C	100.0	99.4	99.4	99.4				
	SYSTEM	100.0	100.0	100.0	100.0	720	720	720	75.3

** PROBLEMS/SOLUTIONS/COMMENTS

END OF THE MONTH EMISSIONS AVERAGES REPORTED BY THE UTILITY FOR SO2, NOX, AND SO2% REDUCTION WERE: SO2, 0.457; NOX, 0.418; SO2% REDUCTION, 73.75. NO PARTICULATE OR OPACITY VIOLATIONS OCCURRED IN NOVEMBER.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: CROSS 2 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
12/85	A	100.0	99.4	99.4	99.4						
	B	100.0	99.8	99.8	99.8						
	C	100.0	99.8	99.8	99.8						
	SYSTEM	100.0	100.0	100.0	100.0			744	744	744	74.8

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS OF JANUARY THROUGH DECEMBER.

END OF THE MONTH EMISSIONS AVERAGES REPORTED BY THE UTILITY FOR SO2, NOX, AND SO2% REDUCTION WERE: SO2, 0.456; NOX, 0.424; SO2% REDUCTION, 73.67. THE UTILITY REPORTED THAT ONE 48 MINUTE OPACITY VIOLATION OCCURRED AS A RESULT OF A DECEMBER BOILER UPSET.

1/86	A	100.0	100.0		100.0						
	B	100.0	100.0		100.0						
	C	100.0	99.5		99.5						
	SYSTEM	100.0	100.0	100.0	100.0			744	744	744	81.8

** PROBLEMS/SOLUTIONS/COMMENTS

END OF THE MONTH EMISSIONS AVERAGES REPORTED BY THE UTILITY FOR SO2 (LBS/MMBTU), NOX (LBS/MMBTU), AND SO2 (%) REDUCTION WERE: 0.45, 0.41, AND 73.46 RESPECTIVELY. NO PARTICULATE OR OPACITY VIOLATIONS OCCURRED IN JANUARY.

2/86	A	99.8	99.5		99.5						
	B	99.8	99.8		99.8						
	C	99.8	99.1		99.1						
	SYSTEM	100.0	100.0	99.8	100.0			672	672	672	75.1

** PROBLEMS/SOLUTIONS/COMMENTS

END OF THE MONTH EMISSIONS AVERAGES REPORTED BY THE UTILITY FOR SO2 (LBS/MMBTU), NOX (LBS/MMBTU), AND SO2 (%) REDUCTION WERE: 0.49, 0.44, AND 73.21 RESPECTIVELY. NO PARTICULATE OR OPACITY VIOLATIONS OCCURRED EXCEPT FOR A 24 MINUTE BOILER UPSET INCIDENT CAUSED BY A B-MODULE ID FAN TRIP.

3/86	A	100.0	99.5		97.1						
	B	100.0	99.5		97.1						
	C	99.6	99.0		96.7						
	SYSTEM	100.0	100.0	100.0	100.0			744	726	744	71.7

** PROBLEMS/SOLUTIONS/COMMENTS

END OF THE MONTH EMISSIONS AVERAGES REPORTED BY THE UTILITY FOR SO2 (LBS/MMBTU), NOX (LBS/MMBTU), AND SO2 (%) REDUCTION WERE: 0.51, 0.43, AND 72.19 RESPECTIVELY. NO PARTICULATE OR OPACITY VIOLATIONS OCCURRED EXCEPT THAT CAUSED BY ONE UNSCHEDULED UNIT TRIP AND RESTART.

4/86	SYSTEM							720			

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTH OF APRIL.

5/86	A	0.0			0.0						
	B	0.0			0.0						
	C	0.0			0.0						
	SYSTEM	0.0			0.0			744	0	0	0.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: CROSS 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FOR TURBINE WARRANTY INSPECTION THROUGHOUT THE MONTH OF MAY. MODULE CLEAN-OUT AND INSPECTION DURING THIS TIMEFRAME ACCOUNTS FOR THEIR UNAVAILABILITY.

6/86	A	100.0	90.1	84.2				
	B	100.0	57.0	53.2				
	C	100.0	67.1	62.7				
	SYSTEM	100.0	100.0	97.8	720	672	704	67.6

** PROBLEMS/SOLUTIONS/COMMENTS

END OF THE MONTH EMISSIONS AVERAGES REPORTED BY THE UTILITY FOR SO2 (LBS/MMBTU), NOX (LBS/MMBTU), AND SO2 (%) REDUCTION WERE: 0.46, 0.44, AND 73.16 RESPECTIVELY. NO PARTICULATE OR OPACITY VIOLATIONS OCCURRED IN JUNE. LOW BOILER HOURS REFLECT THE COMPLETION OF THE TURBINE INSPECTION OUTAGE BEGUN IN MAY.

7/86	A	100.0	67.4	67.3				
	B	100.0	72.7	72.6				
	C	100.0	85.2	85.1				
	SYSTEM	100.0	100.0	100.0	744	743	744	71.6

8/86	A	100.0	87.4	87.2				
	B	100.0	86.8	86.6				
	C	100.0	75.4	75.2				
	SYSTEM	100.0	100.0	100.0	744	742	744	71.1

9/86	A	100.0	100.0	100.0				
	B	100.0	98.6	98.6				
	C	100.0	96.8	96.8				
	SYSTEM	100.0	100.0	100.0	720	720	720	89.1

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD JULY THROUGH OCTOBER.

10/86	A	67.7	97.8	65.8				
	B	67.7	77.5	52.2				
	C	61.4	81.1	54.6				
	SYSTEM	98.5	100.0	86.3	744	501	642	52.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE LOW UTILIZATION VALUES WERE DUE TO A SCHEDULED FALL MAINTENANCE OUTAGE.

11/86	A	100.0	92.3	77.8				
	B	100.0	92.3	77.8				
	C	100.0	91.3	77.0				
	SYSTEM	100.0	100.0	100.0	720	607	720	64.4

** PROBLEMS/SOLUTIONS/COMMENTS

A SHUTDOWN DUE TO ASH HANDLING PROBLEMS RESULTED IN THE LOW CAPACITY UTILIZATION VALUES REPORTED.

12/86	A	88.0	91.5	79.9				
	B	87.1	95.5	83.3				
	C	87.1	91.9	80.2				
	SYSTEM	100.0	100.0	100.0	744	649	744	74.3

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: CROSS 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MONTH OF
 DECEMBER.

1/87	A	100.0	99.1	98.5				
	B	100.0	97.1	96.5				
	C	100.0	94.9	94.4				
	SYSTEM	100.0	100.0	100.0	744	739	744	72.3

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR JANUARY.

2/87	A	100.0	93.2	67.1				
	B	100.0	97.5	70.2				
	C	100.0	97.3	70.0				
	SYSTEM	100.0	100.0	100.0	672	484	672	59.0

** PROBLEMS/SOLUTIONS/COMMENTS

LOW UTILIZATION VALUES RESULTED FROM A MAINTENANCE OUTAGE SCHEDULED TO
 REPAIR BOILER TUBE LEAKS.

3/87	A	100.0	98.2	83.0				
	B	100.0	97.4	82.3				
	C	100.0	98.9	83.6				
	SYSTEM	100.0	100.0	100.0	744	629	744	72.0

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR MARCH.

4/87	A	33.0	96.9	31.9				
	B	37.3	98.4	32.5				
	C	41.5	98.0	32.3				
	SYSTEM	55.9	100.0	48.4	720	237	348	28.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE LOW UTILIZATION FACTOR WAS CAUSED BY A SCHEDULED SPRING MAINTENANCE ,
 OUTAGE.

5/87	A	97.9	94.9	94.9				
	B	99.3	99.1	99.0				
	C	98.7	97.5	97.4				
	SYSTEM	100.0	100.0	100.0	744	744	744	92.1

6/87	A	83.4	99.0	82.3				
	B	84.5	99.4	82.6				
	C	83.4	94.0	78.2				
	SYSTEM	100.0	100.0	100.0	720	598	720	70.5

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MONTHS OF MAY
 OR JUNE.

7/87	A	97.3	99.2	95.7				
	B	97.3	99.9	96.3				
	C	97.2	98.8	95.3				
	SYSTEM	100.0	100.0	100.0	744	717	744	82.7

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: CROSS 2 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER HOURS	BCILER HOURS	FGD HOURS	CAP. FACTOR
8/87	A	100.0	100.0		100.0						
	B	99.5	99.5		99.5						
	C	98.5	98.5		98.5						
	SYSTEM	100.0	100.0		100.0		744	744	744	87.9	
9/87	A	98.3	97.9		97.2						
	B	100.0	99.6		98.9						
	C	98.8	98.0		97.2						
	SYSTEM	100.0	100.0		100.0		720	714	720	85.0	
10/87	A	100.0	98.4		98.2						
	B	100.0	98.4		98.2						
	C	100.0	98.4		98.2						
	SYSTEM	100.0	100.0		100.0		744	743	744	87.1	

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD JULY THROUGH OCTOBER 1987.

11/87	A	50.8	0.0		0.0						
	B	51.7	0.0		0.0						
	C	51.8	0.0		0.0						
	SYSTEM	77.2	0.0		0.0		720	349	0	38.1	

** PROBLEMS/SOLUTIONS/COMMENTS

THE LOW CAPACITY UTILIZATION WAS DUE TO A SCHEDULED FALL MAINTENANCE OUTAGE.

12/87	A	99.6	99.5		99.5						
	B	99.1	98.9		98.9						
	C	98.8	98.4		98.4						
	SYSTEM	100.0	100.0		100.0		744	744	744	91.3	

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR DECEMBER.

DO NOT MICROFILM
THIS COPY

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SOUTH CAROLINA PUBLIC SERVICE	
PLANT NAME	WINYAH	
UNIT NUMBER	2	
CITY	GEORGETOWN	
STATE	SOUTH CAROLINA	
REGULATORY CLASSIFICATION	C	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO ₂ EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NO _x EMISSION LIMITATION - NG/J	301.	(0.700 LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	519	
GROSS UNIT GENERATING CAPACITY - MW	315	
NET UNIT GENERATING CAPACITY W/FGD - MW	260	
NET UNIT GENERATING CAPACITY WO/FGD - MW	263	
EQUIVALENT SCRUBBED CAPACITY - MW	158	

*** UNIT DATA - BOILER AND STACK

BOILER SUPPLIER	BABCOCK & WILCOX	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	384.14	(814030 ACFM)
BOILER FLUE GAS TEMPERATURE - C	132.2	(270 F)
STACK HEIGHT - M	122.	(400 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	4.9	(16.0 FT)

*** FUEL DATA

FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	26749.	(11500 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		****
AVERAGE ASH CONTENT - %	14.00	
RANGE ASH CONTENT - %	****	
AVERAGE MOISTURE CONTENT - %	*****	
RANGE MOISTURE CONTENT - %	6.5-7.0	
AVERAGE SULFUR CONTENT - %	1.00	
RANGE SULFUR CONTENT - %	****	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	

*** PARTICLE CONTROL

*** MECHANICAL COLLECTOR

NUMBER	0
TYPE	NONE

*** ESP

NUMBER	1	
NUMBER OF SPARES	0	
TYPE	COLD SIDE	
SUPPLIER	RESEARCH-COTTRELL	
INLET FLUE GAS CAPACITY - CU.M/S	384.1	(814030 ACFM)
INLET FLUE GAS TEMPERATURE - C	132.2	(270 F)
PRESSURE DROP - KPA	0.1	(1. IN-H ₂ O)
PARTICLE REMOVAL EFFICIENCY - %	99.4	

*** PARTICLE SCRUBBER

NUMBER	0
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON NAME	N/A
SHELL GENERIC MATERIAL	N/A
SHELL SPECIFIC MATERIAL	N/A
LINER GENERIC MATERIAL	N/A
LINER SPECIFIC MATERIAL	N/A
GAS CONTACTING DEVICE TYPE	N/A

*** FGD SYSTEM

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

**** GENERAL DATA**
 SALEABLE PRODUCT/THROWAWAY PRODUCT THROWAWAY PRODUCT
 SO2 REMOVAL MODE WET SCRUBBING
 PROCESS TYPE LIMESTONE
 PROCESS ADDITIVES NONE
 SYSTEM SUPPLIER BABCOCK & WILCOX
 A-E FIRM BURNS & ROE
 DEVELOPMENT LEVEL FULL SCALE
 NEW/RETROFIT NEW
 UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - % 99.40
 UNIT DESIGN SO2 REMOVAL EFFICIENCY - % 45.00
 ENERGY CONSUMPTION - % 1.0
 CURRENT STATUS 1
 COMMERCIAL START-UP 7/1977
 INITIAL START-UP 7/1977

**** DESIGN AND OPERATING PARAMETERS**
 DESIGN CHLORIDE CONTENT - % *****
 OPER. & MAINT. REQUIREMENT - MANHR/DAY 80.0

**** QUENCHER/PRESATURATOR**
 NUMBER 1
 TYPE VARIABLE THROAT VENTURI
 SUPPLIER BABCOCK & WILCOX
 INLET GAS FLOW - CU. M/S 192.06 (407000 ACFM)
 INLET GAS TEMPERATURE - C 135.6 (276 F)
 PRESSURE DROP - KPA 0.7 (3.0 IN-H2O)
 LIQUID RECIRCULATION RATE - LITERS/S 369. (5860 GPM)
 L/G RATIO - L/CU. M 1.9 (14.4 GAL/1000 ACFM)
 CONSTRUCTION MATERIAL GENERIC TYPE CARBON STEEL
 CONSTRUCTION MATERIAL SPECIFIC TYPE AISI 1110

**** ABSORBER**
 NUMBER 1
 NUMBER OF SPARES 0
 GENERIC TYPE TRAY TOWER
 SPECIFIC TYPE SIEVE TRAY
 TRADE NAME/COMMON TYPE N/A
 SUPPLIER BABCOCK & WILCOX
 SHELL GENERIC MATERIAL CARBON STEEL
 SHELL SPECIFIC MATERIAL AISI 1110
 SHELL MATERIAL TRADE NAME/COMMON TYPE N/A
 LINER GENERIC MATERIAL ORGANIC
 LINER SPECIFIC MATERIAL NATURAL RUBBER
 LINER MATERIAL TRADE NAME/COMMON TYPE BLACK NATURAL RUBBER
 GAS CONTACTING DEVICE TYPE PERFORATED TRAY 'TYPE 316L STAINLESS STEEL; ONE
 NUMBER OF CONTACTING ZONES 2
 LIQUID RECIRCULATION RATE - LITER/S 863. (13700 GPM)
 L/G RATIO - L/CU.M 5.4 (40.5 GAL/1000 ACF)
 GAS-SIDE PRESSURE DROP - KPA 1.2 (5.0 IN-H2O)
 SUPERFICIAL GAS VELOCITY - M/SEC 3.2 (10.5 FT/S)
 INLET GAS FLOW - CU. M/S 159.50 (338000 ACFM)
 INLET GAS TEMPERATURE - C 52.2 (126 F)
 SO2 REMOVAL EFFICIENCY - % 69.0

**** MIST ELIMINATOR**
 PRE-MIST ELIMINATOR/MIST ELIMINATOR PRIMARY COLLECTOR
 NUMBER PER SYSTEM 1
 NUMBER OF SPARES PER SYSTEM 0
 NUMBER PER MODULE 1
 GENERIC TYPE IMPINGEMENT
 SPECIFIC TYPE BAFFLE
 TRADE NAME/COMMON TYPE CLOSED VANE
 CONFIGURATION HORIZONTAL
 NUMBER OF STAGES 2
 NUMBER OF PASSES PER STAGE 3
 PRESSURE DROP - KPA 0.2 (1.0 IN-H2O)
 CONSTRUCTION MATERIAL GENERIC TYPE ORGANIC
 CONSTRUCTION MATERIAL SPECIFIC TYPE FIBER-REINFORCED POLYESTER
 WASH WATER SOURCE BLENDED '50% RETURN, 50% FRESH!

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

WASH FREQUENCY	ONCE PER 2 MINUTES
WASH RATE - L/S	11.4 (180 GAL/MIN)
** REHEATER	
GENERIC TYPE	BYPASS
SPECIFIC TYPE	COLD SIDE
TRADE NAME/COMMON TYPE	N/A
LOCATION	100 FT BELOW INLET OF SCRUBBED GAS BREECHING IN
PERCENT GAS BYPASSED - AVG	50.0
TEMPERATURE INCREASE - C	38.9 (70 F)
INLET FLUE GAS FLOW RATE - CU. M/S	192.07 (407015 ACFM)
INLET FLUE GAS TEMPERATURE - C	52.2 (126 F)
OUTLET FLUE GAS TEMPERATURE - C	91.1 (196 F)
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** FANS	
NUMBER	1
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
SUPPLIER	WESTINGHOUSE
FUNCTION	BOOSTER
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	192.06 (407000 ACFM)
FLUE GAS TEMPERATURE - C	132.2 (270 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
NUMBER	1
FUNCTION	SHUT-OFF
GENERIC TYPE	GUILLOTINE
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	HIGH STRENGTH LOW ALLOY 'HSLA'
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	1
FUNCTION	SHUT-OFF
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	HIGH STRENGTH LOW ALLOY 'HSLA'
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
** DAMPERS	
NUMBER	1
FUNCTION	CONTROL
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	HIGH STRENGTH LOW ALLOY 'HSLA'
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	SCRUBBER INLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	HIGH STRENGTH LOW ALLOY 'HSLA'
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	SCRUBBER OUTLET TO DAMPER
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	HIGH STRENGTH LOW ALLOY 'HSLA'
LINER GENERIC MATERIAL TYPE	ORGANIC; INORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER; HYDRAULICALLY-BOND

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

** DUCTWORK	
LOCATION	SCRUBBER OUTLET DAMPER TO STACK
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	HIGH STRENGTH LOW ALLOY 'HSLA'
LINER GENERIC MATERIAL TYPE	HIGH ALLOY
LINER SPECIFIC MATERIAL TYPE	NICKEL BASE/CHROMIUM-IRON-MOLYBDENUM
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED
DEVICE TYPE	NR
MANUFACTURER	KOPPERS
NUMBER	1
NUMBER OF SPARES	0
PRODUCT QUALITY - % SOLIDS	35.0
** TANKS	
SERVICE	NUMBER
-----	-----
VENTURI RECYCLE	****
ABSORBER RECYCLE	****
SLURRY STORAGE	****
RECYCLE WATER	****
MILL PRODUCT SUMP	****
GRIT SEPARATOR	****
** PUMPS	
SERVICE	NUMBER
-----	-----
VENTURI RECIRCULATION	1
ABSORBER RECIRCULATION	1
SLURRY FEED	****
MILL PRODUCT	****
RECYCLE WATER	****
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	DEWATERED
DEVICE	N/A
PROPRIETARY PROCESS	N/A
** DISPOSAL	
NATURE	FINAL
TYPE	POND
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	PIPELINE
SITE TREATMENT	NONE
SITE DIMENSIONS	35 ACRES, 12-15 FT
SITE CAPACITY - CU.M	574810 (470.0 ACRE-FT)
** WATER BALANCE	
WATER LOOP TYPE	OPEN
MAKEUP WATER ADDITION - LITERS/S	6.3 (100 GPM)
** CHEMICALS AND CONSUMPTION	
FUNCTION	ABSORBENT
NAME	LIMESTONE
PRINCIPAL CONSTITUENT	90% CaCO ₃ , 2.5% MgCO ₃
CONSUMPTION	46 TPD
UTILIZATION - %	87.0
POINT OF ADDITION	BALL MILL

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

** FGD SPARE CAPACITY INDICES

ABSORBER - %	0.0
MIST ELIMINATOR - %	0.0
FAN - %	0.0
BALL MILL - %	0.0

** FGD SPARE COMPONENT INDICES

ABSORBER	0.0
MIST ELIMINATOR	0.0
FAN	0.0
BALL MILL	0.0

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD CAP. HOURS FACTOR
7/77	SYSTEM							744	
** PROBLEMS/SOLUTIONS/COMMENTS									
INITIAL OPERATION OF THE WINYAH 2 FGD SYSTEM TOOK PLACE IN JULY.									
8/77	SYSTEM	90.0						744	
9/77	SYSTEM	90.0						720	
** PROBLEMS/SOLUTIONS/COMMENTS									
THE FGD SYSTEM WAS REPORTEDLY AVAILABLE 90% OF THE AUGUST-SEPTEMBER 10/26 TO 10/30. MONITORS.									
10/77	SYSTEM	100.0						744	
11/77	SYSTEM	100.0						720	
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING THE OCTOBER-NOVEMBER PERIOD THE FGD SYSTEM WAS AVAILABLE 100% OF 10/26 TO 10/30. INSTRUMENTATION PROBLEMS.									
12/77	SYSTEM							744	
** PROBLEMS/SOLUTIONS/COMMENTS									
AN ACCEPTANCE TEST WAS RUN IN DECEMBER; HOWEVER, THE RESULTS WERE REJECTED 10/26 TO 10/30.									
1/78	SYSTEM							744	
** PROBLEMS/SOLUTIONS/COMMENTS									
IN EARLY JANUARY THE SYSTEM WENT DOWN TO FOR TWO DAYS TO CHECK THE INSTRU- 10/26 TO 10/30.									
THE SO2 MONITORS HAVE AGAIN MALFUNCTIONED.									
ALL THE SAMPLE LINES HAVE BEEN REPLACED AND NEW HEAT TRACINGS HAVE BEEN 10/26 TO 10/30.									
2/78	SYSTEM							672	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS BYPASSED FOR SEVERAL DAYS IN FEBRUARY TO ALLOW SYSTEM
 10/26 TO 10/30.

3/78	SYSTEM					744			
4/78	SYSTEM					720			
5/78	SYSTEM					744			

** PROBLEMS/SOLUTIONS/COMMENTS

SOME MINOR SCALING WAS ENCOUNTERED DURING THE APRIL-MAY PERIOD BUT IT
 10/26 TO 10/30.

6/78	SYSTEM	100.0		94.3		720	679	679	
7/78	SYSTEM	100.0		97.0		744	722	722	

** PROBLEMS/SOLUTIONS/COMMENTS

ONE SCHEDULED BOILER OUTAGE OCCURRED IN JUNE FOR THE INSTALLATION OF A
 10/26 TO 10/30.
 OUTAGES WERE REPORTED.

8/78	SYSTEM					744			

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED NO FORCED FGD OUTAGES DURING AUGUST.

9/78	SYSTEM					720			

** PROBLEMS/SOLUTIONS/COMMENTS

THE SO2 ANALYZERS PERFORMED WELL DURING A TWO WEEK CERTIFICATION TEST
 10/26 TO 10/30.

10/78	SYSTEM			0.0		744	0	0	0.0
11/78	SYSTEM					720			

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM OCTOBER 1 TO NOVEMBER 15 FOR A TURBINE INSPECTION.
 10/26 TO 10/30.

12/78	SYSTEM	84.8	82.6	82.6	82.1	744	740	611	89.3

** PROBLEMS/SOLUTIONS/COMMENTS

SO2 MONITOR PROBLEMS CONTINUED THROUGH DECEMBER.

AN OUTAGE WAS NECESSARY FOR AN ABSORBER PUMP BELT RENEWAL.

FEED SLURRY FLOWMETER PROBLEMS WERE ENCOUNTERED DURING DECEMBER.

THE LIMESTONE MILL OIL PUMP PROBLEMS TRIPPED THE MILL OFF LINE A NUMBER
 10/26 TO 10/30.

A MINOR OUTAGE WAS CAUSED BY PLUGGING OF THE SLURRY DELIVERY LINE.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987
SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

-----PERFORMANCE DATA-----
PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
SO2 PART. HOURS HOURS HOURS FACTOR

QUENCHER PROBLEMS OCCURRED DURING DECEMBER.

1/79	SYSTEM	99.7	99.7	99.7	99.7	744	744	742	89.3
2/79	SYSTEM	96.6	96.3	96.4	92.7	672	647	623	75.4
3/79	SYSTEM	96.5	96.4	96.4	92.7	744	716	690	75.3

** PROBLEMS/SOLUTIONS/COMMENTS

AN OUTAGE WAS REQUIRED TO RENEW QUENCHER PUMP BELTS AND FOR REPAIRS TO A
10/26 TO 10/30.

OUTAGES WERE REQUIRED TO REPAIR A HOLE IN THE FEED SLURRY LINE, TO INSPECT
10/26 TO 10/30.

THE OPERATING VALUES SHOWN ARE THE FIGURES FOR FEBRUARY AND MARCH COMBINED

4/79	SYSTEM	99.4	99.4	99.4	99.4	720	720	716	67.6

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE SO2 MONITOR HAS PASSED THE STATE CERTIFICA-
10/26 TO 10/30.

A MALFUNCTION OF THE RECIRCULATION TANK LEVEL INDICATOR RESULTED IN A LOW
10/26 TO 10/30.

5/79	SYSTEM	98.4	98.7	100.0	95.6	744	721	711	75.1

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE SO2 MONITOR SAMPLE PUMP REQUIRES MAINTENANCE
10/26 TO 10/30.

A BOILER OUTAGE ALLOWED TIME FOR CLEANING ABSORBER TRAYS, UNPLUGGING FOUR
10/26 TO 10/30.

6/79	SYSTEM	92.4	92.3	92.1	91.6	720	716	660	79.8

** PROBLEMS/SOLUTIONS/COMMENTS

FOUR OUTAGES IN JUNE WERE DUE TO PLUGGED ABSORBER NOZZLES. THE PRIMARY
10/26 TO 10/30.
WAS LEFT OUT DURING THE PREVIOUS OUTAGE.

A HEAVY SCALE BUILD-UP IN THE SUMP BELOW THE VENTURI WAS NOTED.

THE UTILITY REPORTED THAT MGO TESTING HAS BEGUN.

7/79	SYSTEM	98.4	98.4	98.4	97.8	744	740	727	81.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE ABSORBER WAS FORCED OFF-LINE ONCE DURING JULY DUE TO QUENCHER PUMP
10/26 TO 10/30.

SOME PLUGGING WAS ENCOUNTERED WITH ONE OF THE ABSORBER NOZZLES.

SOME OUTAGE TIME WAS NEEDED TO INSTALL A QUENCHER WALL WASH NOZZLE.

TESTS WITH THE ADDITION OF MGO DURING THE MONTH SHOWED IMPROVED SO2
10/26 TO 10/30.
PREVENTED CONCLUSIVE TEST RESULTS.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
8/79	SYSTEM	99.4	99.0	99.4	98.1		744	737	730	88.0
** PROBLEMS/SOLUTIONS/COMMENTS										
A FOUR HOUR OUTAGE RESULTED FROM BOOSTER FAN CONTROL PROBLEMS.										
A NEW PORT FOR THE SCRUBBER OUTLET GAS SAMPLE PROBE HAD TO BE INSTALLED. 10/26 TO 10/30.										
9/79	SYSTEM						720			
10/79	SYSTEM						744			
11/79	SYSTEM						720			
12/79	SYSTEM						744			
** PROBLEMS/SOLUTIONS/COMMENTS										
NO INFORMATION WAS AVAILABLE FOR THIS REPORT PERIOD.										
1/80	SYSTEM						744			
2/80	SYSTEM						696			
3/80	SYSTEM						744			
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING THE FIRST QUARTER OF 1980 NO MAJOR FGD RELATED PROBLEMS WERE 10/26 TO 10/30.										
4/80	SYSTEM	100.0	100.0	100.0	85.3		720	614	614	60.2
5/80	SYSTEM	95.8	94.9	94.9	77.7		744	609	578	61.9
** PROBLEMS/SOLUTIONS/COMMENTS										
THE FGD SYSTEM WAS OFF LINE THROUGH PART OF MAY TO WASH DOWN THE ABSORBER 10/26 TO 10/30.										
6/80	SYSTEM	100.0	100.0	100.0	99.6		720	718	718	76.6
** PROBLEMS/SOLUTIONS/COMMENTS										
NUMEROUS LEAKS IN THE FGD SYSTEM WERE REPAIRED THROUGHOUT THE PERIOD WHILE 10/26 TO 10/30. WERE REPORTED FOR APRIL, MAY, OR JUNE.										
7/80	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	75.3
** PROBLEMS/SOLUTIONS/COMMENTS										
NO OPERATIONAL PROBLEMS WERE REPORTED DURING JULY.										
8/80	SYSTEM	99.7	99.7	99.7	88.3		744	659	657	74.0
** PROBLEMS/SOLUTIONS/COMMENTS										
THE GRIT SEPARATOR PLUGGED CAUSING A TWO HOUR OUTAGE. THE FGD SYSTEM 10/26 TO 10/30.										
9/80	SYSTEM	96.5	100.0	100.0	87.2		720	629	629	73.4

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER AND FGD SYSTEM WENT DOWN FOR A SCHEDULED MAINTENANCE OVERHAUL
 10/26 TO 10/30.
 SECOND TRAY IN THE ABSORBER MODULE, RENEWING DEMISTER WASH SYSTEM WITH
 ALLOY 20 PIPING, AND CLEANING SCALE DEPOSITS FROM QUENCHER THROAT.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. HOURS	FACTOR
10/80	SYSTEM	13.9	94.0	93.4	13.9		744	111	103	10.8	

** PROBLEMS/SOLUTIONS/COMMENTS

DURING OCTOBER THE INSTALLATION OF THE ADDITIONAL ABSORBER TRAY AND THE
 10/26 TO 10/30.

DURING THE SCHEDULED OVERHAUL THE MODULE WAS INSPECTED AND THE RUBBER
 10/26 TO 10/30.

THE MODULE WAS REMOVED FROM SERVICE TO REPACK THE QUENCHER PUMP AND TO
 10/26 TO 10/30.

11/80	SYSTEM	100.0	100.0	100.0	100.0		720	720	720	86.5	

12/80	SYSTEM	98.9	98.9	98.9	98.9		744	744	736	95.7	

** PROBLEMS/SOLUTIONS/COMMENTS

DURING DECEMBER THE SYSTEM WAS REMOVED FROM SERVICE DUE TO A LIMESTONE
 10/26 TO 10/30.

OUTAGE TIME DURING THE MONTH WAS ALSO CAUSED BY NECESSARY REPAIRS OF THE
 10/26 TO 10/30.

1/81	SYSTEM	99.1	99.1	99.1	99.1		744	744	737	92.3	

2/81	SYSTEM	97.0	97.0	97.0	97.0		672	672	652	88.6	

** PROBLEMS/SOLUTIONS/COMMENTS

DURING FEBRUARY THE EXPANSION JOINT ON THE QUENCHER DISCHARGE PUMP FAILED
 10/26 TO 10/30.

3/81	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	70.7	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR PROBLEMS OTHER THAN THE EXPANSION JOINT
 10/26 TO 10/30.

4/81	SYSTEM						720				

5/81	SYSTEM						744				

6/81	SYSTEM						720				

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION FOR THE SECOND QUARTER 1981 IS NOT AVAILABLE AT THIS TIME.

7/81	SYSTEM	89.4	92.8	96.1	44.2		744	355	329	33.3	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

UNIT 2 WAS OFF THREE TIMES DURING JULY AS A RESULT OF BOILER TUBE LEAKS.

THE FGD SYSTEM WAS REMOVED FROM SERVICE FOR PART OF THE MONTH TO REPAIR
10/26 TO 10/30.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER SO2 PART.	BOILER HOURS	FGD HOURS	CAP. HOURS	FACTOR
8/81	SYSTEM	98.0	98.0	98.0	98.0		744	744	730	73.9	

** PROBLEMS/SOLUTIONS/COMMENTS

THE SYSTEM WAS REMOVED FROM SERVICE ONCE DURING THE MONTH TO REPLACE THE
10/26 TO 10/30.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER SO2 PART.	BOILER HOURS	FGD HOURS	CAP. HOURS	FACTOR
9/81	SYSTEM	96.0	98.0	95.6	88.3		720	649	636	62.2	

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE MONTH, MAINTENANCE WAS PERFORMED ON THE QUENCHER SUCTION AND
10/26 TO 10/30.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER SO2 PART.	BOILER HOURS	FGD HOURS	CAP. HOURS	FACTOR
10/81	SYSTEM	31.5	71.0	72.3	30.3		744	318	226	32.4	

** PROBLEMS/SOLUTIONS/COMMENTS

UNIT WAS SHUT DOWN FOR SCHEDULED MAINTENANCE FROM OCTOBER 1 THRU OCTOBER
10/26 TO 10/30.DURING THE UNIT OUTAGE THE MODULES WERE TAKEN OUT OF SERVICE FOR MAINTEN-
10/26 TO 10/30.REPLACING AND UNPLUGGING OF THE ABSORBER NOZZLES
REPAIR LEAKING VENTURI NOZZLES
REPAIR CYCLONE SEPARATOR

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER SO2 PART.	BOILER HOURS	FGD HOURS	CAP. HOURS	FACTOR
11/81	SYSTEM	82.4	88.2	88.1	81.6		720	666	588	74.7	

** PROBLEMS/SOLUTIONS/COMMENTS

BOILER OUTAGE TIME DURING NOVEMBER WAS DUE TO A TUBE LEAK.

QUENCHER PUMP BELT PROBLEMS WERE ENCOUNTERED.

A HOLE IN THE SLURRY FEED PUMP DISCHARGE LINE CAUSED SOME SYSTEM DOWN TIME

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER SO2 PART.	BOILER HOURS	FGD HOURS	CAP. HOURS	FACTOR
12/81	SYSTEM	80.8	81.6	81.1	64.7		744	589	481	58.8	

** PROBLEMS/SOLUTIONS/COMMENTS

DURING DECEMBER THE UNIT OUTAGE TIME WAS FOR ACID CLEANING.

A LEAK IN THE DISCHARGE LINE OF THE ABSORBER PUMP CAUSED SOME SYSTEM OUTAG
10/26 TO 10/30.

PROBLEMS WERE ENCOUNTERED WITH THE QUENCHER PUMP NOT STARTING.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER SO2 PART.	BOILER HOURS	FGD HOURS	CAP. HOURS	FACTOR
1/82	SYSTEM	49.8	53.0	53.9	49.5		744	695	369	70.2	

** PROBLEMS/SOLUTIONS/COMMENTS

A SEVEN DAY OUTAGE OF THE FGD SYSTEM OCCURRED DURING JANUARY DUE TO THE
10/26 TO 10/30.

FROZEN WATER LINES CREATED PROBLEMS IN MAKING SLURRY DURING JANUARY.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

A LEAKING CYCLONE SEPARATOR ALSO CREATED PROBLEMS FOR THE FGD SYSTEM DURING 10/26 TO 10/30.

THE UNIT WAS DOWN DURING JANUARY DUE TO A BOILER TUBE LEAK.

2/82	SYSTEM	85.3	85.3	85.3	85.3	672	672	573	68.7

** PROBLEMS/SOLUTIONS/COMMENTS

PLUGGED QUENCHER AND VENTURI NOZZLES WERE CLEANED DURING FEBRUARY CAUSING 10/26 TO 10/30.

THE REPACKING OF A QUENCHER PUMP CREATED ADDITIONAL DOWN TIME DURING THE 10/26 TO 10/30.

THE REPAIR OF A HOLE IN THE ABSORBER DISCHARGE LINE ALSO RESULTED IN DOWN 10/26 TO 10/30.

3/82	SYSTEM	64.8	64.8	64.8	64.8	744	744	482	69.4

** PROBLEMS/SOLUTIONS/COMMENTS

THE REPAIR OF LEAKS IN A CYCLONE SEPARATOR RESULTED IN OUTAGE TIME FOR THE 10/26 TO 10/30.

LEAKS WERE ALSO REPAIRED IN THE ABSORBER HEADER AND ABSORBER DISCHARGE 10/26 TO 10/30.

A SIX DAY OUTAGE DURING MARCH WAS THE RESULT OF MAINTENANCE ON AN ABSORBER 10/26 TO 10/30.

4/82	SYSTEM	74.4	71.2	71.5	65.4	720	662	471	68.9

** PROBLEMS/SOLUTIONS/COMMENTS

ONE SYSTEM OUTAGE DURING APRIL WAS DUE TO A LOSS OF POWER IN A LINE TO THE 10/26 TO 10/30.

THE SYSTEM WAS TAKEN OFF-LINE TWICE DURING THE MONTH DUE TO QUENCHER PUMP 10/26 TO 10/30.

AN ABSORBER DISCHARGE HEADER LEAK REQUIRED SOME DOWN TIME DURING THE MONTH ONE OF THE RECYCLE PUMP BEARINGS FAILED AND HAD TO BE REPLACED.

THE MODULE DOWNCOMER WAS REPAIRED DURING THE MONTH.

5/82	SYSTEM	85.3	67.2	67.9	20.5	744	227	152	21.9

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF-LINE FOR THREE WEEKS DURING MAY FOR A SCHEDULED OUTAGE.

DURING THE MONTH THE SYSTEM WAS SHUT DOWN PART OF THE TIME DUE TO A LOSS 10/26 TO 10/30.

6/82	SYSTEM	64.0	14.0	14.0	14.0	720	717	101	71.2

** PROBLEMS/SOLUTIONS/COMMENTS

A LOSS OF A TRANSFORMER WHICH POWERS THE FGD SYSTEM FORCED SOME OUTAGE 10/26 TO 10/30.

THE MILL PRODUCT AND QUENCHER PUMPS WERE REPACKED DURING JUNE.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

THE LIMESTONE FEEDER MALFUNCTIONED CAUSING SYSTEM DOWN TIME DURING THE 10/26 TO 10/30.										
7/82	SYSTEM	94.8	94.8	94.8	94.8		744	744	706	78.1
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED 10/26 TO 10/30.										
8/82	SYSTEM	89.5	94.9	97.0	86.8		744	681	646	61.1
** PROBLEMS/SOLUTIONS/COMMENTS										
THE FGD SYSTEM WAS OUT OF SERVICE FOR THREE DAYS DURING AUGUST DUE TO 10/26 TO 10/30.										
9/82	SYSTEM	53.3	54.5	54.4	53.3		720	704	383	68.8
** PROBLEMS/SOLUTIONS/COMMENTS										
THE CLEANING OF PLUGGED NOZZLES CREATED OUTAGE TIME DURING SEPTEMBER.										
THE REPLACEMENT OF ABSORBER AND QUENCHER PUMP SUCTION VALVES ALSO RESULTED 10/26 TO 10/30.										
MAINTENANCE OF QUENCHER AND RECYCLE PUMPS RESULTED IN OUTAGE TIME FOR THE 10/26 TO 10/30.										
MAINTENANCE OF A MILL PRODUCT TANK ALSO CONTRIBUTED TO DOWN TIME FOR THE 10/26 TO 10/30.										
10/82	SYSTEM	83.4	83.1	83.2	82.9		744	742	617	77.0
** PROBLEMS/SOLUTIONS/COMMENTS										
MAINTENANCE OF MILL PRODUCT AND SLURRY TRANSFER PUMPS RESULTED IN OUTAGE 10/26 TO 10/30.										
11/82	SYSTEM	77.0	77.0	77.0	77.0		720	720	555	76.0
** PROBLEMS/SOLUTIONS/COMMENTS										
MAINTENANCE OF SLURRY TRANSFER AND QUENCHER PUMPS CREATED DOWN TIME DURING 10/26 TO 10/30.										
MAINTENANCE OF A CYCLONE SEPARATOR RESULTED IN OUTAGE TIME DURING THE 10/26 TO 10/30.										
SPENT SLURRY LINES WERE UNPLUGGED DURING NOVEMBER CAUSING ADDITIONAL OUTAG 10/26 TO 10/30.										
MAINTENANCE OF A SPENT SLURRY FRESH WATER VALVE CONTRIBUTED TO DOWN TIME 10/26 TO 10/30.										
12/82	SYSTEM	78.9	79.2	79.2	78.9		744	742	587	69.6
** PROBLEMS/SOLUTIONS/COMMENTS										
FGD SYSTEM OUTAGES DURING DECEMBER WERE REQUIRED TO UNPLUG SPENT SLURRY 10/26 TO 10/30.										
MAINTENANCE OF QUENCHER, ABSORBER AND MILL PRODUCT PUMPS RESULTED IN DOWN 10/26 TO 10/30.										

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO ₂ PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR
MAINTENANCE OF AN ABSORBER TANK AGITATOR ALSO CONTRIBUTED TO OUTAGE TIME 10/26 TO 10/30.									
1/83	SYSTEM	64.0	56.7	56.7	41.0		744	537	305 46.9
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UNIT WAS OUT OF SERVICE FROM JANUARY 3 TO JANUARY 12 FOR A SCHEDULED 10/26 TO 10/30.									
A LOSS OF POWER TO THE SCRUBBER OCCURRED DURING THE MONTH CREATING AN FGD 10/26 TO 10/30.									
A BROKEN ABSORBER TANK AGITATOR RESULTED IN OUTAGE TIME DURING JANUARY.									
A LOSS OF SEAL WATER TO ALL PUMPS CONTRIBUTED TO FGD SYSTEM OUTAGES DURING 10/26 TO 10/30.									
2/83	SYSTEM	58.9	62.0	65.6	43.2		672	469	291 44.3
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UNIT WAS OUT OF SERVICE FROM FEBRUARY 2 TO FEBRUARY 4, FEBRUARY 6 TO 10/26 TO 10/30.									
A BROKEN ABSORBER TANK AGITATOR CAUSED AN FGD SYSTEM OUTAGE DURING 10/26 TO 10/30.									
A SLURRY DISPOSAL LINE BURST CREATED ADDITIONAL OUTAGE TIME FOR THE FGD 10/26 TO 10/30.									
MAINTENANCE OF ABSORBER PUMPS RESULTED IN DOWN TIME DURING THE MONTH.									
MAINTENANCE OF LIMESTONE FEEDERS RESULTED IN AN FGD SYSTEM OUTAGE DURING 10/26 TO 10/30.									
3/83	SYSTEM	63.7	74.2	77.1	63.7		744	639	474 56.1
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UNIT WAS TAKEN OUT OF SERVICE ON MARCH 27 FOR A TURBINE INSPECTION.									
MAINTENANCE OF AN ABSORBER PUMP REQUIRED FGD OUTAGE TIME DURING MARCH.									
MAINTENANCE OF A BALL MILL CLASSIFIER ALSO CONTRIBUTED TO DOWN TIME DURING 10/26 TO 10/30.									
MAINTENANCE OF A MODULE OUTLET TEMPERATURE INDICATOR RESULTED IN AN FGD 10/26 TO 10/30.									
A BROKEN ABSORBER TANK AGITATOR CONTRIBUTED TO THE OUTAGE TIME IN MARCH.									
4/83	SYSTEM	0.0			0.0		720	0	0
** PROBLEMS/SOLUTIONS/COMMENTS									
THE FGD SYSTEM WAS OUT OF SERVICE DURING APRIL DUE TO A TURBINE GENERATOR 10/26 TO 10/30. OUTAGE.									
5/83	SYSTEM	59.6	62.0	63.2	59.6		744	716	444 71.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE TURBINE INSPECTION OUTAGE CONTINUED THROUGH MAY 2, 1983. THE FGD
 10/26 TO 10/30.
 SYSTEM COMPONENTS.

MAINTENANCE WORK WAS PERFORMED ON THE CYCLONE SEPARATOR DURING THE OUTAGE.

MAINTENANCE WAS ALSO NEEDED ON RECYCLE PUMPS.

SLURRY LINE FLANGE LEAKS WERE REPAIRED DURING THE OUTAGE IN MAY.

A BOOSTER FAN REQUIRED MAINTENANCE DURING THE FGD SYSTEM OUTAGE IN MAY.

6/83	SYSTEM	77.0	76.5	77.0	46.7	720	439	336	40.6

** PROBLEMS/SOLUTIONS/COMMENTS

A QUENCHER PUMP BEARING WAS REPLACED AND THE PUMP REPACKED DURING JUNE.

A SCHEDULED UNIT OUTAGE OCCURRED FROM JUNE 7 TO JUNE 18.

AN ABSORBER PUMP MOTOR REQUIRED MAINTENANCE DURING THE MONTH OF JUNE.

A FORCED UNIT OUTAGE TOOK PLACE FROM JUNE 27 TO JUNE 29.

7/83	SYSTEM	94.4	94.5	94.3	90.6	744	713	674	69.7

8/83	SYSTEM	98.6	98.0	98.5	94.5	744	717	703	68.4

9/83	SYSTEM	97.3	96.8	97.2	95.2	720	708	685	70.1

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT HIGH AVAILABILITY DURING THE THIRD QUARTER OF
 10/26 TO 10/30.
 SEPARATE CREW HAS BEEN ASSIGNED TO THE FGD SYSTEM AND CREW MEMBERS ARE MOR
 CLOSELY SUPERVISED.

10/83	SYSTEM	86.3	95.7	96.5	86.3	744	671	642	61.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS OUT OF SERVICE FROM OCTOBER 14 TO OCTOBER 17 TO ALLOW
 10/26 TO 10/30.

11/83	SYSTEM	97.6	91.0	91.2	25.3	720	200	182	15.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT WAS DOWN FOR SCHEDULED OUTAGES FROM NO-
 10/26 TO 10/30.

12/83	SYSTEM	89.4	84.6	85.0	59.8	744	527	445	44.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS DOWN FROM DECEMBER 25 TO DECEMBER 27 DUE TO FROZEN WATE
 10/26 TO 10/30.

1/84	SYSTEM	99.9	99.4	99.9	86.1	744	645	641	47.3

2/84	SYSTEM	98.3	98.3	98.3	98.3	696	696	684	65.2

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

3/84 SYSTEM 99.0 97.3 98.6 69.3 744 530 515 46.7

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING THE FIRST QUARTER.

4/84 SYSTEM 720

5/84 SYSTEM 744

6/84 SYSTEM 720

7/84 SYSTEM 744

8/84 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF APRIL THROUGH AUGUST 1984.

9/84 SYSTEM 100.0 86.7 89.1 26.6 720 221 192 18.2

10/84 SYSTEM 99.4 99.0 99.3 94.1 744 707 700 64.6

11/84 SYSTEM 100.0 100.0 100.0 100.0 720 720 720 71.7

12/84 SYSTEM 97.5 99.7 100.0 97.5 744 727 725 61.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
10/26 TO 10/30.

1/85 SYSTEM 99.2 97.4 97.4 91.3 744 698 680 56.4

2/85 SYSTEM 95.7 91.8 100.0 48.6 672 355 326 31.4

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS
10/26 TO 10/30.
THROUGH 3 AND 19 THROUGH 28.

3/85 SYSTEM 0.0 0.0 744 0 0 0.0

4/85 SYSTEM 0.0 0.0 720 0 0 0.0

5/85 SYSTEM 44.0 84.8 98.1 0.6 744 5 4 0.1

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER AND FGD SYSTEM WERE DOWN FOR A SCHEDULED OUTAGE THAT EXTENDED
10/26 TO 10/30.

6/85 SYSTEM 98.9 99.1 98.9 94.5 720 687 680 52.8

7/85 SYSTEM 95.0 100.0 99.6 75.0 744 553 558 41.8

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS
10/26 TO 10/30.
END OF THE MONTH.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
8/85	SYSTEM	0.0			0.0			744	0	0	0.0
9/85	SYSTEM	0.0			0.0			720	0	0	0.0
10/85	SYSTEM	100.0	98.7	99.9	81.2			744	612	604	58.0
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UNIT WAS OUT OF SERVICE AS A RESULT OF BOILER TURBINE PROBLEMS FROM 10/26 TO 10/30. RELATED PROBLEMS WERE REPORTED.											
11/85	SYSTEM	100.0	100.0	100.0	100.0			720	720	720	72.1
12/85	SYSTEM	99.9	99.4	99.9	74.6			744	558	555	49.7
** PROBLEMS/SOLUTIONS/COMMENTS											
NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS 10/26 TO 10/30. THROUGH 26 AND 28 THROUGH 31.											
1/86	SYSTEM	100.0	99.7	99.7	12.9			744	96	96	8.7
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UNIT WAS ON STANDBY FROM THE 1ST THROUGH THE 25TH OF JANUARY 10/26 TO 10/30.											
2/86	SYSTEM	99.9	99.7	99.7	23.2			672	156	156	14.4
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UTILITY REPORTED THAT THE UNIT WAS ON STANDBY FROM THE 1ST THROUGH 10/26 TO 10/30.											
3/86	SYSTEM	100.0	100.0	100.0	100.0			744	742	744	80.0
** PROBLEMS/SOLUTIONS/COMMENTS											
NO PROBLEMS WERE REPORTED FOR THE MONTH OF MARCH.											
4/86	SYSTEM	99.8	95.6	99.7	85.6			720	644	616	67.3
** PROBLEMS/SOLUTIONS/COMMENTS											
THE FGD SYSTEM WAS DOWN FOR SCHEDULED MAINTENANCE FROM 4/19/86 TO 10/26 TO 10/30.											
5/86	SYSTEM	99.5	99.2	98.7	95.2			744	714	709	68.4
** PROBLEMS/SOLUTIONS/COMMENTS											
BOILER TUBE LEAKS WERE REPORTED FOR THE MONTH. NO MAJOR FGD SYSTEM 10/26 TO 10/30.											
6/86	SYSTEM	97.3	97.5	97.5	97.3			720	719	701	74.9
** PROBLEMS/SOLUTIONS/COMMENTS											
NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE 10/26 TO 10/30.											
7/86	SYSTEM	96.9	95.4	97.7	81.5			744	636	607	58.9

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED ABSORBER HEADER BLOCKAGE PROBLEMS DURING JULY.

8/86	SYSTEM	99.9	97.6	99.8	69.9		744	533	520	51.9

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STANDBY 8 DAYS OUT OF THE MONTH OF AUGUST.

9/86	SYSTEM	0.0			0.0		720	0	0	0.0
10/86	SYSTEM	0.0			0.0		744	0	0	0.0
11/86	SYSTEM	0.0			0.0		720	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED UNIT/FGD SYSTEM OUTAGE BEGAN IN SEPTEMBER AND CONTINUED 10/26 TO 10/30.

12/86	A	99.9	98.1	99.8	53.4					
	B									
	SYSTEM	99.9	98.1	99.8	53.4		744	405	397	39.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT WAS ON STANDBY FROM 12/1/86 TO 10/26 TO 10/30.

1/87	SYSTEM	100.0	97.6	100.0	44.9		744	342	334	35.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON A STAND-BY FROM 1/1 TO 1/12 AND FROM 1/18 TO 1/21.

2/87	SYSTEM	100.0	99.9	100.0	68.0		672	457	457	62.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON A STAND-BY FROM 2/1 TO 9/1, 1987.

3/87	SYSTEM	99.4	98.9	99.3	93.3		744	702	694	83.4
4/87	SYSTEM	99.8	99.9	100.0	96.1		720	693	692	78.6

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MONTHS OF MARCH 10/26 TO 10/30.

5/87	SYSTEM	29.0	100.0	99.9	26.3		744	195	196	20.6

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON A SCHEDULED OUTAGE FROM 5/2 TO 5/24.

6/87	SYSTEM	100.0	100.0	100.0	98.2		720	707	707	77.5
7/87	SYSTEM						744			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MONTHS OF JUNE
OR JULY.

8/87	SYSTEM	100.0	100.0	100.0	100.0	744	744	744	78.4
9/87	SYSTEM	99.9	99.9	98.0	60.4	720	436	435	49.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STAND-BY FROM 10/2 TO 10/15, 10/21 TO 10/24 AND
10/26 TO 10/30.

10/87	SYSTEM	32.3			0.0	744	0	0	0.0
10/87	SYSTEM								

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STAND-BY FROM 10/1 TO 10/11. THE UNIT WAS ON OUTAGE
FROM 10/11 TO 10/31. THE CAUSE OF THE OUTAGE WAS NOT REPORTED.

11/87	SYSTEM	99.6	100.0	100.0	71.8	720	517	517	62.6
11/87	SYSTEM					720			

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JULY
TO NOVEMBER 1987.

12/87	SYSTEM	100.0	99.7	100.0	97.4	744	727	725	84.4

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MONTH OF
DECEMBER.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SOUTH CAROLINA PUBLIC SERVICE	
PLANT NAME	WINYAH	
UNIT NUMBER	3	
CITY	GEORGETOWN	
STATE	SOUTH CAROLINA	
REGULATORY CLASSIFICATION	C	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	301.	(0.700 LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	519	
GROSS UNIT GENERATING CAPACITY - MW	315	
NET UNIT GENERATING CAPACITY W/FGD - MW	260	
NET UNIT GENERATING CAPACITY WO/FGD - MW	267	
EQUIVALENT SCRUBBED CAPACITY - MW	315	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	RILEY STOKER	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	394.51	(836000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	132.2	(270 F)
STACK HEIGHT - M	122.	(400 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	*****	(***** FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	26749.	(11500 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		****
AVERAGE ASH CONTENT - %	14.00	
RANGE ASH CONTENT - %	****	
AVERAGE MOISTURE CONTENT - %	*****	
RANGE MOISTURE CONTENT - %	6.5-7.0	
AVERAGE SULFUR CONTENT - %	1.00	
RANGE SULFUR CONTENT - %	****	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
** ESP		
NUMBER	1	
TYPE	COLD SIDE	
SUPPLIER	RESEARCH-COTTRELL	
INLET FLUE GAS CAPACITY - CU.M/S	394.5	(836000 ACFM)
INLET FLUE GAS TEMPERATURE - C	132.2	(270 F)
PARTICLE REMOVAL EFFICIENCY - %	99.3	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
*** FGD SYSTEM		
** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

PROCESS TYPE	LIMESTONE
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	BABCOCK & WILCOX
A-E FIRM	BURNS & ROE
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.30
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	90.00
ENERGY CONSUMPTION - %	2.2
CURRENT STATUS	1
COMMERCIAL START-UP	7/1980
INITIAL START-UP	7/1980
CONTRACT AWARDED	11/1978
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
OPER. & MAINT. REQUIREMENT - MANHR/DAY	80.0
** QUENCHER/PRESATURATOR	
NUMBER	2
TYPE	VARIABLE THROAT VENTURI
SUPPLIER	BABCOCK & WILCOX
INLET GAS FLOW - CU. M/S	394.51 (836000 ACFM)
INLET GAS TEMPERATURE - C	132.2 (270 F)
LIQUID RECIRCULATION RATE - LITERS/S	781. (12400 GPM)
L/G RATIO - L/CU. M	2.0 (14.8 GAL/1000 ACFM)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
** ABSORBER	
NUMBER	2
NUMBER OF SPARES	0
GENERIC TYPE	TRAY TOWER
SPECIFIC TYPE	SIEVE TRAY
TRADE NAME/COMMON TYPE	N/A
SUPPLIER	BABCOCK & WILCOX
SHELL GENERIC MATERIAL	CARBON STEEL
SHELL SPECIFIC MATERIAL	AISI 1110
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A
LINER GENERIC MATERIAL	ORGANIC
LINER SPECIFIC MATERIAL	NATURAL RUBBER
LINER MATERIAL TRADE NAME/COMMON TYPE	BLACK NATURAL RUBBER
GAS CONTACTING DEVICE TYPE	PERFORATED TRAY
NUMBER OF CONTACTING ZONES	2
L/G RATIO - L/CU.M	6.5 (48.9 GAL/1000 ACF)
SUPERFICIAL GAS VELOCITY - M/SEC	3.2 (10.5 FT/S)
SO2 REMOVAL EFFICIENCY - %	90.0
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
NUMBER PER SYSTEM	2
NUMBER OF SPARES PER SYSTEM	0
NUMBER PER MODULE	1
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
CONFIGURATION	HORIZONTAL
NUMBER OF STAGES	2
NUMBER OF PASSES PER STAGE	3
PRESSURE DROP - KPA	0.2 (1.0 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC
CONSTRUCTION MATERIAL SPECIFIC TYPE	FIBER-REINFORCED POLYESTER
WASH WATER SOURCE	BLENDED '50% RETURN, 50% FRESH!
WASH FREQUENCY	ONCE PER 2 MINUTES
WASH RATE - L/S	11.4 (180 GAL/MIN)
** REHEATER	
NUMBER	1
NUMBER OF SPARES	0
GENERIC TYPE	INDIRECT HOT AIR
SPECIFIC TYPE	EXTERNAL HEAT EXCHANGER

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

TRADE NAME/COMMON TYPE	STEAM TUBE BUNDLE
LOCATION	EXTERNAL
PERCENT GAS BYPASSED - AVG	0.0
TEMPERATURE INCREASE - C	16.7 (30 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL; COPPER 'FINS!
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
** FANS	
NUMBER	2
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
FUNCTION	BOOSTER
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS TEMPERATURE - C	132.2 (270 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	HIGH STRENGTH LOW ALLOY 'HSLA!
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	INERT FLAKE-FILLED VINYL ESTER
** DUCTWORK	
LOCATION	INLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	HIGH STRENGTH LOW ALLOY 'HSLA!
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	OUTLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	INERT FLAKE-FILLED VINYL ESTER
** DUCTWORK	
LOCATION	BYPASS
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	HIGH STRENGTH LOW ALLOY 'HSLA!
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	REHEAT
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED
DEVICE TYPE	NR
MANUFACTURER	KOPPERS
NUMBER	2
NUMBER OF SPARES	0
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	3.6 (4 TPH)
PRODUCT QUALITY - % SOLIDS	30.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987
 SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

** TANKS	
SERVICE	NUMBER
-----	-----
QUENCHER RECIRCULATION	****
ABSORBER RECYCLE	****
SLURRY TRANSFER	****
RECYCLE WATER	****
MILL PRODUCT	****
MIST ELIMINATOR WASH	****
** PUMPS	
SERVICE	NUMBER
-----	-----
QUENCHER RECIRCULATION	****
ABSORBER RECIRCULATION	****
SLURRY FEED	****
MILL PRODUCT	****
RECYCLE WATER	****
THICKENER UNDERFLOW	****
THICKENER SUMP	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	2
CONFIGURATION	CIRCULAR
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
FEED STREAM SOURCE	ABSORBER BLEED
FEED STREAM CHARACTERISTICS	13% SOLIDS
OUTLET STREAM CHARACTERISTICS	35% SOLIDS
OUTLET STREAM DISPOSITION	TO POND
OVERFLOW STREAM DISPOSITION	TO CLARIFIED RECYCLE TANK
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	DEWATERED
DEVICE	N/A
PROPRIETARY PROCESS	N/A
** DISPOSAL	
NATURE	FINAL
TYPE	POND
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	PIPELINE
SITE TREATMENT	NONE
SITE SERVICE LIFE - YRS	15
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
** CHEMICALS AND CONSUMPTION	
FUNCTION	ABSORBENT
NAME	LIMESTONE
CONSUMPTION	4 TPH '8 TPH DESIGN VALUE!
POINT OF ADDITION	BALL MILL
** FGD SPARE CAPACITY INDICES	
ABSORBER - %	0.0
MIST ELIMINATOR - %	0.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

FAN - % 0.0
 BALL MILL - % 0.0

** FGD SPARE COMPONENT INDICES

ABSORBER 0.0
 MIST ELIMINATOR 0.0
 FAN 0.0
 BALL MILL 0.0

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

6/80	SYSTEM	60.0	60.0	60.0	46.6		720	559	336	59.5

** PROBLEMS/SOLUTIONS/COMMENTS

INITIAL FGD OPERATIONS BEGAN JUNE 3, 1980.

THE INLET DAMPER LOCKED UP FORCING THE FGD SYSTEM OUT OF SERVICE FOR PART OF JUNE.

THERE HAVE BEEN CONTINUING PROBLEMS WITH THE THICKENER SUMP RESULTING FROM IT'S LOCATION. THESE PROBLEMS FORCED THE FGD SYSTEM OUT OF SERVICE FOR APPROXIMATELY 7 DAYS.

7/80	A	12.8	12.8	12.8	12.8					
	B	12.8	12.8	12.8	12.8					
	SYSTEM	12.8	12.8	12.8	12.8		744	744	95	79.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE THICKNER RAKE DRIVE MECHANISM WAS REPAIRED DURING JULY.

THE LARGE BELT DRIVEN PUMP HAS BEGUN TO SHOW SIGNS OF RAPID WEAR.

THE FGD SYSTEM WAS OUT OF SERVICE BECAUSE OF COMPUTER LOGIC PROBLEMS CAUSE BY A BAD CABLE.

THE THICKNER SUMP PUMP AND MIXER MOTORS WERE FLOODED OUT CAUSING THE FGD SYSTEM TO GO DOWN.

8/80	A	18.0	20.4	20.4	18.0					
	B	18.0	20.4	20.4	18.0					
	SYSTEM	18.0	20.4	20.4	18.0		744	658	134	79.4

** PROBLEMS/SOLUTIONS/COMMENTS

THE THICKNER SUMP PUMP AND MIXER MOTORS CONTINUED TO HAVE PROBLEMS BECAUSE OF THE FLOODING LAST MONTH.

THE SCRUBBER OUTLET DAMPER WOULD NOT CLOSE PROPERLY WHICH REQUIRED WORK DURING AUGUST.

THE ABSORBER TRAY STRAP WAS BROKEN IN SEVERAL AREAS AND REQUIRED REPAIR WORK DURING THE MONTH.

9/80	A	0.0	0.0	0.0	0.0					
	B	0.0	0.0	0.0	0.0					
	SYSTEM	0.0	0.0	0.0	0.0		720	647	0	84.6

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS OUT OF SERVICE THROUGH ALL OF SEPTEMBER BECAUSE OF REPAIRS BEING MADE ON THE THICKNER.

10/80	A	89.2	87.0	87.0	86.0					

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	B	97.2	95.0	95.0	94.0						
	SYSTEM	92.4	91.0	91.0	90.0			744	736	670	89.7

** PROBLEMS/SOLUTIONS/COMMENTS

DURING OCTOBER SOME OF THE FGD SYSTEM OUTAGE TIME WAS DUE TO PLUGGING OF THE THICKENER UNDERFLOW LINE.

THE THICKENER RAKE DRIVE MECHANISM WAS REPAIRED DURING OCTOBER.

SOME OUTAGE TIME DURING THE MONTH WAS CAUSED BY THE REPLACEMENT OF THE BROKEN BELTS ON THE QUENCHER PUMP.

THE UNIT EXPERIENCED FOUR TRIPS DURING THE MONTH OF OCTOBER.

11/80	A	72.5	72.7	72.7	72.5						
	B	73.2	73.4	73.4	73.2						
	SYSTEM	72.8	73.1	73.1	72.8			720	718	524	90.2

** PROBLEMS/SOLUTIONS/COMMENTS

DURING NOVEMBER REPAIRS WERE MADE TO THE QUENCHER DISCHARGE LINE, ABSORBER PUMP BELTS AND QUENCHER HEADER CAUSING THE FGD SYSTEM TO BE DOWN. OUTAGE TIME WAS ALSO NEEDED TO UNPLUG THE QUENCHER NOZZLES.

THE FGD SYSTEM WAS OUT OF SERVICE FOR APPROXIMATELY SIX DAYS DUE TO COMPUTER LOGIC PROBLEMS WHICH WERE CAUSED BY A FAULTY LOGIC CARD HOLDER.

12/80	A	95.7	97.6	97.6	95.7						
	B	94.9	96.8	96.8	94.9						
	SYSTEM	95.3	97.2	97.2	95.3			744	730	709	89.5

** PROBLEMS/SOLUTIONS/COMMENTS

DURING DECEMBER OUTAGE TIME WAS NECESSARY FOR REPAIRS TO THE MODULE B QUENCHER PUMP DISCHARGE VALVE.

1/81	A	62.4	75.5	75.5	62.4						
	B	69.2	83.7	83.7	69.2						
	SYSTEM	65.9	79.7	79.7	65.9			744	615	490	69.1

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JANUARY PROBLEMS WITH THE BALL MILL WERE ENCOUNTERED CAUSING THE SYSTEM TO SHUT DOWN.

2/81	A	83.8	85.2	85.2	80.2						
	B	88.1	89.8	89.8	84.5						
	SYSTEM	86.0	87.6	87.6	82.4			672	633	554	79.2

** PROBLEMS/SOLUTIONS/COMMENTS

DURING FEBRUARY COMPUTER PROBLEMS CAUSED THE THICKENER SUMP TO FLOOD.

THE INLET DAMPER CAUSED PROBLEMS DURING THE MONTH.

3/81	A	84.9	100.0	100.0	80.9						
	B	84.9	100.0	100.0	80.9						
	SYSTEM	84.9	100.0	100.0	80.9			744	602	602	69.4

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE SYSTEM WAS SHUT DOWN ON MARCH 27 DUE TO A SCHEDULED UNIT OUTAGE.

4/81	SYSTEM					720			
5/81	SYSTEM					744			
6/81	SYSTEM					720			

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION FOR THE SECOND QUARTER 1981 IS NOT AVAILABLE AT THIS TIME.

7/81	A	86.2	83.5	85.3	82.8				
	B	90.6	81.3	83.1	80.6				
	SYSTEM	88.4	82.5	84.2	81.8	744	738	608	75.6

** PROBLEMS/SOLUTIONS/COMMENTS

THE WINYAH 3 BOILER TRIPPED OFF TWICE DURING THE MONTH.

THE QUENCHER PUMPS TRIPPED ONCE DURING THE MONTH ON THE "A" MODULE AS A RESULT OF WATER SEEPING INTO THE SWITCHING APPARATUS.

8/81	A	81.3	80.5	78.2	67.2				
	B	81.9	88.2	85.8	73.7				
	SYSTEM	81.6	84.3	82.0	70.4	744	621	524	43.2

** PROBLEMS/SOLUTIONS/COMMENTS

MISCELLANEOUS OUTAGES DURING THE MONTH INCLUDED MAINTENANCE REQUIRED ON THE "A" QUENCHER PUMP AND FLOODING OF THE THICKENER UNDERFLOW SUMP.

9/81	A	97.2	95.3	97.0	85.1				
	B	98.8	96.9	98.6	86.5				
	SYSTEM	98.0	96.0	97.7	85.8	720	643	618	50.1

** PROBLEMS/SOLUTIONS/COMMENTS

ONE OUTAGE WAS REQUIRED DURING THE MONTH AS A RESULT OF THE INABILITY TO START THE BALL MILLS.

THERE WERE FOUR UNIT OUTAGES DURING THE MONTH AS A RESULT OF OPACITY AND PRECIPITATOR PROBLEMS.

10/81	A	95.5	95.7	97.0	95.5				
	B	95.6	95.8	97.1	95.6				
	SYSTEM	95.6	95.7	97.0	95.6	744	742	711	78.2

** PROBLEMS/SOLUTIONS/COMMENTS

DURING OCTOBER THE SPRAY NOZZLES AND MODULES INTERNALS WERE CLEANED. THIS WAS DONE SO THAT TESTS COULD BE PERFORMED.

11/81	A	98.1	96.2	97.0	85.8				
	B	94.4	92.0	92.7	82.0				
	SYSTEM	96.3	94.0	94.8	83.9	720	642	604	70.8

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN PART OF NOVEMBER DUE TO A TUBE LEAK.

MODULE B WAS SHUT DOWN ABOUT 40 HOURS DUE TO ABSORBER PUMP MAINTENANCE.

12/81	A	96.7	96.7	96.7	96.7				
	B	97.5	97.5	97.5	97.5				
	SYSTEM	97.1	97.1	97.1	97.1	744	744	723	77.6

** PROBLEMS/SOLUTIONS/COMMENTS

DURING DECEMBER MODULE A WAS TAKEN OFF-LINE PART OF THE TIME DUE TO ABSORBER PUMP MAINTENANCE.

1/82	A	84.7	86.0	86.1	84.7				
	B	81.4	82.5	82.6	81.4				
	SYSTEM	83.1	84.3	84.3	83.1	744	734	618	69.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER DOWN TIME DURING JANUARY WAS TO REPAIR THE MODULE B FD FAN.

BOTH MODULES WERE TAKEN OUT OF SERVICE PART OF THE MONTH FOR ESP MAINTENANCE.

MODULE B OUTLET DAMPERS MALFUNCTIONED CAUSING ADDITIONAL OUTAGE TIME.

THE MILL PRODUCT DISCHARGE LINE TO THE CLASSIFIERS INLET VALVE FROZE CAUSING ADDITIONAL DOWN TIME.

2/82	A	43.8	54.6	55.0	43.8				
	B	62.1	77.4	77.9	62.1				
	SYSTEM	52.9	66.0	66.4	52.9	672	539	356	46.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FOR FIVE DAYS IN FEBRUARY TO WORK ON THE ID FAN DAMPERS.

BOTH MODULES WERE OFF-LINE PART OF THE TIME TO CLEAN THE SPRAY NOZZLES.

BOTH MODULES EXPERIENCED INLET DAMPER PROBLEMS.

SOME MINOR PROBLEMS EXPERIENCED DURING THE MONTH INCLUDED THE SUMP DRAINS PLUGGING AND A DOWNCOMER LEAK.

3/82	A	82.9	82.9	82.9	82.9				
	B	87.7	87.7	87.7	87.7				
	SYSTEM	85.3	85.3	85.3	85.3	744	744	635	67.8

** PROBLEMS/SOLUTIONS/COMMENTS

MOST OF THE OUTAGE TIME DURING MARCH WAS TO CLEAN THE PLUGGED SPRAY NOZZLES.

THE DOWNCOMERS ON BOTH MODULES HAD TO BE PATCHED DURING THE MONTH.

ADDITIONAL OUTAGE TIME DURING MARCH WAS NECESSARY TO REPACK THE PUMPS.

PROBLEMS WERE ENCOUNTERED WITH OPENING THE INLET AND OUTLET DAMPERS DURING THE MONTH.

4/82	A	22.2	74.4	68.3	22.2				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	B	25.9	86.7	79.7	25.9					
	SYSTEM	24.1	80.6	74.0	24.1		720	215	173	19.1

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS SHUT DOWN FOR THREE WEEKS IN APRIL FOR A SCHEDULED OUTAGE.

DURING THE MONTH THE MODULE WAS DOWN PART OF THE TIME TO TIGHTEN AND CLEAN THE SPRAY NOZZLES.

GENERAL MAINTENANCE WAS PERFORMED ON THE MIST ELIMINATOR DURING THE MONTH.

5/82	A	87.8	90.0	90.3	88.9					
	B	88.5	91.3	91.7	90.3					
	SYSTEM	88.1	90.7	91.0	89.6		744	736	667	79.7

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MAY PROBLEMS WERE ENCOUNTERED WITH THE DAMPERS.

THE SPRAY NOZZLES PLUGGED FORCING THE MODULES OFF-LINE FOR CLEANING.

6/82	A	75.8	78.0	100.0	74.8					
	B	88.8	91.6	100.0	87.8					
	SYSTEM	82.3	84.8	100.0	81.3		720	690	585	72.6

** PROBLEMS/SOLUTIONS/COMMENTS

DAMPER PROBLEMS EXPERIENCED IN MAY CONTINUED THROUGHOUT JUNE.

DURING JUNE THE RECYCLE TANK AND THE A MODULE THICKENER TANK WERE CLEANED.

SOME OF THE PUMPS WERE REPACKED DURING THE MONTH CAUSING ADDITIONAL SYSTEM DOWN TIME.

ADDITIONAL SYSTEM OUTAGES INCLUDED FAILURE OF THE WESTINGHOUSE LOGIC, SWITCHING PUMPS AND POWER OFF DUE TO RAPPING.

7/82	A	94.9	85.9	87.9	85.5					
	B	100.0	97.7	100.0	97.3					
	SYSTEM	97.5	91.8	93.9	91.4		744	741	680	80.1

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING JULY.

8/82	A	94.7	94.1	94.5	91.1					
	B	74.4	73.1	73.4	70.8					
	SYSTEM	84.5	83.6	83.9	81.0		744	720	603	76.4

** PROBLEMS/SOLUTIONS/COMMENTS

MAINTENANCE OF ABSORBER AND QUENCHER PUMPS RESULTED IN DOWN TIME FOR THE FGD SYSTEM DURING AUGUST.

OUTAGE TIME WAS ALSO ATTRIBUTED TO MAINTENANCE OF A RECYCLE TANK LEVEL TRANSMITTER.

PATCHING OF A VENTURI LEAK RESULTED IN DOWN TIME DURING AUGUST.

A CLEANING OF THE QUENCHER NOZZLES ALSO CONTRIBUTED TO OUTAGE TIME DURING THE MONTH.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

THE PURGING OF WATER FROM A CONTROL AIR SYSTEM RESULTED IN DOWN TIME FOR THE FGD SYSTEM DURING AUGUST.

9/82	A	72.5	80.3	80.3	72.4				
	B	76.6	84.6	84.7	76.4				
	SYSTEM	74.6	82.4	82.5	74.4	720	650	536	67.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE PATCHING OF LEAKS IN A QUENCHER WALL RESULTED IN DOWN TIME DURING SEPTEMBER.

REPAIR OF LEAKS IN THE MILL PRODUCT PUMPS ALSO CAUSED OUTAGE TIME DURING THE MONTH.

WALL WASH HEADER LEAK REPAIRS RESULTED IN DOWN TIME DURING SEPTEMBER.

THE CLEANING OF PLUGGED NOZZLES CREATED OUTAGE TIME DURING THE MONTH.

SCRUBBER OUTAGES WERE ALSO ATTRIBUTED TO THE CLEANING OF PLUGGED SLURRY SUPPLY LINES.

THE MAINTENANCE OF ABSORBER AND QUENCHER PUMPS LED TO DOWN TIME FOR THE FG SYSTEM DURING SEPTEMBER.

MAINTENANCE OF AN INLET DAMPER DRIVE RESULTED IN DOWN TIME DURING THE MONTH.

SPENT SLURRY VALVE REPAIRS CREATED OUTAGE TIME FOR THE FGD SYSTEM DURING SEPTEMBER.

10/82	A	94.6	94.3	94.5	94.3				
	B	92.8	93.8	94.0	93.8				
	SYSTEM	93.7	94.0	94.2	94.1	744	744	700	78.9

** PROBLEMS/SOLUTIONS/COMMENTS

QUENCHER LEAK REPAIRS RESULTED IN DOWN TIME DURING OCTOBER.

MAINTENANCE OF ABSORBER PUMPS LED TO OUTAGE TIME DURING THE MONTH.

11/82	A	99.1	99.3	99.5	99.1				
	B	87.7	87.8	88.1	87.7				
	SYSTEM	93.4	93.5	93.8	93.4	720	719	672	74.6

** PROBLEMS/SOLUTIONS/COMMENTS

OUTAGES WERE ATTRIBUTED TO MAINTENANCE OF ABSORBER PUMPS DURING NOVEMBER.

QUENCHER HEADER REPAIRS LED TO FGD SYSTEM DOWN TIME DURING THE MONTH.

12/82	A	93.4	91.8	93.5	77.2				
	B	58.6	65.9	67.1	55.4				
	SYSTEM	76.0	78.9	80.3	66.3	744	625	493	49.4

** PROBLEMS/SOLUTIONS/COMMENTS

MAINTENANCE OF A THICKENER CONE LEAK RESULTED IN OUTAGE TIME DURING DECEMBER.

ABSORBER PUMP REPAIRS LED TO FGD SYSTEM OUTAGES DURING THE MONTH.

MAINTENANCE OF MODULE LEAKS RESULTED IN DOWN TIME DURING DECEMBER.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

THE UNIT WAS OUT OF SERVICE FROM DECEMBER 2 TO DECEMBER 6 FOR A SCHEDULED OUTAGE.

1/83	A	67.0	57.3	57.3	44.3				
	B	96.0	94.8	94.8	73.3				
	SYSTEM	81.5	76.0	76.0	58.8	744	575	437	43.1

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OUT OF SERVICE FROM JANUARY 23 TO JANUARY 31 FOR A SCHEDULED OUTAGE.

MAINTENANCE OF VENTURI LEAKS CONTRIBUTED TO THE OUTAGES DURING JANUARY.

MAINTENANCE OF ABSORBER AND QUENCHER PUMPS RESULTED IN OUTAGE TIME DURING THE MONTH.

OUTAGES WERE ALSO THE RESULT OF REMOVAL OF FLYASH FROM THE SLURRY RECYCLE TANKS.

THE UNPLUGGING OF QUENCHER NOZZLES RESULTED IN FGD SYSTEM OUTAGES DURING JANUARY.

2/83	A	85.9	80.1	81.0	73.1				
	B	89.5	91.8	93.1	83.7				
	SYSTEM	87.7	86.0	87.1	78.4	672	613	527	53.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM FEBRUARY 17 TO FEBRUARY 18 FOR A SCHEDULED OUTAGE.

MAINTENANCE OF AN ABSORBER PUMP DISCHARGE VALVE RESULTED IN OUTAGE TIME DURING THE MONTH.

OUTAGE TIME WAS ALSO THE RESULT OF UNPLUGGING QUENCHER NOZZLES.

A TRIPPED PROGRAMMABLE LOGIC CONTROLLER LED TO AN FGD SYSTEM OUTAGE DURING FEBRUARY.

MAINTENANCE OF A QUENCHER PUMP RESULTED IN DOWN TIME DURING THE MONTH.

THE REPAIR OF A LOW PRESSURE WATER LINE LEAK PRODUCED AN FGD SYSTEM OUTAGE DURING FEBRUARY.

3/83	A	22.6	83.0	83.0	14.4				
	B	21.4	30.3	30.3	5.3				
	SYSTEM	22.0	56.6	56.6	9.8	744	129	73	9.4

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OUT OF SERVICE FROM MARCH 1 TO MARCH 24 FOR A BOILER INSPECTION.

THE UNIT WAS DOWN FROM MARCH 28 TO MARCH 31 FOR A SCHEDULED OUTAGE.

MODULE B WAS TAKEN OUT OF SERVICE TO DRAIN THE FLYASH CONTAMINATED SLURRY FROM THE RECYCLE TANK.

4/83	A	89.9	88.8	89.3	87.6				
	B	96.7	95.8	96.3	94.4				
	SYSTEM	93.3	92.3	92.8	91.0	720	710	655	59.9

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BCILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING APRIL.

5/83	A	26.2	62.6	65.8	26.2				
	B	30.2	71.9	75.7	30.2				
	SYSTEM	28.2	67.2	70.8	28.2	744	312	210	24.6

** PROBLEMS/SOLUTIONS/COMMENTS

SCHEDULED UNIT OUTAGES OCCURRED FROM MAY 6 TO MAY 9 AND AGAIN FROM MAY 11 TO MAY 27.

RECYCLE PUMPS WERE REPAIRED DURING THE PERIOD OF MAY 5 TO MAY 27.

SEVERAL FGD SYSTEM OUTAGES TOOK PLACE DURING MAY DUE TO MAINTENANCE OF ESP'S.

MAINTENANCE WORK WAS NEEDED ON A SPENT SLURRY VALVE DURING THE MONTH.

6/83	A	92.2	82.3	87.1	58.6				
	B	95.3	86.8	91.9	61.8				
	SYSTEM	93.7	84.5	89.5	60.2	720	513	433	42.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING JUNE.

7/83	A	96.5	95.8	96.3	91.6				
	B	95.5	94.5	95.0	90.4				
	SYSTEM	96.0	95.1	95.6	91.0	744	712	677	60.9

8/83	A	96.0	93.8	96.4	70.3				
	B	95.0	91.3	93.9	68.5				
	SYSTEM	95.5	92.6	95.2	69.4	744	558	516	53.1

9/83	A	99.6	98.9	99.6	94.8				
	B	99.0	98.2	98.9	94.1				
	SYSTEM	99.3	98.5	99.3	94.5	720	690	680	61.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT HIGH AVAILABILITY DURING THE THIRD QUARTER OF 1983 CAN BE ATTRIBUTED TO PERSONNEL CHANGES MADE AT UNITS 2, 3, AND 4. A SEPARATE CREW HAS BEEN ASSIGNED TO THE FGD SYSTEM AND CREW MEMBERS ARE MORE CLOSELY SUPERVISED.

10/83	A	93.5	95.0	96.4	77.0				
	B	93.6	94.8	96.2	76.8				
	SYSTEM	93.6	94.9	96.3	76.9	744	603	572	49.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING OCTOBER 1983.

11/83	A	97.0	95.8	96.8	90.9				
	B	98.8	97.7	98.7	92.7				
	SYSTEM	97.9	96.8	97.7	91.8	720	683	661	63.8

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT SCHEDULED UNIT OUTAGES OCCURRED FROM NOVEMBER 4 TO NOVEMBER 5 AND FROM NOVEMBER 18 TO NOVEMBER 19.

12/83	A	88.2	86.6	87.0	78.7				
	B	88.2	86.5	87.0	78.6				
	SYSTEM	88.2	86.6	87.0	78.7	744	676	585	60.5

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED UNIT OUTAGE TOOK PLACE FROM DECEMBER 21 TO DECEMBER 24, 1983.

THE FGD SYSTEM WAS OUT OF SERVICE FROM DECEMBER 25 TO DECEMBER 28 DUE TO FROZEN WATER LINES.

1/84	A	99.4	98.7	98.8	86.6				
	B	99.1	98.3	98.4	86.3				
	SYSTEM	99.3	98.5	98.6	86.4	744	653	643	49.0
2/84	A	96.9	97.0	97.2	96.4				
	B	98.7	98.8	99.0	98.2				
	SYSTEM	97.8	97.9	98.1	97.3	696	692	677	696.0

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING JANUARY AND FEBRUARY.

3/84	A	33.6	96.1	96.2	33.5				
	B	31.8	90.9	91.0	31.7				
	SYSTEM	32.7	93.5	93.6	32.6	744	259	243	16.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE YEARLY SCHEDULED BOILER OUTAGE OCCURRED BETWEEN MARCH 11 AND MARCH 31.

4/84	SYSTEM					720			
5/84	SYSTEM					744			
6/84	SYSTEM					720			
7/84	SYSTEM					744			
8/84	SYSTEM					744			

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF APRIL THROUGH AUGUST 1984.

9/84	A	98.6	96.5	96.7	53.4				
	B	98.9	96.2	96.4	53.2				
	SYSTEM	98.8	96.3	96.5	53.3	720	398	384	34.9
10/84	A	94.0	93.2	91.4	46.7				
	B	95.5	93.9	92.1	47.0				
	SYSTEM	94.7	93.5	91.7	46.9	744	373	349	32.1
11/84	A	99.3	98.0	94.4	86.1				
	B	99.3	98.0	94.4	86.1				
	SYSTEM	99.3	98.0	94.4	86.1	720	633	610	64.2
12/84	A	98.7	94.4	98.8	66.2				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	B	98.8	94.5	98.9	66.3						
	SYSTEM	98.7	94.5	98.9	66.2			744	521	493	44.5
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UTILITY REPORTED THAT THE UNIT WAS ON STANDBY FROM SEPTEMBER 1-13,1984 NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE REMAINDER OF THE YEAR.											
1/85	A	100.0	100.0	97.2	78.7						
	B	100.0	100.0	97.3	79.0						
	SYSTEM	100.0	100.0	97.3	78.8			744	574	586	49.8
2/85	A	85.0	52.3	46.2	31.4						
	B	84.9	52.1	45.9	31.3						
	SYSTEM	84.9	52.2	46.1	31.4			672	404	211	39.2
** PROBLEMS/SOLUTIONS/COMMENTS											
NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MONTHS OF JANUARY OR FEBRUARY. THE UNIT WAS ON STANDBY FROM FEBRUARY 13 THROUGH 27 AND WAS UNAVAILABLE FROM FEBRUARY 5 THROUGH 8 BECAUSE OF BOILER TUBE LEAKS.											
3/85	A	99.7	100.0	100.0	81.2						
	B	99.7	100.0	100.0	81.2						
	SYSTEM	99.7	100.0	100.0	81.2			744	587	604	48.7
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UNIT WAS OUT OF SERVICE FOR SCHEDULED MAINTENANCE WORK FROM MARCH 15 THROUGH 20. NO FGD SYSTEM PROBLEMS WERE REPORTED.											
4/85	A	97.3	99.8	100.0	40.6						
	B	97.1	99.2	99.4	40.4						
	SYSTEM	97.2	99.5	99.7	40.5			720	293	292	27.4
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UNIT WAS ON STANDBY STATUS FROM APRIL 1 THROUGH 17.											
5/85	A	98.8	99.6	98.8	86.1						
	B	98.8	99.6	98.8	86.1						
	SYSTEM	98.8	99.6	98.8	86.1			744	643	641	58.0
6/85	A	99.9	99.9	99.9	99.9						
	B	99.9	99.9	99.9	99.9						
	SYSTEM	99.9	99.9	99.9	99.9			720	720	719	57.2
** PROBLEMS/SOLUTIONS/COMMENTS											
NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MONTHS OF MAY OR JUNE.											
7/85	A	100.0	99.9	99.9	53.3						
	B	99.8	99.6	99.6	53.2						
	SYSTEM	99.9	99.8	99.8	53.2			744	397	396	32.5
8/85	A	99.7	98.2	96.1	55.7						
	B	99.7	98.1	95.9	55.7						
	SYSTEM	99.7	98.2	96.0	55.7			744	422	414	32.8

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STANDBY STATUS FROM JULY 17 THROUGH 30 AND AUGUST 1
 THROUGH 14. NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY.

9/85	A	99.8	99.2	99.7	62.7				
	B	99.5	98.7	99.3	62.4				
	SYSTEM	99.7	98.9	99.5	62.5	720	455	450	45.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM SEPTEMBER 10 THROUGH 21 WITH BOILER TUBE LEAK
 PROBLEMS. NO FGD SYSTEM PROBLEMS WERE REPORTED.

10/85	A	100.0	100.0	100.0	15.2				
	B	100.0	100.0	100.0	15.2				
	SYSTEM	100.0	100.0	100.0	15.2	744	113	113	10.1

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED OUTAGE FOR TURBINE INSPECTION BEGAN ON OCTOBER 5.

11/85	A	99.8	98.3	98.3	13.0				
	B	100.0	99.7	99.7	13.2				
	SYSTEM	99.9	99.0	99.0	13.1	720	96	95	6.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OUT OF SERVICE FROM NOVEMBER 1 THROUGH 18 AND 21 THROUGH 30
 WITH TURBINE PROBLEMS.

12/85	A	100.0	95.6	99.7	16.6				
	B	99.7	94.3	98.4	16.3				
	SYSTEM	99.8	94.9	99.1	16.5	744	129	122	8.6

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT WAS ON STANDBY STATUS FROM DECEMBER 1
 THROUGH 26. NO FGD SYSTEM PROBLEMS WERE REPORTED.

1/86	A	96.5	97.6	99.6	59.9				
	B	96.6	97.7	99.8	60.0				
	SYSTEM	96.5	97.7	99.7	60.0	744	457	446	34.5

** PROBLEMS/SOLUTIONS/COMMENTS

A BOILER TUBE LEAK WAS REPORTED FOR THE MONTH OF JANUARY. NO FGD SYSTEM-
 RELATED PROBLEMS OCCURRED.

2/86	A	100.0	94.5	94.5	2.4				
	B	100.0	94.5	94.5	2.4				
	SYSTEM	100.0	94.5	94.5	2.4	672	17	16	1.6

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STANDBY FROM THE 1ST THROUGH THE 10TH OF FEBRUARY. A
 TUBE LEAK OCCURRED ON THE 12TH. THE UNIT WAS ON STANDBY FOR THE REST OF
 THE MONTH. NO FGD SYSTEM PROBLEMS WERE REPORTED.

3/86	A	99.7	68.9	71.8	7.2				
	B	99.8	69.9	72.8	7.3				
	SYSTEM	99.8	69.4	72.3	7.3	744	78	54	7.7

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STANDBY FROM THE 3RD THROUGH THE 21ST AND THE 24TH
 THROUGH THE 31ST OF MARCH. NO FGD SYSTEM PROBLEMS WERE REPORTED.

4/86	A	99.7	100.0	99.9	89.6				
	B	99.8	100.0	99.9	89.6				
	SYSTEM	99.7	100.0	99.9	89.6	720	630	645	62.9

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM 4/24/86 TO 4/27/86 FOR BOILER TUBE LEAK REPAIRS.
 NO FGD SYSTEM PROBLEMS WERE REPORTED.

5/86	A	100.0	100.0	100.0	100.0				
	B	99.9	99.9	99.9	99.9				
	SYSTEM	99.9	99.9	99.9	99.9	744	744	744	58.9
6/86	A	97.8	96.8	97.0	82.9				
	B	97.8	96.4	96.7	82.6				
	SYSTEM	97.8	96.6	96.9	82.8	720	617	596	61.1
7/86	A	99.8	99.0	99.8	80.6				
	B	99.8	98.8	99.7	80.4				
	SYSTEM	99.8	98.9	99.8	80.5	744	606	599	55.5

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MAY THROUGH JULY
 1986 PERIOD.

8/86	A	97.7	99.7	100.0	96.9				
	B	97.6	99.7	99.9	96.9				
	SYSTEM	97.6	99.7	100.0	96.9	744	723	721	61.7

** PROBLEMS/SOLUTIONS/COMMENTS

TURBINE CONTROL PROBLEMS CAUSED SOME DOWN TIME IN AUGUST. NO FGD SYSTEM
 PROBLEMS OCCURRED.

9/86	A	100.0	100.0	100.0	6.8				
	B	100.0	100.0	100.0	6.8				
	SYSTEM	100.0	100.0	100.0	6.8	720	49	49	4.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STANDBY FROM THE 4TH TO THE 30TH OF SEPTEMBER. NO FGD
 SYSTEM PROBLEMS WERE REPORTED.

10/86	A	77.3	99.8	99.8	66.4				
	B	77.3	99.7	99.8	66.3				
	SYSTEM	77.3	99.7	99.8	66.4	744	495	494	45.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STANDBY FROM THE 22ND THROUGH THE 25TH OF OCTOBER AT
 WHICH TIME THE SCHEDULED FALL UNIT OUTAGE BEGAN.

11/86	A	53.3			0.0				
	B	53.3			0.0				
	SYSTEM	53.3			0.0	720	0	0	0.0

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE FALL OUTAGE CONTINUED THROUGH 11/15/86. THE UNIT WAS ON STANDBY THE
 REMAINDER OF THE MONTH.

12/86	A	100.0			0.0				
	B	100.0			0.0				
	SYSTEM	100.0			0.0	744	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

WINYAH 3 WAS ON STANDBY THE ENTIRE MONTH OF DECEMBER.

1/87	A	99.9	90.5	92.4	2.4				
	B	99.9	92.9	94.9	2.5				
	SYSTEM	99.9	91.7	93.6	2.5	744	20	18	0.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STAND-BY FOR THE ENTIRE MONTH, EXCEPT ON 1/23/87 WHEN IT
 WAS OPERATED FOR 19 HOURS.

2/87	A	100.0	95.8	99.8	16.5				
	B	100.0	95.8	99.8	16.5				
	SYSTEM	100.0	95.8	99.8	16.5	672	116	111	14.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STAND-BY FROM 2/1 TO 2/19. UNIT HAD A TUBE LEAK PROBLEM
 FROM 2/20 TO 2/24.

3/87	A	100.0	99.5	99.5	49.8				
	B	100.0	99.5	99.5	49.8				
	SYSTEM	100.0	99.5	99.5	49.8	744	373	371	41.9

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STAND-BY FROM 3/17 TO 3/31.

4/87	A	99.7	98.1	99.7	66.8				
	B	99.7	98.1	99.7	66.8				
	SYSTEM	99.7	98.1	99.7	66.8	720	490	481	52.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STAND-BY FROM 4/1 TO 4/10.

5/87	A	100.0	100.0	99.9	49.4				
	B	100.0	100.0	99.9	49.4				
	SYSTEM	100.0	100.0	99.9	49.4	744	363	367	39.4

** PROBLEMS/SOLUTIONS/COMMENTS

BOILER TRIPS WERE REPORTED LATE IN THE MONTH. REASONS FOR THE BOILER
 PROBLEMS WERE NOT REPORTED. DURING THIS PERIOD THE SCRUBBER AND ESP
 REMAINED IN SERVICE. THE UNIT WAS ON STAND-BY FROM 5/14 TO 5/29.

6/87	A	99.2	97.1	98.6	53.1				
	B	99.1	96.8	98.3	52.9				
	SYSTEM	99.2	96.9	98.5	53.0	720	394	381	38.7

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STAND-BY FROM 6/4 TO 6/8, 6/18 TO 6/21 AND 6/26 TO 6/30.

7/87	A	100.0	99.5	99.6	71.5				
	B	99.7	99.3	99.6	71.4				
	SYSTEM	100.0	99.4	99.6	71.5	744	535	532	54.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STAND-BY FROM 7/1 TO 7/9.

8/87	A	100.0	99.8	100.0	99.0				
	B	99.8	99.6	99.9	98.8				
	SYSTEM	99.9	99.7	99.9	98.9	744	738	736	76.6

** PROBLEMS/SOLUTIONS/COMMENTS

PROBLEMS WERE ENCOUNTERED WITH WASH WALL BOX NOZZLES ON THE QUENCHERS.
 REPLACEMENT OF THE NOZZLES WAS PLANNED FOR DURING A UNIT OUTAGE. NEW
 NOZZLES WERE SUPPOSED TO BE A "LONG END" TYPE TO PREVENT THE SLURRY FROM
 BLASTING THE CARBON STEEL AND CONSEQUENTLY CORRODE/ERODING THE MATERIAL.

9/87	A	43.4	99.8	98.4	42.7				
	B	43.4	99.8	98.4	42.7				
	SYSTEM	43.4	99.8	98.4	42.7	720	308	308	32.5

** PROBLEMS/SOLUTIONS/COMMENTS

A UNIT OUTAGE OCCURRED FROM 9/14 TO 9/31. REASONS FOR OUTAGE WERE NOT REPORTED.

10/87	A	91.9	97.5	99.1	51.5				
	B	91.7	97.2	98.8	51.4				
	SYSTEM	91.8	97.3	99.0	51.5	744	393	383	42.8

** PROBLEMS/SOLUTIONS/COMMENTS

A UNIT WAS ON OUTAGE OCCURRED FROM 11/1 TO 11/3. REASONS FOR THE OUTAGE WERE NOT FURNISHED. THE UNIT WAS ON A STAND-BY FROM 11/3 TO 11/14.

11/87	A	100.0	100.0	100.0	100.0				
	B	100.0	100.0	100.0	100.0				
	SYSTEM	100.0	100.0	100.0	100.0	720	720	720	85.2

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR NOVEMBER.

12/87	A	100.0	100.0	100.0	37.1				
	B	100.0	100.0	100.0	37.1				
	SYSTEM	100.0	100.0	100.0	37.1	744	276	276	29.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STAND-BY FROM 12/13 TO 12/31.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SOUTH CAROLINA PUBLIC SERVICE	
PLANT NAME	WINYAH	
UNIT NUMBER	4	
CITY	GEORGETOWN	
STATE	SOUTH CAROLINA	
REGULATORY CLASSIFICATION	A	
PARTICULATE EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	*****	
GROSS UNIT GENERATING CAPACITY - MW	315	
NET UNIT GENERATING CAPACITY W/FGD - MW	260	
NET UNIT GENERATING CAPACITY WO/FGD - MW	267	
EQUIVALENT SCRUBBED CAPACITY - MW	315	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	RILEY STOKER	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	*****	(***** ACFM)
BOILER FLUE GAS TEMPERATURE - C	*****	(**** F)
STACK HEIGHT - M	*****	(**** FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	*****	(***** FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	26749.	(11500 BTU/LB)
RANGE HEAT CONTENT - BTU/LB	*****	****
AVERAGE ASH CONTENT - %	*****	
RANGE ASH CONTENT - %	****	
AVERAGE MOISTURE CONTENT - %	*****	
RANGE MOISTURE CONTENT - %	1.0-1.2	
AVERAGE SULFUR CONTENT - %	1.70	
RANGE SULFUR CONTENT - %	****	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** ESP		
NUMBER	1	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
*** FGD SYSTEM		
** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	
PROCESS TYPE	LIMESTONE	
SYSTEM SUPPLIER	AMERICAN AIR FILTER	
A-E FIRM	BURNS & ROE	
DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	NEW	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	80.00	
ENERGY CONSUMPTION - %	2.2	
CURRENT STATUS	1	
COMMERCIAL START-UP	9/1981	

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 4 (CONT.)

INITIAL START-UP	7/1981
CONTRACT AWARDED	1/1979
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
** QUENCHER/PRESATURATOR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** ABSORBER	
GENERIC TYPE	SPRAY TOWER
SPECIFIC TYPE	OPEN COUNTERCURRENT SPRAY
TRADE NAME/COMMON TYPE	N/A
SHELL GENERIC MATERIAL	NR
SHELL SPECIFIC MATERIAL	NR
SHELL MATERIAL TRADE NAME/COMMON TYPE	NR
LINER GENERIC MATERIAL	NR
LINER SPECIFIC MATERIAL	NR
LINER MATERIAL TRADE NAME/COMMON TYPE	NR
GAS CONTACTING DEVICE TYPE	NONE
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** REHEATER	
GENERIC TYPE	INDIRECT HOT AIR
SPECIFIC TYPE	EXTERNAL HEAT EXCHANGER
TRADE NAME/COMMON TYPE	STEAM TUBE BUNDLE
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** FANS	
DESIGN	CENTRIFUGAL
FUNCTION	NR
APPLICATION	FORCED DRAFT
SERVICE	DRY
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED
DEVICE TYPE	NR
** PUMPS	
SERVICE	NUMBER
-----	-----
NR	****

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 4 (CONT.)

** SOLIDS CONCENTRATING/DEWATERING
DEVICE NA

*** SALEABLE BYPRODUCTS
NATURE NONE
DISPOSITION N/A

*** SLUDGE

** TREATMENT
METHOD UNSTABILIZED
DEVICE NR
PROPRIETARY PROCESS NR

** DISPOSAL
NATURE FINAL
TYPE POND
SITE TREATMENT NONE

** WATER BALANCE
WATER LOOP TYPE CLOSED

-----PERFORMANCE DATA-----
PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
SO2 PART. HOURS HOURS HOURS FACTOR

7/81 SYSTEM 744

8/81 SYSTEM 744

9/81 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD OPERATION COMMENCED IN JULY 1981. HOWEVER, ONLY ONE OF THE TWO
ABSORBER MODULES IS OPERATIONAL. A MAJOR FIRE HAS DELAYED THE SCHEDULED
START-UP OF THE OTHER MODULE UNTIL FEBRUARY 1982.

10/81 SYSTEM 744

11/81 A 0.0 0.0 0.0
B 51.9 52.8 54.1 51.9
SYSTEM 51.9 52.8 54.1 51.9 720 709 374 79.1

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS STILL UNDER CONSTRUCTION IN NOVEMBER.

DURING THE MONTH PROBLEMS WERE ENCOUNTERED WITH THE CL PRESCRUBBER NOZZLES
PLUGGING AND WATER IN THE AIR SYSTEM.

DURING NOVEMBER THE CL PRESCRUBBER SECTION WAS COATED AND DEFLECTORS
WERE INSTALLED.

THE CL PRESCRUBBER PUMP WAS REPACKED.

12/81 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION FOR THE MONTHS OF OCTOBER AND DECEMBER WAS NOT AVAILABLE.

1/82 A 24.6 28.7 27.1 24.6

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 4 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	B SYSTEM	0.0 12.3	0.0 14.3	0.0 13.6	0.0 12.3		744	638	92	55.6

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE B WAS OUT OF SERVICE DURING PART OF JANUARY DUE TO REPAIR OF THE CHLORIDE PRESCRUBBER.

MODULE A WAS TAKEN OUT OF SERVICE ON JANUARY 8, 1982 DUE TO BADLY LEAKING DOOR FRAMES TO THE CHLORIDE PRESCRUBBER.

A SCHEDULED OUTAGE FOR THE UNIT OCCURRED DURING JANUARY.

ONLY ONE MODULE WAS USED FROM JANUARY, 1982 TO MARCH 30, 1982 DUE TO A FIRE IN MODULE B.

2/82	A	56.7	62.1	66.0	56.7					
	B	0.0	0.0	0.0	0.0					
	SYSTEM	28.3	31.1	33.0	28.3		672	613	190	46.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS OUT OF SERVICE DURING PART OF FEBRUARY FOR MAINTENANCE.

REPAIR ON A HOLE IN THE CL PRESCRUBBER PUMP RESULTED IN OUTAGE TIME DURING THE MONTH.

THE DEVELOPMENT OF WATER IN THE AIR SYSTEM CREATED DOWN TIME DURING FEBRUARY.

MODULE A WAS ALSO DOWN DURING THE MONTH FOR A CLEANING OF THE CHLORIDE PRESCRUBBER NOZZLES.

PLUGGED BLEED LINES RESULTED IN OUTAGE TIME FOR MODULE A DURING THE MONTH.

A LEAK IN THE CHLORIDE PRESCRUBBER PRODUCED AN OUTAGE DURING FEBRUARY.

THE UNIT WAS DOWN DURING THE MONTH FOR PRECIPITATOR MAINTENANCE.

THE MODULE A SURGE PUMPS WERE ALSO OUT OF SERVICE DURING FEBRUARY AND LED TO ADDITIONAL OUTAGE TIME.

3/82	A	17.3	20.3	20.3	17.3					
	B	3.2	3.8	3.8	3.2					
	SYSTEM	10.3	12.1	12.1	10.3		744	634	77	49.1

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A SURGE PUMPS WERE OUT OF SERVICE DURING MARCH RESULTING IN OUTAGE TIME.

MODULE B WAS UNDER CONSTRUCTION DURING THE MONTH AND LATER PLACED BACK IN SERVICE ON MARCH 30. THE UNIT WAS ALSO BROUGHT DOWN WHILE THE REPAIR WORK ON MODULE B CONTINUED.

A LEAK IN THE CHLORIDE PRESCRUBBER FORCED MODULE A OUT OF SERVICE DURING THE MONTH.

A UNIT TRIP ALSO OCCURRED DURING MARCH RESULTING IN DOWN TIME.

4/82	A	45.0	45.4	45.3	45.0					
	B	51.4	51.9	61.8	51.4					
	SYSTEM	48.2	48.7	53.6	48.2		720	713	347	68.2

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING APRIL MIST ELIMINATOR TRAYS WERE INSTALLED IN MODULE B.

MODULE B WAS OFF-LINE PART OF THE MONTH TO CLEAN PLUGGED NOZZLES AND DUE TO A LOW PH.

THE SYSTEM WAS OFF-LINE APPROXIMATELY 11 DAYS TO CLEAN THE THICKENER OVERFLOW TANKS.

PROBLEMS WERE EXPERIENCED WITH THE REACTION TANK LEVEL CONTROLLER CAUSING MODULE A DOWN TIME.

DURING APRIL THE RECYCLE PUMPS FOR MODULE A WERE REPACKED.

THE SPRAY NOZZLES ON MODULE A WERE PLUGGED AND REQUIRED THE MODULE TO BE SHUT DOWN FOR CLEANING.

MODULE A EXPERIENCED A LEAK IN THE CHLORIDE PRESCRUBBER.

5/82	A	48.7	49.3	49.3	48.7				
	B	43.6	44.2	44.2	43.6				
	SYSTEM	46.1	46.7	46.7	46.1	744	735	344	71.8

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MAY THE SPRAY NOZZLES PLUGGED REQUIRING DOWN TIME FOR CLEANING.

SOME OF THE PUMPS WERE REPACKED DURING THE MONTH.

THE UTILITY REPORTED EXPERIENCING DAMPER PROBLEMS IN MAY.

THE THICKENER TANKS AND THE QUENCHER TANKS REQUIRED DOWN TIME IN MAY TO BE CLEANED.

6/82	A	26.6	26.6	27.0	26.6				
	B	64.9	64.2	65.2	64.2				
	SYSTEM	45.7	45.4	46.1	45.4	720	719	327	65.6

** PROBLEMS/SOLUTIONS/COMMENTS

DAMPER PROBLEMS CONTINUED IN JUNE WITH THE A MODULE INLET DAMPER MAL-FUNCTIONING.

BOTH SURGE PUMPS WERE OUT OF SERVICE AT ONE POINT IN JUNE.

LOW QUENCHER FLOW CAUSED ADDITIONAL DOWN TIME FOR THE SYSTEM DURING MAY AND JUNE.

7/82	A	63.2	62.3	62.4	61.7				
	B	78.9	78.1	78.2	77.4				
	SYSTEM	71.1	70.2	70.3	69.6	744	738	518	71.8

** PROBLEMS/SOLUTIONS/COMMENTS

A CLEANING OF THE CL PRESCRUBBER NOZZLES AND HEADER RESULTED IN OUTAGE TIME FOR THE FGD SYSTEM DURING JULY.

MAINTENANCE OF AN INLET DAMPER CONTRIBUTED TO THE OUTAGES DURING JULY.

MAINTENANCE OF ADDITIVE FEED PUMPS ALSO LED TO DOWN TIME DURING THE MONTH.

THE REPLACEMENT OF MIST ELIMINATOR WASH NOZZLES TOOK PLACE DURING JULY

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

AND CAUSED ADDITIONAL OUTAGE TIME.

THE REPAIR OF CL PRESCRUBBER LEAKS PRODUCED OUTAGES DURING THE MONTH.

THE UNPLUGGING OF A MASS ADDITIVE FLOW CONTROLLER REQUIRED DOWN TIME FOR THE FGD SYSTEM DURING JULY.

THE DRAINING AND CLEANING OF SLURRY HOLD TANKS CONTRIBUTED TO FGD SYSTEM OUTAGES DURING THE MONTH.

8/82	A	53.5	53.4	53.3	52.3				
	B	45.6	45.6	45.5	44.7				
	SYSTEM	49.5	49.5	49.4	48.5	744	728	361	68.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE CLEANING OF ADDITIVE SUPPLY PUMP SUCTION LINES RESULTED IN DOWN TIME FOR THE FGD SYSTEM DURING AUGUST.

THE REMOVAL OF PLUGGAGE FROM A CL PRESCRUBBER TROUGH CAUSED SOME OUTAGE TIME DURING THE MONTH.

THE REPAIR OF CL PRESCRUBBER FLOOR LEAKS CONTRIBUTED TO OUTAGES DURING AUGUST.

MAINTENANCE OF SLURRY HEADER LEAKS ALSO LED TO FGD SYSTEM OUTAGE TIME.

MAINTENANCE OF THICKENER SURGE PUMPS RESULTED IN DOWN TIME FOR THE FGD SYSTEM DURING AUGUST.

THE CLEANING OF CL PRESCRUBBER NOZZLES CAUSED ADDITIONAL OUTAGE TIME DURING THE MONTH.

9/82	A	22.9	34.9	34.9	21.0				
	B	21.0	35.0	35.0	21.0				
	SYSTEM	22.0	34.9	34.9	21.0	720	433	151	42.4

** PROBLEMS/SOLUTIONS/COMMENTS

PUMP MAINTENANCE WAS A PRIMARY CAUSE OF FGD SYSTEM OUTAGES DURING SEPTEMBER.

AN INSPECTION OF REACTION TANK MIXERS RESULTED IN DOWN TIME DURING THE MONTH.

THE UNIT WAS TAKEN OUT OF SERVICE ON OCTOBER 19 FOR A SCHEDULED OUTAGE. A TURBINE INSPECTION WAS MADE.

10/82	A	0.0	0.0	0.0	0.0				
	B	0.0	0.0	0.0	0.0				
	SYSTEM	0.0	0.0	0.0	0.0	744	71	0	4.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE SCHEDULED TURBINE INSPECTION OUTAGE CONTINUED UNTIL OCTOBER 27, 1982. THE OUTAGE WAS CONTINUED THROUGHOUT THE MONTH FOR MAINTENANCE ON VARIOUS COMPONENTS OF THE FGD SYSTEM.

11/82	A	64.5	73.2	73.2	64.5				
	B	46.1	52.3	52.3	46.1				
	SYSTEM	55.3	62.8	62.8	55.3	720	634	398	54.5

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

MAINTENANCE OF CL PRESCRUBBER LEAKS TOOK PLACE DURING NOVEMBER AND CONTRIBUTED TO OUTAGE TIME.

MAINTENANCE OF THICKENER SURGE PUMPS RESULTED IN DOWN TIME DURING THE MONTH.

12/82	A	71.3	77.1	77.1	56.7				
	B	70.4	72.5	72.5	53.3				
	SYSTEM	70.9	74.8	74.8	55.0	744	548	409	43.9

** PROBLEMS/SOLUTIONS/COMMENTS

CL PRESCRUBBER NOZZLES WERE CLEANED DURING DECEMBER LEADING TO OUTAGE TIME.

THE UNIT WAS TAKEN OUT OF SERVICE FROM DECEMBER 24, 1982 TO JANUARY 2, 1983 FOR A SCHEDULED OUTAGE.

1/83	A	89.3	88.6	89.3	85.9				
	B	85.9	84.9	85.6	82.3				
	SYSTEM	87.6	86.8	87.4	84.1	744	721	626	57.1

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OUT OF SERVICE JANUARY 1 AND 2 FOR A SCHEDULED OUTAGE.

PROBLEMS CONTROLLING PH WERE EXPERIENCED DURING JANUARY.

MAINTENANCE ON THE MODULE B INLET DAMPER CONTRIBUTED TO THE OUTAGE TIME DURING THE MONTH.

THE SYSTEM EXPERIENCED CL PRESCRUBBER FLOW PROBLEMS DURING JANUARY.

MAINTENANCE OF RECYCLE PUMPS RESULTED IN DOWN TIME DURING THE MONTH.

2/83	A	50.1	69.8	70.5	49.9				
	B	21.9	30.6	30.9	21.9				
	SYSTEM	36.0	50.2	50.7	35.9	672	481	241	42.4

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OUT OF SERVICE FROM FEBRUARY 8 TO FEBRUARY 11 AND AGAIN FROM FEBRUARY 23 TO FEBRUARY 28 FOR SCHEDULED OUTAGES.

MAINTENANCE OF AN INLET PRESSURE TRANSMITTER TOOK PLACE DURING FEBRUARY.

THE SYSTEM EXPERIENCED CL PRESCRUBBER FLOW PROBLEMS DURING THE MONTH.

MAINTENANCE OF RECYCLE PUMPS TOOK PLACE DURING FEBRUARY.

A CL PRESCRUBBER HEADER LEAK OCCURRED DURING THE MONTH.

PROBLEMS CONTROLLING PH WERE EXPERIENCED DURING FEBRUARY.

3/83	A	79.3	63.7	65.6	42.7				
	B	31.4	25.3	26.1	17.0				
	SYSTEM	55.4	44.5	45.8	29.9	744	499	222	43.2

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OUT OF SERVICE FROM MARCH 1 TO MARCH 3 AND AGAIN FROM MARCH 8 TO MARCH 13 FOR SCHEDULED OUTAGES.

MODULE B WAS OUT OF SERVICE DURING MARCH DUE TO MAINTENANCE OF AN INLET DAMPER.

CHLORIDE PRESCRUBBER PROBLEMS OCCURRED DURING THE MONTH.

4/83	A	87.6	84.6	85.7	77.5				
	B	49.3	48.2	48.8	44.2				
	SYSTEM	68.4	66.4	67.2	60.8	720	659	438	58.6

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE B WAS OUT OF SERVICE FROM APRIL 1 TO APRIL 15 DUE TO INLET DAMPER MAINTENANCE.

LEAKS WERE REPAIRED IN THE CL PRESCRUBBER DOOR AND HEADER DURING APRIL.

QUENCHER NOZZLES WERE UNPLUGGED DURING THE MONTH.

MAINTENANCE WAS REQUIRED ON SLURRY RECYCLE PUMPS DURING APRIL.

5/83	A	85.3	82.5	83.0	78.2				
	B	88.1	85.2	85.7	80.7				
	SYSTEM	86.7	83.9	84.3	79.4	744	705	591	65.8

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A EXPERIENCED PH CONTROL PROBLEMS DURING MAY.

A MODULE INSPECTION WAS PERFORMED DURING MAY ACCOUNTING FOR OUTAGE TIME.

SPRAY NOZZLE MODIFICATIONS WERE MADE DURING THE MONTH RESULTING IN OUTAGE TIME.

CL PRESCRUBBER FLOW PROBLEMS WERE ENCOUNTERED DURING MAY MAKING IT NECESSARY TO DRAIN THE TANK.

A COMMON BLEED DISCHARGE LINE HAD TO BE UNPLUGGED DURING MAY ACCOUNTING FOR OUTAGE TIME.

6/83	A	84.7	84.7	84.7	84.7				
	B	86.3	86.3	86.3	86.3				
	SYSTEM	85.5	85.5	85.5	85.5	720	720	616	57.6

** PROBLEMS/SOLUTIONS/COMMENTS

AN INSPECTION OF THE B MODULE INTERNAL COMPONENTS WAS PERFORMED DURING JUNE.

REPAIRS WERE MADE ON A LEAK IN THE CL PRESCRUBBER DUCTWORK.

RUPTURED SEAL WATER LINES WERE REPAIRED DURING THE MONTH OF JUNE.

7/83	A	79.4	77.1	77.5	70.8				
	B	97.6	96.9	97.3	88.9				
	SYSTEM	88.5	87.0	87.4	79.9	744	683	594	59.3

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS OUT OF SERVICE FROM JULY 11 TO JULY 16 FOR MODIFICATION OF THE
 INTERNAL MODULE COMPONENTS.

8/83	A	98.9	99.3	99.3	98.8				
	B	98.2	98.5	98.5	98.1				
	SYSTEM	98.6	98.9	98.9	98.4	744	741	732	68.2
9/83	A	98.8	98.1	98.7	94.9				
	B	99.1	98.5	99.1	95.2				
	SYSTEM	99.0	98.3	98.9	95.1	720	696	685	59.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT HIGH AVAILABILITY DURING THE THIRD QUARTER OF
 1983 CAN BE ATTRIBUTED TO PERSONNEL CHANGES MADE AT UNITS 2, 3, AND 4. A
 SEPARATE CREW HAS BEEN ASSIGNED TO THE FGD SYSTEM AND CREW MEMBERS ARE MORE
 CLOSELY SUPERVISED.

10/83	A	24.3	99.2	99.2	24.3				
	B	24.3	99.2	99.2	24.3				
	SYSTEM	24.3	99.2	99.2	24.3	744	183	181	15.1

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED ANNUAL MAINTENANCE OUTAGE FOR THE UNIT AND FGD SYSTEM OCCURRED
 FROM OCTOBER 8 TO THE END OF THE MONTH.

11/83	A	84.1	73.9	90.3	73.9				
	B	86.4	76.1	93.0	76.1				
	SYSTEM	85.2	75.0	91.7	75.0	720	720	540	48.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE ANNUAL MAINTENANCE OUTAGE WHICH BEGAN IN OCTOBER CONTINUED UNTIL NOVEMBER
 3, 1983.

A SCHEDULED UNIT OUTAGE TOOK PLACE FROM NOVEMBER 8 TO NOVEMBER 11, 1983.

SLURRY PUMP TRIPS ACCOUNTED FOR ABSORBER OUTAGE TIME DURING NOVEMBER.

AN ACCIDENTAL BREAKAGE OF THE AIR LINE TO AN INLET DAMPER CYLINDER CAUSED
 ADDITIONAL DOWN TIME DURING THE MONTH.

REPAIR OF A SPRAY HEADER LEAK ACCOUNTED FOR ABSORBER DOWN TIME DURING
 NOVEMBER.

THE UNPLUGGING OF CHLORIDE PRESCRUBBER SPRAY NOZZLES AND CHEVRONS CONTRIBUTED
 TO FGD SYSTEM OUTAGES DURING THE MONTH.

12/83	A	89.2	87.7	88.8	81.3				
	B	89.0	86.6	87.7	80.3				
	SYSTEM	89.1	87.1	88.2	80.8	744	690	601	58.9

** PROBLEMS/SOLUTIONS/COMMENTS

BOILER TUBE LEAKS ACCOUNTED FOR A FORCED UNIT OUTAGE FROM DECEMBER 24 TO
 DECEMBER 27, 1983.

FROZEN WATER LINES RESULTED IN AN ABSORBER OUTAGE FROM DECEMBER 27 TO
 DECEMBER 28, 1983.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 4 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

1/84	A	95.6	95.5	95.5	92.4					
	B	96.3	96.2	96.2	93.1					
	SYSTEM	96.0	95.9	95.8	92.8		744	720	690	60.9
2/84	A	100.0	92.7	95.8	21.1					
	B	100.0	92.7	95.8	21.1					
	SYSTEM	100.0	92.7	95.8	21.1		696	158	147	11.2
3/84	A	94.4	90.7	92.3	67.5					
	B	95.5	92.1	93.8	68.6					
	SYSTEM	94.9	91.4	93.1	68.1		744	554	506	45.8

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING THE FIRST QUARTER OF 1984.

4/84	SYSTEM						720			
5/84	SYSTEM						744			
6/84	SYSTEM						720			
7/84	SYSTEM						744			
8/84	SYSTEM						744			

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTH OF APRIL THROUGH AUGUST 1984.

9/84	A	94.9	95.8	95.8	94.9					
	B	86.8	87.6	87.6	86.8					
	SYSTEM	90.9	91.7	91.7	90.9		720	713	654	64.4
10/84	A	93.9	93.2	93.8	86.3					
	B	87.5	86.2	86.9	79.8					
	SYSTEM	90.7	89.7	90.4	83.1		744	689	618	54.5
11/84	A	97.7	97.5	97.6	96.9					
	B	95.1	94.8	95.0	94.3					
	SYSTEM	96.4	96.1	96.3	95.6		720	716	688	63.1
12/84	A	97.3	97.7	96.1	56.5					
	B	98.2	99.1	97.4	57.3					
	SYSTEM	97.7	98.4	96.8	56.9		744	430	423	33.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE MONTHS OF SEPTEMBER THRU DECEMBER 1984.

1/85	A	94.6	72.1	20.0	15.7					
	B	93.7	67.8	18.8	14.8					
	SYSTEM	94.1	70.0	19.4	15.3		744	162	114	11.9

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STANDBY STATUS FROM JANUARY 1 THROUGH 20 AND JANUARY 29 THROUGH 31.

2/85	A	95.3	98.6	99.6	31.0					

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 4 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	B	93.1	91.7	92.6	28.8						
	SYSTEM	94.2	95.2	96.1	29.9			672	211	201	13.8
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UNIT WAS ON STANDBY STATUS FROM FEBRUARY 1 THROUGH 4 AND FEBRUARY 15 THROUGH 28.											
3/85	A	98.5	85.3	98.5	14.6						
	B	98.5	85.1	98.3	14.6						
	SYSTEM	98.5	85.2	98.4	14.6			744	128	109	9.8
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UTILITY REPORTED THAT THE UNIT WAS ON STANDBY STATUS FOR 26 DAYS OF THE MONTH OF MARCH.											
4/85	A	99.9	94.7	98.9	7.7						
	B	99.7	92.1	96.0	7.5						
	SYSTEM	99.8	93.4	97.5	7.6			720	59	55	4.8
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UNIT WAS ON STANDBY STATUS FROM APRIL 1 THROUGH 28.											
5/85	A	92.9	92.8	93.0	91.8						
	B	91.6	94.5	94.7	93.5						
	SYSTEM	92.3	93.7	93.9	92.6			744	736	689	67.0
6/85	A	98.1	95.4	95.5	39.6						
	B	96.1	92.3	92.4	38.3						
	SYSTEM	97.1	93.9	94.0	38.9			720	299	280	24.2
** PROBLEMS/SOLUTIONS/COMMENTS											
NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MONTHS OF JANUARY THROUGH JUNE.											
THE UNIT WAS ON STANDBY STATUS FROM JUNE 13 THROUGH 30.											
7/85	A	84.2	88.6	96.0	43.7						
	B	84.8	90.0	98.9	44.4						
	SYSTEM	84.5	89.3	97.5	44.1			744	367	328	27.5
** PROBLEMS/SOLUTIONS/COMMENTS											
THE FGD SYSTEM WAS TAKEN OUT OF SERVICE ON JULY 29 FOR MODULE B MIST ELIMINATOR PROBLEMS.											
THE UNIT WAS ON STANDBY STATUS FROM JULY 1 THROUGH 9.											
8/85	A	82.9	98.3	97.3	63.4						
	B	83.1	98.6	97.7	63.6						
	SYSTEM	83.0	98.4	97.5	63.5			744	480	472	43.0
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UNIT WAS ON STANDBY FROM AUGUST 25 THROUGH 31.											
9/85	A	99.2	73.2	74.4	15.2						
	B	98.9	87.9	89.5	18.2						
	SYSTEM	99.1	80.6	82.0	16.7			720	149	120	12.5

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MONTHS OF AUGUST OR SEPTEMBER.

THE UNIT WAS ON STANDBY FROM SEPTEMBER 1 THROUGH 11 AND 13 THROUGH 25.

10/85	A	94.1	89.6	93.1	79.9				
	B	94.6	90.2	93.7	80.4				
	SYSTEM	94.3	89.9	93.4	80.1	744	663	596	58.2

** PROBLEMS/SOLUTIONS/COMMENTS

FGD SYSTEM PROBLEMS ASSOCIATED WITH THE DISCOVERY OF HOLES IN ABSORBER WALLS AND SPRAY HEADERS WERE REPORTED BY THE UTILITY DURING THE MONTH. SOME OUTAGE TIME WAS DUE TO UNIT STANDBY STATUS THAT BEGAN ON OCTOBER 27.

11/85	A	99.9	91.5	91.5	0.9				
	B	99.9	87.3	87.3	0.9				
	SYSTEM	99.9	89.4	89.4	0.9	720	7	6	0.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STANDBY STATUS FROM NOVEMBER 1 THROUGH 30.

12/85	A	100.0	100.0	100.0	86.7				
	B	99.8	99.8	99.8	86.5				
	SYSTEM	99.9	99.9	99.9	86.6	744	645	644	54.8

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS OF NOVEMBER OR DECEMBER.

THE UTILITY REPORTED THAT THE UNIT WAS ON STANDBY STATUS FROM DECEMBER 27 THROUGH 31.

1/86	A	99.4	85.9	91.9	6.8				
	B	99.4	85.9	91.9	6.8				
	SYSTEM	99.4	85.9	91.9	6.8	744	58	50	4.4

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STANDBY FROM THE 1ST THROUGH THE 8TH AND THE 10TH THROUGH THE 26TH OF JANUARY.

2/86	A	100.0			0.0				
	B	100.0			0.0				
	SYSTEM	100.0			0.0	672	0	0	0.0

3/86	A	19.4			0.0				
	B	19.4			0.0				
	SYSTEM	19.4			0.0	744	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

WINYAH 4 WAS ON STAND-BY THE ENTIRE MONTH OF FEBRUARY AND MARCH 1 TO 7 AT WHICH TIME A SCHEDULED FGD SYSTEM OUTAGE BEGAN AND CONTINUED THROUGH THE END OF THE MONTH.

4/86	A	0.0			0.0				
	B	0.0			0.0				
	SYSTEM	0.0			0.0	720	0	0	0.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

5/86	A	1.3	80.3	94.9	1.3				
	B	1.3	81.2	96.0	1.3				
	SYSTEM	1.3	80.8	95.5	1.3	744	12	9	0.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE SCHEDULED OUTAGE THAT BEGAN ON 3/7/86 CONTINUED THROUGH 5/31/86.

6/86	A	99.6	99.0	96.2	55.0				
	B	99.7	99.8	97.4	55.5				
	SYSTEM	99.7	99.4	96.8	55.2	720	400	398	38.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STANDBY FROM THE 4TH THROUGH THE 13TH AND THE 18TH THROUGH THE 22ND OF JUNE. NO FGD SYSTEM PROBLEMS WERE REPORTED.

7/86	A	100.0	99.8	100.0	97.7				
	B	100.0	99.8	100.0	97.7				
	SYSTEM	100.0	99.8	100.0	97.7	744	728	727	66.1

8/86	A	99.9	97.8	99.9	46.0				
	B	99.9	98.2	99.9	46.2				
	SYSTEM	99.9	98.0	99.9	46.1	744	350	343	29.9

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STANDBY 15 DAYS OUT OF THE MONTH OF AUGUST.

9/86	A	100.0	100.0	100.0	100.0				
	B	100.0	100.0	100.0	100.0				
	SYSTEM	100.0	100.0	100.0	100.0	720	715	720	76.0

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE 3RD QUARTER OF 1986.

10/86	A	100.0	99.5	100.0	94.1				
	B	100.0	99.5	100.0	94.1				
	SYSTEM	100.0	99.5	100.0	94.1	744	703	700	68.1

11/86	A	99.6	99.0	99.0	31.7				
	B	99.8	99.1	99.1	31.7				
	SYSTEM	99.7	99.0	99.0	31.7	720	230	228	24.1

** PROBLEMS/SOLUTIONS/COMMENTS

WINYAH 4 WAS ON STANDBY FROM THE 2ND THROUGH THE 13TH AND 16TH THROUGH THE 25TH OF NOVEMBER.

12/86	A	96.8	88.7	99.9	39.7				
	B	96.7	88.1	95.8	39.4				
	SYSTEM	96.8	88.4	97.9	39.5	744	333	294	33.1

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STANDBY FROM THE 6TH THROUGH THE 11TH AND 25TH THROUGH THE END OF THE MONTH OF DECEMBER.

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE 4TH QUARTER.

1/87	A	99.9	99.0	99.1	59.0				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 4 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	B	99.9	99.0	99.1	59.0					
	SYSTEM	99.9	99.0	99.1	59.0		744	444	439	49.2
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UNIT WAS ON STAND-BY FROM 1/1 TO 1/2 AND FROM 1/7 TO 1/17.										
2/87	A	100.0	100.0	100.0	100.0					
	B	100.0	100.0	100.0	100.0					
	SYSTEM	100.0	100.0	100.0	100.0		672	672	672	88.6
** PROBLEMS/SOLUTIONS/COMMENTS										
NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR FEBRUARY.										
3/87	A	100.0	99.4	100.0	84.3					
	B	100.0	99.4	100.0	84.3					
	SYSTEM	100.0	99.4	100.0	84.3		744	631	627	74.7
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UNIT WAS ON STAND-BY FROM 3/7 TO 4/12.										
4/87	A	99.1	99.2	99.2	99.1					
	B	99.9	100.0	100.0	99.9					
	SYSTEM	99.5	99.6	99.6	99.5		720	719	716	83.8
5/87	A	99.9	99.9	99.9	99.9					
	B	99.9	99.9	99.9	99.9					
	SYSTEM	99.9	99.9	99.9	99.9		744	744	743	87.8
6/87	A	99.4	99.4	99.4	99.4					
	B	100.0	98.7	98.7	98.7					
	SYSTEM	99.7	99.1	99.1	99.1		720	720	713	79.3
** PROBLEMS/SOLUTIONS/COMMENTS										
NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD APRIL THROUGH JUNE 1987.										
7/87	A	99.9	99.9	99.9	84.1					
	B	99.9	99.7	99.7	83.9					
	SYSTEM	99.9	99.8	99.8	84.0		744	626	625	84.2
** PROBLEMS/SOLUTIONS/COMMENTS										
BOILER WAS OFF-LINE FOR MAINTENANCE FROM 7/15 TO 7/20. INFORMATION ON THE NATURE OF THE OUTAGE WAS NOT AVAILABLE.										
8/87	A	99.7	99.3	99.6	97.4					
	B	99.9	99.7	99.9	97.8					
	SYSTEM	99.8	99.5	99.8	97.6		744	730	726	77.5
9/87	A	100.0	99.9	100.0	93.6					
	B	100.0	99.8	100.0	93.6					
	SYSTEM	100.0	99.9	100.0	93.6		720	675	674	70.8
** PROBLEMS/SOLUTIONS/COMMENTS										
NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD AUGUST THROUGH SEPTEMBER.										
10/87	A	50.7	99.7	99.8	50.3					

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH CAROLINA PUBLIC SERVICE: WINYAH 4 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	B	50.7	93.5	93.6	47.2						
	SYSTEM	50.7	96.6	96.7	48.8			744	376	363	41.4

** PROBLEMS/SOLUTIONS/COMMENTS

A UNIT OUTAGE OCCURRED FROM 11/16 TO 11/31. NO INFORMATION WAS AVAILABLE REGARDING THE NATURE OF THE OUTAGE.

11/87	A	24.4			0.0						
	B	51.1			0.0						
	SYSTEM	37.8			0.0			720	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON AN OUTAGE THE ENTIRE MONTH OF NOVEMBER. THE REASON FOR THE OUTAGE WAS NOT GIVEN.

12/87	A	99.8	99.2	99.2	21.1						
	B	99.8	99.1	99.1	21.0						
	SYSTEM	99.8	99.1	99.1	21.1			744	158	157	15.6

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED UNIT OUTAGE OCCURRED FROM 12/1 TO 12/13. UNIT WAS ON STAND-BY FROM 12/25 TO 12/31.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SOUTH MISSISSIPPI ELEC PWR	
PLANT NAME	R.D. MORROW, SR.	
UNIT NUMBER	1	
CITY	PURVIS	
STATE	MISSISSIPPI	
REGULATORY CLASSIFICATION	D	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	301.	(0.700 LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	400	
GROSS UNIT GENERATING CAPACITY - MW	215	
NET UNIT GENERATING CAPACITY W/FGD - MW	200	
NET UNIT GENERATING CAPACITY WO/FGD - MW	206	
EQUIVALENT SCRUBBED CAPACITY - MW	133	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	RILEY STOKER	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	335.76	(711500 ACFM)
BOILER FLUE GAS TEMPERATURE - C	132.2	(270 F)
STACK HEIGHT - M	122.	(400 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	3.3	(10.7 FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	28494.	(12250 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		11500-12500
AVERAGE ASH CONTENT - %	10.00	
RANGE ASH CONTENT - %	8.0-12.0	
AVERAGE MOISTURE CONTENT - %	6.50	
RANGE MOISTURE CONTENT - %	6.0-7.0	
AVERAGE SULFUR CONTENT - %	1.64	
RANGE SULFUR CONTENT - %	1.0-1.8	
AVERAGE CHLORIDE CONTENT - %	0.12	
RANGE CHLORIDE CONTENT - %	0.10-0.13	
*** PARTICLE CONTROL		
** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
** ESP		
NUMBER	1	
NUMBER OF SPARES	0	
TYPE	HOT SIDE	
SUPPLIER	BUELL DIVISION, ENVIROTECH	
INLET FLUE GAS CAPACITY - CU.M/S	579.5	(1228000 ACFM)
INLET FLUE GAS TEMPERATURE - C	426.7	(800 F)
PRESSURE DROP - KPA	0.1	(0. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.6	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
*** FGD SYSTEM		

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	ENVIRONEERING, RILEY STOKER
A-E FIRM	BURNS & MCDONNELL
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.60
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	85.00
ENERGY CONSUMPTION - %	2.8
CURRENT STATUS	1
COMMERCIAL START-UP	8/1978
INITIAL START-UP	8/1978
CONTRACT AWARDED	5/1975

** DESIGN AND OPERATING PARAMETERS

DESIGN COAL SULFUR CONTENT - %	1.30	
DESIGN COAL HEAT CONTENT - J/G	27912.0	(12000 BTU/LB)
DESIGN COAL ASH CONTENT - %	15.00	
DESIGN MOISTURE CONTENT - %	6.50	
DESIGN CHLORIDE CONTENT - %	0.01	
OPER. & MAINT. REQUIREMENT - MANHR/DAY	88.0	

** QUENCHER/PRESATURATOR

** ABSORBER

NUMBER	1	
NUMBER OF SPARES	0	
GENERIC TYPE	PACKED TOWER	
SPECIFIC TYPE	ROD DECK	
TRADE NAME/COMMON TYPE	VENTRI-SORBER	
SUPPLIER	ENVIRONEERING, RILEY STOKER	
DIMENSIONS - FT	51.5 WIDE X 47.7 HIGH X 22.0 DEEP	
SHELL GENERIC MATERIAL	CARBON STEEL	
SHELL SPECIFIC MATERIAL	AISI 1110	
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A	
LINER GENERIC MATERIAL	ORGANIC; HIGH ALLOY	
LINER SPECIFIC MATERIAL	SYNTHETIC RUBBER; NICKEL BASE/CHROMIUM-IRON-MOLY	
LINER MATERIAL TRADE NAME/COMMON TYPE	CHLOROBUTYL; HASTELLOY C-276	
GAS CONTACTING DEVICE TYPE	ROD DECKS	
NUMBER OF CONTACTING ZONES	4	
LIQUID RECIRCULATION RATE - LITER/S	1260.	(20000 GPM)
L/G RATIO - L/CU.M	6.0	(45.2 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	2.0	(8.0 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/SEC	3.0	(10.0 FT/S)
INLET GAS FLOW - CU. M/S	208.58	(442000 ACFM)
INLET GAS TEMPERATURE - C	132.2	(270 F)
SO2 REMOVAL EFFICIENCY - %	85.0	
PARTICLE REMOVAL EFFICIENCY - %	0.0	

** MIST ELIMINATOR

PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR	
NUMBER PER SYSTEM	1	
NUMBER OF SPARES PER SYSTEM	0	
NUMBER PER MODULE	1	
GENERIC TYPE	IMPINGEMENT	
SPECIFIC TYPE	BAFFLE	
TRADE NAME/COMMON TYPE	CLOSED VANE	
MANUFACTURER	ENVIRONEERING	
CONFIGURATION	VERTICAL	
NUMBER OF STAGES	2	
NUMBER OF PASSES PER STAGE	3	
DISTANCE BETWEEN STAGES - CM	91.44	(36.0 IN)
DISTANCE BETWEEN VANES - CM	53.3	(21.00 IN)
PRESSURE DROP - KPA	0.9	(3.5 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC	
CONSTRUCTION MATERIAL SPECIFIC TYPE	FIBER-REINFORCED POLYESTER	
WASH WATER SOURCE	SUPERNATANT FOR FIRST STAGE; MAKEUP FOR SECOND S	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

WASH FREQUENCY	INTERMITTENT	
WASH RATE - L/S	15.8	(250 GAL/MIN)
** REHEATER		
GENERIC TYPE	BYPASS	
SPECIFIC TYPE	COLD SIDE	
TRADE NAME/COMMON TYPE	N/A	
PERCENT GAS BYPASSED - AVG	38.0	
TEMPERATURE INCREASE - C	28.9	(52 F)
INLET FLUE GAS FLOW RATE - CU. M/S	190.65	(404000 ACFM)
INLET FLUE GAS TEMPERATURE - C	52.2	(126 F)
OUTLET FLUE GAS TEMPERATURE - C	86.7	(188 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL; HIGH ALLOY	
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110; NICKEL BASE/CHROMIUM-IRON-COPPER-MOLY	
** FANS		
NUMBER	2	
NUMBER OF SPARES	0	
DESIGN	CENTRIFUGAL	
SUPPLIER	GREEN FAN	
FUNCTION	UNIT	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
FLUE GAS FLOW RATE - CU.M/S	201.03	(426000 ACFM)
FLUE GAS TEMPERATURE - C	148.9	(300 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** DAMPERS		
NUMBER	2	
FUNCTION	SHUT-OFF	
GENERIC TYPE	LOUVER	
SPECIFIC TYPE	PARALLEL BLADE MULTILOUVER	
MANUFACTURER	RILEY STOKER	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110	
LINER GENERIC MATERIAL TYPE	NONE	
LINER SPECIFIC MATERIAL TYPE	N/A	
** DAMPERS		
NUMBER	1	
FUNCTION	SHUT-OFF	
GENERIC TYPE	LOUVER	
SPECIFIC TYPE	PARALLEL BLADE MULTILOUVER	
MANUFACTURER	RILEY STOKER	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110	
LINER GENERIC MATERIAL TYPE	NONE	
LINER SPECIFIC MATERIAL TYPE	N/A	
** DAMPERS		
NUMBER	1	
FUNCTION	SHUT-OFF	
GENERIC TYPE	LOUVER	
SPECIFIC TYPE	PARALLEL BLADE MULTILOUVER	
MANUFACTURER	DAMPER DESIGN	
CONSTRUCTION MATERIAL GENERIC TYPE	HIGH ALLOY 'SEALS!	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NICKEL BASE/CHROMIUM-MOLYBDENUM-NICKEL-COPPER	
LINER GENERIC MATERIAL TYPE	ORGANIC	
LINER SPECIFIC MATERIAL TYPE	NATURAL RUBBER	
** DAMPERS		
NUMBER	1	
FUNCTION	CONTROL	
GENERIC TYPE	LOUVER	
SPECIFIC TYPE	PARALLEL BLADE MULTILOUVER	
MANUFACTURER	RILEY STOKER	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110	
LINER GENERIC MATERIAL TYPE	NONE	
LINER SPECIFIC MATERIAL TYPE	N/A	

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

** DAMPERS	
NUMBER	1
FUNCTION	CONTROL
GENERIC TYPE	LOUVER
SPECIFIC TYPE	PARALLEL BLADE MULTILOUVER
MANUFACTURER	RILEY STOKER
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	SCRUBBER INLET
CONFIGURATION	RECTANGULAR
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	SCRUBBER OUTLET TO STACK
CONFIGURATION	RECTANGULAR
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	HIGH ALLOY
LINER SPECIFIC MATERIAL TYPE	NICKEL BASE/CHROMIUM-IRON-COPPER-MOLYBDENUM
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED
DEVICE TYPE	TUBE MILL
MANUFACTURER	KENNEDY VAN SAUN
NUMBER	1
NUMBER OF SPARES	0
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	7.3 (8 TPH)
PRODUCT QUALITY - % SOLIDS	35.0
** TANKS	
SERVICE	NUMBER
-----	-----
REAGENT PREP PRODUCT	1
ABSORBER RECYCLE	1
MILL SUMP	1
THICKENER SUPPLY SUMP	1
THICKENER OVERFLOW	1
ME WASH	1
** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER RECIRCULATION	3
SLURRY TRANSFER	2
MILL SLURRY	2
ME WASH	2
CLEAR WATER TRANSFER 'SUPERNATANT'	2
THICKENER UNDERFLOW	2
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	VACUUM FILTER
NUMBER	1
NUMBER OF SPARES	0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	EPOXY
BELT GENERIC MATERIAL TYPE	ORGANIC
BELT SPECIFIC MATERIAL TYPE	NYLON
FEED STREAM SOURCE	THICKENER UNDERFLOW
FEED STREAM CHARACTERISTICS	40% SOLIDS
OUTLET STREAM CHARACTERISTICS	70% SOLIDS

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

OUTLET STREAM DISPOSITION	TO PUG MILL AND DISPOSAL
OVERFLOW STREAM DISPOSITION	TO THICKENER
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	1
NUMBER OF SPARES	0
DIMENSIONS - FT	60.0 DIA X 11.0
CAPACITY	230000
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	BITUMASTIC
FEED STREAM SOURCE	ABSORBER BLEED
FEED STREAM CHARACTERISTICS	70-100 GPM PER UNIT, 15% SOLIDS
OUTLET STREAM CHARACTERISTICS	40% SOLIDS
OVERFLOW STREAM CHARACTERISTICS	<5% SOLIDS
OUTLET STREAM DISPOSITION	TO VACUUM FILTER
OVERFLOW STREAM DISPOSITION	TO MILL SLURRY TANK, ABSORBER ME TANK, AND RECYC
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
FULL LOAD SLUDGE QUANTITY - M.TONS/HR (DRY)	3.6 (4.0 TPH)
MOISTURE CONTENT - % TOTAL FREE WATER	20.0
% CASO3 - DRY	20.0
% CASO4 - DRY	70.0
% CAOH2 - DRY	5.0
% CACO3 - DRY	5.0
% ASH - DRY	5.0
% OTHER COMPOUNDS - DRY	1.0
** TREATMENT	
METHOD	FIXATION
DEVICE	PUG MILL
PROPRIETARY PROCESS	NONE
INLET QUALITY - %	70.0
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	TRUCK/CONVEYED
SITE TREATMENT	CLAY LINING 'NATURAL'
SITE DIMENSIONS	13 ACRES X 30 FEET
SITE CAPACITY - CU.M	476970 (390.0 ACRE-FT)
SITE SERVICE LIFE - YRS	6
** PROCESS CONTROL AND INSTRUMENTATION	
PROCESS STREAM	ABSORBER RECYCLE, FLUE GAS
CHEMICAL PARAMETERS	PH, SO2
PHYSICAL VARIABLES	DENSITY, FLOW
CONTROL LEVELS	PH 5.4-5.6, SO2 - 1.2 LB/MM BTU
MONITOR TYPE	L & N, LEAR SIEGLER
MONITOR LOCATION	RECYCLE TANK/INLET DUCT
PROCESS CONTROL MANNER	AUTOMATIC
PROCESS CHEMISTRY MODE	FEEDBACK
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
** CHEMICALS AND CONSUMPTION	
FUNCTION	ABSORBENT
NAME	LIMESTONE
PRINCIPAL CONSTITUENT	>85% CACO3

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

SOURCE/SUPPLIER	CALERA QUARRY
CONSUMPTION	70 TONS/DAY *2 UNITS AT FULL LOAD!
UTILIZATION - %	80.0
POINT OF ADDITION	BALL MILL

** FGD SPARE CAPACITY INDICES

ABSORBER - %	0.0
MIST ELIMINATOR - %	0.0
FAN - %	0.0
BALL MILL - %	0.0
THICKENER - %	0.0
VACUUM FILTER - %	0.0

** FGD SPARE COMPONENT INDICES

ABSORBER	0.0
MIST ELIMINATOR	0.0
FAN	0.0
BALL MILL	0.0
THICKENER	0.0
VACUUM FILTER	0.0

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

8/78	SYSTEM						744		

9/78	SYSTEM						720		

** PROBLEMS/SOLUTIONS/COMMENTS

A FORCED BOILER OUTAGE OCCURRED DURING THE PERIOD AS A RESULT OF BOILER TUBE LEAKS. THE UNIT IS EXPECTED TO START UP AGAIN IN EARLY NOVEMBER.

10/78	SYSTEM				0.0		744	0	0	0.0

11/78	SYSTEM				0.0		720	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

OPERATION OF THE UNIT WAS INTERMITTENT DUE TO CONTINUING BOILER TUBE PROBLEMS. THE BOILER WAS SHUT DOWN NOVEMBER 1 AS A RESULT OF BOILER TUBE PROBLEMS. RESUMPTION OF OPERATION IS SCHEDULED FOR MARCH 1979.

THE FGD SYSTEM WAS BYPASSED ENTIRELY IN OCTOBER DUE TO SERIOUS CONTROL VALVE PLUGGING.

12/78	SYSTEM				0.0		744	0	0	0.0

1/79	SYSTEM				0.0		744	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT HAS NOT YET BEEN RESTARTED SINCE THE NOVEMBER SHUTDOWN.

2/79	SYSTEM				0.0		672	0	0	0.0

3/79	SYSTEM				0.0		744	0	0	0.0

4/79	SYSTEM						720	631		

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER RETURNED TO SERVICE ON APRIL 1 AFTER COMPLETION OF REPAIRS TO THE BOILER TUBES.

NO FGD SYSTEM RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR APRIL.

5/79	SYSTEM						744			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR
6/79	SYSTEM						720		
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT THE SYSTEM OPERATED MOST OF MAY AND JUNE WITH NO MAJOR PROBLEMS.									
7/79	SYSTEM						744		
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING THE FIRST WEEK OF JULY THE UNIT WAS REMOVED FROM SERVICE DUE TO SEVERE PROBLEMS WITH THE FGD SYSTEM. THE UTILITY NOTED THAT ABOUT HALF OF THE MODULE HEADERS WERE PLUGGED, HOLES WERE NOTED IN THE MODULE SHELL, THE UPPER ROD BANK CORRODED AWAY FROM THE SHELL, AND EXTENSIVE PLUGGING OF THE MIST ELIMINATOR OCCURRED. LINER FAILURE AT THE OUTLET DUCTWORK WAS ALSO EXPERIENCED. THE UTILITY PLANS TO REPLACE THE DUCTWORK WITH HASTALLOY. THE FGD SYSTEM IS EXPECTED TO BE OFF LINE FOR SEVERAL MONTHS FOR REPAIRS TO BE COMPLETED.									
8/79	SYSTEM	0.0			0.0		744	0	0 0.0
9/79	SYSTEM	0.0			0.0		720	0	0 0.0
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UNIT REMAINED OFF LINE DURING THE MONTHS OF AUGUST AND SEPTEMBER AS MAINTENANCE AND REPAIR WORK CONTINUED.									
10/79	SYSTEM	0.0	0.0	0.0	0.0		744	282	0 23.0
11/79	SYSTEM	0.0	0.0	0.0	0.0		720		0
12/79	SYSTEM	0.0	0.0	0.0	0.0		744		0
** PROBLEMS/SOLUTIONS/COMMENTS									
THE SCRUBBER HAS REMAINED OFF LINE THROUGH THE REPORT PERIOD DUE TO THE LINING FAILURE. RELINING SHOULD BE COMPLETED AND THE UNIT ON LINE IN MARCH.									
1/80	SYSTEM	0.0		0.0	0.0		740	0	0 0.0
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UNIT REMAINED OFF LINE DURING JANUARY AS RELINING OF THE SCRUBBERS WAS COMING TO COMPLETION.									
THE PRESATURATOR AREAS, BYPASS DUCTS, AND THE SECTIONS OF DUCT FROM ABSORBER EXITS AT POINTS WHERE BYPASSED GAS MIXES WITH WET GAS ALL THE WAY TO THE STACK ARE BEING LINED WITH HASTELLOY G (A 1/8 INCH LINING IS BEING WELDED TO THE EXISTING CARBON STEEL). THE MAIN BODY OF THE ABSORBER MODULES IMMEDIATELY ABOVE THE PRESATURATOR SECTIONS ALL THE WAY TO THE ABSORBER EXIT IS BEING LINED WITH CHLOROBUTYL RUBBER (ON THE EXISTING CARBON STEEL).									
2/80	SYSTEM	0.0		0.0	0.0		696	0	0 0.0
3/80	SYSTEM	41.5	95.1	100.0	39.5		744	309	294

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MARCH THE UNIT 1 FGD SYSTEM RETURNED TO SERVICE OPERATING 294 HOURS

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
4/80	SYSTEM	100.0	99.0	100.0	99.0		720	720	713	

** PROBLEMS/SOLUTIONS/COMMENTS

THERE WERE NO OPERATIONAL PROBLEMS RELATED TO THE FGD SYSTEM DURING APRIL. FOUR INSPECTIONS WERE PERFORMED WHICH REQUIRED THE FGD SYSTEM TO BE OUT OF SERVICE FOR SEVEN HOURS.

5/80	SYSTEM	99.7	99.8	100.0	88.7		744	660	658	

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER WAS SCHEDULED TO BE OUT OF SERVICE FOR 84 HOURS TO CLEAN THE AIR PREHEATERS. THE BOILER OPERATED THE REMAINING HOURS IN MAY.

THE FGD SYSTEM WAS SCHEDULED TO BE OUT OF SERVICE FOR 1.5 HOURS FOR ROUTINE MODULE INSPECTION. THE FGD SYSTEM WAS AVAILABLE 99.7% DURING MAY.

6/80	SYSTEM	99.2	97.0	99.0	93.0		720	690	668	68.9

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JUNE OPERATIONS CAME TO A HALT FOR APPROXIMATELY SIX HOURS TO CLEAN THE MIST ELIMINATORS. OTHER OUTAGE TIME DURING THE MONTH WAS CAUSED BY BOILER-RELATED PROBLEMS.

7/80	SYSTEM	94.1	99.3	99.3	94.1		744	705	700	67.3

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JULY THE SCRUBBER WAS INSPECTED FOR SCALE ACCUMULATION AND A TRIP TEST WAS CONDUCTED ON THE SCRUBBER CONTROLS TO CHECK ON EARLIER MODIFICATIONS.

THE MAJORITY OF OUTAGE TIME WAS CAUSED BY A MALFUNCTION OF THE BALL MILL. THIS RESULTED IN A LOSS OF LIMESTONE SUPPLY IN THE STORAGE TANK.

A LEAK IN THE FEED WATER LINE CAUSED ADDITIONAL OUTAGE TIME DURING THE MONTH.

8/80	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	77.7

** PROBLEMS/SOLUTIONS/COMMENTS

NO PROBLEMS WERE ENCOUNTERED DURING THE MONTH OF AUGUST.

9/80	SYSTEM	99.2	99.6	99.6	99.2		720	717	714	70.3

** PROBLEMS/SOLUTIONS/COMMENTS

DURING SEPTEMBER THE SCRUBBER WAS INSPECTED CAUSING TWO HOURS OF OUTAGE TIME.

A BRIEF FGD OUTAGE OF 12 MINUTES WAS CAUSED BY AN ELECTRICAL SHORT.

THE UNIT AND FGD SYSTEM WERE OUT OF SERVICE FOR APPROXIMATELY 3 1/2 HOURS DUE TO ESP PROBLEMS.

10/80	SYSTEM	62.6	94.4	94.4	25.1		744	198	187	18.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING OCTOBER THE FGD SYSTEM WAS OFF LINE FOR 278 HOURS SO THAT GENERAL SYSTEM REPAIRS COULD BE MADE.

BOILER TUBE LEAKS CAUSED A BOILER OUTAGE OF 38 HOURS DURING THE MONTH.

ESP PROBLEMS ENCOUNTERED IN OCTOBER CAUSED APPROXIMATELY 241 HOURS OF OUTAGE TIME.

11/80	SYSTEM	24.9	41.9	41.9	10.8	720	185	78	20.6

** PROBLEMS/SOLUTIONS/COMMENTS

DURING NOVEMBER THE FGD SYSTEM WAS SHUTDOWN FOR APPROXIMATELY 516 HOURS TO MAKE REPAIRS TO THE HASTELLOY G MATERIAL IN THE SCRUBBER.

A BOILER TUBE LEAK CAUSED ADDITIONAL OUTAGE TIME DURING THE MONTH.

12/80	SYSTEM	99.9	99.4	99.4	64.0	744	479	476	49.8

** PROBLEMS/SOLUTIONS/COMMENTS

DURING DECEMBER A FIRE IN THE BOILER CAUSED TWO BALL MILLS TO EXPLODE RESULTING IN APPROXIMATELY 267 HOURS OF OUTAGE TIME.

A DUCT VOLTAGE TEST WAS CONDUCTED DURING DECEMBER.

1/81	SYSTEM	100.0			0.0	744	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER REMAINED OUT SERVICE DUE TO A BALL MILL EXPLOSION.

2/81	SYSTEM	100.0	91.5	100.0	11.5	672	84	77	9.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER REMAINED OFF LINE 576 HOURS IN FEBRUARY DUE TO THE MILL EXPLOSION.

3/81	SYSTEM	86.0	80.3	80.3	26.8	744	248	199	25.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MARCH THE RECYCLE PUMPS TRIPPED CAUSING APPROXIMATELY A HALF HOUR OF OUTAGE TIME.

A COMPUTER POWER FAILURE AND AN INSPECTION CAUSED AN ADDITIONAL TWO HOUR OUTAGE.

THE LIMESTONE BALL TUBE MILL NEEDED REPAIR DURING MARCH.

4/81	SYSTEM	49.7	94.1	33.6	26.3	720	202	189	19.5

** PROBLEMS/SOLUTIONS/COMMENTS

DURING APRIL THE FGD SYSTEM WAS UNAVAILABLE APPROXIMATELY 362 HOURS DUE TO A LIMESTONE BALL MILL OUTLET SCREEN AND SCRUBBER DUCT INSPECTION.

5/81	SYSTEM	0.0			0.0	744	0	0	0.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING MAY THE BOILER DID NOT OPERATE DUE TO SOME NECESSARY REPAIR TO THE SCRUBBER DUCTWORK.										
AN EXPLOSION IN THE BALL TUBE MILL ALSO PREVENTED OPERATIONS DURING THE MONTH.										
6/81	SYSTEM	91.0	91.3	91.3	90.7			720	715	653 76.6
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING JUNE A BALL MILL EXPLOSION AND REPAIRS TO THE DUCT WORK CAUSED 58 HOURS OF DOWN TIME.										
A BALL TUBE MILL BEARING WAS REPLACED CAUSING SIX HOURS OF DOWN TIME.										
7/81	SYSTEM	100.0	98.7	98.7	93.5			744	705	696 77.9
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING JULY, THE FGD SYSTEM WAS AVAILABLE FOR OPERATION 100 PERCENT OF THE TIME. THERE WERE FOUR MINOR UNIT OUTAGES DURING THE MONTH ATTRIBUTED TO PROBLEMS WITH THE BOILER.										
8/81	SYSTEM	100.0	100.0	100.0	100.0			744	744	744 83.1
9/81	SYSTEM	99.4	99.0	99.0	98.2			720	707	700 68.9
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING THE MONTH, THERE WAS A MINOR OUTAGE (11 HOURS) FOR REPAIR OF THE PRIMARY AIR DUCT.										
10/81	SYSTEM	75.2	99.3	99.3	72.2			744	541	538 51.8
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING OCTOBER 184 HOURS OF DOWN TIME WAS DUE TO AN INSPECTION OF THE SCRUBBER DUCT.										
A SUPERHEATER SECTION TUBE LEAK ACCOUNTED FOR APPROXIMATELY 22 HOURS OF OUTAGE TIME.										
11/81	SYSTEM	100.0	99.4	99.4	98.0			720	710	706 76.5
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING NOVEMBER THE RECYCLE PUMP TRIPPED CAUSING A MINOR OUTAGE.										
A BOILER CONTROL CARD FAILURE CAUSED APPROXIMATELY FIVE HOURS OF DOWN TIME										
NINE HOURS OF OUTAGE TIME WAS NECESSARY TO REPAIR THE FEED WATER VALVE.										
12/81	SYSTEM	100.0	100.0	100.0	100.0			744	744	744 70.7
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING DECEMBER THE UTILITY REPORTED THAT NO FGD-RELATED PROBLEMS OCCURRED										
1/82	SYSTEM	100.0	98.5	98.5	32.6			744	246	242 22.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING JANUARY, A FROZEN DRUM LEVEL TRANSMITTER AND COLD REHEAT PIPING CAUSED APPROXIMATELY 500 HOURS OF OUTAGE TIME.									
2/82	SYSTEM	100.0	99.8	100.0	99.8		672	672	670 74.5
3/82	SYSTEM	74.2	99.8	74.2	74.2		744	553	552 58.4
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING MARCH APPROXIMATELY 192 HOURS OF OUTAGE TIME WAS DUE TO ABSORBER DUCT LINING REPAIRS.									
DURING THE FIRST QUARTER 1982 APPROXIMATELY 3 HOURS OF DOWN TIME WAS CAUSED BY LOSS OF BOILER SEAL AIR.									
4/82	SYSTEM	0.0			0.0		720	0	0 0.0
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING APRIL THE UNIT AND SYSTEM WERE SHUT DOWN TO PERFORM ABSORBER DUCT REPAIRS.									
5/82	SYSTEM	44.1	94.7	94.7	43.9		744	345	327 33.6
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING MAY THE SYSTEM WAS SHUT DOWN FOR APPROXIMATELY 413 HOURS TO REPAIR THE ABSORBER DUCTWORK LINING.									
A BREAK IN THE MIST ELIMINATOR PIPING CAUSED ABOUT ONE HOUR OF OUTAGE TIME ADDITIONAL OUTAGE TIME WAS DUE TO A MIST ELIMINATOR NOZZLE PROBLEM.									
6/82	SYSTEM	100.0	100.0	100.0	100.0		720	720	720 79.0
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE EXPERIENCED DURING JUNE.									
7/82	SYSTEM	98.0	97.5	97.6	91.2		744	696	678 78.3
** PROBLEMS/SOLUTIONS/COMMENTS									
A 15 HOUR OUTAGE OCCURRED DURING JULY DUE TO A HOLE IN A SLURRY STORAGE TANK.									
A BOILER TUBE LEAK CAUSED A 51 HOUR OUTAGE DURING JULY.									
8/82	SYSTEM	100.0	100.0	100.0	100.0		744	744	744 84.8
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING AUGUST.									
9/82	SYSTEM	99.9	99.9	99.9	99.9		720	720	720 74.6

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
** PROBLEMS/SOLUTIONS/COMMENTS										
A 30 MINUTE OUTAGE RESULTED FROM LOSS OF POWER TO THE SCRUBBER CONTROLS.										
10/82	SYSTEM	76.1	100.0	100.0	76.1		744	566	566	61.4
** PROBLEMS/SOLUTIONS/COMMENTS										
A 177 HOUR OUTAGE OCCURRED DURING OCTOBER DUE TO AN INSPECTION OF DUCTWORK										
11/82	SYSTEM	99.9	99.9	99.9	99.9		720	720	720	71.6
** PROBLEMS/SOLUTIONS/COMMENTS										
A LOSS OF WATER TO THE MIST ELIMINATOR SECTION PRODUCED A 25 MINUTE OUTAGE DURING NOVEMBER.										
12/82	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	76.9
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING DECEMBER.										
1/83	SYSTEM	97.0	97.8	96.9	96.0		744	731	714	73.6
** PROBLEMS/SOLUTIONS/COMMENTS										
THE FGD SYSTEM WAS OUT OF SERVICE FOR APPROXIMATELY 23 HOURS DURING JANUARY DUE TO A PLUGGING PROBLEM IN THE DEMIST SECTION.										
A 7 HOUR OUTAGE OCCURRED DURING THE MONTH AS A RESULT OF BOILER AND TURBIN PROBLEMS.										
2/83	SYSTEM	48.0	97.6	48.0	48.0		672	330	322	32.2
** PROBLEMS/SOLUTIONS/COMMENTS										
APPROXIMATELY 350 HOURS OF DOWN TIME RESULTED FROM WORK BEING DONE ON THE DUCTWORK OF THE FGD SYSTEM.										
RECYCLE PUMP PROBLEMS ALSO CONTRIBUTED TO THE OUTAGE TIME DURING FEBRUARY.										
3/83	SYSTEM	95.9	95.9	95.9	95.9		744	744	714	81.4
** PROBLEMS/SOLUTIONS/COMMENTS										
A LOSS OF POWER TO THE FGD SYSTEM PRODUCED AN 11 HOUR OUTAGE DURING MARCH.										
THE FAILURE OF A LIMESTONE MILL TO PRODUCE SUFFICIENT SLURRY RESULTED IN APPROXIMATELY 19 HOURS OF DOWN TIME FOR THE FGD SYSTEM DURING MARCH. A POOR GRADE OF LIMESTONE WAS REPORTED AS THE REASON FOR FAILURE.										
4/83	SYSTEM	100.0	99.0	100.0	93.0		720	677	670	63.7
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED A UNIT OUTAGE DURING APRIL LASTING 50 HOURS AND 26 MINUTES. THE OUTAGE WAS DUE TO BOILER-RELATED PROBLEMS.										
5/83	SYSTEM	100.0	99.7	100.0	99.6		744	744	741	69.1

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS OFF-LINE FOR 1.7 HOUR DURING MAY DUE TO
 BOILER PRESSURE EXCURSION.

A BRIEF 1.7 HOUR OUTAGE DURING THE MONTH OCCURRED DUE TO THE
 CHANGING OF TAPS ON THE UNIT'S MAIN TRANSFORMER.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
6/83	SYSTEM	100.0	100.0	100.0	100.0		720	720	720	73.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING JUNE.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
7/83	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING JULY.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
8/83	SYSTEM	100.0	99.7	100.0	99.3		744	741	739	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN APPROXIMATELY 3 HOURS DURING AUGUST DUE TO ELECTRICAL
 PROBLEMS NOT RELATED TO THE FGD SYSTEM.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
9/83	SYSTEM	100.0	100.0	100.0	100.0		720	720	720	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING SEPTEMBER.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
10/83	SYSTEM	40.8	99.3	40.8	40.8		744	305	303	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF LINE APPROXIMATELY 441 HOURS DURING OCTOBER FOR ABSORBER
 DUCT WORK REPAIRS.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
11/83	SYSTEM	100.0	100.0	100.0	100.0		720	720	720	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING NOVEMBER 1983.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
12/83	SYSTEM	91.2	87.3	80.7	68.8		744	587	512	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF LINE APPROXIMATELY 157 HOURS DURING DECEMBER DUE TO BOILER
 RELATED PROBLEMS.

THE FGD SYSTEM WAS OUT OF SERVICE APPROXIMATELY 65 HOURS DURING DECEMBER
 DUE TO FROZEN LIMESTONE.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
1/84	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
2/84	SYSTEM	100.0	100.0	100.0	100.0		696	696	696	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING JANUARY AND FEBRUARY.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
3/84	SYSTEM	100.0	100.0	100.0	22.4		744	166	166	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF LINE 24 DAYS FOR MAINTENANCE AND ACID CLEANING.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
4/84	SYSTEM	100.0	99.7	100.0	95.5		720	690	688	

** PROBLEMS/SOLUTIONS/COMMENTS

THE ABSORBER WAS OFF FOR 32 HOURS DUE TO BOILER TUBE LEAKS.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
5/84	SYSTEM	100.0	99.6	100.0	95.9		744	716	713	

** PROBLEMS/SOLUTIONS/COMMENTS

THE ABSORBER WAS OFF 1.25 DAYS DURING MAY DUE TO BOILER RELATED PROBLEMS.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
6/84	SYSTEM	100.0	99.7	100.0	95.5		720	690	688	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF LINE 30 HOURS DUE TO A SUPERHEAT TUBE LEAK IN THE BOILER.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
7/84	SYSTEM	100.0	99.8	100.0	93.7		744	698	697	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF LINE 45 HOURS BECAUSE OF A BOILER TUBE LEAK.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
8/84	SYSTEM						744			

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTH OF AUGUST.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
9/84	SYSTEM	99.7	99.7	99.7	99.7		720	720	718	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD WAS OUT OF SERVICE FOR APPROXIMATELY TWO HOURS DUE TO PLUGGING IN THE ABSORBER INLET.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
10/84	SYSTEM						744			

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS AVAILABLE FOR THE MONTH OF OCTOBER.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
11/84	SYSTEM	100.0	100.0	100.0	100.0		720	720	720	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE MONTH OF NOVEMBER.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
12/84	SYSTEM	99.9	98.9	99.9	98.8		744	743	735	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS OFF-LINE TWICE DURING DECEMBER. ONCE OF APPROXIMATELY 8 HOURS DUE TO BOILER CONTROL PROBLEMS AND SECONDLY FOR 25 MINUTES DUE TO A LOSS OF ABSORBER CONTROL POWER.

1/85	SYSTEM	100.0	100.0	100.0	100.0	744	744	744
2/85	SYSTEM	100.0	100.0	100.0	100.0	672	672	672
3/85	SYSTEM	100.0	100.0	100.0	3.1	744	23	23

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT WAS OFF-LINE 720 HOURS AND 57 MINUTES FOR TURBINE INSPECTION AND OTHER WORK.

4/85	SYSTEM	100.0			0.0	720	0	0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF-LINE 59.4 HOURS AS A RESULT OF A BOILER TUBE LEAK.

5/85	SYSTEM	100.0			0.0	744	0	0 0.0
6/85	SYSTEM	100.0	98.3	100.0	51.1	720	374	368

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF-LINE THE ENTIRE MONTHS OF APRIL AND MAY FOR TURBINE WORK. THE OUTAGE CONTINUED INTO JUNE (345.7 HOURS).

7/85	SYSTEM	100.0	99.7	100.0	95.6	744	713	711

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF-LINE FOR 30.8 HOURS DUE TO A BOILER TUBE LEAK.

8/85	SYSTEM					744		

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTH OF AUGUST.

9/85	SYSTEM	100.0	100.0	100.0	100.0	720	720	720
10/85	SYSTEM	100.0	100.0	100.0	100.0	744	744	744
11/85	SYSTEM	100.0	99.8	99.8	99.8	720	710	718
12/85	SYSTEM	100.0	100.0	100.0	97.8	744	728	728

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS OF JANUARY THROUGH DECEMBER.

THE UNIT WAS ON STANDBY FOR 16 HOURS DURING DECEMBER WHEN LOAD DEMAND WAS LOW.

1/86	SYSTEM	100.0	100.0	100.0	82.8	744	616	616

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS										
THE UNIT WAS OFF-LINE 128 HOURS DUE TO LOW LOAD DEMAND.										
2/86	SYSTEM	100.0	100.0	100.0	71.0		672	477	477	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UNIT OFF-LINE 195 HOURS IN FEBRUARY DUE TO LOW LOAD DEMAND.										
3/86	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	
4/86	SYSTEM	100.0	100.0	100.0	100.0		720	720	720	
5/86	SYSTEM	100.0	100.0	100.0	57.1		744	425	425	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UNIT WAS OFF-LINE FOR PART OF MAY AS A RESULT OF LOW LOAD DEMAND.										
6/86	SYSTEM	100.0	100.0	100.0	100.0		720	720	720	
7/86	SYSTEM	100.0	100.0	100.0	99.9		744	743	743	
** PROBLEMS/SOLUTIONS/COMMENTS										
A BOILER TRIP FORCED THE FGD SYSTEM OFF-LINE 0.9 HOURS IN JULY. NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED.										
8/86	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	
9/86	SYSTEM	100.0	100.0	100.0	75.4		720	543	543	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UNIT WAS OFF-LINE 177 HOURS FOR MAINTENANCE AND LOW LOAD DEMAND.										
10/86	SYSTEM	100.0	100.0	100.0	61.6		744	458	458	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UNIT WAS OFF-LINE 286.5 HOURS FOR MAINTENANCE AND LOW LOAD DEMAND.										
11/86	SYSTEM	100.0	100.0	100.0	88.2		720	635	635	
12/86	SYSTEM	100.0	100.0	100.0	59.4		744	442	442	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UNIT WAS OFF-LINE 302 HOURS DUE TO LOW LOAD DEMAND.										
NO MAJOR FGD SYSTEM PROBLEMS WERE REPORTED FOR THE JANUARY-DECEMBER 1986 PERIOD.										
1/87	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	
2/87	SYSTEM	100.0	100.0	100.0	100.0		672	672	672	
3/87	SYSTEM	100.0	100.0	100.0	83.9		744	624	624	
4/87	SYSTEM	100.0	100.0	100.0	14.6		720	105	105	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD JANUARY THROUGH APRIL 1987.

5/87	SYSTEM	96.8	100.0	100.0	14.1		744	105	105	

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS OFF-LINE FOR MOST OF MAY BECAUSE OF LOW LOAD DEMAND.

6/87	SYSTEM	100.0	100.0	100.0	100.0		720	744	720	

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MONTH OF JUNE.

7/87	SYSTEM	100.0	100.0	100.0	90.5		744	673	673	

** PROBLEMS/SOLUTIONS/COMMENTS

A BOILER TUBE LEAK OCCURRED IN JULY.

8/87	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	

9/87	SYSTEM	100.0	100.0	100.0	100.0		720	744	720	

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD AUGUST THROUGH SEPTEMBER 1987.

10/87	SYSTEM	100.0	100.0	100.0	8.7		744	65	65	

11/87	SYSTEM	100.0	100.0	100.0	0.7		720	5	5	

** PROBLEMS/SOLUTIONS/COMMENTS

THE SYSTEM WAS OFF-LINE FOR MOST OF THE OCTOBER-NOVEMBER PERIOD BECAUSE OF LOW LOAD DEMAND.

12/87	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR DECEMBER.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SOUTH MISSISSIPPI ELEC PWR	
PLANT NAME	R.D. MORROW, SR.	
UNIT NUMBER	2	
CITY	PURVIS	
STATE	MISSISSIPPI	
REGULATORY CLASSIFICATION	D	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	301.	(0.700 LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	400	
GROSS UNIT GENERATING CAPACITY - MW	215	
NET UNIT GENERATING CAPACITY W/FGD - MW	200	
NET UNIT GENERATING CAPACITY WO/FGD - MW	206	
EQUIVALENT SCRUBBED CAPACITY - MW	133	

** UNIT DATA - BOILER AND STACK

BOILER SUPPLIER	RILEY STOKER	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	335.76	(711500 ACFM)
BOILER FLUE GAS TEMPERATURE - C	132.2	(270 F)
STACK HEIGHT - M	122.	(400 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	3.3	(10.7 FT)

** FUEL DATA

FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	28494.	(12250 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		11500-12500
AVERAGE ASH CONTENT - %	10.00	
RANGE ASH CONTENT - %	8.0-12.0	
AVERAGE MOISTURE CONTENT - %	6.50	
RANGE MOISTURE CONTENT - %	6.0-7.0	
AVERAGE SULFUR CONTENT - %	1.64	
RANGE SULFUR CONTENT - %	1.0-1.8	
AVERAGE CHLORIDE CONTENT - %	0.12	
RANGE CHLORIDE CONTENT - %	0.10-0.13	

*** PARTICLE CONTROL

** MECHANICAL COLLECTOR

NUMBER	0
TYPE	NONE

** ESP

NUMBER	1	
NUMBER OF SPARES	0	
TYPE	HOT SIDE	
SUPPLIER	BUELL DIVISION, ENVIROTECH	
INLET FLUE GAS CAPACITY - CU.M/S	579.5	(1228000 ACFM)
INLET FLUE GAS TEMPERATURE - C	426.7	(800 F)
PRESSURE DROP - KPA	0.1	(0. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.6	

** PARTICLE SCRUBBER

NUMBER	0
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON NAME	N/A
SHELL GENERIC MATERIAL	N/A
SHELL SPECIFIC MATERIAL	N/A
LINER GENERIC MATERIAL	N/A
LINER SPECIFIC MATERIAL	N/A
GAS CONTACTING DEVICE TYPE	N/A

*** FGD SYSTEM

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	
PROCESS TYPE	LIMESTONE	
PROCESS ADDITIVES	NONE	
SYSTEM SUPPLIER	ENVIRONEERING, RILEY STOKER	
A-E FIRM	BURNS & MCDONNELL	
DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	NEW	
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.60	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	85.00	
ENERGY CONSUMPTION - %	2.8	
CURRENT STATUS	1	
COMMERCIAL START-UP	6/1979	
INITIAL START-UP	6/1979	
CONTRACT AWARDED	5/1975	
** DESIGN AND OPERATING PARAMETERS		
DESIGN COAL SULFUR CONTENT - %	1.30	
DESIGN COAL HEAT CONTENT - J/G	27912.0	(12000 BTU/LB)
DESIGN COAL ASH CONTENT - %	15.00	
DESIGN MOISTURE CONTENT - %	6.50	
DESIGN CHLORIDE CONTENT - %	0.01	
OPER. & MAINT. REQUIREMENT - MANHR/DAY	88.0	
** QUENCHER/PRESATURATOR		
** ABSORBER		
NUMBER	1	
NUMBER OF SPARES	0	
GENERIC TYPE	PACKED TOWER	
SPECIFIC TYPE	ROD DECK	
TRADE NAME/COMMON TYPE	VENTRI-SORBER	
SUPPLIER	ENVIRONEERING, RILEY STOKER	
DIMENSIONS - FT	51.5 WIDE X 47.7 HIGH X 22.0 DEEP	
SHELL GENERIC MATERIAL	CARBON STEEL	
SHELL SPECIFIC MATERIAL	AISI 1110	
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A	
LINER GENERIC MATERIAL	ORGANIC; HIGH ALLOY	
LINER SPECIFIC MATERIAL	SYNTHETIC RUBBER; NICKEL BASE/CHROMIUM-IRON-MOLY	
LINER MATERIAL TRADE NAME/COMMON TYPE	CHLOROBUTYL; HASTELLOY C-276	
GAS CONTACTING DEVICE TYPE	ROD DECKS	
NUMBER OF CONTACTING ZONES	4	
LIQUID RECIRCULATION RATE - LITER/S	1260.	(20000 GPM)
L/G RATIO - L/CU.M	6.0	(45.2 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	2.0	(8.0 IN-H2O)
SUPERFICAL GAS VELOCITY - M/SEC	3.0	(10.0 FT/S)
INLET GAS FLOW - CU. M/S	208.58	(442000 ACFM)
INLET GAS TEMPERATURE - C	132.2	(270 F)
SO2 REMOVAL EFFICIENCY - %	85.0	
PARTICLE REMOVAL EFFICIENCY - %	0.0	
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR	
NUMBER PER SYSTEM	1	
NUMBER OF SPARES PER SYSTEM	0	
NUMBER PER MODULE	1	
GENERIC TYPE	IMPINGEMENT	
SPECIFIC TYPE	BAFFLE	
TRADE NAME/COMMON TYPE	CLOSED VANE	
MANUFACTURER	ENVIRONEERING	
CONFIGURATION	VERTICAL	
NUMBER OF STAGES	2	
NUMBER OF PASSES PER STAGE	3	
DISTANCE BETWEEN STAGES - CM	91.44	(36.0 IN)
DISTANCE BETWEEN VANES - CM	53.3	(21.00 IN)
PRESSURE DROP - KPA	0.9	(3.5 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC	
CONSTRUCTION MATERIAL SPECIFIC TYPE	FIBER-REINFORCED POLYESTER	
WASH WATER SOURCE	SUPERNATANT FOR FIRST STAGE; MAKEUP FOR SECOND S	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

WASH FREQUENCY	INTERMITTENT
WASH RATE - L/S	15.8 (250 GAL/MIN)
** REHEATER	
GENERIC TYPE	BYPASS
SPECIFIC TYPE	COLD SIDE
TRADE NAME/COMMON TYPE	N/A
PERCENT GAS BYPASSED - AVG	38.0
TEMPERATURE INCREASE - C	28.9 (52 F)
INLET FLUE GAS FLOW RATE - CU. M/S	190.65 (404000 ACFM)
INLET FLUE GAS TEMPERATURE - C	52.2 (126 F)
OUTLET FLUE GAS TEMPERATURE - C	86.7 (188 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL; HIGH ALLOY
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110; NICKEL BASE/CHROMIUM-IRON-COPPER-MOLY
** FANS	
NUMBER	2
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
SUPPLIER	GREEN FAN
FUNCTION	UNIT
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	201.03 (426000 ACFM)
FLUE GAS TEMPERATURE - C	148.9 (300 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
NUMBER	2
FUNCTION	SHUT-OFF
GENERIC TYPE	LOUVER
SPECIFIC TYPE	PARALLEL BLADE MULTILOUVER
MANUFACTURER	RILEY STOKER
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	1
FUNCTION	SHUT-OFF
GENERIC TYPE	LOUVER
SPECIFIC TYPE	PARALLEL BLADE MULTILOUVER
MANUFACTURER	RILEY STOKER
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	1
FUNCTION	SHUT-OFF
GENERIC TYPE	LOUVER
SPECIFIC TYPE	PARALLEL BLADE MULTILOUVER
MANUFACTURER	DAMPER DESIGN
CONSTRUCTION MATERIAL GENERIC TYPE	HIGH ALLOY 'SEALS'
CONSTRUCTION MATERIAL SPECIFIC TYPE	NICKEL BASE/CHROMIUM-MOLYBDENUM-NICKEL-COPPER
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	NATURAL RUBBER
** DAMPERS	
NUMBER	1
FUNCTION	CONTROL
GENERIC TYPE	LOUVER
SPECIFIC TYPE	PARALLEL BLADE MULTILOUVER
MANUFACTURER	RILEY STOKER
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

** DAMPERS	
NUMBER	1
FUNCTION	CONTROL
GENERIC TYPE	LOUVER
SPECIFIC TYPE	PARALLEL BLADE MULTILOUVER
MANUFACTURER	RILEY STOKER
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	SCRUBBER INLET
CONFIGURATION	RECTANGULAR
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	SCRUBBER OUTLET TO STACK
CONFIGURATION	RECTANGULAR
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	HIGH ALLOY
LINER SPECIFIC MATERIAL TYPE	NICKEL BASE/CHROMIUM-IRON-COPPER-MOLYBDENUM
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED
DEVICE TYPE	TUBE MILL
MANUFACTURER	KENNEDY VAN SAUN
NUMBER	1
NUMBER OF SPARES	0
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	7.3
PRODUCT QUALITY - % SOLIDS	35.0
	(8 TPH)
** TANKS	
SERVICE	NUMBER
-----	-----
REAGENT PREP PRODUCT	1
ABSORBER RECYCLE	1
MILL SUMP	1
THICKENER SUPPLY SUMP	1
THICKENER OVERFLOW	1
ME WASH	1
** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER RECIRCULATION	3
SLURRY TRANSFER	2
MILL SLURRY	2
ME WASH	2
CLEAR WATER TRANSFER 'SUPERNATANT'	2
THICKENER UNDERFLOW	2
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	VACUUM FILTER
NUMBER	1
NUMBER OF SPARES	0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	EPOXY
BELT GENERIC MATERIAL TYPE	ORGANIC
BELT SPECIFIC MATERIAL TYPE	NYLON
FEED STREAM SOURCE	THICKENER UNDERFLOW
FEED STREAM CHARACTERISTICS	40% SOLIDS
OUTLET STREAM CHARACTERISTICS	70% SOLIDS

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

OUTLET STREAM DISPOSITION	TO PUG MILL AND DISPOSAL
OVERFLOW STREAM DISPOSITION	TO THICKENER
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	1
NUMBER OF SPARES	0
DIMENSIONS - FT	60.0 DIA X 11.0
CAPACITY	230000
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	BITUMASTIC
FEED STREAM SOURCE	ABSORBER BLEED
FEED STREAM CHARACTERISTICS	70-100 GPM PER UNIT, 15% SOLIDS
OUTLET STREAM CHARACTERISTICS	40% SOLIDS
OVERFLOW STREAM CHARACTERISTICS	<5% SOLIDS
OUTLET STREAM DISPOSITION	TO VACUUM FILTER
OVERFLOW STREAM DISPOSITION	TO MILL SLURRY TANK, ABSORBER ME TANK, AND RECYC
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
FULL LOAD SLUDGE QUANTITY - M.TONS/HR (DRY)	3.6 (4.0 TPH)
MOISTURE CONTENT - % TOTAL FREE WATER	20.0
% CASO3 - DRY	20.0
% CASO4 - DRY	70.0
% CAOH2 - DRY	5.0
% CACO3 - DRY	5.0
% ASH - DRY	5.0
% OTHER COMPOUNDS - DRY	1.0
** TREATMENT	
METHOD	FIXATION
DEVICE	PUG MILL
PROPRIETARY PROCESS	NONE
INLET QUALITY - %	70.0
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	TRUCK/CONVEYED
SITE TREATMENT	CLAY LINING 'NATURAL'
SITE DIMENSIONS	13 ACRES X 30 FEET
SITE CAPACITY - CU.M	476970 (390.0 ACRE-FT)
SITE SERVICE LIFE - YRS	6
** PROCESS CONTROL AND INSTRUMENTATION	
PROCESS STREAM	ABSORBER RECYCLE, FLUE GAS
CHEMICAL PARAMETERS	PH, SO2
PHYSICAL VARIABLES	DENSITY, FLOW
CONTROL LEVELS	PH 5.4-5.6, SO2 - 1.2 LB/MM BTU
MONITOR TYPE	L & N, LEAR SIEGLER
MONITOR LOCATION	RECYCLE TANK/INLET DUCT
PROCESS CONTROL MANNER	AUTOMATIC
PROCESS CHEMISTRY MODE	FEEDBACK
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
** CHEMICALS AND CONSUMPTION	
FUNCTION	ABSORBENT
NAME	LIMESTONE
PRINCIPAL CONSTITUENT	>85% CACO3

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

SOURCE/SUPPLIER	CALERA QUARRY
CONSUMPTION	70 TONS/DAY '2 UNITS AT FULL LOAD!
UTILIZATION - %	80.0
POINT OF ADDITION	BALL MILL

** FGD SPARE CAPACITY INDICES

ABSORBER - %	0.0
MIST ELIMINATOR - %	0.0
FAN - %	0.0
BALL MILL - %	0.0
THICKENER - %	0.0
VACUUM FILTER - %	0.0

** FGD SPARE COMPONENT INDICES

ABSORBER	0.0
MIST ELIMINATOR	0.0
FAN	0.0
BALL MILL	0.0
THICKENER	0.0
VACUUM FILTER	0.0

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

6/79	SYSTEM						720		

** PROBLEMS/SOLUTIONS/COMMENTS

R.D. MORROW 2 BEGAN SCRUBBER OPERATIONS IN THE LATTER PART OF JUNE. OPERATIONAL DATA ARE NOT YET AVAILABLE.

7/79	SYSTEM						744		

8/79	SYSTEM						744		

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS AVAILABLE FOR THE JULY-AUGUST 1979 PERIOD.

9/79	SYSTEM	4.7	100.0	4.7	4.7		720	34	34 2.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING SEPTEMBER THE UNIT WAS TAKEN OFF LINE DUE TO FAILURE OF LINERS AND PLUGGING IN THE MIST ELIMINATOR SECTIONS.

10/79	SYSTEM	0.0		0.0	0.0		744	477	0 52.5

11/79	SYSTEM	0.0		0.0	0.0		720		0

12/79	SYSTEM	0.0		0.0	0.0		744		0

** PROBLEMS/SOLUTIONS/COMMENTS

THE SCRUBBER HAS REMAINED OFF LINE THROUGH THE REPORT PERIOD DUE TO THE LINING FAILURES. RELINING SHOULD BE COMPLETED AND THE UNIT ON SHOULD BE BACK ON LINE IN MAY.

1/80	SYSTEM	0.0		0.0	0.0		744	743	0 75.4

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT REMAINED OFF LINE DURING JANUARY WHILE SCRUBBER LINER REPAIRS CONTINUED.

THE PRESATURATOR AREAS, BYPASS DUCTS, AND THE SECTIONS OF DUCT FROM ABSORBER EXITS AT POINTS WHERE BYPASSED GAS MIXES WITH WET GAS ALL THE

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO ₂ PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR
WAY TO THE STACK ARE BEING LINED WITH HASTELLOY G (A 1/8 INCH LINING IS BEING WELDED TO THE EXISTING CARBON STEEL). THE MAIN BODY OF THE ABSORBER MODULES IMMEDIATELY ABOVE THE PRESATURATOR SECTIONS ALL THE WAY TO THE ABSORBER EXIT IS BEING LINED WITH CHLOROBUTYL RUBBER (ON THE EXISTING CARBON STEEL).									
2/80	SYSTEM	0.0	0.0	0.0	0.0		696	698	0 75.0
3/80	SYSTEM	0.0	0.0	0.0	0.0		744	486	0
4/80	SYSTEM	0.0			0.0		720	0	0 0.0
** PROBLEMS/SOLUTIONS/COMMENTS									
THE FGD SYSTEM REMAINED OFF LINE THROUGH APRIL AS SCRUBBER LINER REPAIRS CONTINUED. THE UNIT IS EXPECTED BACK ON LINE AT THE END OF MAY.									
5/80	SYSTEM	2.4	14.2	14.2	2.4		744	127	18
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UNIT REMAINED OFF LINE DURING MOST OF MAY TO COMPLETE SCRUBBER AND STACK LINING MODIFICATIONS. THE BOILER OPERATED 127 HOURS IN MAY; HOWEVER, THE FGD SYSTEM OPERATED ONLY 18 HOURS BECAUSE OF COMPUTER CONTROL PROBLEMS.									
6/80	SYSTEM	99.3	90.0	99.1	78.0		720	625	561 68.9
** PROBLEMS/SOLUTIONS/COMMENTS									
THE FGD SYSTEM COMPUTER LOST POWER DURING JUNE CAUSING THE UNIT TO BE SHUT DOWN FOR 25 MINUTES. DURING JUNE OPERATIONS CAME TO A HALT FOR APPROXIMATELY FIVE HOURS TO CLEAN THE MIST ELIMINATORS. OTHER OUTAGE TIME DURING THE MONTH WAS CAUSED BY BOILER RELATED PROBLEMS.									
7/80	SYSTEM	79.8	80.7	80.7	79.8		744	736	594 73.8
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING JULY BALL MILL REPAIRS ACCOUNTED FOR THE MAJOR PORTION OF THE FGD- RELATED OUTAGE TIME. THE SCRUBBER WAS INSPECTED FOR SCALE ACCUMULATION AND A TRIP TEST WAS CONDUCTED ON THE SCRUBBER CONTROLS TO CHECK ON EARLIER MODIFICATIONS. THE SCRUBBING SYSTEM WENT OFF LINE DUE TO AN ALARM TRIGGERED BY HIGH TEMPERATURE, WHICH WAS DETERMINED TO BE A FALSE ALARM. A POSSIBLE TUBE LEAK SHUT THE BOILER DOWN ON JULY 27. THE UNIT WENT BACK ON LINE WITHOUT FINDING THE LEAK. THE BOILER WAS THEN TAKEN OFF LINE ON JULY 28 TO FIND THE LEAK AND MAKE THE NECESSARY REPAIRS. PROBLEMS WITH THE BURNER MANAGEMENT CONTROL SYSTEM ALSO CAUSED A BOILER- RELATED OUTAGE.									
8/80	SYSTEM	98.8	99.5	99.5	98.8		744	739	735 74.3

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 S02 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER WAS OUT OF SERVICE APPROXIMATELY FIVE HOURS DURING AUGUST DUE TO A BOILER TUBE LEAK.

AFTER THE REPAIRS TO THE BOILER TUBE AN ADDITIONAL FOUR HOURS OF OUTAGE TIME WAS NECESSARY TO START UP THE FGD SYSTEM.

9/80	SYSTEM	99.8	99.5	99.5	88.3	720	639	636	62.4

** PROBLEMS/SOLUTIONS/COMMENTS

DURING SEPTEMBER THE BOILER WAS TAKEN OUT OF SERVICE FOR APPROXIMATELY 83 HOURS DUE TO A TUBE LEAK.

A BOILER INSPECTION AND AN ELECTRICAL SHORT IN THE CONTROLS CAUSED THE FGD SYSTEM TO SHUT DOWN WITH THE BOILER FOR APPROXIMATELY 1 1/2 HOURS.

10/80	SYSTEM	79.8	98.9	98.9	79.5	744	598	591	68.6

** PROBLEMS/SOLUTIONS/COMMENTS

PITTING OF THE HASTELLOY G MATERIAL IN THE SCRUBBER WAS DETECTED DURING A SCRUBBER INSPECTION.

DURING OCTOBER FURNACE DRAFT PROBLEMS ACCOUNTED FOR APPROXIMATELY FOUR HOURS OF DOWN TIME.

11/80	SYSTEM	80.2	95.3	95.3	74.8	720	565	538	67.7

** PROBLEMS/SOLUTIONS/COMMENTS

DURING NOVEMBER THE FGD SYSTEM WAS OFF LINE APPROXIMATELY 131 HOURS TO REPAIR DUCTWORK.

AN ADDITIONAL 8 HOURS OF OUTAGE TIME WAS REQUIRED FOR NOZZLE CLEANING.

12/80	SYSTEM	49.7	92.7	92.7	49.7	744	399		39.6

** PROBLEMS/SOLUTIONS/COMMENTS

DURING DECEMBER REPAIRS TO THE SCRUBBER DUCT CAUSED APPROXIMATELY 348 HOUR OF DOWN TIME.

THE RECYCLE NOZZLES PLUGGED CAUSING THE SYSTEM TO SHUTDOWN FOR APPROXIMATELY 24 HOURS.

A ONE HOUR OUTAGE WAS CAUSED BY A MODULE HIGH TEMPERATURE ALARM.

1/81	SYSTEM	89.4	97.6	97.6	87.2	744	665	649	86.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER WAS OUT OF SERVICE APPROXIMATELY 79 HOURS DURING JANUARY DUE TO A BOILER TUBE LEAK.

ADDITIONAL OUTAGE TIME WAS DUE TO THE REPAIRING OF THE MIST ELIMINATOR DRAIN PIPING.

THE SYSTEM WAS UNAVAILABLE APPROXIMATELY TWO HOURS DUE TO THE CLEANING OF THE RECYCLE NOZZLES.

THE LIMESTONE MAKE-UP LINE BROKE CAUSING 12 HOURS OF ADDITIONAL OUTAGE

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

TIME.										
2/81	SYSTEM	100.0	99.9	100.0	85.6		672	576	575	74.9
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING FEBRUARY THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED.										
3/81	SYSTEM	85.5	86.6	86.6	58.4		744	502	434	49.5
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING MARCH THE FGD SYSTEM WAS OUT OF SERVICE APPROXIMATELY THREE HOURS TO CLEAN THE RECYCLE NOZZLES.										
AN ADDITIONAL TWO HOURS OF OUTAGE TIME WAS DUE TO A LEAK IN THE SLURRY SUPPLY PIPING.										
THE FGD SYSTEM WAS OUT OF SERVICE APPROXIMATELY 102 HOURS DUE TO REPAIRS TO THE LIMESTONE BALL MILL.										
4/81	SYSTEM	99.5	98.0	99.5	87.1		720	640	627	71.5
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING APRIL THE BOILER WAS OUT OF SERVICE APPROXIMATELY 80 HOURS DUE TO A SUPERHEATER TUBE LEAK.										
SOME MINOR OUTAGES ENCOUNTERED DURING THE MONTH INCLUDED A RECYCLE PUMP TRIP, A LOOSE CONNECTION ON A TEMPERATURE PROBE AND A SCRUBBER INSPECTION.										
5/81	SYSTEM	100.0	99.1	100.0	93.1		744	699	693	77.4
** PROBLEMS/SOLUTIONS/COMMENTS										
DUE TO A TUBE LEAK IN THE SUPERHEAT AND REHEAT SECTIONS, THE SYSTEM WAS OFF LINE 45 HOURS IN MAY.										
ADDITIONAL OUTAGE TIME WAS CAUSED BY A TURBINE TRIP.										
6/81	SYSTEM	97.8	97.3	97.3	97.0		720	718	699	99.7
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING JUNE TWO OUTAGE CAUSED BY THE BALL MILL. ON ONE OCCASION A BEARING HAD TO BE REPLACED AND ANOTHER TIME WAS FOR GENERAL REPAIRS.										
TEN HOURS OF DOWN TIME WAS CAUSED BY PROBLEMS WITH THE CONTROL CIRCUIT IN THE ESP.										
7/81	SYSTEM	100.0	97.1	99.6	93.4		744	716	695	80.9
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING JULY, TWO UNIT OUTAGES TOTALLING 48 HOURS OCCURRED. THERE WERE NO FGD RELATED PROBLEMS REPORTED.										
8/81	SYSTEM	100.0	99.9	100.0	96.4		744	718	717	82.1

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING AUGUST, BOILER TUBE LEAKS CAUSED A 25 HOUR UNIT OUTAGE.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
9/81	SYSTEM	98.1	98.1	98.1	98.1		720	720	706	75.4

** PROBLEMS/SOLUTIONS/COMMENTS

THERE WERE NO FGD RELATED PROBLEMS ENCOUNTERED DURING THE MONTH OF SEPTEMBER.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
10/81	SYSTEM	99.9	99.9	99.9	99.9		744	744	743	67.5

** PROBLEMS/SOLUTIONS/COMMENTS

A PLANNED OUTAGE FOR GENERAL REPAIRS ACCOUNTED FOR APPROXIMATELY ONE HALF HOUR DOWNTIME DURING OCTOBER.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
11/81	SYSTEM	32.4	98.8	98.8	32.3		720	236	233	19.1

** PROBLEMS/SOLUTIONS/COMMENTS

DURING NOVEMBER 486 HOURS OF OUTAGE TIME WAS DUE TO EXPANSION JOINT AND RECYCLE TANK REPAIRS.

PROBLEMS WERE ALSO ENCOUNTERED WITH THE ESP.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
12/81	SYSTEM	100.0	99.1	99.1	93.6		744	702	696	63.1

** PROBLEMS/SOLUTIONS/COMMENTS

DURING DECEMBER THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS OCCURRED.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
1/82	SYSTEM	98.7	98.7	98.7	91.9		744	693	684	72.6

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JANUARY THE RECYCLE PUMP TRIPPED THREE TIMES AMOUNTING TO ABOUT 4 HOURS OF OUTAGE TIME.

A REHEATER TUBE LEAK AMOUNTED TO APPROXIMATELY 41 HOURS OF DOWNTIME.

THE FLUSH VALVE FOR THE RECYCLE PUMP WAS REPLACED DURING THE MONTH.

THE DRUM LEVEL TRANSMITTER SIGNAL WAS UNOPERABLE FOR 10 HOURS IN JANUARY DUE TO COLD WEATHER.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
2/82	SYSTEM	23.4	99.8	23.4	23.4		672	157	157	15.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING FEBRUARY THE FGD SYSTEM WAS DOWN FOR 515 HOURS FOR RELINING OF THE RECYCLE TANK AND DUCT LINING REPAIRS.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
3/82	SYSTEM	28.2	97.1	28.2	28.2		744	216	209	21.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE DUCTWORK REPAIRS STARTED IN FEBRUARY CONTINUED INTO MARCH.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
4/82	SYSTEM	99.9	99.9	99.9	99.9		720	720	719	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING APRIL TWO OUTAGES OCCURRED WHICH SHUT THE SYSTEM DOWN FOR APPROXIMATELY ONE HALF HOUR. ONE OUTAGE WAS DUE TO A LOSS OF POWER SUPPLY AND THE OTHER OUTAGE WAS CAUSED BY A RECYCLE PUMP TRIP.

5/82	SYSTEM	99.9	99.2	99.2	86.6		744	650	645	65.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MAY THE UNIT WAS OFF-LINE FOR 27 MINUTES DUE TO AN ELECTRICAL SWITCHING PROBLEM.

PROBLEMS WERE ENCOUNTERED WITH THE BOILER FEED PUMP CONTROLS.

DURING THE MONTH THE TURBINE SCREENS HAD TO BE REMOVED.

6/82	SYSTEM	100.0	100.0	100.0	100.0		720	720	720	63.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING JUNE.

7/82	SYSTEM	96.5	96.2	96.2	96.0		744	743	715	85.2

** PROBLEMS/SOLUTIONS/COMMENTS

A 3 HOUR OUTAGE RESULTED FROM BOILER-RELATED PROBLEMS DURING JULY.

THE SCRUBBER WAS OUT OF SERVICE FOR 26 HOURS DURING THE MONTH AS A RESULT OF A HOLE IN A SLURRY STORAGE TANK.

8/82	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	83.1

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING AUGUST.

9/82	SYSTEM	98.5	98.5	98.5	98.5		720	720	709	75.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE SCRUBBER WAS DOWN FOR 11 HOURS DURING SEPTEMBER DUE TO STACK MONITORING TESTS.

10/82	SYSTEM	71.9	99.1	99.1	71.6		744	537	532	57.7

** PROBLEMS/SOLUTIONS/COMMENTS

A 214 HOUR OUTAGE OCCURRED DURING OCTOBER DUE TO AN INSPECTION OF DUCTWORK

A 32 HOUR OUTAGE RESULTED FROM A BOILER TUBE RUPTURE.

11/82	SYSTEM	100.0	99.0	99.0	89.8		720	653	647	63.3

** PROBLEMS/SOLUTIONS/COMMENTS

A 73 HOUR OUTAGE OCCURRED DURING NOVEMBER DUE TO BOILER TUBE LEAKS.

12/82	SYSTEM	77.6	99.4	99.9	77.6		744	581	578	57.1

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

AN OUTAGE LASTING 166 HOURS OCCURRED DURING DECEMBER DUE TO BOILER REPAIR WORK.

A 25 MINUTE OUTAGE RESULTED FROM A POWER FAILURE TO THE FGD SYSTEM.

1/83	SYSTEM	100.0	100.0	100.0	95.0	744	713	707	72.4

** PROBLEMS/SOLUTIONS/COMMENTS

BOILER AND TURBINE PROBLEMS WERE EXPERIENCED DURING JANUARY.

2/83	SYSTEM	85.6	100.0	85.6	85.6	672	575	575	63.4

** PROBLEMS/SOLUTIONS/COMMENTS

DUCTWORK REPAIRS CAUSED A 97 HOUR OUTAGE FOR THE FGD SYSTEM IN FEBRUARY.

PROBLEMS WITH A RECYCLE TANK ALSO CONTRIBUTED TO THE DOWN TIME DURING FEBRUARY.

3/83	SYSTEM	44.3	95.5	40.6	38.1	744	297	284	25.2

** PROBLEMS/SOLUTIONS/COMMENTS

A BOILER TUBE LEAK PRODUCED 46 HOURS OF DOWN TIME FOR THE UNIT DURING THE MONTH.

APPROXIMATELY 401 HOURS OF DOWN TIME OCCURRED DURING MARCH AS A RESULT OF REPAIRS BEING MADE ON DUCTWORK.

DUE TO A POOR GRADE OF LIMESTONE, A LIMESTONE MILL FAILED TO GRIND A PROPE AMOUNT OF THE MATERIAL. APPROXIMATELY 14 HOURS OF OUTAGE TIME RESULTED.

4/83	SYSTEM	100.0	99.2	100.0	87.9	720	638	633	57.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF-LINE FOR 86.8 HOURS DURING APRIL TO WORK ON A PRECIPITATOR.

5/83	SYSTEM	100.0	100.0	100.0	100.0	744	744	744	70.6

6/83	SYSTEM	100.0	100.0	100.0	100.0	720	720	720	72.6

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING MAY AND JUNE, 1983.

7/83	SYSTEM	100.0	100.0	100.0	100.0	744	744	744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING JULY.

8/83	SYSTEM	100.0	100.0	100.0	90.9	744	676	676	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN APPROXIMATELY 2 HOURS DURING AUGUST DUE TO PROBLEMS WITH THE TURBINE HYDRAULIC OIL.

THE UNIT WAS DOWN APPROXIMATELY 65 HOURS DURING THE MONTH DUE TO RUPTURED BOILER TUBING.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER BOILER	FGD	CAP.
						SO2 PART.	HOURS	HOURS	HOURS FACTOR
9/83	SYSTEM	100.0	99.7	100.0	99.6		720	719	717

** PROBLEMS/SOLUTIONS/COMMENTS

A BRIEF 1-HOUR OUTAGE OCCURRED DURING SEPTEMBER DUE TO ELECTRICAL PROBLEMS NOT RELATED TO THE FGD SYSTEM.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER BOILER	FGD	CAP.
						SO2 PART.	HOURS	HOURS	HOURS FACTOR
10/83	SYSTEM	61.4	100.0	100.0	61.4		744	457	457

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF LINE APPROXIMATELY 287 HOURS DURING OCTOBER FOR MAINTENANCE.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER BOILER	FGD	CAP.
						SO2 PART.	HOURS	HOURS	HOURS FACTOR
11/83	SYSTEM	100.0	99.5	100.0	94.2		720	681	678

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF LINE APPROXIMATELY 39 HOURS DURING NOVEMBER FOR BOILER AND DUCTWORK REPAIRS.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER BOILER	FGD	CAP.
						SO2 PART.	HOURS	HOURS	HOURS FACTOR
12/83	SYSTEM	91.3	90.8	90.8	90.6		744	742	674

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS OUT OF SERVICE APPROXIMATELY 65 HOURS DURING DECEMBER DUE TO FROZEN LIMESTONE.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER BOILER	FGD	CAP.
						SO2 PART.	HOURS	HOURS	HOURS FACTOR
1/84	SYSTEM	100.0	99.7	100.0	94.9		744	708	706

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FOR REPAIR OF THE BOILER BURNER FRONT AND PRECIPITATOR.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER BOILER	FGD	CAP.
						SO2 PART.	HOURS	HOURS	HOURS FACTOR
2/84	SYSTEM	100.0	100.0	100.0	100.0		696	696	696

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING FEBRUARY.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER BOILER	FGD	CAP.
						SO2 PART.	HOURS	HOURS	HOURS FACTOR
3/84	SYSTEM	100.0	100.0	100.0	80.4		744	598	598

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF LINE 6 DAYS FOR MAINTENANCE AND ACID CLEANING.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER BOILER	FGD	CAP.
						SO2 PART.	HOURS	HOURS	HOURS FACTOR
4/84	SYSTEM	100.0	99.0	100.0	65.9		720	479	475

** PROBLEMS/SOLUTIONS/COMMENTS

THE ABSORBER WAS DOWN 9 DAYS FOR A SCHEDULED OUTAGE, A BOILER FEED PUMP TRIP, AND FOR REPAIR OF BOILER TUBE LEAKS.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER BOILER	FGD	CAP.
						SO2 PART.	HOURS	HOURS	HOURS FACTOR
5/84	SYSTEM	100.0	99.9	100.0	99.4		744	741	740

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE ABSORBER WAS DOWN 4 HOURS DUE TO A LACK OF VOLTAGE.

6/84 SYSTEM 99.9 99.6 99.9 97.9 720 708 705

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN 12 HOURS DUE TO A WATER WALL TUBE LEAK AND A GENERATOR VOLTAGE REGULATOR PROBLEM. THE ABSORBER WAS DOWN 40 MINUTES DUE TO A POWER LOSS.

7/84 SYSTEM 100.0 100.0 100.0 100.0 744 744 744

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING JULY.

8/84 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTH OF AUGUST.

9/84 SYSTEM 100.0 99.9 100.0 96.0 720 692 691

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD WAS OFFLINE FOR APPROXIMATELY 29 HOURS IN SEPTEMBER DUE TO A BOILER TUBE LEAK.

10/84 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS AVAILABLE FOR THE MONTH OF OCTOBER.

11/84 SYSTEM 100.0 99.6 100.0 62.5 720 452 450

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFFLINE FOR APPROXIMATELY 262 HOURS IN NOVEMBER FOR ESP REPAIR.

12/84 SYSTEM 99.9 99.9 99.9 99.9 744 744 743

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD WAS OFF-LINE FOR 25 MINUTES DUE TO LOSS OF CONTROL POWER TO THE SYSTEM.

1/85 SYSTEM 100.0 100.0 100.0 100.0 744 744 744

2/85 SYSTEM 100.0 100.0 100.0 100.0 672 672 672

3/85 SYSTEM 100.0 100.0 100.0 100.0 744 744 744

4/85 SYSTEM 100.0 99.7 100.0 91.5 720 661 659

5/85 SYSTEM 100.0 100.0 100.0 100.0 744 744 744

6/85 SYSTEM 100.0 100.0 100.0 100.0 720 720 720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS
 OF JANUARY THROUGH JUNE.

7/85 SYSTEM 99.8 99.4 99.8 99.1 744 742 737

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS DOWN FOR APPROXIMATELY 2 HOURS TO PERMIT SCRUBBER INLET
 CLEANING.

THE UNIT WAS OFF-LINE APPROXIMATELY 2 HOURS FOR REPAIR OF AN AIR PREHEATER
 MOTOR SHEARED COUPLING.

8/85 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTH OF AUGUST.

9/85 SYSTEM 80.1 100.0 100.0 46.8 720 337 337

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT WAS OUT OF SERVICE FOR 240 HOURS DUE TO
 LOW POWER DEMAND.

THE FGD SYSTEM WAS OFF-LINE 143 HOURS FOR PLUGGING PROBLEMS.

10/85 SYSTEM 100.0 100.0 100.0 62.8 744 467 467

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON STANDBY STATUS 278 HOURS IN OCTOBER DUE TO LOW LOAD
 DEMAND.

11/85 SYSTEM 100.0 100.0 100.0 100.0 720 720 720

12/85 SYSTEM 100.0 100.0 100.0 96.6 744 719 719

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS
 OF OCTOBER THROUGH DECEMBER.

1/86 SYSTEM 100.0 100.0 100.0 100.0 744 744 744

2/86 SYSTEM 100.0 100.0 100.0 87.9 672 591 591

3/86 SYSTEM 0.0 0.0 744 0 0

4/86 SYSTEM 0.0 0.0 720 0 0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS SHUT DOWN THE ENTIRE MARCH-APRIL PERIOD FOR A TURBINE-
 GENERATOR INSPECTION.

5/86 SYSTEM 100.0 100.0 100.0 77.3 744 575 575

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

OUTAGES DURING MAY WERE ATTRIBUTED TO AN OVERSPEED CHECK ON THE TURBINE,
 A TURBINE HOT VALVE ADJUSTMENT AND A SUPER HEATER TUBE LEAK. NO FGD
 SYSTEM-RELATED PROBLEMS WERE REPORTED.

6/86	SYSTEM	100.0	100.0	100.0	98.3	720	708	708
7/86	SYSTEM	100.0	100.0	100.0	100.0	744	744	744
8/86	SYSTEM	100.0	100.0	100.0	100.0	744	744	744
9/86	SYSTEM	91.8	100.0	100.0	91.8	720	661	661

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS SHUTDOWN DURING PART OF THE MONTH TO PREPARE FOR STACK
 TESTING.

10/86	SYSTEM	100.0	100.0	100.0	66.7	744	496	496

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OUT OF SERVICE PART OF OCTOBER TO INSTALL TURBINE BALANCE
 SHOT AND AS A RESULT OF LOW LOAD DEMAND.

11/86	SYSTEM	100.0	100.0	100.0	15.4	720	111	111

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OUT OF SERVICE PART OF NOVEMBER AS A RESULT OF LOW LOAD
 DEMAND.

12/86	SYSTEM	100.0	100.0	100.0	69.0	744	513	513

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF-LINE DUE TO LOW LOAD DEMAND. DURING THE OUTAGE A BOILER
 TUBE LEAK WAS REPAIRED AND THE ESP AND FGD SYSTEM WERE INSPECTED AND
 CLEANED.

NO MAJOR FGD SYSTEM RELATED PROBLEMS WERE REPORTED FOR THE JANUARY-
 DECEMBER 1986 PERIOD.

1/87	SYSTEM	100.0	100.0	100.0	54.3	744	404	404
2/87	SYSTEM	0.0			0.0	672	0	0
3/87	SYSTEM	100.0	100.0	100.0	17.7	744	132	132
4/87	SYSTEM	88.1	100.0	100.0	88.1	720	634	634

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS SHUT DOWN FROM JANUARY THROUGH APRIL BECAUSE OF LOW LOAD
 DEMAND.

5/87	SYSTEM	96.8	100.0	100.0	85.2	744	634	634
6/87	SYSTEM	100.0	100.0	100.0	48.9	720	352	352
7/87	SYSTEM	100.0	100.0	100.0	92.5	744	688	688

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTH MISSISSIPPI ELEC PWR: R.D. MORROW, SR. 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF-LINE BRIEFLY DURING THE MAY-JULY PERIOD BECAUSE OF LOW LOAD DEMAND.

8/87	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR AUGUST.

9/87	SYSTEM	100.0	100.0	100.0	100.0		720	744	720	

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS OFF-LINE DURING THE MONTH DUE TO A BOILER TRIP.

10/87	SYSTEM	100.0	100.0	100.0	92.6		744	689	689	

** PROBLEMS/SOLUTIONS/COMMENTS

THE SYSTEM WAS OFF-LINE BRIEFLY IN OCTOBER DUE TO LOW LOAD DEMAND.

11/87	SYSTEM	100.0		100.0	100.0		720		720	

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR NOVEMBER.

12/87	SYSTEM	100.0	100.0	100.0	73.0		744	543	543	

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS OFF-LINE FOR 167 HOURS AS A RESULT OF AN ESP FAILURE.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SOUTHERN ILLINOIS POWER	
PLANT NAME	MARION	
UNIT NUMBER	4	
CITY	MARION	
STATE	ILLINOIS	
REGULATORY CLASSIFICATION	D	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	272	
GROSS UNIT GENERATING CAPACITY - MW	184	
NET UNIT GENERATING CAPACITY W/FGD - MW	170	
NET UNIT GENERATING CAPACITY WO/FGD - MW	174	
EQUIVALENT SCRUBBED CAPACITY - MW	184	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	BABCOCK & WILCOX	
BOILER TYPE	CYCLONE	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	297.30	(630000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	148.9	(300 F)
STACK HEIGHT - M	122.	(400 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	6.4	(21.0 FT)
** FUEL DATA		
FUEL TYPE	COAL/REFUSE	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	25586.	(11000 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		8500-11400
AVERAGE ASH CONTENT - %	16.80	
RANGE ASH CONTENT - %	7.5-23.0	
AVERAGE MOISTURE CONTENT - %	12.20	
RANGE MOISTURE CONTENT - %	1.5-20.0	
AVERAGE SULFUR CONTENT - %	3.75	
RANGE SULFUR CONTENT - %	2.9-4.4	
AVERAGE CHLORIDE CONTENT - %	0.10	
RANGE CHLORIDE CONTENT - %	0.00-0.12	
*** PARTICLE CONTROL		
** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
** ESP		
NUMBER	1	
NUMBER OF SPARES	0	
TYPE	COLD SIDE	
SUPPLIER	BABCOCK & WILCOX	
INLET FLUE GAS CAPACITY - CU.M/S	326.3	(691500 ACFM)
INLET FLUE GAS TEMPERATURE - C	148.9	(300 F)
PRESSURE DROP - KPA	0.1	(1. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.6	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
*** FGD SYSTEM		

SOUTHERN ILLINOIS POWER: MARION 4 (CONT.)

** GENERAL DATA
 SALEABLE PRODUCT/THROWAWAY PRODUCT THROWAWAY PRODUCT
 SO2 REMOVAL MODE WET SCRUBBING
 PROCESS TYPE LIMESTONE
 PROCESS ADDITIVES NONE
 SYSTEM SUPPLIER BABCOCK & WILCOX
 A-E FIRM BURNS & MCDONNELL
 DEVELOPMENT LEVEL FULL SCALE
 NEW/RETROFIT NEW
 UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - % 0.00
 UNIT DESIGN SO2 REMOVAL EFFICIENCY - % 89.40
 ENERGY CONSUMPTION - % 2.2
 CURRENT STATUS 1
 COMMERCIAL START-UP 6/1979
 INITIAL START-UP 4/1979
 CONTRACT AWARDED 1/1976

** DESIGN AND OPERATING PARAMETERS
 DESIGN CHLORIDE CONTENT - % *****

** QUENCHER/PRESATURATOR
 NUMBER 2
 TYPE VENTURI
 SUPPLIER BABCOCK & WILCOX
 INLET GAS FLOW - CU. M/S 165.16 (350000 ACFM)
 INLET GAS TEMPERATURE - C 148.9 (300 F)
 LIQUID RECIRCULATION RATE - LITERS/S 338. (5360 GPM)
 L/G RATIO - L/CU. M 2.0 (15.3 GAL/1000 ACFM)
 CONSTRUCTION MATERIAL GENERIC TYPE CARBON STEEL
 CONSTRUCTION MATERIAL SPECIFIC TYPE AISI 1110

** ABSORBER
 NUMBER 2
 NUMBER OF SPARES 0
 GENERIC TYPE TRAY TOWER
 SPECIFIC TYPE SIEVE TRAY
 TRADE NAME/COMMON TYPE N/A
 SUPPLIER BABCOCK & WILCOX
 SHELL GENERIC MATERIAL CARBON STEEL
 SHELL SPECIFIC MATERIAL AISI 1110
 SHELL MATERIAL TRADE NAME/COMMON TYPE N/A
 LINER GENERIC MATERIAL ORGANIC
 LINER SPECIFIC MATERIAL GLASS FLAKE-FILLED POLYESTER
 LINER MATERIAL TRADE NAME/COMMON TYPE RESISTA-FLAKE 1103
 GAS CONTACTING DEVICE TYPE SIEVE TRAYS
 NUMBER OF CONTACTING ZONES 2
 LIQUID RECIRCULATION RATE - LITER/S 827. (13120 GPM)
 L/G RATIO - L/CU.M 5.9 (44.3 GAL/1000 ACF)
 GAS-SIDE PRESSURE DROP - KPA 1.5 (6.0 IN-H2O)
 INLET GAS FLOW - CU. M/S 139.68 (296000 ACFM)
 INLET GAS TEMPERATURE - C 53.9 (129 F)
 SO2 REMOVAL EFFICIENCY - % 89.4

** MIST ELIMINATOR
 PRE-MIST ELIMINATOR/MIST ELIMINATOR PRIMARY COLLECTOR
 NUMBER PER SYSTEM 2
 NUMBER OF SPARES PER SYSTEM 0
 NUMBER PER MODULE 1
 GENERIC TYPE IMPINGEMENT
 SPECIFIC TYPE BAFFLE
 TRADE NAME/COMMON TYPE CLOSED VANE
 CONFIGURATION HORIZONTAL
 NUMBER OF STAGES 2
 NUMBER OF PASSES PER STAGE 3
 CONSTRUCTION MATERIAL GENERIC TYPE ORGANIC
 CONSTRUCTION MATERIAL SPECIFIC TYPE FIBER-REINFORCED POLYESTER
 WASH WATER SOURCE BLENDED FOR UNDERSPRAY AND FRESH FOR OVERSPRAY
 WASH FREQUENCY CONTINUOUS UNDERSPRAY AND ONCE PER 2 HOURS OVERS

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN ILLINOIS POWER: MARION 4 (CONT.)

** REHEATER	
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON TYPE	N/A
PERCENT GAS BYPASSED - AVG	0.0
CONSTRUCTION MATERIAL GENERIC TYPE	N/A
CONSTRUCTION MATERIAL SPECIFIC TYPE	N/A
** FANS	
NUMBER	2
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
SUPPLIER	BUFFALO FORGE
FUNCTION	BOOSTER
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	165.16 (350000 ACFM)
FLUE GAS TEMPERATURE - C	148.9 (300 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
NUMBER	2
FUNCTION	ISOLATION
GENERIC TYPE	GUILLOTINE
SPECIFIC TYPE	NR
MANUFACTURER	MOSSER
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	2
FUNCTION	ISOLATION
GENERIC TYPE	GUILLOTINE
SPECIFIC TYPE	NR
MANUFACTURER	MOSSER
CONSTRUCTION MATERIAL GENERIC TYPE	HIGH ALLOY
CONSTRUCTION MATERIAL SPECIFIC TYPE	NICKEL BASE/CHROMIUM-IRON-MOLYBDENUM
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	1
FUNCTION	ISOLATION
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	MOSSER
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL/HIGH ALLOY
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110; NICKEL BASE/CHROMIUM-IRON-MOLYBDENUM
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	INLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	OUTLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED

SOUTHERN ILLINOIS POWER: MARION 4 (CONT.)

DEVICE TYPE	NR
MANUFACTURER	KOPPERS
PRODUCT QUALITY - % SOLIDS	30.0
** TANKS	
SERVICE	NUMBER
-----	-----
MIST ELIMINATOR WASH	1
ABSORBER RECYCLE	2
POND RETURN	1
REAGENT PREP PRODUCT	2
CENTRATE SUMP	****
WASTE SLURRY SUMP	****
** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER RECIRCULATION	5
QUENCHER RECIRCULATION	2
MIST ELIMINATOR WASH	2
WASTE SLURRY	2
RECLAIMED WATER	2
MILL PRODUCT	2
LIMESTONE SLURRY TRANSFER	2
SLUDGE TRANSFER	3
CENTRATE	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	1
NUMBER OF SPARES	0
DIMENSIONS - FT	125.0 DIA X 9.0
CAPACITY	826000 GAL
SHELL GENERIC MATERIAL TYPE	INORGANIC
SHELL SPECIFIC MATERIAL TYPE	HYDRAULICALLY-BONDED CONCRETE
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	BITUMASTIC
FEED STREAM SOURCE	ABSORBER BLEED
FEED STREAM CHARACTERISTICS	8% SOLIDS
OUTLET STREAM CHARACTERISTICS	30% SOLIDS
OUTLET STREAM DISPOSITION	TO CENTRIFUGE
OVERFLOW STREAM DISPOSITION	TO RECIRCULATION TANK AND BALL MILL
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	CENTRIFUGE
NUMBER	2
NUMBER OF SPARES	0
CAPACITY	125 GPM
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
FEED STREAM SOURCE	THICKENER UNDERFLOW
FEED STREAM CHARACTERISTICS	30% SOLIDS
OUTLET STREAM CHARACTERISTICS	55% SOLIDS
OUTLET STREAM DISPOSITION	PUG MILL FOR SLUDGE STABILIZATION
OVERFLOW STREAM DISPOSITION	THICKENER
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	STABILIZATION
DEVICE	PUG MILL
PROPRIETARY PROCESS	NONE
INLET QUALITY - %	55.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN ILLINOIS POWER: MARION 4 (CONT.)

** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	CONVEYED
SITE TREATMENT	NONE
** PROCESS CONTROL AND INSTRUMENTATION	
CHEMICAL PARAMETERS	PH
CONTROL LEVELS	PH 5-6
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
SOURCE OF MAKEUP WATER	LAKE EGYPT
** CHEMICALS AND CONSUMPTION	
FUNCTION	ABSORBENT
NAME	LIMESTONE
PRINCIPAL CONSTITUENT	CAC03
UTILIZATION - %	69.0
POINT OF ADDITION	BALL MILL
** FGD SPARE CAPACITY INDICES	
ABSORBER - %	0.0
MIST ELIMINATOR - %	0.0
FAN - %	0.0
THICKENER - %	0.0
** FGD SPARE COMPONENT INDICES	
ABSORBER	0.0
MIST ELIMINATOR	0.0
FAN	0.0
THICKENER	0.0

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER BOILER	FGD	CAP.
						SO2	PART. HOURS	HOURS	FACTOR

5/79	SYSTEM							744	
6/79	SYSTEM							720	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT BEGAN OPERATION IN MAY. HOWEVER, THE UNIT IS NOW DOWN AND HAS SUFFERED TWO PREVIOUS OUTAGES. THE PREVIOUS OUTAGES WERE DUE TO CENTRIFUGE AND THICKENER PROBLEMS. THE PRESENT OUTAGE IS DUE TO BEARING FAILURES ON THE PUG MILL AND IMPROPER FIT OF THE SLUDGE CONVEYING BELT.

7/79	SYSTEM							744	
8/79	SYSTEM							744	
9/79	SYSTEM							720	

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE THIRD QUARTER A ROUTINE INSPECTION OF THE SCRUBBER INTERNALS SHOWED NO SCALE FORMATION.

THE UTILITY REPORTED THAT THE FGD SYSTEM HAS ACHIEVED A 0.7 LB/MMBTU OF SO2 EMISSION LEVEL. THE UNIT IS SUBJECT TO THE 1.2 LB/MMBTU SO2 EMISSION STANDARD.

THE CONTINUOUS MONITORS HAVE NOT BEEN OPERATING ACCEPTABLY.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN ILLINOIS POWER: MARION 4 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

A TURBINE OVERHAUL/INSPECTION IS SCHEDULED FOR OCTOBER 1, 1979.										
10/79	SYSTEM				0.0		744	0	0	0.0
11/79	SYSTEM		100.0		26.7		720	192	192	
12/79	SYSTEM		100.0		71.0		744	528	528	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UNIT WAS DOWN FROM OCTOBER 1 THROUGH NOVEMBER 17 FOR A BOILER/TURBINE INSPECTION. NO MAJOR FGD RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER OF 1979 OTHER THAN SOME FREEZE-UPS CAUSED BY THE WINTER WEATHER.										
1/80	SYSTEM		100.0		10.0		744	72	72	
2/80	SYSTEM		100.0		31.0		696	216	216	
3/80	SYSTEM		100.0		48.4		744	360	360	
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING JANUARY THE LOW BOILER AND SCRUBBER HOURS WERE A RESULT OF AN 18 DAY BOILER OUTAGE NEEDED FOR CORRECTION OF TUBE PROBLEMS. BOILER OUTAGES DUE TO TUBE PROBLEMS WERE ALSO EXPERIENCED IN FEBRUARY AND MARCH.										
THE ONLY REPORTED FGD-RELATED PROBLEM DURING THE FIRST QUARTER OF 1980 WAS MAINTAINING THE BELT ALIGNMENT IN THE SLUDGE DISPOSAL SYSTEM.										
4/80	SYSTEM	66.7	66.7	66.7	66.7		720	720	480	81.3
** PROBLEMS/SOLUTIONS/COMMENTS										
SHAFT BREAKAGE WITHIN THE RECLAIM WATER PUMP CAUSED FGD SYSTEM OUTAGE TIME DURING APRIL.										
5/80	SYSTEM	77.4	58.8	58.8	32.3		744	408	240	49.6
** PROBLEMS/SOLUTIONS/COMMENTS										
A BOILER OUTAGE CAUSED THE FGD SYSTEM NOT TO OPERATE FOR TWO WEEKS.										
SHAFT BREAKAGE WITHIN THE WATER RECLAIM PUMP CONTINUED THROUGH MAY.										
6/80	SYSTEM	50.0	50.0	50.0	50.0		720	720	360	82.3
** PROBLEMS/SOLUTIONS/COMMENTS										
SHAFT BREAKAGE WITHIN THE WATER RECLAIM PUMP CONTINUED TO CAUSE FGD OUTAGE TIME. A SOLUTION HAS BEEN PROPOSED TO SIPCO BY THEIR ENGINEERING CONSULTANT FOR CONSIDERATION.										
7/80	SYSTEM	96.7	100.0	100.0	95.9		744	714	714	82.0
** PROBLEMS/SOLUTIONS/COMMENTS										
AFTER REVIEW OF THE PROPOSED SOLUTION OF THE SHAFT BREAKAGE PROBLEM WITHIN THE RECLAIM WATER PUMP, SIPCO AUTHORIZED THEIR CONSULTANT TO PROCEED WITH THE WORK TO CORRECT THE PROBLEM.										
8/80	SYSTEM	100.0	100.0	100.0	90.5		744	673	673	89.6

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

PROBLEMS WITH THE SHAFT BREAKAGE IN THE RECLAIM WATER PUMPS CONTINUED THROUGH AUGUST. A REPLACEMENT PUMP HAS BEEN PURCHASED TO SOLVE THE PROBLEM.

9/80	A	100.0	100.0	100.0	100.0				
	B	100.0	100.0	100.0	100.0				
	SYSTEM	100.0	100.0	100.0	100.0	720	720	720	100.0

** PROBLEMS/SOLUTIONS/COMMENTS

SUMMARY OF GENERAL PROBLEMS TO DATE

THE MAJOR CAUSES OF SCRUBBER OUTAGES HAVE CENTERED AROUND COLD WEATHER-RELATED CONVEYOR BELT AND PIPING PROBLEMS, PUG MILL BEARING FAILURES, AND RECLAIM WATER PUMP SHAFT FAILURES. OTHER PROBLEMS HAVE BEEN RELATED TO PROCESS CHEMISTRY CONTROL. THE UTILITY REPORTED THAT NUMEROUS SMALL PROBLEMS ALSO HAVE OCCURRED BUT HAVE GENERALLY BEEN CORRECTED SOON AFTER THEIR DISCOVERY. DETAILS OF THE PRIMARY SCRUBBER PROBLEMS ARE OUTLINED BELOW:

COLD WEATHER PROBLEMS

THE MOST SEVERE FREEZING PROBLEM CONCERNS THE SLUDGE CONVEYOR SYSTEM. WHEN THE AMBIENT TEMPERATURE DROPS BELOW 30 F THE CONVEYOR SYSTEM BECOMES INOPERABLE. THE UTILITY HAS ATTEMPTED TO REMOVE THE FROZEN SLUDGE USING VARIOUS COMMERCIAL AND COMPANY-BUILT SCRAPERS WITH LITTLE SUCCESS. THE UTILITY ALSO INSTALLED HEATERS AT THE VARIOUS TRANSFER POINTS TO THAW THE SLUDGE. THIS PROVED UNSUCCESSFUL AS WELL. THE PROBLEM HAS NOT YET BEEN SOLVED.

AN ADDITIONAL PROBLEM WITH THE CONVEYOR SYSTEM HAS BEEN THE FAILURE OF THE BELT TO TRACK CORRECTLY. ON SEVERAL OCCASIONS THE BELT HAS TOUCHED THE STRUCTURAL STEEL SUPPORTS RESULTING IN BELT DAMAGE. HOWEVER, BY REDUCING THE CONVEYOR SPEED THE UTILITY HAS INCREASED THE ESTIMATED BELT LIFE FROM FIVE TO 10 YEARS.

THE OTHER COLD WEATHER PROBLEM IS RELATED TO THE SCRUBBER VESSEL PIPING SYSTEM. ON SEVERAL OCCASIONS WATER LINE FREEZE UPS HAVE RESULTED IN SCRUBBER OUTAGES. WHEN THE PROBLEM WAS DISCOVERED, THE UTILITY INSTALLED EXTENSIVE HEAT TRACING ON EXPOSED WATER LINES. ALTHOUGH THERE HAS BEEN NO COLD WEATHER SINCE THE HEAT TRACING INSTALLATION, THE UTILITY BELIEVES THAT THE PROBLEM IS SOLVED.

PUG MILL PROBLEM

SEVERAL BEARING FAILURES HAVE OCCURRED ON THE PUG MILL. THE UTILITY HAS INCREASED THE MAINTENANCE ON THE MILL SYSTEM TO LESSEN THE LIKELIHOOD OF ANOTHER FAILURE. THE UTILITY REPORTED THAT IF THIS PROCEDURE MODIFICATION DOES NOT INCREASE THE PUG MILL RELIABILITY TO AN ACCEPTABLE LEVEL OTHER ACTION WILL BE TAKEN.

RECLAIM WATER PUMP SHAFT FAILURE

THE RECLAIM WATER PUMPS PRODUCE A VERY FLAT OUTPUT PRESSURE CURVE BUT THEY FEED A SYSTEM COMPOSED OF MANY AUTOMATICALLY CONTROLLED DIAPHRAGM VALVES. THE OPENING AND CLOSING OF THESE VALVES EXPOSES THE PUMPS TO A WIDE VARIABILITY IN WATER REQUIREMENTS. MOTOR SHAFT FATIGUE RESULTS WHEN THE PUMPS ATTEMPT TO RESPOND TO THE VARIABLE DEMAND. THE SYSTEM SUPPLIER IS CURRENTLY SUPPLYING THE UTILITY WITH INFORMATION ON THE OPERATION OF THE DIAPHRAGM VALVES. THE UTILITY'S CONSULTANT ENGINEERING FIRM WILL REVIEW THE MATERIAL AND SUGGEST POSSIBLE CONTROL VALVE CHANGES. THE UTILITY REPORTED THAT IF THIS IS NOT POSSIBLE OR DOES NOT

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN ILLINOIS POWER: MARION 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

WORK, A DESIGN CHANGE TO A DIFFERENT PUMP TYPE WILL BE CONSIDERED.
 WHILE THE PROBLEM CONTINUES, THE UTILITY IS KEEPING A COMPLETE SHAFT AN
 IMPELLER ON SITE.

PROCESS CHEMISTRY

THE UTILITY HAS LOST CONTROL OF THE PROCESS CHEMISTRY SEVERAL TIMES.
 THE SLURRY SOLIDS LEVEL HAS CONSEQUENTLY INCREASED TO THE POINT THAT
 THE THICKENER RAKE HAS BECOME INOPERABLE. TO SOLVE THE PROBLEM THE
 UTILITY HAS BEEN IMPROVING THE CHEMISTRY MONITORING SYSTEM. IN THE
 INTERIM, WHERE EXISTING MONITORS ARE OUT OF SERVICE, LAB PERSONNEL
 PERFORM MANUAL TESTS TO MAINTAIN PROCESS CHEMISTRY CONTROL.

THE BOILER AND THE FGD SYSTEM OPERATED THE ENTIRE MONTH OF SEPTEMBER WITH
 NO PROBLEMS.

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER SO2 PART.	BOILER HOURS	FGD HOURS	CAP. HOURS	FACTOR
10/80	SYSTEM	100.0	100.0	100.0	57.7		744	429	429	42.3	

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER WAS TAKEN OFF LINE ON OCTOBER 18 FOR A SCHEDULED ANNUAL
 OVERHAUL, DURING WHICH TIME THE FGD SYSTEM REMAINED AVAILABLE.

11/80	A	90.2	0.0	0.0	0.0						
	B	90.2	0.0	0.0	0.0						
	SYSTEM	90.2	0.0	0.0	0.0		720	71	0	11.2	

** PROBLEMS/SOLUTIONS/COMMENTS

DUE TO PROBLEMS ENCOUNTERED WITH THE BOILER, THE SCHEDULED MAINTENANCE
 OUTAGE WAS CONTINUED THROUGH NOVEMBER 26.

WHEN THE UTILITY ATTEMPTED TO START THE FGD SYSTEM, A LEAK WAS DETECTED IN
 THE HIGH PRESSURE LUBRICATION LINE ON THE BALL MILL CAUSING THE SYSTEM TO
 REMAIN OUT OF SERVICE THROUGH NOVEMBER.

12/80	A	79.7	78.1	78.1	72.2						
	B	79.4	77.8	77.8	71.9						
	SYSTEM	79.6	77.9	77.9	72.0		744	688	536	88.3	

** PROBLEMS/SOLUTIONS/COMMENTS

THE BALL MILL LUBRICATION PROBLEM CONTINUED INTO DECEMBER CAUSING APPROX-
 IMATELY 150 HOURS OF OUTAGE TIME.

ON DECEMBER 30 THE B MODULE WAS TAKEN OFF LINE FOR APPROXIMATELY THREE
 HOURS TO REPAIR A WALL LEAK IN THE QUENCHER SECTION. MODULE A WAS TAKEN
 OFF LINE LATER THAT DAY DUE TO THE SAME PROBLEM.

1/81	A	40.0	33.9	33.9	33.6						
	B	77.4	65.3	74.9	64.6						
	SYSTEM	59.0	50.0	53.0	49.0		744	737	366	97.0	

** PROBLEMS/SOLUTIONS/COMMENTS

MODULES A AND B WERE OUT OF SERVICE APPROXIMATELY 159 HOURS DUE TO THE
 CONVEYOR SYSTEM FREEZING. MODULES A AND B WERE OFFLINE AN ADDITIONAL TWO
 HOURS DUE TO A LEAK IN THE WASH WALL HEADER.

AN ADDITIONAL 278 HOURS OF OUTAGE TIME TO MODULE A WAS DUE TO A LEAK IN
 THE CONTINUOUS MIST ELIMINATOR SUPPLY LINE. THE REPAIR OF THIS FIBER-
 GLAS LINE WAS HAMPERED BY THE COLD WEATHER.

2/81	A	64.3	64.3	64.3	64.3						

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN ILLINOIS POWER: MARION 4 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD CAP. HOURS FACTOR
	B	70.1	70.1	70.1	70.1				
	SYSTEM	67.3	67.3	67.3	67.3		672	672	452 95.1

** PROBLEMS/SOLUTIONS/COMMENTS

DURING FEBRUARY THE FGD SYSTEM EXPERIENCED INTERMITTENT OPERATION DUE TO A BELT FREEZING. BOTH MODULES WERE OFF LINE APPROXIMATELY 141 HOURS.

A HOLE IN THE OUTLET DUCTWORK BETWEEN THE ISOLATION DAMPER AND THE STACK CAUSED MODULES A AND B TO BE OFFLINE APPROXIMATELY 59 HOURS.

MODULE B WAS TAKEN OFF LINE FOR APPROXIMATELY THREE HOURS TO REPAIR A LEAK IN THE WALLWASH HEADER.

MODULE A WAS TAKEN OFF LINE TO REPAIR A PINHOLE IN THE ABSORBER DISCHARGE SECTION. THE REPAIR WAS COMPLETED, BUT A MALFUNCTION OF THE OUTLET GUILLOTINE DAMPER CAUSED THE MODULE 11 HOURS OF OUTAGE TIME.

DURING FEBRUARY A BOOSTER FAN TRIPPED OFF LINE THREE TIMES DUE TO HIGH VIBRATION CAUSING APPROXIMATELY 38 HOURS OF OUTAGE TIME.

3/81	A	30.6	46.3	50.3	30.6				
	B	98.6	96.7	97.9	64.0				
	SYSTEM	64.6	72.3	74.9	47.3		744	492	352 93.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER WAS TAKEN OFF LINE ON MARCH 21, 1981 FOR AN ANNUAL MAINTENANCE INSPECTION, AND REMAINED OFF LINE THE REST OF THE MONTH.

MODULE A WAS OFF LINE APPROXIMATELY ONE HOUR DUE TO HIGH VIBRATIONS OF THE BOOSTER FAN. ON MARCH 10 A SHORT IN THE BOOSTER FAN MOTOR CAUSED MODULE A TO BE OUT OF SERVICE FOR THE REST OF THE MONTH.

MODULE B WAS OUT OF SERVICE A TOTAL OF 10 HOURS FOR REPAIRS TO THE LEAKS IN THE WALL WASH HEADERS.

4/81	A	76.3	59.6	83.9	51.9				
	B	85.0	82.8	82.8	72.1				
	SYSTEM	81.0	71.0	83.0	62.0		720	627	447 77.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING APRIL MODULE A WAS UNAVAILABLE APPROXIMATELY 206 HOURS DUE TO THE INSTALLATION OF THE REBUILT FAN MOTOR.

ADDITIONAL OUTAGE TIME WAS DUE TO THE REPACKING OF THE QUENCHER PUMP.

APPROXIMATELY FOUR HOURS OF OUTAGE TIME WAS NECESSARY TO REPAIR A WALL WASH HEADER LEAK.

MODULE B WAS OUT OF SERVICE APPROXIMATELY 91 HOURS DUE TO THE INSTALLATION OF A HYDROCLONE HEAD IN THE QUENCHER.

5/81	A	99.5	99.5	99.6	99.5				
	B	68.4	68.4	91.2	68.4				
	SYSTEM	84.0	84.0	96.0	84.0		744	744	625 82.7

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MAY MODULES A AND B EXPERIENCED WALL WASH HEADER LEAKS CAUSING SOME OUTAGE TIME.

MODULE B WAS OUT OF SERVICE APPROXIMATELY 227 HOURS DUE TO THE REPLACEMENT

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN ILLINOIS POWER: MARION 4 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR

OF THE IMPELLER AND RUBBER LINERS ON THE ENGINE AND SUCTION SIDES OF THE PUMP.									
6/81	A	89.5	89.5	89.5	89.5				
	B	47.2	47.2	54.0	47.2				
	SYSTEM	68.4	68.4	71.8	68.4		720	720	493 94.7
** PROBLEMS/SOLUTIONS/COMMENTS									
ON JUNE 3 BOTH MODULES WERE OFF-LINE TO ALLOW REPAIR OF WALL WASH HEADER LEAKS. UPON ATTEMPTED STARTUP ON JUNE 3, IT WAS DISCOVERED THAT SEVERAL OF THE ABSORBER PUMP DISCHARGE VALVES WOULD NOT FUNCTION CORRECTLY. THIS CAUSED THE SYSTEM TO REMAIN DOWN THROUGH JUNE 5.									
THE BEARING ON MODULE B QUENCHER PUMP FAILED RESULTING IN AN OUTAGE.									
MODULE A WAS TAKEN OFF-LINE ON JUNE 24 FOR FOUR HOURS TO REPAIR THE WALL WASH HEADER.									
7/81	A	75.1	75.1	91.5	75.1				
	B	73.4	73.4	95.8	73.4				
	SYSTEM	74.3	74.3	93.6	74.3		744	744	553 66.1
** PROBLEMS/SOLUTIONS/COMMENTS									
THE A AND B MODULES WERE OFF THREE AND FOUR TIMES, RESPECTIVELY, DURING THE MONTH FOR REPAIR OF WALL WASH HEADER LEAKS.									
8/81	A	46.1	42.5	54.3	42.5				
	B	58.7	50.9	65.2	50.9				
	SYSTEM	52.4	46.8	59.9	46.8		744	744	348 75.0
** PROBLEMS/SOLUTIONS/COMMENTS									
THE FGD SYSTEM DID NOT OPERATE DURING THE FIRST PART OF THE MONTH AS A RESULT OF A THICKENER OVERLOAD.									
OTHER MISCELLANEOUS OUTAGES DURING THE MONTH OCCURRED TO CHANGE A WALL WAS HEADER GASKET ON MODULE B AND TO CORRECT HIGH BOOSTER FAN VIBRATION ON MODULE A.									
9/81	A	100.0	79.4	100.0	46.8				
	B	100.0	58.2	100.0	34.3				
	SYSTEM	100.0	68.8	100.0	40.6		720	424	292
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING SEPTEMBER THE FGD SYSTEM WAS OPERATIONAL FOR 100% OF THE TIME IT WAS NEEDED. THERE WERE, HOWEVER, 302.5 HOURS WHEN ONLY ONE MODULE WAS NECESSARY TO HANDLE THE BOILER LOAD.									
10/81	A	100.0	92.5	100.0	63.4				
	B	100.0	86.1	100.0	59.0				
	SYSTEM	100.0	89.3	100.0	61.2		744	510	456
11/81	A	100.0	93.1	100.0	92.5				
	B	100.0	78.6	100.0	78.1				
	SYSTEM	100.0	85.9	100.0	85.3		720	715	614
12/81	A	97.6	94.3	99.3	80.2				
	B	76.5	89.9	96.1	76.5				
	SYSTEM	87.0	92.1	97.7	78.3		744	633	583

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN ILLINOIS POWER: MARION 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER 1981.

1/82	A	89.9	89.9	92.1	89.9				
	B	78.2	68.9	89.3	68.9				
	SYSTEM	84.0	79.4	90.7	79.4	744	744	591	
2/82	A	86.9	80.4	84.3	69.6				
	B	92.4	89.8	100.0	77.8				
	SYSTEM	89.6	85.1	92.1	73.7	672	582	496	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE EXPERIENCED DURING JANUARY AND FEBRUARY.

3/82	SYSTEM					744			
4/82	SYSTEM					720			
5/82	SYSTEM					744			
6/82	SYSTEM					720			
7/82	SYSTEM					744			
8/82	SYSTEM					744			
9/82	SYSTEM					720			

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE PERIOD OF MARCH 1982 THROUGH SEPTEMBER 1982.

10/82	A	5.4	85.0	100.0	4.6				
	B	5.4	0.0		0.0				
	SYSTEM	5.4	42.5	100.0	2.3	744	40	17	1.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OUT OF SERVICE DURING MOST OF OCTOBER DUE TO A SCHEDULED OUTAGE.

11/82	A	100.0	84.4	100.0	84.4				
	B	99.6	91.7	100.0	91.7				
	SYSTEM	99.8	88.1	100.0	88.1	720	720	634	70.3

** PROBLEMS/SOLUTIONS/COMMENTS

DUE TO LOW LOADS, ONLY ONE MODULE WAS REQUIRED DURING NOVEMBER.

12/82	A	100.0	88.7	100.0	88.7				
	B	100.0	98.4	100.0	98.4				
	SYSTEM	100.0	93.5	100.0	93.5	744	744	696	66.3

** PROBLEMS/SOLUTIONS/COMMENTS

DUE TO LOW LOADS, ONLY ONE MODULE WAS REQUIRED DURING DECEMBER.

1/83	SYSTEM					744			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN ILLINOIS POWER: MARION 4 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
2/83	SYSTEM						672			
3/83	SYSTEM						744			
** PROBLEMS/SOLUTIONS/COMMENTS										
INFORMATION WAS UNAVAILABLE FOR THE PERIOD OF JANUARY 1983 THROUGH MARCH 1983.										
4/83	A	100.0	86.9	100.0	41.3					
	B	100.0	81.8	100.0	38.9					
	SYSTEM	100.0	84.4	100.0	40.1		720	343	289	
5/83	A	100.0	86.9	100.0	41.2					
	B	100.0	81.8	100.0	38.8					
	SYSTEM	100.0	84.4	100.0	40.0		744	353	298	
6/83	A	100.0	86.9	100.0	41.3					
	B	100.0	81.8	100.0	38.9					
	SYSTEM	100.0	84.4	100.0	40.1		720	343	289	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT THE UNIT WAS DOWN 1146 HOURS DURING THE SECOND QUARTER OF 1983.										
7/83	A	98.4	98.4	98.4	98.4					
	B	99.1	97.4	99.2	97.4					
	SYSTEM	98.7	97.9	98.8	97.9		744	744	729	93.6
8/83	A	98.9	96.5	98.9	96.0					
	B	97.6	95.4	98.7	94.9					
	SYSTEM	98.3	95.9	98.8	95.4		744	740	710	91.3
9/83	A	39.6	100.0	98.2	37.5					
	B	40.0	95.2	100.0	35.7					
	SYSTEM	39.8	97.6	100.0	36.6		720	270	264	31.8
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT THE UNIT WAS DOWN 450 HOURS DURING SEPTEMBER FOR A SCHEDULED FALL OUTAGE.										
10/83	A	97.0	94.1	98.2	94.1					
	B	97.7	92.2	100.0	92.2					
	SYSTEM	97.4	93.1	99.2	93.1		744	744	693	
11/83	A	96.9	94.0	98.1	94.0					
	B	97.6	92.1	100.0	92.1					
	SYSTEM	97.3	93.1	99.1	93.1		720	720	670	
12/83	A	97.0	94.1	98.2	94.1					
	B	97.7	92.2	100.0	92.2					
	SYSTEM	97.4	93.1	99.2	93.1		744	744	693	
1/84	A	99.2	97.9	100.0	95.6					
	B	93.7	90.5	98.4	88.3					
	SYSTEM	96.4	94.2	100.0	91.9		744	726	684	
2/84	A	99.7	97.8	100.0	96.1					
	B	94.3	90.4	98.3	88.8					
	SYSTEM	97.0	94.1	100.0	92.5		696	684	644	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN ILLINOIS POWER: MARION 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

3/84	A	99.2	97.9	100.0	95.6				
	B	93.7	90.5	98.4	88.3				
	SYSTEM	96.4	94.2	100.0	91.9	744	726	684	
4/84	A	38.9	85.3	100.0	32.4				
	B	37.8	85.7	100.0	32.5				
	SYSTEM	38.3	85.5	100.0	32.4	720	273	234	
5/84	A	38.7	85.1	100.0	32.3				
	B	37.8	85.5	100.0	32.4				
	SYSTEM	38.2	85.3	100.0	32.3	744	282	241	
6/84	A	38.9	85.3	100.0	32.4				
	B	37.8	85.7	100.0	32.5				
	SYSTEM	38.3	85.5	100.0	32.4	720	273	234	

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD RELATED OUTAGES WERE REPORTED FOR THE PERIOD OF OCTOBER 1983 THROUGH JUNE 1984.

7/84	SYSTEM	99.0	97.0	100.0	94.0	744		699	
8/84	SYSTEM	99.0	99.0	99.0	99.0	744		737	
9/84	SYSTEM	99.0	98.0	100.0	98.0	720		706	
10/84	SYSTEM	78.4	84.2	97.2	65.2	744		485	
11/84	SYSTEM	78.4	84.2	97.2	65.2	720		469	
12/84	SYSTEM	78.4	84.2	97.2	65.2	744		485	

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD RELATED OUTAGES WERE REPORTED FOR THE PERIOD OF JULY THROUGH DECEMBER 1984.

1/85	SYSTEM					744			
2/85	SYSTEM					672			
3/85	SYSTEM					744			
4/85	SYSTEM					720			
5/85	SYSTEM					744			
6/85	SYSTEM					720			
7/85	SYSTEM					744			
8/85	SYSTEM					744			
9/85	SYSTEM					720			
10/85	SYSTEM					744			
11/85	SYSTEM					720			
12/85	SYSTEM					744			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN ILLINOIS POWER: MARION 4 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM	96.4	94.4	100.0	96.4		744		717	
2/86	SYSTEM	96.4	94.4	100.0	96.4		672		648	
3/86	SYSTEM	96.4	94.4	100.0	96.4		744		717	
4/86	SYSTEM	98.1	93.6	97.5	67.7		720		487	
5/86	SYSTEM	98.1	93.6	97.5	67.7		744		504	
6/86	SYSTEM	98.1	93.6	97.5	67.7		744		504	
7/86	SYSTEM	98.0	98.6	98.5	94.5		744		703	
8/86	SYSTEM	98.0	98.6	98.5	94.5		744		703	
9/86	SYSTEM	98.0	98.6	98.5	94.5		720		680	
10/86	SYSTEM	95.5	93.3	93.6	77.8		744		579	
11/86	SYSTEM	95.5	93.3	93.6	77.8		720		560	
12/86	SYSTEM	95.5	93.3	93.6	77.8		744		579	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED IN 1986. MIST ELIMINATOR AND SPRAY NOZZLE PLUGGING ARE STILL VERY COMMON. THE UTILITY IS MAINTAINING A STRICT CLEANING SCHEDULE TO KEEP THEM CLEAN. THE UTILITY HAS YET TO TEST AN ANTI-SCALE OR OTHER TYPE OF CHEMICAL ADDITIVE TO REDUCE PLUGGING/SCALING.

1/87	SYSTEM						744			
2/87	SYSTEM						672			
3/87	SYSTEM						744			
4/87	SYSTEM						720			
5/87	SYSTEM						744			
6/87	SYSTEM						720			
7/87	SYSTEM						744			
8/87	SYSTEM						744			
9/87	SYSTEM						720			
10/87	SYSTEM						744			
11/87	SYSTEM						720			
12/87	SYSTEM						744			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN ILLINOIS POWER: MARION 4 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY
TO DECEMBER 1987.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SOUTHERN INDIANA GAS & ELEC	
PLANT NAME	A.B. BROWN	
UNIT NUMBER	1	
CITY	WEST FRANKLIN	
STATE	INDIANA	
REGULATORY CLASSIFICATION	D	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	301.	(0.700 LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	500	
GROSS UNIT GENERATING CAPACITY - MW	265	
NET UNIT GENERATING CAPACITY W/FGD - MW	250	
NET UNIT GENERATING CAPACITY WO/FGD - MW	252	
EQUIVALENT SCRUBBED CAPACITY - MW	225	
 ** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	BABCOCK & WILCOX	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	429.43	(910000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	154.4	(310 F)
STACK HEIGHT - M	152.	(498 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	4.4	(14.5 FT)
 ** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	25819.	(11100 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		10100-11600
AVERAGE ASH CONTENT - %	9.40	
RANGE ASH CONTENT - %	8.4-11.4	
AVERAGE MOISTURE CONTENT - %	13.30	
RANGE MOISTURE CONTENT - %	10.1-21.1	
AVERAGE SULFUR CONTENT - %	3.35	
RANGE SULFUR CONTENT - %	2.8-4.5	
AVERAGE CHLORIDE CONTENT - %	0.05	
RANGE CHLORIDE CONTENT - %	0.01-0.08	
 *** PARTICLE CONTROL		
 ** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
 ** FABRIC FILTER		
NUMBER	0	
TYPE	NONE	
 ** ESP		
NUMBER	1	
TYPE	COLD SIDE	
SUPPLIER	BUELL DIVISION, ENVIROTECH	
INLET FLUE GAS CAPACITY - CU.M/S	372.8	(790036 ACFM)
INLET FLUE GAS TEMPERATURE - C	145.0	(293 F)
PRESSURE DROP - KPA	0.8	(3. 1N-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.5	
 ** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	DUAL ALKALI
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	FMC
A-E FIRM	MID-VALLEY
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.50
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	85.00
ENERGY CONSUMPTION - %	0.8
CURRENT STATUS	1
COMMERCIAL START-UP	4/1979
INITIAL START-UP	3/1979
CONTRACT AWARDED	12/1976

** DESIGN AND OPERATING PARAMETERS

DESIGN CHLORIDE CONTENT - %	*****

** QUENCHER/PRESATURATOR

CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR

** ABSORBER

NUMBER	2
NUMBER OF SPARES	0
GENERIC TYPE	IMPINGEMENT TOWER
SPECIFIC TYPE	FIXED BAFFLE
TRADE NAME/COMMON TYPE	DISC CONTACTOR
SUPPLIER	FMC
DIMENSIONS - FT	30.5 DIA X 61.0
SHELL GENERIC MATERIAL	CARBON STEEL
SHELL SPECIFIC MATERIAL	AISI 1110
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A
LINER GENERIC MATERIAL	ORGANIC
LINER SPECIFIC MATERIAL	GLASS FLAKE-FILLED POLYESTER
LINER MATERIAL TRADE NAME/COMMON TYPE	NR
GAS CONTACTING DEVICE TYPE	FULL DIAMETER CONE-SPLASH RING CASCADES
NUMBER OF CONTACTING ZONES	3
LIQUID RECIRCULATION RATE - LITER/S	315. (5000 GPM)
L/G RATIO - L/CU.M	1.3 (10.0 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	1.0 (4.0 IN-H2O)
INLET GAS FLOW - CU. M/S	237.84 (504000 ACFM)
INLET GAS TEMPERATURE - C	145.0 (293 F)
SO2 REMOVAL EFFICIENCY - %	85.0

** MIST ELIMINATOR

PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
NUMBER PER SYSTEM	2
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
CONFIGURATION	HORIZONTAL
NUMBER OF STAGES	1
NUMBER OF PASSES PER STAGE	1
DISTANCE BETWEEN STAGES - CM	1.78 (0.7 IN)
PRESSURE DROP - KPA	0.5 (2.0 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPHENYLENE
WASH WATER SOURCE	FRESH
WASH FREQUENCY	INTERMITTENT

** FANS

NUMBER	2
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
SUPPLIER	WESTINGHOUSE

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

FUNCTION	BOOSTER
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	237.84 (504000 ACFM)
FLUE GAS TEMPERATURE - C	145.0 (293 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	SCRUBBER INLET
DIMENSIONS	9.5 X 12.3
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	SCRUBBER OUTLET
DIMENSIONS	12.0 X 8.0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	SLAKER
DEVICE	NR
DEVICE TYPE	NR
MANUFACTURER	WALLACE & TIERNAN
NUMBER	3
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	3.6 (4 TPH)
PRODUCT QUALITY - % SOLIDS	20.0
** TANKS	
SERVICE	NUMBER
-----	-----
ABSORBER RECYCLE	2
WASTE SLURRY BLEED	2
** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER RECIRCULATION	4
THICKENER UNDERFLOW	6
REGENERATION RETURN	2
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	VACUUM FILTER
NUMBER	3
NUMBER OF SPARES	1
CAPACITY	340 TON/DAY
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
OUTLET STREAM CHARACTERISTICS	60% SOLIDS
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	1
NUMBER OF SPARES	0
DIMENSIONS - FT	100.0 DIA X 16.0
CAPACITY	800,000 GAL
SHELL GENERIC MATERIAL TYPE	CARBON STEEL

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

*** SALEABLE BYPRODUCTS
 NATURE NONE
 DISPOSITION N/A

*** SLUDGE

** TREATMENT
 METHOD DEWATERED
 DEVICE N/A
 PROPRIETARY PROCESS N/A

** DISPOSAL
 NATURE FINAL
 TYPE LANDFILL
 LOCATION ON-SITE
 SITE TRANSPORTATION METHOD TRUCK
 SITE TREATMENT NONE
 SITE DIMENSIONS 1400 FT X 1400 FT X 35 FT DEEP
 SITE CAPACITY - CU.M 1834500 (1500.0 ACRE-FT)
 SITE SERVICE LIFE - YRS 20

** PROCESS CONTROL AND INSTRUMENTATION
 CHEMICAL PARAMETERS SCRUBBER MODULE PH, LIME REACTOR PH
 CONTROL LEVELS SCRUBBER MODULE 6.3-6.8, LIME REACTOR 8.0-10.0
 MONITOR LOCATION ABSORBER RECIR. LINE-LIME REACTOR OVERFLOW
 PROCESS CONTROL MANNER AUTOMATIC
 PROCESS CHEMISTRY MODE FEEDBACK

** WATER BALANCE
 WATER LOOP TYPE OPEN/CLOSED

** CHEMICALS AND CONSUMPTION
 NAME LIME
 CONSUMPTION 6.3 TPH

** FGD SPARE CAPACITY INDICES
 ABSORBER - % 20.0

** FGD SPARE COMPONENT INDICES
 ABSORBER 0.3

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR
3/79	SYSTEM						744		
4/79	SYSTEM						720		29.6
** PROBLEMS/SOLUTIONS/COMMENTS									
THE FGD SYSTEM BEGAN OPERATIONS ON MARCH 18, 1979. NO OPERATIONAL DATA ARE YET AVAILABLE.									
5/79	SYSTEM						744		54.7
6/79	SYSTEM						720		65.4
** PROBLEMS/SOLUTIONS/COMMENTS									
OPERATING HOURS ARE NOT YET AVAILABLE. HOWEVER, THE UNIT HAS BEEN RUNNING INTERMITTENTLY AS A RESULT OF PUMP LINER AND FRP PIPING DESIGN PROBLEMS.									
7/79	SYSTEM	62.8			54.8		744	650	408 48.1

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
8/79	SYSTEM		94.3		94.2		744	743	701	51.7
** PROBLEMS/SOLUTIONS/COMMENTS										
IN AUGUST THE FGD SYSTEM WAS FORCED OFF LINE FOR 43 HOURS DUE TO PROBLEMS WITH THE RECYCLE PUMP IMPELLERS.										
9/79	SYSTEM		74.6		74.2		720	716	534	62.5
** PROBLEMS/SOLUTIONS/COMMENTS										
IN SEPTEMBER 52 HOURS OF SCHEDULED OUTAGE WERE USED TO INSTALL A WATER FILTER. THE SCRUBBER WAS ALSO TAKEN OFF LINE FOR 72 HOURS FOR PRECIPITATO TESTING. THE ONLY FORCED OUTAGE DURING THE MONTH BEGAN ON SEPTEMBER 28 AND LASTED THROUGH THE END OF THE MONTH AS A RESULT OF POOR FILTER CAKE QUALITY. THIS HAS RESULTED FROM PROBLEMS WITH THE VACUUM FILTERS AS WELL AS CHEMICAL PROBLEMS.										
10/79	A	88.6	96.8	100.0	84.5					
	B	87.3	98.5	98.5	86.0					
	SYSTEM	88.0	97.7	99.3	85.3		744	649	634	49.6
11/79	A	91.0	97.1	98.2	89.4					
	B	91.0	94.4	95.5	86.9					
	SYSTEM	91.0	95.8	96.9	88.2		720	663	635	62.1
12/79	A	80.9	80.9	80.9	80.8					
	B	81.2	81.3	81.2	81.2					
	SYSTEM	81.1	81.1	81.1	81.0		744	743	603	53.5
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING THE FOURTH QUARTER PROBLEMS WERE ENCOUNTERED WITH THE LIME SLAKER FEED.										
THE THICKENER RAKE FROZE CAUSING 9 DAYS OUTAGE TIME.										
THE ISOLATION DAMPER HAS CAUSED SOME PROBLEMS THIS QUARTER. THE UTILITY HAS NOT YET SOLVED THIS PROBLEM.										
1/80	A	99.0	96.5	99.1	96.4					
	B	99.0	99.0	99.1	99.0					
	SYSTEM	99.0	98.0	99.1	97.7		744	744	727	65.8
** PROBLEMS/SOLUTIONS/COMMENTS										
SEVEN HOURS OF FGD SYSTEM FORCED OUTAGE TIME DURING JANUARY WERE CAUSED BY A THICKENER RAKE STALL.										
2/80	A	99.1	70.3	98.8	69.4					
	B	98.4	70.0	97.8	68.7					
	SYSTEM	98.8	70.2	98.3	69.1		696	687	481	75.5
** PROBLEMS/SOLUTIONS/COMMENTS										
SOME OUTAGE TIME IN FEBRUARY RESULTED FROM A WET SLUDGE PRODUCT. A CHEMICAL IMBALANCE CAUSED THE SLUDGE PROBLEM.										
3/80	A	98.7	64.8	95.2	26.5					
	B	99.2	51.6	96.3	21.1					
	SYSTEM	99.0	58.2	95.8	23.8		744	304	177	23.8

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MARCH, BOILER DOWN TIME WAS DUE TO A SCHEDULED UNIT OUTAGE, DURING WHICH TIME MAINTENANCE WAS PERFORMED ON THE SCRUBBER.

4/80	A	100.0	96.8	100.0	92.9				
	B	100.0	99.7	100.0	95.7				
	SYSTEM	100.0	98.3	100.0	94.3	720	691	679	58.6

** PROBLEMS/SOLUTIONS/COMMENTS

DURING APRIL, THERE WERE NO OPERATIONAL PROBLEMS WITH THE FGD SYSTEM. THE SYSTEM WAS AVAILABLE 100% OF THE TIME.

5/80	A	100.0	100.0	100.0	82.8				
	B	100.0	100.0	100.0	82.8				
	SYSTEM	100.0	100.0	100.0	82.8	744	604	616	53.7

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MAY NO FORCED OUTAGES WERE EXPERIENCED WITH THE FGD SYSTEM. THE BOILER WAS OFF LINE FOR 140 HOURS DURING THE MONTH FOR GENERAL MAINTENANCE DURING WHICH TIME SOME GENERAL FGD SYSTEM MAINTENANCE WAS ALSO PERFORMED.

6/80	A	100.0	100.0	100.0	98.2				
	B	100.0	100.0	100.0	98.2				
	SYSTEM	100.0	100.0	100.0	98.2	720	706	707	55.4

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD RELATED PROBLEMS WERE REPORTED FOR THE MONTH OF JUNE. THE FGD SYSTEM OPERATED 100% OF THE TIME THE BOILER WAS ON LINE.

7/80	A	98.1	97.9	97.9	92.5				
	B	86.8	87.7	87.7	82.9				
	SYSTEM	92.4	92.8	92.8	87.7	744	703	653	62.6

** PROBLEMS/SOLUTIONS/COMMENTS

THE B MODULE RECIRCULATION PUMPS WERE THE MAJOR CAUSE OF DOWNTIME. TWO PIECES OF THE CHEVRON MIST ELIMINATOR FELL CAUSING THE SUCTION LINES TO PLUG.

ADDITIONAL PROBLEMS WITH THE PUMP WERE CAUSED BY THE THRUST BEARING. THIS WAS CORRECTED BY THE MANUFACTURER.

THE UNAVAILABILITY OF THE VACUUM FILTERS AND ASSOCIATED EQUIPMENT REQUIRED THE SCRUBBER TO SHUTDOWN TO AVOID A STOPPAGE OF THE THICKENER RAKE. THIS SITUATION ACCOUNTED FOR APPROXIMATELY 15 HOURS OF SYSTEM OUTAGE TIME DURING JULY.

8/80	A	94.5	94.5	94.5	94.5				
	B	94.8	94.8	94.8	94.8				
	SYSTEM	94.6	94.6	94.6	94.6	744	744	704	61.4

** PROBLEMS/SOLUTIONS/COMMENTS

THE MAJOR CAUSE OF UNAVAILABILITY FOR AUGUST WAS PROBLEMS WITH SOLIDS DISPOSAL, INCLUDING PROBLEMS WITH PRIMARY LIQUID-SOLID SEPARATION UP TO AND INCLUDING FINAL LANDFILLING.

9/80	A	100.0	99.6	99.6	99.6				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD CAP. HOURS FACTOR
	B	100.0	99.6	99.6	99.6				
	SYSTEM	100.0	99.6	99.6	99.6		720	720	717 59.8

** PROBLEMS/SOLUTIONS/COMMENTS

SLUDGE DISPOSAL REMAINS THE MOST PREVALENT PROBLEM DUE TO MECHANICAL BREAKDOWN OF THE DISPOSAL TRUCKS AND UNDERFLOW PUMPS, IN ADDITION TO THE HIGH MAINTENANCE REQUIREMENTS OF THE ROTARY VACUUM FILTERS.

THE MONTH OF SEPTEMBER ALSO SAW AN EXTREMELY HIGH RATE OF FAILURE OF RECIRCULATION PUMPS, WITH DAMAGE TO THE RUBBER LINED CASINGS AND IMPELLERS THE CAUSE OF THIS PROBLEM IS UNKNOWN TO THE UTILITY AT THIS POINT.

10/80	A	98.4	98.2	98.2	98.2				
	B	100.0	93.8	93.8	93.8				
	SYSTEM	99.2	96.0	96.0	96.0		744	744	714 59.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE SYSTEM UNAVAILABILITY DURING THE MONTH WAS CAUSED BY TWO SEPARATE INSTANCES OF REGULATOR VALVE FAILURE.

NO MAJOR FGD RELATED PROBLEMS WERE REPORTED FOR OCTOBER; HOWEVER, SEVERAL PROCESS LINES HAD LOW FLOWS AT TIMES DUE TO BLOCKAGES CAUSED BY PIECES OF BROKEN MIST ELIMINATOR.

11/80	A	97.5	83.8	85.2	54.6				
	B	97.5	83.8	85.2	54.6				
	SYSTEM	97.5	83.8	85.2	54.6		720	469	393 38.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER WAS DOWN FROM NOVEMBER 7 TO NOVEMBER 17.

THE FGD SYSTEM WAS SHUTDOWN ON NOVEMBER 6 DUE TO DEPLETION OF THE SODA ASH INVENTORY WHICH RESULTED IN A LOW CHEMICAL CONCENTRATION.

THE TRANSITION DUCTWORK FROM ONE MODULE TO THE STACK WAS REPLACED WITH 317L SS WHILE THE OTHER SIDE RECEIVED A FLOUROELASTOMER COATING.

THE CHEVRONS WERE CAKED WITH AN EXTREMELY HARD AND HEAVY MATERIAL CONSISTING PRIMARILY OF SODIUM CARBONATES AND SULFATES.

THE MIST ELIMINATORS WERE RE-TIED DURING NOVEMBER TO PREVENT FURTHER SECTIONS FROM FALLING.

12/80	A	100.0	97.4	97.4	94.3				
	B	98.2	95.0	95.0	92.1				
	SYSTEM	99.2	96.2	96.2	93.2		744	721	694 52.4

** PROBLEMS/SOLUTIONS/COMMENTS

A MAJOR EQUIPMENT PROBLEM WITH THE LIME SLAKERS WAS ENCOUNTERED DURING DECEMBER. THE PH AND LEVEL CONTROLS CAUSED ERRATIC OPERATION SEVERAL TIMES DURING THE MONTH, ADDING TO THE CONTINUAL WATER BALANCE PROBLEMS.

1/81	A	99.3	98.9	98.9	98.9				
	B	99.3	98.8	98.8	98.8				
	SYSTEM	99.3	98.9	98.9	98.9		744	744	736 61.8

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING JANUARY OUTAGE TIME OCCURRED DUE TO ELECTRICAL MALFUNCTIONS OF THE SLAKE FEEDER.										
ADDITIONAL PROBLEMS WERE ENCOUNTERED WITH DRIFTING OF THE PH MEASUREMENT SYSTEM.										
2/81	A	99.0	99.0	99.0	99.0					
	B	99.6	99.6	99.6	99.6					
	SYSTEM	99.3	99.3	99.3	99.3		672	672	667	56.8
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING FEBRUARY MODULES A AND B WERE DOWN FOR THREE HOURS DUE TO LIME TRANSFER SYSTEM PROBLEMS.										
MODULE A REQUIRED AN ADDITIONAL FOUR HOURS OF DOWNTIME DUE TO PROBLEMS WITH THE RECIRCULATION PUMPS AND ASSOCIATED DISCHARGE VALVES.										
MAINTENANCE WAS NECESSARY ON THE VACUUM FILTERS AND THE SLUDGE DISPOSAL TRUCKS DURING THE MONTH.										
3/81	A	89.4	79.5	83.4	78.1					
	B	97.9	92.7	92.7	91.1					
	SYSTEM	93.6	86.1	88.2	84.6		744	731	630	59.8
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING MARCH A LOW CHEMICAL CONCENTRATION IN THE FGD SYSTEM CAUSED BY PREPARATION FOR A FIVE WEEK TURBINE OVERHAUL RESULTED IN SOME OUTAGE TIME.										
ADDITIONAL DOWN TIME WAS DUE TO PROBLEMS ENCOUNTERED WITH THE ID FAN.										
MODULE A EXPERIENCED SOME OUTAGE TIME DUE TO FAILURE OF THE RECIRCULATION PUMP LINING.										
4/81	A	100.0	0.0		0.0					
	B	100.0	0.0		0.0					
	SYSTEM	100.0	0.0		0.0		720	87	0	5.5
** PROBLEMS/SOLUTIONS/COMMENTS										
IN PREPARATION FOR A SCHEDULED FIVE-WEEK TURBINE/GENERATOR OUTAGE, THE SODA ASH PLANT WAS SHUTDOWN AT THE END OF MARCH. THE BOILER REMAINED ON LINE FOR 87 HOURS AT THE BEGINNING OF APRIL; HOWEVER, THE FGD SYSTEM WAS NOT OPERATED DUE TO THE LACK OF SODA ASH, PRECLUDING THE POSSIBILITY OF MEETING EMISSION LIMITATIONS.										
DURING THE OVERHAUL THE LINING WAS REPLACED IN THE BYPASS DUCT, A SLAKER GRIT REMOVAL SLUICING SYSTEM WAS INSTALLED AND A DRAIN RECOVERY SYSTEM WAS ADDED.										
THE MIST ELIMINATORS WERE REPLACED CAUSING INTERNAL AND EXTERNAL PIPING CHANGES FOR THE MIST ELIMINATOR WASH HEADERS.										
5/81	A	86.7	79.5	80.9	49.6					
	B	88.7	82.5	84.0	51.5					
	SYSTEM	87.7	81.0	82.4	50.5		744	464	376	35.9

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE TURBINE-GENERATOR OUTAGE, WHICH LASTED UNTIL MAY 12, THE CAST-IRON TEES ADJACENT TO THE DOWNSTREAM SIDE OF THE REGENERATION PUMP DISCHARGE VALVES WERE REPLACED WITH A HIGH DENSITY PLASTIC MATERIAL. THIS ACCOUNTED FOR 46 HOURS OF DOWN TIME.

TWO INSTANCES ACCOUNTING FOR SOME ADDITIONAL OUTAGE TIME WAS CAUSED BY A MALFUNCTION OF THE LIME TRANSFER SYSTEM.

A PROBLEM WITH THE LIME REACTOR PH MEASUREMENT SYSTEM AND THE REPAIR OF A RECIRCULATION PUMP ACCOUNTED FOR ADDITIONAL SYSTEM DOWN TIME.

6/81	A	99.9	99.2	99.2	99.6				
	B	99.8	98.1	99.1	96.5				
	SYSTEM	99.9	98.6	99.1	97.0	720	708	699	63.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JUNE RECIRCULATION PUMP TRIPS ACCOUNTED FOR THE UNAVAILABILITY.

THE LIME SLAKERS, THE LIME TRANSFER SYSTEM AND THE ROTARY VACUUM FILTERS WERE CONSTANT PROBLEMS DURING THE MONTH BUT THE SPARE CAPACITY ENABLED CONTINUED OPERATION.

7/81	A	100.0	91.3	96.3	91.3				
	B	82.8	77.4	78.9	77.4				
	SYSTEM	91.4	84.3	87.4	84.3	744	744	627	62.5

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JULY, THE B MODULE WAS UNAVAILABLE FOR 128 HOURS AS A RESULT OF PROBLEMS WITH THE RECIRCULATION PUMPS. REPLACEMENT LINERS HAD NOT BEEN RECEIVED.

8/81	A	99.9	97.0	97.0	96.6				
	B	84.7	81.8	81.8	81.5				
	SYSTEM	92.3	89.4	89.4	89.0	744	741	662	52.6

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNAVAILABILITY OF THE B MODULE DURING THE MONTH RESULTED FROM CONTINUING PROBLEMS WITH THE RECIRCULATION PUMP LINERS.

FREQUENT BREAKDOWNS OF THE LIME PROCESSING EQUIPMENT (SLAKER AND PNEUMATIC TRANSFER SYSTEM) LED TO NUMEROUS SHORT TERM PERIODS DURING THE MONTH WHEN THE FLUE GAS WAS NOT TREATED.

9/81	A	97.5	97.3	97.3	90.3				
	B	97.5	97.3	90.3	90.3				
	SYSTEM	97.5	97.3	90.3	90.3	720	668	650	45.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE BOILER WAS TAKEN OFF LINE ON THE WEEKEND OF SEPTEMBER 18 TO FIX SEVERAL STEAM LEAKS. THE UNIT CAME BACK ON LINE ON SEPTEMBER 21, BUT THE LIME REACTOR AGITATOR MOTOR WOULD NOT OPERATE AND REQUIRED REPLACEMENT. THIS ACCOUNTED FOR THE FGD SYSTEM UNAVAILABILITY DURING THE MONTH.

10/81	A	98.2	94.4	94.4	85.0				
	B	98.2	93.0	93.8	83.8				
	SYSTEM	98.2	93.7	94.1	84.4	744	670	628	53.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING OCTOBER NUMEROUS INSTANCES OF LIME SLAKER AND LIME TRANSFER SYSTEM PROBLEMS OCCURRED.

11/81	A	96.0	92.9	92.9	92.9				
	B	90.3	88.9	88.9	88.9				
	SYSTEM	92.6	90.9	90.9	90.9	720	720	654	49.2

** PROBLEMS/SOLUTIONS/COMMENTS

DURING NOVEMBER PROBLEMS WERE ENCOUNTERED WITH THE THICKENER RAKE.

ADDITIONAL OUTAGE TIME DURING THE MONTH WAS CAUSED BY RECIRCULATION PUMP FAILURES.

ISOLATION DAMPER PROBLEMS CAUSED THREE HOURS OF DOWN TIME.

12/81	A	95.0	67.4	67.4	41.3				
	B	100.0	57.9	57.9	35.5				
	SYSTEM	97.5	62.7	62.7	38.4	744	456	286	32.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING DECEMBER THE BOILER WAS SHUT DOWN FOR APPROXIMATELY TWO WEEKS.

ISOLATION DAMPER PROBLEMS CONTINUED TO BE A PROBLEM DURING DECEMBER.

FGD SYSTEM OPERATION WAS INTERRUPTED SEVERAL TIMES BY THE PNEUMATIC LIME TRANSFER SYSTEM.

1/82	A	89.5	81.8	81.8	81.7				
	B	89.5	76.0	76.0	75.9				
	SYSTEM	89.5	78.9	78.9	78.8	744	743	586	46.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE 78 HOURS OF UNAVAILABLE TIME IN JANUARY WAS DUE TO FROZEN WATER SUPPLY LINES FOR THE LIME SLAKERS.

2/82	A	94.0	84.6	84.6	68.4				
	B	100.0	93.7	93.7	75.7				
	SYSTEM	97.0	89.2	89.2	72.1	672	543	484	38.1

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS OUT OF SERVICE FOR 107 HOURS DURING FEBRUARY DUE TO A LEAK IN THE PLANT IN-COMING WATER SUPPLY PIPE.

3/82	A	100.0	98.2	98.2	71.6				
	B	100.0	78.3	78.3	56.2				
	SYSTEM	100.0	89.0	89.0	63.9	744	534	475	35.5

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED UNIT OUTAGE BEGAN ON MARCH 23 AND IS SCHEDULED THRU APRIL. NO MAJOR WORK IS REQUIRED ON THE FGD SYSTEM.

4/82	A	92.5	90.2	90.2	81.9				
	B	96.3	93.2	93.2	84.6				
	SYSTEM	94.4	91.7	91.7	83.2	720	654	599	55.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING APRIL THE SYSTEM WAS FORCED DOWN PART OF THE TIME DUE TO A BROKEN
 OIL DRAIN LINE ON THE THICKENER.

OUTAGE TIME WAS DUE TO AN INLET ISOLATION DAMPER AND BOOSTER FAN INLET
 DAMPER PROBLEM.

5/82	A	100.0	97.6	97.6	89.0				
	B	100.0	100.0	100.0	92.2				
	SYSTEM	100.0	98.8	98.8	90.6	744	678	674	43.9

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MAY NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED.

6/82	A	97.4	96.8	96.8	96.0				
	B	97.4	96.8	96.8	96.0				
	SYSTEM	97.4	96.8	96.8	96.0	720	714	691	42.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING JUNE.

7/82	N	99.2	97.3	97.3	96.0				
	S	99.2	99.2	99.2	97.8				
	SYSTEM	99.2	98.2	98.2	96.9	744	734	721	44.2

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING JULY.

8/82	N	100.0	100.0	100.0	100.0				
	S	97.6	85.6	97.3	85.6				
	SYSTEM	98.8	92.8	98.6	92.8	744	744	690	45.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING AUGUST.

9/82	N	98.9	97.3	97.3	42.4				
	S	98.2	95.7	95.7	41.7				
	SYSTEM	98.5	96.5	96.5	42.1	720	314	303	20.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FROM SEPTEMBER 10 TO SEPTEMBER 27 FOR A SCHEDULED OUTAGE

10/82	N	100.0	100.0	100.0	100.0				
	S	100.0	100.0	100.0	100.0				
	SYSTEM	100.0	100.0	100.0	100.0	744	744	744	57.1

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING OCTOBER.

11/82	N	100.0	100.0	100.0	100.0				
	S	96.4	96.4	100.0	96.4				
	SYSTEM	98.2	98.2	100.0	98.2	720	720	707	87.9

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED NO MAJOR FGD-RELATED PROBLEMS DURING NOVEMBER.									
12/82	N	96.9	96.9	96.9	96.9				
	S	96.4	96.4	96.4	96.4				
	SYSTEM	96.6	96.6	96.6	96.6		744	744	719 68.4
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING DECEMBER.									
1/83	N	98.9	98.9	98.9	98.9				
	S	98.7	98.7	98.7	98.7				
	SYSTEM	98.8	98.8	98.8	98.8		744	744	735 57.1
** PROBLEMS/SOLUTIONS/COMMENTS									
NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED BY THE UTILITY DURING JANUARY.									
2/83	N	100.0	100.0	100.0	100.0				
	S	100.0	100.0	100.0	100.0				
	SYSTEM	100.0	100.0	100.0	100.0		672	672	672 51.3
** PROBLEMS/SOLUTIONS/COMMENTS									
NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED BY THE UTILITY DURING FEBRUARY.									
3/83	N	100.0	100.0	100.0	100.0				
	S	100.0	100.0	100.0	100.0				
	SYSTEM	100.0	100.0	100.0	100.0		744	744	744 54.8
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING MARCH.									
4/83	SYSTEM	48.1	67.4	67.4	48.1		720	513	346 36.6
** PROBLEMS/SOLUTIONS/COMMENTS									
THE FGD SYSTEM WAS SHUT DOWN ONE WEEK PRIOR TO A BOILER OUTAGE IN APRIL. DURING THE SHUT-DOWN, A MAJOR REWORKING OF THE FGD SYSTEM WAS PERFORMED.									
INCLUDED IN THE FGD SYSTEM REWORKING WAS THE INSTALLATION OF A HORIZONTAL BELT VACUUM FILTER.									
A NEW THICKENER TANK WALL EXTENSION AND RAKE WERE INSTALLED DURING THE FGD SYSTEM REWORKING.									
NEW UNDERFLOW, LIME SLURRY, AND SUMP PUMPS WERE INSTALLED DURING THE FGD SYSTEM REWORKING.									
MODIFICATIONS WERE MADE TO THE LIME SLAKING AREA DURING THE FGD SYSTEM REWORKING.									
5/83	N	62.5	80.7	80.7	62.5				
	S	62.5	80.7	80.7	62.5				
	SYSTEM	62.5	80.7	80.7	62.5		744	576	465 37.7

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM REWORKING OUTAGE WAS COMPLETED DURING MAY, FIVE DAYS AFTER START-UP OF THE BOILER.

6/83	N	99.9	99.9	99.9	98.3				
	S	94.6	94.5	94.5	93.1				
	SYSTEM	97.2	97.2	97.2	95.7	720	709	689	52.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING JUNE.

7/83	N	100.0	100.0	100.0	98.8				
	S	100.0	100.0	100.0	98.8				
	SYSTEM	100.0	100.0	100.0	98.8	744	735	735	61.0

8/83	N	100.0	100.0	100.0	100.0				
	S	100.0	100.0	100.0	100.0				
	SYSTEM	100.0	100.0	100.0	100.0	744	744	744	61.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING JULY AND AUGUST 1983.

9/83	N	67.9	75.1	75.1	67.9				
	S	67.9	75.1	75.1	67.9				
	SYSTEM	67.9	75.1	75.1	67.9	720	651	489	59.3

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED FGD SYSTEM OUTAGE OCCURRED FROM SEPTEMBER 19 TO 28.

NEW EQUIPMENT AND PIPING TIE-INS WERE INSTALLED DURING SEPTEMBER TO MAINTAIN AVAILABILITY AND RELIABILITY.

10/83	N	100.0	99.9	99.9	99.9				
	S	100.0	99.9	99.9	99.9				
	SYSTEM	100.0	99.9	99.9	99.9	744	744	743	70.1

** PROBLEMS/SOLUTIONS/COMMENTS

BOTH MODULES WERE FORCED OUT OF SERVICE DURING PART OF OCTOBER DUE TO PLUG GAGE AT THE THICKENER TANK UNDERFLOW LINE.

11/83	N	100.0	100.0	100.0	99.6				
	S	100.0	100.0	100.0	99.6				
	SYSTEM	100.0	100.0	100.0	99.6	720	717	717	72.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING NOVEMBER 1983.

12/83	N	26.6	16.4	16.4	7.3				
	S	28.5	16.4	16.4	7.3				
	SYSTEM	27.6	16.4	16.4	7.3	744	330	54	26.1

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT EXPERIENCED PRECIPITATOR HOPPER FREEZING PROBLEMS DURING THE MONTH WHICH DELAYED FGD SYSTEM USAGE.

A MAJOR BOILER AND FGD OUTAGE OCCURRED IN DECEMBER. THE FGD SYSTEM EXPERIENCED A CHEMICAL IMBALANCE PROBLEM THAT CAUSED SOLID CARRYOVER TO THE ABSORBERS. THE PROBLEM WAS RESOLVED IN JANUARY 1984.

DAMPER FREEZING PROBLEMS WERE REPORTED DURING DECEMBER.

FREEZING UNDERFLOW IN THE THICKENER TANK RECIRCULATION LINE CONTRIBUTED TO FGD SYSTEM DOWN TIME DURING THE MONTH.

1/84	N	99.6	77.1	77.1	69.8				
	S	99.6	77.1	77.1	69.8				
	SYSTEM	99.6	77.1	77.1	69.8	744	673	519	55.1

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED PROBLEMS WITH THE NEWLY INSTALLED MODULATING DAMPERS.

THE FGD SYSTEM WAS DOWN DURING THE FIRST PART OF JANUARY DUE TO A SOLID CARRYOVER PROBLEM IN THE ABSORBERS. THE RATIOS AND LEVELS OF CHEMICALS WERE SUCH THAT SOLID FORMATION WAS NOT SUFFICIENT TO ALLOW PROPER SETTLING.

2/84	N	100.0	100.0	100.0	100.0				
	S	100.0	100.0	100.0	100.0				
	SYSTEM	100.0	100.0	100.0	100.0	696	696	696	58.3

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING FEBRUARY.

3/84	N	99.7	99.7	99.7	99.7				
	S	99.7	99.7	99.7	99.7				
	SYSTEM	99.7	99.7	99.7	99.7	744	744	742	75.2

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MARCH, BOTH FD FANS TRIPPED ON A FALSE HIGH BEARING TEMPERATURE ALARM.

4/84	N	43.1	99.7	100.0	42.9				
	S	42.9	99.4	99.7	42.8				
	SYSTEM	43.0	99.5	99.8	42.8	720	310	309	32.6

** PROBLEMS/SOLUTIONS/COMMENTS

A SPRING OUTAGE CONTINUED THROUGH APRIL DUE TO STACK LINER REPAIRS.

5/84	N	0.0			0.0				
	S	0.0			0.0				
	SYSTEM	0.0			0.0	744	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED A BOILER OUTAGE DURING MAY.

6/84	N	80.0	83.5	83.5	61.1				
	S	80.0	83.5	83.5	61.1				
	SYSTEM	80.0	83.5	83.5	61.1	720	527	440	49.1

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

7/84	N	99.5	100.0	99.5	97.4				
	B	99.5	100.0	99.5	97.4				
	SYSTEM	99.5	100.0	99.5	97.4	744	722	725	56.9

8/84	N	97.3	97.3	97.3	97.3				
	S	99.6	99.6	99.6	99.6				
	SYSTEM	98.5	98.5	98.5	98.5	744	744	733	56.4

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD RELATED PROBLEMS WERE ENCOUNTERED IN JUNE THROUGH AUGUST.

9/84	NORTH	100.0	100.0	100.0	99.9				
	SOUTH	100.0	100.0	100.0	99.9				
	SYSTEM	100.0	100.0	100.0	99.9	720	719	719	52.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE MONTH OF SEPTEMBER.

10/84	NORTH	100.0	99.6	100.0	99.6				
	SOUTH	94.8	94.2	100.0	94.2				
	SYSTEM	97.4	96.9	100.0	96.9	744	744	721	57.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT BOTH ABSORBERS WERE ALTERNATELY REMOVED FROM SERVICE IN OCTOBER DURING REDUCED BOILER LOAD TO MAKE MINOR REPAIRS. IN ADDITION, THE SOUTH FD FAN WAS ALSO REMOVED TWICE DURING THE MONTH DURING LOW LOADS TO LUBE BEARINGS.

11/84	NORTH	62.9	95.9	95.9	57.9				
	SOUTH	55.1	83.0	83.0	50.1				
	SYSTEM	59.0	89.4	89.4	54.0	720	435	389	31.4

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY AGAIN REPORTED PROBLEMS WITH HIGH BEARING TEMPERATURES ON THE SOUTH FD FAN. THE UNIT WAS DOWN PART OF THE MONTH DUE TO A SCHEDULED FALL OUTAGE.

12/84	NORTH	97.3	97.3	98.5	97.3				
	SOUTH	75.5	75.5	98.8	75.5				
	SYSTEM	86.4	86.4	98.6	86.4	744	744	643	57.7

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE MONTH OF DECEMBER, THE UTILITY REPORTED EXPERIENCING BEARING PROBLEMS WITH THE SOUTH AND NORTH FGD FD FANS.

1/85	A	44.4	44.4	100.0	44.4				
	B	96.0	96.0	100.0	96.0				
	SYSTEM	70.2	70.2	100.0	70.2	744	744	522	44.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE NORTH MODULE WAS OUT OF SERVICE PART OF THE MONTH FOR FD FAN BEARING AND SHAFT REPAIRS.

THE SOUTH MODULE FAN WAS REMOVED DURING THE MONTH SO REPAIRS COULD BE MADE TO AN ABSORBER OUTLET DUCT LEAK.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD CAP. HOURS FACTOR
2/85	A	99.6	99.6	99.6	99.6				
	B	97.8	97.8	99.5	97.8				
	SYSTEM	98.7	98.7	99.5	98.7		672	672	663 54.6
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UNIT EXPERIENCED A TRANSFORMER MALFUNCTION THAT CAUSED A LOSS OF CONTROL IN THE FGD SYSTEM. THE ABSORBER FANS WERE SHUT DOWN UNTIL THE UNIT CONTROL WAS ESTABLISHED.									
3/85	N	70.3	100.0	100.0	70.3				
	S	60.2	85.7	100.0	60.2				
	SYSTEM	65.3	92.8	100.0	65.3		744	523	486 31.7
** PROBLEMS/SOLUTIONS/COMMENTS									
MARCH FGD SYSTEM OUTAGE TIME RESULTED FROM A SOUTH MODULE FGD SYSTEM FD FAN OUTBOARD BEARING INSPECTION AND A BOILER OUTAGE.									
4/85	N	81.5	99.7	100.0	81.5				
	S	81.5	99.7	100.0	81.5				
	SYSTEM	81.5	99.7	100.0	81.5		720	589	587 58.3
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT FGD SYSTEM DOWNTIME IN APRIL RESULTED FROM A SCHEDULED UNIT/FGD SYSTEM OUTAGE.									
5/85	N	100.0	100.0	100.0	100.0				
	S	100.0	100.0	100.0	100.0				
	SYSTEM	100.0	100.0	100.0	100.0		744	744	744 59.8
6/85	N	100.0	100.0	100.0	100.0				
	S	100.0	100.0	100.0	100.0				
	SYSTEM	100.0	100.0	100.0	100.0		720	720	720 54.0
7/85	N	100.0	98.8	98.8	98.8				
	S	99.5	99.5	100.0	99.5				
	SYSTEM	99.7	99.1	99.4	99.1		744	744	738 52.6
** PROBLEMS/SOLUTIONS/COMMENTS									
NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS OF MAY THROUGH JULY.									
8/85	N	100.0	100.0	100.0	100.0				
	S	98.3	98.3	100.0	98.3				
	SYSTEM	99.1	99.1	100.0	99.1		744	744	738 47.8
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY DISCOVERED BROKEN PIECES OF MIST ELIMINATOR MATERIAL PLUGGING CHEMICAL LINES AT THE SOUTH ABSORBER. THIS ACCOUNTED FOR SOME OF THE ABSORBER DOWNTIME DURING THE MONTH.									
9/85	N	100.0	100.0	100.0	100.0				
	S	100.0	100.0	100.0	100.0				
	SYSTEM	100.0	100.0	100.0	100.0		720	720	720 54.7
10/85	N	80.8	100.0	100.0	80.8				
	S	80.8	100.0	100.0	80.8				
	SYSTEM	80.8	100.0	100.0	80.8		744	601	601 42.4

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS OF SEPTEMBER OR OCTOBER.

11/85	N	79.9	100.0	100.0	81.0				
	S	81.0	100.0	100.0	81.0				
	SYSTEM	80.4	100.0	100.0	81.0	720	583	583	42.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED PROBLEMS WITH A MODULATING DAMPER ON THE NORTH ABSORBER TOWER DURING THE MONTH.

12/85	N	100.0	100.0	100.0	100.0				
	S	100.0	100.0	100.0	100.0				
	SYSTEM	100.0	100.0	100.0	100.0	744	744	744	51.9

** PROBLEMS/SOLUTIONS/COMMENTS

ALTHOUGH THE DECEMBER AVAILABLE APPEARED TO BE VERY HIGH, THE UTILITY INDICATED THAT IT DID NOT MEAN THERE WERE NO FGD SYSTEM PROBLEMS. PLUGGING PROBLEMS IN THE SOUTH ABSORBER TOWER MIST ELIMINATOR CAUSED A DECREASE IN UNIT CAPACITY FROM FULL LOAD 250 MW TO ROUGHLY 200 MW. HALFWAY THROUGH THE MONTH A SECTION OF MIST ELIMINATOR BECAME DISLODGED, ALLOWING HIGHER GAS FLOWS AND COMPLIANCE AT 250 MW. A SHORT JANUARY OUTAGE WAS PLANNED TO PERMIT CLEANING AND REPAIR OF THE SOUTH ABSORBER TOWER MIST ELIMINATORS.

1/86	N	100.0	100.0	100.0	71.2				
	S	100.0	100.0	100.0	71.2				
	SYSTEM	100.0	100.0	100.0	71.2	744	530	530	32.5

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE MONTH OF JANUARY.

2/86	N	98.5	98.5	100.0	98.5				
	S	100.0	100.0	100.0	100.0				
	SYSTEM	99.3	99.3	100.0	99.3	672	672	667	50.5

** PROBLEMS/SOLUTIONS/COMMENTS

THE NORTH TOWER WAS OUT OF SERVICE BRIEFLY IN FEBRUARY AS A RESULT OF POSITIONER PROBLEMS WITH THE MODULATING DAMPER.

3/86	N	78.5	78.5	100.0	78.5				
	S	100.0	100.0	100.0	100.0				
	SYSTEM	89.2	89.2	100.0	89.2	744	744	664	50.7

** PROBLEMS/SOLUTIONS/COMMENTS

NORTH TOWER FD FAN BEARING REPAIRS WERE REPORTED FOR MARCH.

4/86	N	63.6	93.8	93.9	63.6				
	S	63.6	93.8	93.9	63.6				
	SYSTEM	63.6	93.8	93.9	63.6	720	488	458	42.3

** PROBLEMS/SOLUTIONS/COMMENTS

A THICKENER TANK RAKE PROBLEM TRIPPED THE UNIT OFF ON 4/15/86 AND CAUSED 18 HOURS OF FGD SYSTEM DOWNTIME.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
5/86	N	92.1	91.2	100.0	85.6					
	S	98.4	98.0	100.0	91.9					
	SYSTEM	95.2	94.6	100.0	88.8		744	698	661	50.2
** PROBLEMS/SOLUTIONS/COMMENTS										
THE SOUTH TOWER WAS OFF-LINE 12 HOURS FOR BLEED PIPE LEAK REPAIRS IN MAY.										
6/86	N	100.0	99.6	100.0	99.6					
	S	100.0	100.0	100.0	100.0					
	SYSTEM	100.0	99.8	100.0	99.8		720	720	719	59.7
** PROBLEMS/SOLUTIONS/COMMENTS										
THE NORTH TOWER WAS DOWN A FEW HOURS IN JUNE FOR ESP REPAIRS. THE BOILER OPERATED AT LOW LOAD BEGINNING ON THE 26TH OF THE MONTH.										
7/86	N	100.0	100.0	100.0	100.0					
	S	100.0	100.0	100.0	100.0					
	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	58.5
8/86	N	100.0	100.0	100.0	100.0					
	S	100.0	100.0	100.0	100.0					
	SYSTEM	100.0	100.0	100.0	100.0			744	744	48.6
** PROBLEMS/SOLUTIONS/COMMENTS										
NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD JULY THROUGH AUGUST 1986.										
9/86	N	86.8	86.8	86.8	86.8					
	S	86.8	86.8	86.8	86.8					
	SYSTEM	86.8	86.8	86.8	86.8			720	625	54.4
** PROBLEMS/SOLUTIONS/COMMENTS										
REPAIRS WERE MADE TO A THICKENER TANK RAKE DRIVE CHAIN AND SPROCKET THAT FAILED IN SEPTEMBER.										
10/86	N	77.0	100.0	100.0	77.0					
	S	77.0	100.0	100.0	77.0					
	SYSTEM	77.0	100.0	100.0	77.0		744	573	573	49.7
11/86	N	62.5	88.3	88.3	54.3					
	S	61.5	100.0	100.0	61.5					
	SYSTEM	62.0	94.1	94.1	57.9			443	417	38.2
** PROBLEMS/SOLUTIONS/COMMENTS										
A SCHEDULED BOILER OUTAGE TOOK PLACE OVER THE OCTOBER-NOVEMBER PERIOD.										
12/86	N	100.0	100.0	100.0	99.9					
	S	100.0	100.0	100.0	99.9					
	SYSTEM	100.0	100.0	100.0	99.9			743	743	77.4
** PROBLEMS/SOLUTIONS/COMMENTS										
NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR DECEMBER 1986.										
1/87	N	98.5	98.8	98.8	98.5					
	S	98.5	98.8	98.8	98.5					
	SYSTEM	98.5	98.8	98.8	98.5			742	733	60.5

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

MODULATING DAMPER PROBLEMS WERE REPORTED AND A NORTH TOWER BLEED
 CONTROL VALVE FAILED DURING THE MONTH.

2/87 SYSTEM

672

3/87 SYSTEM

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS AVAILABLE FOR FEBRUARY OR MARCH.

4/87 SYSTEM

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR APRIL.

4/87 N 100.0 100.0 100.0 100.0
 S 100.0 100.0 100.0 100.0
 SYSTEM

720 716 55.8

5/87 SYSTEM

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED UNIT OUTAGE TOOK PLACE IN MAY.

5/87 N 58.2 100.0 100.0 55.0
 S 5.8 100.0 100.0 55.0
 SYSTEM 32.0 100.0 100.0 55.0

744 409 409 37.7

6/87 N 99.4 99.4 99.4 97.8
 S 99.4 99.4 99.4 97.8
 SYSTEM 99.4 99.4 99.4 97.8

720 708 704 62.3

6/87 SYSTEM

** PROBLEMS/SOLUTIONS/COMMENTS

A SLAKER MALFUNCTION WAS REPORTED IN JUNE.

7/87 N 99.7 99.7 99.7 99.7
 S 97.8 97.8 97.8 97.8
 SYSTEM 98.8 98.8 98.8 98.8

744 744 735 58.6

8/87 N 100.0 100.0 100.0 100.0
 S 100.0 100.0 100.0 100.0
 SYSTEM 100.0 100.0 100.0 100.0

744 744 59.2

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD JUNE
 THROUGH AUGUST.

9/87 N 100.0 100.0 100.0 89.2
 S 100.0 100.0 100.0 89.2
 SYSTEM 100.0 100.0 100.0 89.2

720 642 642 69.8

9/87 SYSTEM

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

A FORCED BOILER OUTAGE OCCURRED IN SEPTEMBER.

NO INFORMATION WAS AVAILABLE FOR OCTOBER.

11/87	N	30.0	100.0	100.0	30.0			
	S	30.0	66.7	66.7	20.0			
	SYSTEM	30.0	83.3	83.3	25.0	216	180	16.6

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED UNIT OUTAGE OCCURRED FROM 11/1 TO 11/21.

12/87	N	100.0	100.0	100.0	100.0			
	S	100.0	100.0	100.0	100.0			
	SYSTEM	100.0	100.0	100.0	100.0	744	744	69.5

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR DECEMBER.

DO NOT REGRUELM
THIS PAGE.

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SOUTHERN INDIANA GAS & ELEC	
PLANT NAME	A.B. BROWN	
UNIT NUMBER	2	
CITY	WEST FRANKLIN	
STATE	INDIANA	
REGULATORY CLASSIFICATION	B	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	500	
GROSS UNIT GENERATING CAPACITY - MW	265	
NET UNIT GENERATING CAPACITY W/FGD - MW	250	
NET UNIT GENERATING CAPACITY WO/FGD - MW	252	
EQUIVALENT SCRUBBED CAPACITY - MW	265	

** UNIT DATA - BOILER AND STACK

BOILER SUPPLIER	BABCOCK & WILCOX	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	523.81	(1110000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	154.4	(310 F)
STACK HEIGHT - M	152.	(498 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	4.4	(14.5 FT)

** FUEL DATA

FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	25819.	(11100 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		10100-11600
AVERAGE ASH CONTENT - %	9.40	
RANGE ASH CONTENT - %	8.45-11.4	
AVERAGE MOISTURE CONTENT - %	13.30	
RANGE MOISTURE CONTENT - %	10.10-21.10	
AVERAGE SULFUR CONTENT - %	3.35	
RANGE SULFUR CONTENT - %	2.8-3.9	
AVERAGE CHLORIDE CONTENT - %	0.05	
RANGE CHLORIDE CONTENT - %	0.1-0.8	

*** PARTICLE CONTROL

** ESP

NUMBER	1
TYPE	COLD SIDE
SUPPLIER	CARBORUNDUM

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	DUAL ALKALI
SYSTEM SUPPLIER	FMC
A-E FIRM	FMC
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	90.00
ENERGY CONSUMPTION - %	0.8
CURRENT STATUS	1
COMMERCIAL START-UP	2/1986
INITIAL START-UP	2/1986
CONTRACT AWARDED	1/1982

** DESIGN AND OPERATING PARAMETERS

DESIGN CHLORIDE CONTENT - %	*****

** REHEATER

GENERIC TYPE	NONE
SPECIFIC TYPE	N/A

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 2 (CONT.)

TRADE NAME/COMMON TYPE	N/A
PERCENT GAS BYPASSED - AVG	0.0
CONSTRUCTION MATERIAL GENERIC TYPE	N/A
CONSTRUCTION MATERIAL SPECIFIC TYPE	N/A
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	VACUUM FILTER
NUMBER	2
NUMBER OF SPARES	1
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	1
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** WATER BALANCE	
WATER LOOP TYPE	CLOSED

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
2/86	N	64.0	77.7	77.8	64.0					
	S	64.0	77.7	77.8	64.0					
	SYSTEM	64.0	77.7	77.8	64.0		672	553	430	48.6

** PROBLEMS/SOLUTIONS/COMMENTS

A.B. BROWN 2 BEGAN COMMERCIAL OPERATIONS FEBRUARY 1, 1986.

3/86	N	99.5	93.4	100.0	93.3					
	S	99.5	94.6	100.0	94.5					
	SYSTEM	99.5	94.0	100.0	93.9		744	743	699	62.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS OUT OF SERVICE 4 HOURS FOR A PH PROBE CHANGE OUT IN MARCH.

THE FGD SYSTEM AND BOILER WERE ISOLATED SO THAT ESP WORK COULD BE PERFORMED IN MARCH.

4/86	N	99.9	100.0	100.0	99.9					
	S	96.1	96.2	100.0	96.1					
	SYSTEM	98.0	98.1	100.0	98.0		720	719	706	73.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM SOUTH TOWER WAS OUT OF SERVICE PART OF THE MONTH FOR MAINTENANCE.

5/86	N	87.6	100.0	100.0	87.6					
	S	84.5	96.5	100.0	84.5					
	SYSTEM	86.1	98.3	100.0	86.1		744	652	641	58.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE SOUTH TOWER WAS OFF LINE 23 HOURS FOR ESP REPAIRS.

6/86	N	100.0	100.0	100.0	98.6				
	S	99.7	99.7	99.7	98.3				
	SYSTEM	99.9	99.9	99.9	98.5	720	710	709	60.4

** PROBLEMS/SOLUTIONS/COMMENTS

A SOUTH TOWER RECIRCULATING LIQUOR FLOWMETER FAILURE CAUSED A 2-HOUR TOWER OUTAGE IN JUNE.

7/86	N	99.6	99.6	99.6	97.2				
	S	99.6	99.6	99.6	97.2				
	SYSTEM	99.6	99.6	99.6	97.2	744	726	723	57.4
8/86	N	99.3	99.3	99.3	99.3				
	S	99.6	99.6	99.6	99.6				
	SYSTEM	99.5	99.5	99.5	99.5	744	744	740	50.7
9/86	N	100.0	100.0	100.0	97.1				
	S	100.0	100.0	100.0	97.1				
	SYSTEM	100.0	100.0	100.0	97.1	720	699	699	60.8
10/86	N	97.0	96.9	96.9	97.0				
	S	97.0	96.9	96.9	97.0				
	SYSTEM	97.0	96.9	96.9	97.0	744	745	722	74.0
11/86	N	83.6	97.9	97.9	83.6				
	S	83.6	97.9	97.9	83.6				
	SYSTEM	83.6	97.9	97.9	83.6	720	615	602	61.7

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD JULY THROUGH NOVEMBER 1986.

12/86	N	59.7	84.1	84.1	59.7				
	S	59.7	84.1	84.1	59.7				
	SYSTEM	59.7	84.1	84.1	59.7	744	528	444	47.7
1/87	N	91.7	92.7	92.7	91.7				
	S	91.7	92.7	92.7	91.7				
	SYSTEM	91.7	92.7	92.7	91.7	744	736	682	61.2

** PROBLEMS/SOLUTIONS/COMMENTS

A BOILER OUTAGE OCCURRED AS A RESULT OF AN EXPANSION JOINT REPAIR/REPLACEMENT.

2/87	SYSTEM					672			
3/87	SYSTEM					744			

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION FOR FEBRUARY AND MARCH WAS UNAVAILABLE.

4/87	SYSTEM					720			
4/87	N	100.0	100.0	100.0	99.9				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHERN INDIANA GAS & ELEC: A.B. BROWN 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	S	100.0	100.0	100.0	99.9					
	SYSTEM	100.0	100.0	100.0	99.9		720	719	719	

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR APRIL 1987.

5/87 SYSTEM

744

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED OUTAGE TOOK PLACE IN MAY.

5/87	N	75.5	100.0	100.0	72.3					
	S	75.5	100.0	100.0	72.3					
	SYSTEM	75.5	100.0	100.0	72.3		744	538	538	55.5
6/87	N	100.0	100.0	100.0	100.0					
	S	100.0	100.0	100.0	100.0					
	SYSTEM	100.0	100.0	100.0	100.0		720	720	720	71.9
7/87	N	100.0	100.0	100.0	100.0					
	S	100.0	100.0	100.0	100.0					
	SYSTEM	100.0	100.0	100.0	100.0		744	741	744	64.8
8/87	N	100.0	99.9	99.9	99.9					
	S	100.0	99.9	99.9	99.9					
	SYSTEM	100.0	99.9	99.9	99.9		744	744	743	59.6
9/87	N	100.0	100.0	100.0	100.0					
	S	100.0	100.0	100.0	100.0					
	SYSTEM	100.0	100.0	100.0	100.0		720	720	720	68.7

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD JUNE THROUGH SEPTEMBER 1987.

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF FEBRUARY TO SEPTEMBER 1987.

NO INFORMATION WAS AVAILABLE FOR OCTOBER.

11/87	N	71.9	100.0	100.0	71.9					
	S	71.9	58.9	58.9	42.4					
	SYSTEM	71.9	79.4	79.4	57.2		720	518	412	58.0

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED UNIT OUTAGE OCCURRED FROM 11/22 TO 11/30.

12/87	N	0.0	0.0		0.0					
	S	0.0	0.0		0.0					
	SYSTEM	0.0	0.0		0.0		744	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT AND SCRUBBER WERE OUT OF SERVICE FOR A SCHEDULED OUTAGE IN DECEMBER. DETAILS REGARDING THE NATURE OF THE OUTAGE WERE UNAVAILABLE.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SOUTHWESTERN ELECTRIC POWER	
PLANT NAME	DOLET HILLS	
UNIT NUMBER	1	
CITY	MANSFIELD	
STATE	LOUISIANA	
REGULATORY CLASSIFICATION	B	
PARTICULATE EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	*****	
GROSS UNIT GENERATING CAPACITY - MW	720	
NET UNIT GENERATING CAPACITY W/FGD - MW	640	
NET UNIT GENERATING CAPACITY WO/FGD - MW	658	
EQUIVALENT SCRUBBED CAPACITY - MW	720	
*** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	****	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	*****	(***** ACFM)
BOILER FLUE GAS TEMPERATURE - C	72.8	(163 F)
STACK HEIGHT - M	160.	(525 FT)
STACK SHELL	NR	
STACK TOP DIAMETER - M	*****	(***** FT)
*** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	LIGNITE	
AVERAGE HEAT CONTENT - J/G	16515.	(7100 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		6000-7700
AVERAGE ASH CONTENT - %	13.00	
RANGE ASH CONTENT - %	7.2-19.8	
AVERAGE MOISTURE CONTENT - %	*****	
RANGE MOISTURE CONTENT - %	****	
AVERAGE SULFUR CONTENT - %	0.70	
RANGE SULFUR CONTENT - %	0.4-1.7	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** ESP		
NUMBER	1	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
*** FGD SYSTEM		
** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	
PROCESS TYPE	LIMESTONE	
SYSTEM SUPPLIER	AIR CORRECTION DIVISION, UOP	
A-E FIRM	SARGENT & LUNDY	
DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	NEW	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	76.00	
ENERGY CONSUMPTION - %	2.5	
CURRENT STATUS	1	
COMMERCIAL START-UP	0/1986	

SOUTHWESTERN ELECTRIC POWER: DOLET HILLS 1 (CONT.)

INITIAL START-UP	12/1985
CONTRACT AWARDED	7/1980
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
** QUENCHER/PRESATURATOR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** ABSORBER	
GENERIC TYPE	NR
SPECIFIC TYPE	NR
TRADE NAME/COMMON TYPE	NR
SHELL GENERIC MATERIAL	NR
SHELL SPECIFIC MATERIAL	NR
SHELL MATERIAL TRADE NAME/COMMON TYPE	NR
LINER GENERIC MATERIAL	NR
LINER SPECIFIC MATERIAL	NR
LINER MATERIAL TRADE NAME/COMMON TYPE	NR
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
TRADE NAME/COMMON TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** REHEATER	
GENERIC TYPE	NR
SPECIFIC TYPE	NR
TRADE NAME/COMMON TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** FANS	
DESIGN	NR
FUNCTION	NA
APPLICATION	NR
SERVICE	NA
CONSTRUCTION MATERIAL GENERIC TYPE	NA
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	NR
DEVICE TYPE	NR
** PUMPS	
SERVICE	NUMBER
-----	-----
NA	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	NA

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHWESTERN ELECTRIC POWER: DOLET HILLS 1 (CONT.)

*** SALEABLE BYPRODUCTS

NATURE	NONE
DISPOSITION	N/A

*** SLUDGE

** TREATMENT

METHOD	FIXATION
DEVICE	NA
PROPRIETARY PROCESS	CONVERSION SYSTEMS 'POZ-O-TEC'

** DISPOSAL

NATURE	FINAL
TYPE	LANDFILL
SITE TREATMENT	NR

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

12/85	SYSTEM						744		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY ANNOUNCED THAT INITIAL START-UP OF THE FGD SYSTEM OCCURRED IN DECEMBER, 1985. THE START IS SCHEDULED TO GO COMMERCIAL IN APRIL OF NEXT YEAR.

1/86	SYSTEM						774		
2/86	SYSTEM						672		
3/86	SYSTEM						774		
4/86	SYSTEM						720		
5/86	SYSTEM						774		
6/86	SYSTEM						720		
7/86	SYSTEM						774		
8/86	SYSTEM						774		
9/86	SYSTEM						720		
10/86	SYSTEM						774		
11/86	SYSTEM						720		
12/86	SYSTEM						774		

** PROBLEMS/SOLUTIONS/COMMENTS

THE PLANT WAS DECLARED COMMERCIAL ON APRIL 25, 1986. NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE YEAR.

1/87	SYSTEM						744		
2/87	SYSTEM						672		
3/87	SYSTEM						744		
4/87	SYSTEM						720		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHWESTERN ELECTRIC POWER: DOLET HILLS 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR
5/87	SYSTEM							744		
6/87	SYSTEM							720		
7/87	SYSTEM							744		
8/87	SYSTEM							744		
9/87	SYSTEM							720		
10/87	SYSTEM							744		
11/87	SYSTEM							720		
12/87	SYSTEM							744		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED ABSORBER OUTLET DUCTWORK LINER FAILURES. THE MATERIAL, WHICH IS ONLY 2 YEARS OLD, WAS BLISTERING AND PEELING OFF. THE UTILITY REPORTED THAT NO DAMAGE TO THE SUBSTRATE METAL DUCTWORK HAS OCCURRED TO THIS DATE. THE POLYMER MATERIAL IS CURRENTLY BEING PATCHED BY THE SUPPLIER BUT THE UTILITY IS STILL LOOKING FOR A POSSIBLE REPLACEMENT MATERIAL.

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING 1987. THE UNIT WAS REPORTED TO HAVE BEEN OFF-LINE TWICE DURING THE YEAR FOR SCHEDULED MAINTENANCE OUTAGES. ONE OUTAGE OCCURRED IN THE SPRING OF THE YEAR AND LASTED APPROXIMATELY 6 WEEKS AND THE SECOND SCHEDULED OUTAGE OCCURRED IN DECEMBER AND LASTED APPROXIMATELY 4 WEEKS.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SOUTHWESTERN ELECTRIC POWER	
PLANT NAME	HENRY W. PIRKEY	
UNIT NUMBER	1	
CITY	HALLSVILLE	
STATE	TEXAS	
REGULATORY CLASSIFICATION	D	
PARTICULATE EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	670	
GROSS UNIT GENERATING CAPACITY - MW	720	
NET UNIT GENERATING CAPACITY W/FGD - MW	640	
NET UNIT GENERATING CAPACITY WO/FGD - MW	658	
EQUIVALENT SCRUBBED CAPACITY - MW	720	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	BABCOCK & WILCOX	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	1349.63	(2860000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	140.6	(285 F)
STACK HEIGHT - M	160.	(525 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	7.6	(25.0 FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	LIGNITE	
AVERAGE HEAT CONTENT - J/G	14654.	(6300 BTU/LB)
RANGE HEAT CONTENT - BTU/LB	****	
AVERAGE ASH CONTENT - %	20.00	
RANGE ASH CONTENT - %	15.0-38.0	
AVERAGE MOISTURE CONTENT - %	30.00	
RANGE MOISTURE CONTENT - %	26.0-35.0	
AVERAGE SULFUR CONTENT - %	0.80	
RANGE SULFUR CONTENT - %	0.4-1.2	
AVERAGE CHLORIDE CONTENT - %	0.01	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** ESP		
NUMBER	2	
TYPE	COLD SIDE	
SUPPLIER	AIR CORRECTION DIVISION, UOP	
INLET FLUE GAS CAPACITY - CU.M/S	1349.6	(2860000 ACFM)
INLET FLUE GAS TEMPERATURE - C	141.7	(287 F)
PRESSURE DROP - KPA	0.5	(2. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.8	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
*** FGD SYSTEM		
** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	
PROCESS TYPE	LIMESTONE	
SYSTEM SUPPLIER	AIR CORRECTION DIVISION, UOP	
A-E FIRM	SARGENT & LUNDY	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHWESTERN ELECTRIC POWER: HENRY W. PIRKEY 1 (CONT.)

DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.78
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	85.00
ENERGY CONSUMPTION - %	2.5
CURRENT STATUS	1
COMMERCIAL START-UP	1/1985
INITIAL START-UP	12/1984
CONTRACT AWARDED	5/1978
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
** QUENCHER/PRESATURATOR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** ABSORBER	
NUMBER	4
NUMBER OF SPARES	0
GENERIC TYPE	PACKED TOWER
SPECIFIC TYPE	MOBILE BED PACKING
TRADE NAME/COMMON TYPE	TURBULENT CONTACT ABSORBER
SUPPLIER	AIR CORRECTION DIVISION, UOP
DIMENSIONS - FT	35.0 DIA X 70
SHELL GENERIC MATERIAL	CARBON STEEL
SHELL SPECIFIC MATERIAL	ASTM A-36
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A
LINER GENERIC MATERIAL	ORGANIC
LINER SPECIFIC MATERIAL	MAT-REINFORCED EPOXY
LINER MATERIAL TRADE NAME/COMMON TYPE	RIGIFLAK 413 GS
GAS CONTACTING DEVICE TYPE	PLASTIC/RUBBER MOBILE BALLS
NUMBER OF CONTACTING ZONES	4
GAS-SIDE PRESSURE DROP - KPA	0.7 (3.0 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/SEC	2.3 (7.6 FT/S)
INLET GAS FLOW - CU. M/S	339.45 (719326 ACFM)
INLET GAS TEMPERATURE - C	141.7 (287 F)
SO2 REMOVAL EFFICIENCY - %	76.0
PARTICLE REMOVAL EFFICIENCY - %	0.0
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
NUMBER PER SYSTEM	4
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
CONFIGURATION	VERTICAL
NUMBER OF STAGES	2
NUMBER OF PASSES PER STAGE	1
DISTANCE BETWEEN STAGES - CM	15.24 (6.0 IN)
PRESSURE DROP - KPA	0.1 (0.6 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/S	2.4 (8.0 FT/S)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC
CONSTRUCTION MATERIAL SPECIFIC TYPE	FIBER-REINFORCED POLYESTER
** REHEATER	
GENERIC TYPE	BYPASS
SPECIFIC TYPE	COLD SIDE
TRADE NAME/COMMON TYPE	N/A
INLET FLUE GAS TEMPERATURE - C	141.7 (287 F)
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** FANS	
NUMBER	2
NUMBER OF SPARES	0
DESIGN	AXIAL
SUPPLIER	WESTINGHOUSE
FUNCTION	NR
APPLICATION	FORCED DRAFT
SERVICE	DRY

SOUTHWESTERN ELECTRIC POWER: HENRY W. PIRKEY 1 (CONT.)

FLUE GAS FLOW RATE - CU.M/S	674.82	(1430000 ACFM)
FLUE GAS TEMPERATURE - C	141.7	(287 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL; ALUMINUM	
** DAMPERS		
FUNCTION	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	
** DUCTWORK		
SHELL GENERIC MATERIAL TYPE	STAINLESS STEEL	
SHELL SPECIFIC MATERIAL TYPE	NR	
LINER GENERIC MATERIAL TYPE	ORGANIC	
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER	
** REAGENT PREPARATION EQUIPMENT		
FUNCTION	WET BALL MILL	
DEVICE	NR	
DEVICE TYPE	NR	
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	28.1	(31 TPH)
** TANKS		
SERVICE	NUMBER	
-----	-----	
REAGENT PREP PRODUCT	3	
ABSORBER RECYCLE	4	
** PUMPS		
SERVICE	NUMBER	
-----	-----	
MAKEUP SLURRY	3	
WASTE SLURRY	3	
WASH WATER	2	
** SOLIDS CONCENTRATING/DEWATERING		
DEVICE	CENTRIFUGE	
NUMBER	2	
NUMBER OF SPARES	1	
SHELL GENERIC MATERIAL TYPE	STAINLESS STEEL	
SHELL SPECIFIC MATERIAL TYPE	AUSTENITIC	
** SOLIDS CONCENTRATING/DEWATERING		
DEVICE	VACUUM FILTER	
NUMBER	3	
NUMBER OF SPARES	1	
CAPACITY	629 TON/DAY	
SHELL GENERIC MATERIAL TYPE	CARBON STEEL	
** SOLIDS CONCENTRATING/DEWATERING		
DEVICE	THICKENER	
NUMBER	2	
NUMBER OF SPARES	0	
CONFIGURATION	CIRCULAR	
DIMENSIONS - FT	110.0 DIA X 10.0	
SHELL GENERIC MATERIAL TYPE	CARBON STEEL	
*** SALEABLE BYPRODUCTS		
NATURE	NONE	
DISPOSITION	N/A	
*** SLUDGE		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHWESTERN ELECTRIC POWER: HENRY W. PIRKEY 1 (CONT.)

** TREATMENT	
METHOD	FIXATION
DEVICE	PUG MILL
PROPRIETARY PROCESS	CONVERSION SYSTEMS 'POZ-O-TEC'
INLET QUALITY - %	10.6
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	TRUCK
SITE TREATMENT	NONE
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
** FGD SPARE CAPACITY INDICES	
ABSORBER - %	0.0
** FGD SPARE COMPONENT INDICES	
ABSORBER	0.0

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

12/84	SYSTEM						744		
	** PROBLEMS/SOLUTIONS/COMMENTS								
	UTILITY ANNOUNCED THAT INITIAL OPERATIONS OF THE FGD SYSTEM ON HENRY W. PIRKEY 1 COMMENCED DURING THE MONTH OF DECEMBER 1984								
1/85	SYSTEM						744		
2/85	SYSTEM						672		
3/85	SYSTEM						744		
	** PROBLEMS/SOLUTIONS/COMMENTS								
	THE UNIT WAS DECLARED COMMERCIAL ON JANUARY 3, 1985. NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED FOR THE FIRST QUARTER.								
4/85	SYSTEM						720		
	** PROBLEMS/SOLUTIONS/COMMENTS								
	THE UTILITY REPORTED THAT THE UNIT WAS DOWN MOST OF APRIL DUE TO TURBINE BLADE REPAIRS. AN EPA FGD ACCEPTANCE TEST WAS DELAYED DUE TO THESE REPAIRS. TESTING IS SCHEDULED TO TAKE PLACE LATER THIS YEAR.								
5/85	SYSTEM						744		
6/85	SYSTEM						720		
7/85	SYSTEM						744		
8/85	SYSTEM						744		
9/85	SYSTEM						720		
10/85	SYSTEM						744		
11/85	SYSTEM						720		
12/85	SYSTEM						744		

SOUTHWESTERN ELECTRIC POWER: HENRY W. PIRKEY 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD RELATED OUTAGES WERE ENCOUNTERED DURING THE MONTHS OF MAY THROUGH DECEMBER. DURING THIS PERIOD, DESIGN MODIFICATIONS WERE MADE TO THE TRAP OUT TRAYS AND SPRAY NOZZLES TO IMPROVE SO2 REMOVAL EFFICIENCY AND REDUCE SCALING PROBLEMS. AN EPA COMPLIANCE TEST WAS COMPLETED SUCCESSFULLY AT REDUCED LOAD.

1/86	SYSTEM							774	
2/86	SYSTEM							672	
3/86	SYSTEM							774	
4/86	SYSTEM							720	
5/86	SYSTEM							774	
6/86	SYSTEM							720	
7/86	SYSTEM							774	
8/86	SYSTEM							774	
9/86	SYSTEM							720	
10/86	SYSTEM							774	
11/86	SYSTEM							720	
12/86	SYSTEM							774	

** PROBLEMS/SOLUTIONS/COMMENTS

UTILITY REPORTED THAT ALL TRAP OUT TRAY MODIFICATIONS WERE COMPLETED IN 1986. SCALING HAS BEEN GREATLY REDUCED SINCE THIS DESIGN CHANGE. NO OTHER MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE YEAR.

1/87	SYSTEM							744	
2/87	SYSTEM							672	
3/87	SYSTEM							744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT WAS OFF-LINE FOR APPROXIMATELY 4 WEEKS DURING THE SPRING FOR SCHEDULED TURBINE MAINTENANCE. THE ADDITION OF SODIUM THIOSULFATE AS A SCALE INHIBITOR WAS ALSO INITIATED DURING SPRING OF 1987.

4/87	SYSTEM							720	
5/87	SYSTEM							744	
6/87	SYSTEM							720	
7/87	SYSTEM							744	
8/87	SYSTEM							744	
9/87	SYSTEM							720	
10/87	SYSTEM							744	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SOUTHWESTERN ELECTRIC POWER: HENRY W. PIRKEY 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART. HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
11/87	SYSTEM						720			
12/87	SYSTEM						744			

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT SCRUBBER OUTLET DUCTWORK REPAIRS WERE MADE DURING AN 8 WEEK SCHEDULED UNIT OUTAGE WHICH OCCURRED IN THE FALL OF 1987. THE CORRODED DUCTWORK WAS RELINED WITH HASTELLOY C-22. APPROXIMATELY 13,000 SQUARE FEET OF MATERIAL AT A COST OF \$500,000 WAS INSTALLED.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SPRINGFIELD WATER, LIGHT & PWR	
PLANT NAME	DALLMAN	
UNIT NUMBER	3	
CITY	SPRINGFIELD	
STATE	ILLINOIS	
REGULATORY CLASSIFICATION	D	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	301.	(0.700 LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	350	
GROSS UNIT GENERATING CAPACITY - MW	192	
NET UNIT GENERATING CAPACITY W/FGD - MW	178	
NET UNIT GENERATING CAPACITY WO/FGD - MW	181	
EQUIVALENT SCRUBBED CAPACITY - MW	192	
 ** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	401.11	(850000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	137.8	(280 F)
STACK HEIGHT - M	152.	(500 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	*****	(***** FT)
 ** FUEL DATA		
FUEL TYPE	COAL 1 '50%!	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	26444.	(11369 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		NR; 10500-11500
AVERAGE ASH CONTENT - %	10.65	
RANGE ASH CONTENT - %	NR; 8.0-14.0	
AVERAGE MOISTURE CONTENT - %	11.75	
RANGE MOISTURE CONTENT - %	6.9-10.3; 13.6-17.5	
AVERAGE SULFUR CONTENT - %	3.05	
RANGE SULFUR CONTENT - %	NR; 2.5-4.0	
AVERAGE CHLORIDE CONTENT - %	0.10	
RANGE CHLORIDE CONTENT - %	NR; .07-.16	
 *** PARTICLE CONTROL		
 ** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
 ** FABRIC FILTER		
NUMBER	0	
TYPE	NONE	
 ** ESP		
NUMBER	1	
NUMBER OF SPARES	0	
TYPE	COLD SIDE	
SUPPLIER	AIR CORRECTION DIVISION, UOP	
INLET FLUE GAS CAPACITY - CU.M/S	413.9	(877127 ACFM)
INLET FLUE GAS TEMPERATURE - C	161.7	(323 F)
PRESSURE DROP - KPA	0.5	(2. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.5	
 ** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	RESEARCH-COTTRELL
A-E FIRM	BURNS & MCDONNELL
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.50
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	95.00
ENERGY CONSUMPTION - %	1.6
CURRENT STATUS	1
COMMERCIAL START-UP	1/1981
INITIAL START-UP	10/1980
CONTRACT AWARDED	12/1977

** DESIGN AND OPERATING PARAMETERS

DESIGN COAL SULFUR CONTENT - %	3.30	
DESIGN COAL HEAT CONTENT - J/G	25586.0	(11000 BTU/LB)
DESIGN COAL ASH CONTENT - %	10.40	
DESIGN MOISTURE CONTENT - %	15.90	
DESIGN CHLORIDE CONTENT - %	0.07	
OPER. & MAINT. REQUIREMENT - MANHR/DAY	64.0	

** QUENCHER/PRESATURATOR

NUMBER	2	
TYPE	QUENCHER	
SUPPLIER	RESEARCH-COTTRELL	
INLET GAS FLOW - CU. M/S	215.19	(456000 ACFM)
INLET GAS TEMPERATURE - C	137.8	(280 F)
PRESSURE DROP - KPA	0.2	(1.0 IN-H2O)
LIQUID RECIRCULATION RATE - LITERS/S	416.	(6600 GPM)
L/G RATIO - L/CU. M	1.9	(14.5 GAL/1000 ACFM)
CONSTRUCTION MATERIAL GENERIC TYPE	HIGH ALLOY	
CONSTRUCTION MATERIAL SPECIFIC TYPE	IRON BASE/NICKEL-CHROMIUM-COPPER-MOLYBDENUM	

** ABSORBER

NUMBER	2	
NUMBER OF SPARES	0	
GENERIC TYPE	COMBINATION TOWER	
SPECIFIC TYPE	SPRAY/PACKED	
TRADE NAME/COMMON TYPE	SPRAY/FIXED BED PACKING	
SUPPLIER	RESEARCH-COTTRELL	
DIMENSIONS - FT	30.0 DIA X 92.5	
SHELL GENERIC MATERIAL	STAINLESS STEEL	
SHELL SPECIFIC MATERIAL	AUSTENITIC	
SHELL MATERIAL TRADE NAME/COMMON TYPE	TYPE 316L	
LINER GENERIC MATERIAL	NONE	
LINER SPECIFIC MATERIAL	N/A	
LINER MATERIAL TRADE NAME/COMMON TYPE	N/A	
GAS CONTACTING DEVICE TYPE	VERTICAL CROSS CHANNEL FIXED GRID PACKING	
NUMBER OF CONTACTING ZONES	2	
DISTANCE BETWEEN GAS CONTACTING ZONES - CM	61.0	(24.0IN)
LIQUID RECIRCULATION RATE - LITER/S	1600.	(25400 GPM)
L/G RATIO - L/CU.M	7.4	(55.7 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	0.2	(0.7 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/SEC	2.8	(9.1 FT/S)
INLET GAS FLOW - CU. M/S	215.19	(456000 ACFM)
INLET GAS TEMPERATURE - C	137.8	(280 F)
SO2 REMOVAL EFFICIENCY - %	95.0	
PARTICLE REMOVAL EFFICIENCY - %	0.0	

** MIST ELIMINATOR

PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
NUMBER PER SYSTEM	2
NUMBER OF SPARES PER SYSTEM	0
NUMBER PER MODULE	1

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
MANUFACTURER	RESEARCH-COTTRELL
CONFIGURATION	HORIZONTAL
NUMBER OF STAGES	2
NUMBER OF PASSES PER STAGE	2
FREEBOARD DISTANCE - M	1.83 (6.0 FT)
DISTANCE BETWEEN STAGES - CM	91.44 (36.0 IN)
DISTANCE BETWEEN VANES - CM	2.5 (1.00 IN)
VANE ANGLES - DEGREES	30
PRESSURE DROP - KPA	0.1 (0.5 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/S	2.7 (9.0 FT/S)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPROPYLENE
WASH WATER SOURCE	FRESH
WASH FREQUENCY	EVERY 8 HRS 'UPPER!, 15 MIN 'LOWER!
WASH RATE - L/S	14.5 (230 GAL/MIN)
** REHEATER	
NUMBER	1
NUMBER OF SPARES	0
GENERIC TYPE	BYPASS
SPECIFIC TYPE	COLD SIDE
TRADE NAME/COMMON TYPE	N/A
PERCENT GAS BYPASSED - AVG	10.0
TEMPERATURE INCREASE - C	27.8 (50 F)
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** FANS	
NUMBER	2
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
SUPPLIER	AMERICAN STANDARD
FUNCTION	BOOSTER
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	217.07 (460000 ACFM)
FLUE GAS TEMPERATURE - C	137.8 (280 F)
PRESSURE DROP - KPA	1.2 (4.0 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** FANS	
NUMBER	2
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
SUPPLIER	WESTINGHOUSE
FUNCTION	UNIT
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	217.07 (460000 ACFM)
FLUE GAS TEMPERATURE - C	137.8 (280 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
NUMBER	2
FUNCTION	CONTROL
GENERIC TYPE	LOUVER
SPECIFIC TYPE	N/A
MANUFACTURER	AMERICAN STANDARD
MODULATION	OPEN
SEAL AIR FLOW - CU. M/S	0.00 (0 ACFM)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	INERT FLAKE-FILLED VINYL ESTER
** DAMPERS	
NUMBER	2
FUNCTION	SHUT-OFF

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

GENERIC TYPE	GUILLOTINE
SPECIFIC TYPE	NR
MANUFACTURER	ANDCO
MODULATION	OPEN
SEAL AIR FLOW - CU. M/S	0.00 (0 ACFM)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	INERT FLAKE-FILLED VINYL ESTER
** DAMPERS	
NUMBER	2
FUNCTION	SHUT-OFF
GENERIC TYPE	GUILLOTINE
SPECIFIC TYPE	NR
MANUFACTURER	ANDCO
CONSTRUCTION MATERIAL GENERIC TYPE	HIGH ALLOY 'WROUGHT!
CONSTRUCTION MATERIAL SPECIFIC TYPE	IRON BASE/NICKEL-CHROMIUM-COPPER-MOLYBDENUM
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	1
FUNCTION	SHUT-OFF
GENERIC TYPE	LOUVER
SPECIFIC TYPE	N/A
MANUFACTURER	MOSSER
MODULATION	OPEN
SEAL AIR FLOW - CU. M/S	0.00 (0 ACFM)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	ABSORBER OUTLET
CONFIGURATION	RECTANGULAR
DIMENSIONS	100.0 X 13.5 X 13.5
SHELL GENERIC MATERIAL TYPE	HIGH ALLOY
SHELL SPECIFIC MATERIAL TYPE	IRON BASE/CHROMIUM-MOLYBDENUM-NICKEL-COPPER
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	FIBER-REINFORCED POLYESTER
** DUCTWORK	
LOCATION	ABSORBER INLET
CONFIGURATION	RECTANGULAR
DIMENSIONS	30.0 X 9.5 X 11.0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	BYPASS
CONFIGURATION	RECTANGULAR
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED
DEVICE TYPE	TUBE MILL
MANUFACTURER	KENNEDY VAN SAUN
NUMBER	2
NUMBER OF SPARES	1
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	121.6 (134 TPH)
PRODUCT QUALITY - % SOLIDS	35.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

** REAGENT PREPARATION EQUIPMENT	
FUNCTION	GRIT REMOVAL 'BALL MILL/REAGENT FEED TANK!
DEVICE	HYDROCYCLONE
MANUFACTURER	KREBS
NUMBER	4
NUMBER OF SPARES	2
 ** REAGENT PREPARATION EQUIPMENT	
FUNCTION	CLASSIFICATION 'ABSORBER FEED TANK!
DEVICE	HYDROCYCLONE
MANUFACTURER	KREBS
NUMBER	8
 ** TANKS	
SERVICE	NUMBER
-----	-----
QUENCHER FEED	2
ABSORBER FEED	1
REAGENT PREP PRODUCT	1
MIST ELIMINATOR WASH	1
VACUUM FILTER FILTRATE	1
WASTE SLURRY BLEED	1
MILL SLURRY SUMP	2
 ** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER FEED	6
QUENCHER	4
DEMISTER WASH	2
SUMP	2
MILL SLURRY	4
VACUUM FILTER	2
FILTRATE	2
HYDROCLONE FEED	4
REAGENT FEED	2
 ** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	VACUUM FILTER
NUMBER	2
NUMBER OF SPARES	1
DIMENSIONS - FT	4.1 X 4 X 20
CAPACITY	30
SHELL GENERIC MATERIAL TYPE	CAST IRON
SHELL SPECIFIC MATERIAL TYPE	NR
BELT GENERIC MATERIAL TYPE	ORGANIC
BELT SPECIFIC MATERIAL TYPE	POLYPROPYLENE; DACRON
FEED STREAM SOURCE	ABSORBER BLEED & QUENCHER HOLD TANK
FEED STREAM CHARACTERISTICS	55% SOLIDS
OUTLET STREAM CHARACTERISTICS	85% SOLIDS
OVERFLOW STREAM CHARACTERISTICS	118GPM
 ** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	HYDROCYCLONE
NUMBER	18
NUMBER OF SPARES	6
DIMENSIONS - FT	8.5 X 9
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	NATURAL RUBBER
 *** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

*** SLUDGE
 FULL LOAD SLUDGE QUANTITY - M.TONS/HR (DRY) 27.2 (30.0 TPH)
 MOISTURE CONTENT - % TOTAL FREE WATER 85.0

** TREATMENT
 METHOD FORCED OXIDATION
 DEVICE SPARGER IN QUENCHER

** DISPOSAL
 NATURE FINAL
 TYPE LANDFILL
 LOCATION OFF-SITE
 SITE TRANSPORTATION METHOD TRUCK
 SITE TREATMENT CLAY LINING
 SITE DIMENSIONS 50 ACRES

** PROCESS CONTROL AND INSTRUMENTATION
 CHEMICAL PARAMETERS PH
 CONTROL LEVELS QUENCHER PUMP 'PH 4.5!; ABSORBER FEED TANK PUMP
 MONITOR TYPE BECKMAN
 MONITOR LOCATION PUMP DISCHARGE
 PROCESS CONTROL MANNER AUTOMATIC
 PROCESS CHEMISTRY MODE FEEDBACK

** WATER BALANCE
 WATER LOOP TYPE CLOSED
 MAKEUP WATER ADDITION - LITERS/S 15.1 (239 GPM)
 SOURCE OF MAKEUP WATER LAKE WATER

** CHEMICALS AND CONSUMPTION
 FUNCTION ABSORBENT
 NAME LIMESTONE
 PRINCIPAL CONSTITUENT CALCIUM CARBONATE (CAC03)
 SOURCE/SUPPLIER CENTRAL STONE
 CONSUMPTION 1.02 STOICHOMETRIC
 UTILIZATION - % 67.0
 POINT OF ADDITION BALL MILL

** FGD SPARE CAPACITY INDICES
 ABSORBER - % 20.0
 BALL MILL - % 20.0
 VACUUM FILTER - % 100.0

** FGD SPARE COMPONENT INDICES
 ABSORBER 0.3
 VACUUM FILTER 1.0

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

10/80 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

FGD SYSTEM OPERATION AT DALLMAN 3 COMMENCED IN OCTOBER 1980.

11/80 SYSTEM 720

12/80 SYSTEM 744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

SINCE STARTUP NO MAJOR FGD-RELATED PROBLEMS HAVE BEEN ENCOUNTERED. THE UTILITY HAS REPORTED SOME CONDENSER TUBE PROBLEMS HAVE BEEN EXPERIENCED WITH THE BOILER.

1/81	A	93.5	93.5	93.5	93.5				
	B	22.6	22.6	22.6	22.6				
	SYSTEM	58.1	58.1	58.1	58.1	744	744	432	79.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JANUARY SOME OUTAGE TIME WAS DUE TO PH EXCURSIONS IN THE QUENCHER SECTIONS THAT NECESSITATED THE INSPECTION OF BOTH MODULES.

ACCUMULATION OF FLY ASH AND SULFITE PARTICLES LED TO THE REPLACEMENT OF SOME PACKING MATERIAL IN MODULE B.

2/81	A	0.0	0.0	0.0	0.0				
	B	100.0	95.0	95.0	80.2				
	SYSTEM	50.0	47.6	47.6	40.2	672	567	270	68.6

** PROBLEMS/SOLUTIONS/COMMENTS

DURING FEBRUARY THE BOILER WAS OUT OF SERVICE APPROXIMATELY 49 HOURS.

MODULE A REMAINED OUT OF SERVICE DUE TO INADEQUATE PACKING.

3/81	A	0.0	0.0	0.0	0.0				
	B	100.0	91.5	91.5	38.7				
	SYSTEM	50.0	45.7	45.7	19.4	744	315	144	31.5

** PROBLEMS/SOLUTIONS/COMMENTS

DURING MARCH APPROXIMATELY 429 HOURS OF OUTAGE TIME WAS DUE TO THE CONDENSER TUBES BEING REPLACED.

MODULE A WAS NOT AVAILABLE DURING MARCH DUE TO INADEQUATE PACKING.

4/81	SYSTEM	0.0	0.0	0.0	0.0	720	78	0	4.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING APRIL THE BOILER WAS OUT OF SERVICE APPROXIMATELY 642 HOURS DUE TO A SCHEDULED MAINTENANCE OVERHAUL.

THE FGD SYSTEM WAS UNAVAILABLE THE ENTIRE MONTH TO FACILITATE REPAIRS TO PROCESS PIPING, REPLACEMENT OF THE PACKING MATERIAL IN THE ABSORBER TOWERS INSTALLATION OF THE STRAINER SYSTEMS ON ABSORBER FEED TANK AND MAKEUP WATER SYSTEM, AND REPAIR MINOR CORROSION DAMAGE.

5/81	A	39.5	33.5	33.5	27.3				
	B	40.7	3.6	3.6	3.0				
	SYSTEM	40.1	18.6	18.6	15.1	744	606	113	50.0

** PROBLEMS/SOLUTIONS/COMMENTS

FROM MAY 1 TO MAY 18 THE SYSTEM WAS UNAVAILABLE SO THAT THE HYDROCLONE FRP LINE COULD BE REPLACED WITH CARBON STEEL FOR MODULE B AND RUBBER FOR MODULE A.

6/81	A	53.1	58.2	58.2	53.1				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO ₂ PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	B	39.2	42.9	42.9	39.2					
	SYSTEM	46.2	50.6	50.6	46.2		720	657	333	63.0
** PROBLEMS/SOLUTIONS/COMMENTS										
THE FGD SYSTEM WAS REMOVED FROM SERVICE TWICE DURING THE MONTH DUE TO PROBLEMS WITH THE ELECTROSTATIC PRECIPITATOR.										
BOTH TOWERS WERE TAKEN OUT OF SERVICE ON JUNE 19 DUE TO WET WELL HYDROCLON PROBLEMS.										
7/81	A	40.6	29.8	29.8	28.6					
	B	67.6	57.9	57.9	55.6					
	SYSTEM	54.1	43.9	43.9	42.1		744	715	313	69.0
** PROBLEMS/SOLUTIONS/COMMENTS										
MODULE A WAS REMOVED FROM SERVICE FOR PART OF THE MONTH FOR CLEANING THAT WAS NECESSITATED BY PLUGGED PACKING.										
THE MODULE B DOWNTIME DURING THE MONTH WAS ATTRIBUTED TO INSPECTIONS AND CLEANING OF THE PACKING, NOZZLES, AND HEADERS.										
8/81	SYSTEM	0.0	0.0	0.0	0.0		744	709	0	69.0
** PROBLEMS/SOLUTIONS/COMMENTS										
BOTH MODULES WERE UNAVAILABLE DURING AUGUST AS THE PACKING WAS REPLACED IN BOTH TOWERS.										
9/81	A	87.9	78.0	88.5	77.8					
	B	54.2	47.0	68.8	46.9					
	SYSTEM	71.1	62.5	80.0	62.4		720	718	449	55.0
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING SEPTEMBER DOWN TIME FOR MODULE A WAS DUE TO CELL PROBLEMS IN THE ESP.										
A LEAK IN THE PIPELINE OF THE A MODULE HYDROCLONES RESULTED IN REPIPING CAUSING ADDITIONAL OUTAGE TIME.										
MODULE B WAS OFF-LINE PART OF THE MONTH FOR CLEANING AND LATER IN THE MONTH FOR HYDROCLONE REPAIRS.										
10/81	A	98.8	60.8	88.3	47.0					
	B	88.6	75.4	80.3	58.4					
	SYSTEM	93.7	68.0	83.6	52.7		744	576	392	51.0
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING OCTOBER DOWN TIME FOR MODULE A WAS DUE TO AN INSPECTION OF THE PACKING AND MAINTENANCE ON THE HYDROCLONE PUMPS.										
MODULE B OUTAGE TIME DURING THE MONTH WAS FOR AN ABSORBER FEED PUMP INSPECTION, WORK ON THE ABSORBER FEED TANK HYDROCLONES AND MAINTENANCE ON THE QUENCHER PUMP.										
11/81	SYSTEM	0.0			0.0		720	0	0	0.0
12/81	A	45.3	63.0	63.0	45.3					
	B	1.1	1.5	3.0	1.1					
	SYSTEM	23.2	32.2	43.1	23.2		744	535	172	51.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING NOVEMBER THRU DECEMBER 16 THE FGD SYSTEM WAS OFF-LINE FOR A SCHEDULED OUTAGE. DURING THIS TIME MODIFICATIONS WERE PERFORMED ON THE FORCED OXIDATION SYSTEM. OTHER WORK INCLUDED PIPING AND TESTING OF THE PRESSURE RELIEF VALVE ON THE OX-AIR RECEIVER, WIRING AND INSTRUMENTATION CONNECTIONS FOR TEMPERATURE TRANSMITTERS AND PRESSURE INDICATIONS, REWIRING OF HIGH TEMPERATURE ALARM THAT CAUSED A COMPRESSOR TRIP.

1/82	A	70.6	64.7	64.7	53.9					
	B	0.0	0.0	0.0	0.0					
	SYSTEM	35.3	32.3	35.8	26.9		744	620	200	67.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JANUARY MODULE B WAS OFF-LINE DUE TO THE CONTINUAL WORK TO INSTALL A PRESSURE REGULATING STATION FOR THE FORCED OXIDATION SYSTEM.

MODULE A FORCED OXIDATION SYSTEM COMPRESSOR ACCOUNTED FOR SOME OF THE OUTAGE TIME.

OUTAGE TIME WAS ALSO DUE TO PLUGGING IN THE MODULE A HYDROCLONE FEED PUMPS AND THE WET WELL HYDROCLONES.

MODULE A EXPERIENCED SEVERE SULFITE BUILDUP REQUIRING OUTAGE TIME FOR CLEANING.

MODULE A EXPERIENCED A BROKEN FLANGE IN THE FRP LINE OF THE OUTLET DUCT.

2/82	A	97.2	91.4	91.4	75.6					
	B	0.1	0.2	0.2	0.1					
	SYSTEM	48.7	45.9	47.0	37.9		672	556	255	65.0

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS UNAVAILABLE FOR 19 HOURS DUE TO REPAIRS ON AN ACID LINE.

THE INSTALLATION OF A FORCED OXIDATION PRESSURE REGULATING STATION FOR MODULE B CONTINUED THROUGHOUT FEBRUARY.

3/82	SYSTEM	100.0		0.0		744	0	0	0.0	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN THE ENTIRE MONTH OF MARCH DUE TO A VIOLENT STORM WHICH RESULTED IN THE UNBALANCING OF THE TURBINE GENERATOR. THE UTILITY HOPES TO HAVE THE UNIT BACK ON-LINE SOMETIME IN JUNE.

4/82	SYSTEM	100.0		0.0		720	0	0	0.0	

5/82	SYSTEM	100.0		0.0		744	0	0	0.0	

** PROBLEMS/SOLUTIONS/COMMENTS

DURING APRIL AND MAY THE TURBINE AND GENERATOR REPAIRS CONTINUED.

6/82	A	55.1	48.3	75.9	38.1					
	B	73.1	76.0	92.5	59.9					
	SYSTEM	64.1	62.1	84.2	49.0		720	567	352	53.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE SYSTEM WAS SHUT DOWN ON JUNE 1 THRU JUNE 7 FOR A SCHEDULED OUTAGE AND TO TEST FOR VIBRATION.

MODULE A WAS OFF-LINE PART OF THE MONTH DUE TO PROBLEMS WITH THE DISCHARGE VALVES ON THE QUENCHER PUMPS.

ADDITIONAL PROBLEMS EXPERIENCED BY MODULE A DURING JUNE INCLUDED PACKING AND SEAL WATER PROBLEMS WITH THE MIXERS AND A LEAK IN THE MAKEUP WATER PUMP.

MODULE B WAS UNAVAILABLE FOR APPROXIMATELY 26 HOURS DUE TO A DENSITY PROBLEM IN THE ABSORBER.

MODULE A EXPERIENCED BYPASS DAMPER PROBLEMS DURING THE MONTH.

7/82	NORTH	100.0	91.2	91.2	86.6				
	SOUTH	100.0	55.0	98.7	52.2				
	SYSTEM	100.0	73.1	95.0	69.4	744	706	516	69.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN DURING JULY AS A RESULT OF EQUIPMENT PROBLEMS AND SUBSEQUENT STARTUP OF THE SCRUBBER TOWERS.

8/82	NORTH	74.2	66.2	78.7	66.2				
	SOUTH	100.0	51.7	72.5	51.7				
	SYSTEM	87.1	59.0	75.6	59.0	744	744	439	72.0

** PROBLEMS/SOLUTIONS/COMMENTS

ON AUGUST 13 THE NORTH MODULE WAS UNAVAILABLE APPROXIMATELY 11 HOURS DUE TO REPAIRS BEING MADE ON THE SEAL WATER LINE.

DURING THE LAST WEEK OF AUGUST THE NORTH MODULE WAS UNAVAILABLE 181 HOURS DUE TO PROBLEMS WITH A BOOSTER FAN MOTOR.

9/82	NORTH	0.0	0.0	0.0	0.0				
	SOUTH	100.0	95.7	95.7	95.1				
	SYSTEM	50.0	47.8	47.8	47.6	720	716	343	70.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING SEPTEMBER THE SOUTH MODULE WAS DOWN FOR 24 HOURS TO PREVENT PACKING DAMAGE FROM THE INCINERATION OF A POTASIU BROMATE BOILER CLEANING SOLUTION.

ON SEPTEMBER 13 AND 14 THE SOUTH MODULE WAS DOWN 20 HOURS FOR TURBINE MAINTENANCE.

ON SEPTEMBER 20 THE SOUTH MODULE WAS DOWN FOR 1 HOUR DUE TO A FEEDER TRIP.

10/82	NORTH	0.0	0.0	0.0	0.0				
	SOUTH	0.0	0.0	0.0	0.0				
	SYSTEM	0.0	0.0	0.0	0.0	744	52	0	4.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN OCTOBER 2 THROUGH 29 FOR A SCHEDULED OUTAGE.

THE UNIT WAS DOWN AT DIFFERENT TIMES DURING THE PERIOD OF OCTOBER 29 TO 31 FOR TURBINE BALANCE TESTS.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

11/82	NORTH	43.2	32.5	58.2	32.1					
	SOUTH	64.3	53.0	55.1	52.2					
	SYSTEM	53.8	42.7	56.7	42.2		720	710	304	61.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE NORTH MODULE WAS UNAVAILABLE DURING THE PERIOD OF NOVEMBER 1 THROUGH 1 DUE TO REPAIRS ON THE BOOSTER FAN MOTOR.

ELECTRICAL PROBLEMS WITH THE OX-AIR COMPRESSOR MOTOR AND ALARM CONTRIBUTED TO THE UNAVAILABLE TIME FOR THE NORTH MODULE DURING NOVEMBER 1 THROUGH 16.

THE SOUTH MODULE WAS DOWN DURING NOVEMBER 1 THROUGH 16 FOR REPAIRS ON TWO SUCTION VALVES.

THE UNIT WAS DOWN DURING NOVEMBER DUE IN PART TO VACUUM PUMP REPAIRS AND CLOGGED MAKEUP WATER PUMPS.

A CHECK ON THE BYPASS DAMPER GAUGE CONTRIBUTED TO THE OUTAGES FOR THE UNIT DURING NOVEMBER.

12/82	NORTH	100.0	60.3	78.6	56.7					
	SOUTH	99.6	50.0	72.8	47.0					
	SYSTEM	99.8	55.2	75.7	51.8		744	699	385	57.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING DECEMBER, THE UNIT DEMONSTRATED LOW SCRUBBER RELIABILITY DUE TO A VARIETY OF PROBLEMS. ONE OF WHICH WAS THE USE OF WET COAL CREATING LOAD LIMITATION PROBLEMS.

REDUCED RELIABILITY WAS ALSO ATTRIBUTED TO VIBRATION DATA READINGS TAKEN DURING DECEMBER.

UNIT TRIPPING OCCURRED DURING THE MONTH LOWERING SCRUBBER RELIABILITY.

TUBE LEAK CHECKS ALSO CONTRIBUTED TO REDUCED RELIABILITY DURING DECEMBER.

APPROXIMATELY 15% OF THE BOILER HOURS DURING DECEMBER INVOLVED THE INJECTION OF OIL INTO THE BOILER. THE SCRUBBER CAN NOT OPERATE DURING THESE PERIODS DUE TO THE CLOGGING OF PACKING MATERIAL FROM OIL CARRYOVER.

1/83	NORTH	96.3	57.8	88.2	51.1					
	SOUTH	99.2	68.9	81.8	60.8					
	SYSTEM	97.7	63.4	85.0	55.9		744	657	416	57.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE NORTH MODULE WAS UNAVAILABLE FOR 21.5 HOURS ON JANUARY 9-10 DUE TO A BLOWN FUSE ON A BOOSTER FAN.

ON JANUARY 21, ICE AND WIND STORMS PRODUCED A LOSS OF VOLTAGE POWER TO THE NORTH AND SOUTH MODULES THAT LED TO A DISRUPTION OF EQUIPMENT OPERATION.

THE NORTH AND SOUTH MODULES WERE NOT OPERATING FOR 38.5 HOURS DURING JANUARY DUE TO THE INJECTION OF OIL INTO THE BOILER.

THE UNIT WAS DOWN AT DIFFERENT TIMES DURING THE PERIOD OF JANUARY 1 THROUGH 13 FOR TESTING AND BALANCING OF THE TURBINE. FULL SERVICE DID NOT COMMENCE UNTIL JANUARY 13.

2/83	NORTH	67.2	69.4	92.6	67.4					

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	SOUTH SYSTEM	70.5 68.8	72.5 70.9	97.4 95.0	70.5 68.9		672	653	463	72.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE NORTH MODULE WAS UNAVAILABLE FOR 1.5 HOURS DURING FEBRUARY TO FIX AN ABSORBER FEED DUMP SEAL WATER LEAK.

BOTH MODULES WERE DOWN FOR 36 HOURS DURING THE MONTH DUE TO THE INJECTION OF OIL INTO THE BOILER AT LOW MW LOADS.

A BOILER TRIP ON FEBRUARY 1 PRODUCED A BRIEF 30 MINUTE OUTAGE.

AN 18 HOUR OUTAGE ON FEBRUARY 26 RESULTED FROM PRECIPITATOR REPAIRS.

3/83	NORTH	100.0	56.8	84.8	44.0					
	SOUTH	96.8	71.5	91.3	55.4					
	SYSTEM	98.4	64.1	88.1	49.7		744	577	370	48.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE NORTH MODULE WAS UNAVAILABLE FOR 24 HOURS ON MARCH 16-17 DUE TO THE PLUGGING OF A STORM SEWER.

THE NORTH MODULE WAS DOWN FOR 20 HOURS DURING MARCH DUE TO THE INJECTION OF OIL INTO THE BOILER AT LOW LOADS.

THE SOUTH MODULE WAS DOWN FOR 12.5 HOURS DURING MARCH DUE TO OIL INJECTION OF THE BOILER AT LOW LOADS.

4/83	NORTH	5.5	56.8	56.8	5.5					
	SOUTH	0.0	0.0	0.0	0.0					
	SYSTEM	2.7	28.4	28.4	2.7		720	70	20	5.6

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED BOILER OUTAGE TOOK PLACE DURING THE MONTH THROUGH APRIL 27. START-UP PROBLEMS WERE ENCOUNTERED UNTIL APRIL 28 AND OPERATIONS RESUMED ON APRIL 31.

BOTH MODULES WERE UNAVAILABLE DURING THE APRIL OUTAGE AS MAINTENANCE WORK WAS PERFORMED.

AT THE END OF APRIL, BOTH MODULES WERE UNAVAILABLE DUE TO PROBE PROBLEMS WITH THE TOWER SLURRY LEVEL SYSTEM.

5/83	NORTH	99.7	55.8	65.4	55.6					
	SOUTH	64.7	30.0	48.9	29.9					
	SYSTEM	82.2	42.9	57.1	42.8		744	743	318	62.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE SOUTH MODULE WAS UNAVAILABLE FROM MAY 9 TO MAY 19 DURING AN INSPECTION FOR PLUGGING. PACKING WAS CLEANED DURING THIS OUTAGE.

A CRACK IN THE SILENCER ON THE OX-AIR COMPRESSOR WAS WELDED DURING THE MAY 9 - MAY 19 OUTAGE.

A BRIEF OUTAGE OCCURRED ON MAY 21 TO CORRECT THE PH LEVEL AT THE SOUTH MODULE.

ON MAY 23 A LEAK WAS REPAIRED ON THE ABSORBER PRESSURE-INDICATING PROBE AT THE SOUTH MODULE.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

THE SOUTH MODULE BOOSTER FAN WAS BEING REPAIRED FROM MAY 24 TO MAY 31, 1983.

A TWO-HOUR OUTAGE OCCURRED ON MAY 2 AT THE NORTH MODULE TO REPLACE PACKING IN THE ABSORBER FEED PUMPS.

6/83	NORTH	99.9	75.3	98.6	69.9				
	SOUTH	99.6	80.2	93.5	74.4				
	SYSTEM	99.7	77.8	96.1	72.2	720	668	520	65.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING JUNE.

7/83	NORTH	86.2	88.3	97.9	88.0				
	SOUTH	90.5	92.0	98.6	91.8				
	SYSTEM	88.3	90.2	98.2	89.9	744	742	669	74.7

8/83	NORTH	100.0	92.3	100.0	85.8				
	SOUTH	100.0	93.6	100.0	86.9				
	SYSTEM	100.0	92.9	100.0	86.3	744	691	642	73.0

9/83	NORTH	100.0	98.1	100.0	75.9				
	SOUTH	100.0	97.0	99.4	75.1				
	SYSTEM	100.0	97.6	99.7	75.5	720	557	544	61.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE PERIOD OF JULY THROUGH SEPTEMBER 1983.

10/83	SYSTEM					744	0		0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS ON A SCHEDULED MAINTENANCE OUTAGE DURING THE MONTH OF OCTOBER

11/83	NORTH	100.0	91.8	96.1	73.5				
	SOUTH	100.0	93.9	99.6	75.3				
	SYSTEM	100.0	92.9	97.9	74.4	720	577	536	59.0

12/83	NORTH	99.5	97.7	99.5	95.2				
	SOUTH	98.0	95.3	97.9	92.9				
	SYSTEM	98.8	96.5	98.7	94.0	744	725	700	72.0

1/84	NORTH	96.8	97.9	99.7	92.7				
	SOUTH	95.2	96.7	100.0	91.5				
	SYSTEM	96.0	97.3	100.0	92.1	744	704	685	65.0

2/84	NORTH	100.0	95.4	100.0	95.4				
	SOUTH	100.0	94.5	100.0	94.5				
	SYSTEM	100.0	95.0	100.0	95.0	696	696	661	65.0

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING THE PERIOD OF NOVEMBER 1983 THROUGH FEBRUARY 1984.

3/84	NORTH	8.9	100.0	100.0	8.9				
	SOUTH	8.9	100.0	100.0	8.9				
	SYSTEM	8.9	100.0	100.0	8.9	744	66	66	5.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS REMOVED FROM SERVICE ON MARCH 3 FOR A 10-WEEK MAINTENANCE OUTAGE.

4/84	NORTH	0.0			0.0						
	SOUTH	0.0			0.0						
	SYSTEM	0.0			0.0			720	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OUT OF SERVICE FOR A MAINTENANCE OUTAGE DURING APRIL.

5/84	NORTH	20.3	87.7	99.3	17.8						
	SOUTH	20.3	97.7	100.0	19.8						
	SYSTEM	20.3	92.7	99.6	18.8			744	151	140	13.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS STARTED MAY 25 AFTER ITS SPRING MAINTENANCE OUTAGE.

6/84	NORTH	97.1	97.2	100.0	97.1						
	SOUTH	98.6	98.7		98.6						
	SYSTEM	97.8	98.0	100.0	97.8			720	719	705	77.0
7/84	NORTH	100.0	97.8	100.0	97.6						
	SOUTH	100.0	96.8	100.0	96.5						
	SYSTEM	100.0	97.3	100.0	97.0			744	742	722	75.0

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING JUNE AND JULY.

8/84	SYSTEM							744			
9/84	SYSTEM							720			

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR AUGUST AND SEPTEMBER 1984.

10/84	NORTH	7.1	80.9	100.0	7.1						
	SOUTH	7.3	83.2	100.0	7.3						
	SYSTEM	7.2	82.1	100.0	7.2			744	66	54	5.0

** PROBLEMS/SOLUTIONS/COMMENTS

BOILER AND FGD WERE OFF-LINE OCTOBER 1-29 DUE TO SCHEDULED UNIT OUTAGE.

11/84	SYSTEM							720			

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTH OF NOVEMBER.

12/84	NORTH	99.1	99.1	100.0	99.1						
	SOUTH	97.4	97.4	100.0	97.4						
	SYSTEM	98.3	98.3	100.0	98.3			744	744	731	77.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE MONTH OF DECEMBER.

1/85	S	99.1	98.6	99.8	93.1				
	N	97.3	96.6	99.7	91.2				
	SYSTEM	98.2	97.6	99.7	92.2	744	703	686	72.0
2/85	N	98.4	98.5	100.0	98.4				
	S	99.3	99.3	100.0	99.3				
	SYSTEM	98.8	98.9	100.0	98.8	672	672	664	74.0
3/85	N	94.2	97.8	100.0	94.2				
	S	95.2	98.9	99.9	95.2				
	SYSTEM	94.7	98.4	99.9	94.7	744	717	705	68.0
4/85	N	0.0			0.0				
	S	0.0			0.0				
	SYSTEM	0.0			0.0	720	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT AND FGD SYSTEM WERE OUT OF SERVICE FOR THE ENTIRE MONTH FOR A SCHEDULED SPRING MAINTENANCE OUTAGE.

5/85	N	91.3	96.9	98.8	90.5				
	S	92.8	98.4	98.8	91.9				
	SYSTEM	92.1	97.7	98.8	91.2	744	695	678	69.0
6/85	N	97.9	97.9	99.7	97.9				
	S	97.7	97.7	99.7	97.7				
	SYSTEM	97.8	97.8	99.7	97.8	720	720	704	77.0
7/85	N	98.2	98.2	100.0	98.2				
	S	99.2	99.2	100.0	99.2				
	SYSTEM	98.7	98.7	100.0	98.7	744	744	734	75.0
8/85	N	97.5	97.5	100.0	97.5				
	S	98.4	98.4	99.6	98.4				
	SYSTEM	98.0	98.0	99.8	98.0	744	744	729	68.0
9/85	N	96.3	96.3	100.0	96.3				
	S	98.8	98.8	99.6	98.8				
	SYSTEM	97.6	97.6	99.8	97.6	720	720	703	65.0
10/85	N	32.3	95.8	96.2	32.3				
	S	32.5	96.4	95.8	32.5				
	SYSTEM	32.4	96.1	96.0	32.4	744	251	241	65.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT AND FGD SYSTEM WERE OUT OF SERVICE FROM OCTOBER 12 THROUGH THE END OF THE MONTH FOR A SCHEDULED FALL MAINTENANCE OUTAGE.

11/85	N	76.9	93.2	98.9	72.4				
	S	75.2	93.9	99.5	72.9				
	SYSTEM	76.0	93.6	99.2	72.6	720	559	523	55.0
12/85	N	100.0	98.6	99.5	98.6				
	S	100.0	98.7	99.3	98.7				
	SYSTEM	100.0	98.7	99.4	98.7	744	744	734	74.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS
 OF JANUARY THROUGH DECEMBER.

1/86	NORTH	97.4	87.9	98.6	87.9				
	SOUTH	97.5	95.2	99.6	95.2				
	SYSTEM	97.5	91.6	99.1	91.6	744	744	681	67.0
2/86	NORTH	100.0	94.9	100.0	94.9				
	SOUTH	100.0	96.7	100.0	96.7				
	SYSTEM	100.0	95.8	100.0	95.8	672	672	644	69.0
3/86	NORTH	89.5	82.8	98.9	74.1				
	SOUTH	89.5	95.9	99.2	85.9				
	SYSTEM	89.5	89.4	99.1	80.0	744	666	595	57.0
4/86	NORTH	4.7	50.0	92.7	2.6				
	SOUTH	4.9	88.2	95.7	4.7				
	SYSTEM	4.8	69.1	94.2	3.6	720	38	26	3.0

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED UNIT SPRING OUTAGE BEGAN ON APRIL 1 AND CONTINUED UNTIL
 APRIL 29, 1986.

5/86	NORTH	100.0	91.4	100.0	91.4				
	SOUTH	100.0	88.6	100.0	88.6				
	SYSTEM	100.0	90.0	100.0	90.0	744	744	670	62.0
6/86	NORTH	100.0	95.2	100.0	95.2				
	SOUTH	100.0	94.2	100.0	94.2				
	SYSTEM	100.0	94.7	100.0	94.7	720	720	682	72.0
7/86	NORTH	98.8	90.0	100.0	90.0				
	SOUTH	100.0	89.4	100.0	89.4				
	SYSTEM	99.4	89.7	100.0	89.7	744	744	667	68.0
8/86	NORTH	99.7	83.3	99.8	83.3				
	SOUTH	99.3	88.0	99.8	88.0				
	SYSTEM	99.5	85.7	99.8	85.7	744	744	637	65.0
9/86	NORTH	100.0	86.7	100.0	86.7				
	SOUTH	100.0	94.9	100.0	94.9				
	SYSTEM	100.0	90.8	100.0	90.8	720	720	654	68.3
10/86	NORTH	26.3	86.5	95.5	22.8				
	SOUTH	26.3	90.8	95.7	23.9				
	SYSTEM	26.3	88.6	95.6	23.4	744	196	174	17.0

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS AVAILABLE DESCRIBING THE CAUSES OF LOW FGD SYSTEM
 AVAILABILITY.

11/86	NORTH	100.0	95.0	100.0	95.0				
	SOUTH	100.0	96.5	100.0	96.5				
	SYSTEM	100.0	95.7	100.0	95.7	720	720	689	70.0
12/86	NORTH	100.0	98.3	99.9	95.0				
	SOUTH	100.0	98.2	99.9	94.9				
	SYSTEM	100.0	98.2	99.9	94.9	744	719	706	69.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED NO MAJOR FGD SYSTEM-RELATED PROBLEMS FOR THE
 JANUARY - DECEMBER 1986 PERIOD.

1/87	NORTH	99.9	99.7	99.9	98.0				
	SOUTH	99.9	96.4	100.0	94.8				
	SYSTEM	99.9	98.1	100.0	96.4	744	732	717	73.6
2/87	NORTH	100.0	97.8	100.0	97.8				
	SOUTH	100.0	98.0	100.0	98.0				
	SYSTEM	100.0	97.9	100.0	97.9	672	672	658	73.0
3/87	NORTH	64.5	97.7	100.0	62.5				
	SOUTH	64.5	98.8	100.0	63.2				
	SYSTEM	64.5	98.3	100.0	62.9	744	476	468	45.0

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD JANUARY
 THROUGH MARCH.

4/87	NORTH	0.0			0.0				
	SOUTH	0.0			0.0				
	SYSTEM	0.0			0.0	720	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD SYSTEM WAS OUT OF SERVICE IN APRIL.
 NO DETAILS WERE AVAILABLE REGARDING THE OUTAGE.

5/87	NORTH	32.3	91.0	99.5	26.5				
	SOUTH	32.3	88.0	99.5	25.6				
	SYSTEM	32.3	89.5	99.5	26.0	744	217	194	18.6
6/87	NORTH	100.0	88.1	99.8	86.7				
	SOUTH	100.0	80.9	99.8	79.6				
	SYSTEM	100.0	84.5	99.8	83.2	720	709	599	61.9
7/87	NORTH	99.3	90.8	99.9	90.2				
	SOUTH	99.3	91.7	99.9	91.1				
	SYSTEM	99.3	91.2	99.9	90.6	744	739	674	73.0
8/87	NORTH	100.0	95.6	100.0	95.6				
	SOUTH	100.0	88.0	100.0	88.0				
	SYSTEM	100.0	91.8	100.0	91.8	744	744	683	70.0
9/87	NORTH	100.0	96.8	100.0	96.8				
	SOUTH	100.0	93.9	100.0	93.9				
	SYSTEM	100.0	95.3	100.0	95.3	720	720	687	71.0
10/87	NORTH	74.2	92.7	100.0	68.8				
	SOUTH	74.2	89.9	100.0	66.7				
	SYSTEM	74.2	91.3	100.0	67.7	744	552	504	47.0
11/87	NORTH	46.7	100.0	99.3	39.6				
	SOUTH	46.7	96.7	99.2	36.5				
	SYSTEM	46.7	98.3	99.3	38.0	720	272	274	26.0
12/87	NORTH	100.0	98.7	99.9	98.3				
	SOUTH	97.5	94.5	99.9	94.2				
	SYSTEM	98.8	96.6	99.9	96.2	744	741	716	70.8

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SPRINGFIELD WATER, LIGHT & PWR: DALLMAN 3 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD MAY
THROUGH DECEMBER 1987.

DO NOT MICROFILM
THIS TAPES

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	SUNFLOWER ELECTRIC	
PLANT NAME	HOLCOMB	
UNIT NUMBER	1	
CITY	HOLCOMB	
STATE	KANSAS	
REGULATORY CLASSIFICATION	B	
PARTICULATE EMISSION LIMITATION - NG/J	13.	(0.030 LB/MMBTU)
SO ₂ EMISSION LIMITATION - NG/J	206.	(0.480 LB/MMBTU)
NO _x EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	280	
GROSS UNIT GENERATING CAPACITY - MW	319	
NET UNIT GENERATING CAPACITY W/FGD - MW	294	
NET UNIT GENERATING CAPACITY WO/FGD - MW	312	
EQUIVALENT SCRUBBED CAPACITY - MW	319	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	BABCOCK & WILCOX	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	632.35	(1340000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	126.7	(260 F)
STACK HEIGHT - M	145.	(475 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	5.0	(16.3 FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	SUBBITUMINOUS	
AVERAGE HEAT CONTENT - J/G	19336.	(8313 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		7880-8250
AVERAGE ASH CONTENT - %	5.56	
RANGE ASH CONTENT - %	6.0-8.0	
AVERAGE MOISTURE CONTENT - %	29.70	
RANGE MOISTURE CONTENT - %	30.0-32.5	
AVERAGE SULFUR CONTENT - %	0.34	
RANGE SULFUR CONTENT - %	****	
AVERAGE CHLORIDE CONTENT - %	0.02	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
** FABRIC FILTER		
NUMBER	2	
SUPPLIER	JOY MANUFACTURING	
NUMBER OF COMPARTMENTS	14	
NUMBER OF SPARE COMPARTMENTS	2	
INLET FLUE GAS CAPACITY - CU.M/S	316.2	(670000 ACFM)
INLET FLUE GAS TEMPERATURE - C	81.7	(179 F)
PRESSURE DROP - KPA	7.5	(30.0 IN-H ₂ O)
PARTICLE REMOVAL EFFICIENCY - %	99.0	
TYPICAL GAS/CLOTH RATIO - M/MIN	0.6	(2.0 FT/MIN)
** ESP		
NUMBER	0	
TYPE	NONE	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SUNFLOWER ELECTRIC: HOLCOMB 1 (CONT.)

GAS CONTACTING DEVICE TYPE	N/A

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	SPRAY DRYING
PROCESS TYPE	LIME/SPRAY DRYING
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	JOY MFG/NIRO ATOMIZER
A-E FIRM	UNITED ENGINEERS & CONSTRUCTORS
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.87
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	80.00
ENERGY CONSUMPTION - %	5.6
CURRENT STATUS	1
COMMERCIAL START-UP	8/1983
INITIAL START-UP	7/1983
CONTRACT AWARDED	6/1980

** DESIGN AND OPERATING PARAMETERS

DESIGN COAL SULFUR CONTENT - %	1.00	
DESIGN COAL HEAT CONTENT - J/G	18142.8	(7800 BTU/LB)
DESIGN COAL ASH CONTENT - %	12.00	
DESIGN CHLORIDE CONTENT - %	*****	

** QUENCHER/PRESATURATOR

CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR

** ABSORBER

NUMBER	3	
NUMBER OF SPARES	1	
GENERIC TYPE	SPRAY DRYER	
SPECIFIC TYPE	NR	
TRADE NAME/COMMON TYPE	ROTARY ATOMIZER	
DIMENSIONS - FT	50.9 FT DIA. X 39.4 FT HT. X 60 DEG. CONE UNDER	
SHELL GENERIC MATERIAL	NR	
SHELL SPECIFIC MATERIAL	NR	
SHELL MATERIAL TRADE NAME/COMMON TYPE	NR	
LINER GENERIC MATERIAL	NONE	
LINER SPECIFIC MATERIAL	N/A	
LINER MATERIAL TRADE NAME/COMMON TYPE	N/A	
INLET GAS FLOW - CU. M/S	316.17	(670000 ACFM)
INLET GAS TEMPERATURE - C	120.6	(249 F)
SO2 REMOVAL EFFICIENCY - %	80.0	
PARTICLE REMOVAL EFFICIENCY - %	99.8	

** MIST ELIMINATOR

PRE-MIST ELIMINATOR/MIST ELIMINATOR	NONE
NUMBER PER SYSTEM	0
GENERIC TYPE	N/A
SPECIFIC TYPE	N/A
TRADE NAME/COMMON TYPE	N/A
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR

** REHEATER

NUMBER	0
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON TYPE	N/A
CONSTRUCTION MATERIAL GENERIC TYPE	NONE
CONSTRUCTION MATERIAL SPECIFIC TYPE	N/A

** FANS

NUMBER	2
NUMBER OF SPARES	0
DESIGN	NR
FUNCTION	NR

SUNFLOWER ELECTRIC: HOLCOMB 1 (CONT.)

APPLICATION	FORCED DRAFT
SERVICE	DRY
CONSTRUCTION MATERIAL GENERIC TYPE	NR
** FANS	
NUMBER	2
NUMBER OF SPARES	0
DESIGN	NR
FUNCTION	NR
APPLICATION	INDUCED DRAFT
SERVICE	DRY
FLUE GAS TEMPERATURE - C	82.2 (180 F)
CONSTRUCTION MATERIAL GENERIC TYPE	NR
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	BOILER TO ATOMIZER
DIMENSIONS	165.0 X 11.0 X 16.5
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	SLAKER
DEVICE	BALL MILL
DEVICE TYPE	NR
MANUFACTURER	DENVER
NUMBER	4
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	2.7 (3 TPH)
PRODUCT QUALITY - % SOLIDS	20.0
** TANKS	
SERVICE	NUMBER
-----	-----
REAGENT PREP PRODUCT	6
** PUMPS	
SERVICE	NUMBER
-----	-----
LIME MILK TRANSFER	6
LIME MILK STORAGE	4
RECYCLE SLURRY TRANSFER	4
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	NONE
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	UNSTABILIZED
DEVICE	PUG MILL
PROPRIETARY PROCESS	N/A

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SUNFLOWER ELECTRIC: HOLCOMB 1 (CONT.)

** DISPOSAL
 NATURE FINAL
 TYPE LANDFILL
 LOCATION ON-SITE
 SITE TRANSPORTATION METHOD TRUCK
 SITE TREATMENT NONE
 SITE DIMENSIONS 35 ACRES
 SITE SERVICE LIFE - YRS 35

** PROCESS CONTROL AND INSTRUMENTATION
 CONTROL LEVELS FINAL WASTE = 30% MOISTURE

** WATER BALANCE
 WATER LOOP TYPE CLOSED 'DESIGN!
 SOURCE OF MAKEUP WATER 6 DEEP WELLS

** CHEMICALS AND CONSUMPTION
 FUNCTION ABSORBENT
 NAME LIME
 CONSUMPTION 2.3 TPH

** FGD SPARE CAPACITY INDICES
 ABSORBER - % 50.0

** FGD SPARE COMPONENT INDICES
 ABSORBER 1.0

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

7/83 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT INITIAL START-UP COMMENCED IN JULY, 1983.

8/83 SYSTEM 744

9/83 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED TYPICAL PROBLEMS ASSOCIATED WITH START-UP DURING THE ENTIRE THIRD QUARTER. COMPUTER PROBLEMS WERE EXPERIENCED DURING THE LAST WEEK OF SEPTEMBER AND REQUIRED THE REPLACEMENT OF A DISK.

10/83 SYSTEM 744

11/83 SYSTEM 720

12/83 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE FOURTH QUARTER OF 1983.

1/84 SYSTEM 744

2/84 SYSTEM 696

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS DOWN APPROXIMATELY FOUR WEEKS DURING THE LAST PART OF JANUARY AND THE FIRST PART OF FEBRUARY FOR ABSORBER CLEANING.

3/84 SYSTEM 744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SUNFLOWER ELECTRIC: HOLCOMB 1 (CONT.)

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

4/84	SYSTEM							720			
5/84	SYSTEM							744			
6/84	SYSTEM							720			
7/84	SYSTEM							744			
8/84	SYSTEM							744			
9/84	SYSTEM							720			

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT OVERALL FGD SYSTEM AVAILABILITY DURING THE FIRST THREE QUARTERS OF 1984 WAS ESTIMATED AT 85%. NO MAJOR FGD-RELATED OUTAGES WERE REPORTED.

10/84	SYSTEM							744			
11/84	SYSTEM							720			
12/84	SYSTEM							744			

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FOR APPROXIMATELY 6 WEEKS DURING OCTOBER AND NOVEMBER FOR GENERATOR ROTOR REPAIRS. NO FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE PERIOD.

1/85	A	100.0	52.7	100.0	52.2						
	B	100.0	67.7	100.0	66.9						
	C	100.0	48.2	100.0	47.7						
	SYSTEM	100.0	84.3	100.0	83.4			744	736	621	54.7

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTH OF JANUARY.

2/85	A	71.9	20.4	97.2	20.4						
	B	100.0	59.3	100.0	59.2						
	C	100.0	67.5	100.0	67.4						
	SYSTEM	100.0	73.6	100.0	73.5			672	671	494	60.7

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS FORCED OUT OF SERVICE ON FEBRUARY 22 WHEN A CRACK WAS FOUND ON A 4160V ATOMIZER CONNECTOR. THE REPLACEMENT PARTS WERE STILL ON ORDER AS THE MONTH CAME TO A CLOSE.

3/85	A	0.0	2.2	100.0	2.2						
	B	100.0	74.8	100.0	73.9						
	C	100.0	95.2	100.0	94.1						
	SYSTEM	100.0	86.1	100.0	85.1			744	735	633	63.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE A TRAIN WAS STILL OUT OF SERVICE IN MARCH. THIS SECTION OF THE FGD SYSTEM WAS USED AS A BY-PASS PATH WHILE OTHER TRAINS WERE INSPECTED DURING THE MONTH.

4/85	A	100.0	53.7	97.5	54.7						

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SUNFLOWER ELECTRIC: HOLCOMB 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	B	100.0	69.4	98.1	70.7					
	C	100.0	42.9	98.4	43.8					
	SYSTEM	100.0	83.0	100.0	84.6		720	734	609	62.0
** PROBLEMS/SOLUTIONS/COMMENTS										
NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTH OF APRIL.										
5/85	SYSTEM						744			
** PROBLEMS/SOLUTIONS/COMMENTS										
NO INFORMATION WAS AVAILABLE FOR THE MONTH OF MAY.										
6/85	A	99.2	40.2		36.4					
	B	98.3	95.1		86.1					
	C	99.2	50.6		45.8					
	SYSTEM	100.0	92.9		84.2		720	652	606	48.0
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT MODULES A, B AND C WERE OUT OF SERVICE DURING PART OF THE MONTH FOR A SCHEDULED INSPECTION.										
7/85	A	100.0	79.8	100.0	69.0					
	B	100.0	67.2	100.0	58.1					
	C	100.0	35.3	100.0	30.5					
	SYSTEM	100.0	91.2	100.0	78.8		744	643	586	55.0
** PROBLEMS/SOLUTIONS/COMMENTS										
NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTH OF JULY.										
8/85	A	100.0	74.7		74.1					
	B	100.0	61.0		60.5					
	C	74.2	30.6		30.4					
	SYSTEM	100.0	83.1		82.5		744	738	614	59.0
** PROBLEMS/SOLUTIONS/COMMENTS										
MODULE C WAS UNAVAILABLE FOR SPRAYING SERVICE BECAUSE OF A FAULTY ATOMIZER INSTRUMENTATION LEAD CABLE/WIRE. AFTER ATOMIZER REMOVAL THE MODULE WAS AVAILABLE FOR USE AS A BY-PASS PATH DURING A AND B MODULE INSPECTION.										
9/85	A	100.0	59.0		59.0					
	B	100.0	72.6		72.6					
	C	76.7	18.5		18.5					
	SYSTEM	100.0	75.1		75.1		720	720	540	50.0
** PROBLEMS/SOLUTIONS/COMMENTS										
THE C-MODULE ABSORBER WAS OUT OF SERVICE FOR 168 HOURS OF THE MONTH AS FAULTY VIBRATION INSTRUMENTATION CABLE PROBLEMS CONTINUED FROM LAST MONTH.										
10/85	A	87.1	0.0		0.0					
	B	87.1	81.2	100.0	70.7					
	C	87.1	54.6	100.0	47.6					
	SYSTEM	100.0	67.9	100.0	59.1		744	648	440	44.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SUNFLOWER ELECTRIC: HOLCOMB 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS NOT USED DURING THE MONTH OF OCTOBER BECAUSE OF INLET ISOLATION DAMPER PROBLEMS. THE ABSORBER WAS AVAILABLE BUT THE DAMPER DRIVER WOULD NOT CLOSE THE DAMPER COMPLETELY IF MODULE SHUTDOWN WAS REQUIRED.

11/85	A	100.0	0.0		0.0				
	B	100.0	71.7	100.0	71.7				
	C	100.0	67.1	100.0	67.1				
	SYSTEM	100.0	69.4	100.0	69.4	720	720	500	51.0

12/85	A	100.0	3.8		3.8				
	B	100.0	72.0		72.0				
	C	100.0	63.3		63.3				
	SYSTEM	100.0	69.6		69.6	744	744	518	50.2

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A DAMPER PROBLEMS CONTINUED THROUGH NOVEMBER AND DECEMBER. NO OTHER FGD SYSTEM PROBLEMS WERE REPORTED BY THE UTILITY.

1/86	A	100.0	8.2	100.0	8.2				
	B	100.0	70.0	100.0	69.9				
	C	100.0	44.4	100.0	44.4				
	SYSTEM	100.0	61.3	100.0	61.2	744	742	455	47.6

** PROBLEMS/SOLUTIONS/COMMENTS

MODULE A WAS ONLY USED SPARINGLY BECAUSE A CONTINUING ISOLATION DAMPER PROBLEM DOES NOT PERMIT MODULE ISOLATION.

IMPROVEMENTS IN OPACITY AND PARTICULATE REMOVAL EFFICIENCY WERE NOTED AS A RESULT OF THE REPLACEMENT OF TWO BAGS IN THE BAG HOUSE. HOLES HAD FORMED IN THE OLD BAGS.

2/86	A	100.0	0.0		0.0				
	B	100.0	80.7		80.7				
	C	100.0	19.3		19.3				
	SYSTEM	100.0	50.0		50.0	672	672	336	48.2

** PROBLEMS/SOLUTIONS/COMMENTS

BECAUSE OF ISOLATION DAMPER PROBLEMS MODULE A WAS NOT OPERATED AT ALL AND MODULE C WAS ONLY USED MINIMALLY. THE UTILITY WAS UNABLE TO ISOLATE AND INSPECT ABSORBERS.

3/86	A	100.0	31.5		28.2				
	B	100.0	81.4		72.8				
	C	100.0	57.5		51.5				
	SYSTEM	100.0	85.3		76.3	744	666	568	63.2

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR MARCH.

4/86	A	100.0			0.0				
	B	100.0			0.0				
	C	100.0			0.0				
	SYSTEM	100.0			0.0	720	0	0	0.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SUNFLOWER ELECTRIC: HOLCOMB 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS TAKEN OUT OF SERVICE FOR A SCHEDULED OUTAGE IN APRIL.

5/86	A	98.8	52.1	51.7				
	B	98.8	26.8	26.6				
	C	98.8	47.6	47.3				
	SYSTEM	100.0	63.3	62.8	744	739	468	42.9

** PROBLEMS/SOLUTIONS/COMMENTS

HOLCOMB 1 HAS BEEN AVERAGING 5.1 LBS/MWH OF LIME TO MAINTAIN AN SO2 REMOVAL EFFICIENCY OF 73% (30 DAY ROLLING AVERAGE) FOR THE PAST 1.5 YEARS.

6/86	A	100.0	27.7	27.6				
	B	100.0	46.8	46.7				
	C	100.0	45.0	44.9				
	SYSTEM	100.0	59.8	59.6	720	718	429	60.5

7/86	SYSTEM				774			

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS AVAILABLE FOR THE MONTH OF JULY.

8/86	A	100.0	63.4	63.4				
	B	100.0	41.3	41.3				
	C	100.0	41.3	41.3				
	SYSTEM	100.0	73.0	73.0	744	744	543	57.3

9/86	A	100.0	49.6	49.3				
	B	100.0	38.0	37.8				
	C	100.0	80.1	79.7				
	SYSTEM	100.0	83.8	83.4	720	716	600	53.0

10/86	A	100.0	43.7	43.7				
	B	100.0	75.3	75.3				
	C	100.0	13.4	13.4				
	SYSTEM	100.0	66.2	66.2	744	744	492	46.3

11/86	A	100.0	51.0	51.0				
	B	100.0	77.8	77.8				
	C	100.0	65.1	65.1				
	SYSTEM	100.0	96.9	96.9	720	720	698	57.3

12/86	A	100.0	61.2	60.1				
	B	100.0	48.3	47.4				
	C	100.0	82.0	80.5				
	SYSTEM	100.0	95.7	94.0	744	731	700	56.1

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE ENTIRE SECOND HALF OF 1986.

1/87	A	100.0	43.8	43.8				
	B	100.0	34.3	34.3				
	C	100.0	40.6	40.6				
	SYSTEM	100.0	59.3	59.3	744	744	442	51.4

2/87	A	100.0	39.1	39.1				

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SUNFLOWER ELECTRIC: HOLCOMB 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD HOURS	CAP. FACTOR
	B	100.0	81.1		81.1					
	C	100.0	7.9		7.9					
	SYSTEM	100.0	64.1		64.1		672	672	431	57.2
3/87	A	100.0	48.6		43.8					
	B	100.0	75.6		68.1					
	C	100.0	15.5		14.0					
	SYSTEM	100.0	69.9		63.0		744	671	469	51.0
** PROBLEMS/SOLUTIONS/COMMENTS										
NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD JANUARY THROUGH MARCH.										
4/87	A	100.0	60.6		34.3					
	B	100.0	99.9		56.5					
	C	100.0	56.2		31.8					
	SYSTEM	100.0	100.0		61.3		720	408	441	34.5
5/87	A	100.0	68.4		33.2					
	B	100.0	61.5		29.8					
	C	100.0	66.5		32.3					
	SYSTEM	100.0	98.2		47.6		744	361	355	43.7
** PROBLEMS/SOLUTIONS/COMMENTS										
UNIT WAS OFF-LINE FROM 4/10 TO 5/15 FOR A SCHEDULED ANNUAL OUTAGE.										
6/87	A	100.0	58.9		58.9					
	B	100.0	68.5		68.5					
	C	100.0	89.3		89.3					
	SYSTEM	100.0	100.0		100.0		720	720	720	72.3
7/87	A	100.0	21.4		17.5					
	B	100.0	40.2		32.8					
	C	100.0	92.0		75.0					
	SYSTEM	100.0	76.8		62.6		744	607	466	60.4
8/87	A	100.0	34.8	100.0	34.8					
	B	100.0	43.3	100.0	43.3					
	C	100.0	66.5	100.0	66.4					
	SYSTEM	100.0	72.3	100.0	72.2		744	743	538	65.8
9/87	A	100.0	40.0		40.0					
	B	100.0	45.0		45.0					
	C	100.0	50.6		50.6					
	SYSTEM	100.0	67.8		67.8		720	719	488	59.9
10/87	A	100.0	46.2		46.2					
	B	100.0	45.6		45.6					
	C	100.0	87.6		87.6					
	SYSTEM	100.0	89.7		89.7		744	744	668	69.2
11/87	A	100.0	77.8	100.0	77.8					
	B	100.0	97.2	100.0	97.2					
	C	100.0	29.2	100.0	29.2					
	SYSTEM	100.0	100.0	100.0	100.0		720	720	720	59.3
12/87	A	100.0	75.3	100.0	75.3					
	B	100.0	55.4	100.0	55.4					
	C	100.0	13.6	100.0	13.6					
	SYSTEM	100.0	72.2	100.0	72.1		744	743	537	58.1

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

SUNFLOWER ELECTRIC: HOLCOMB 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS	FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD JUNE
THROUGH DECEMBER 1987.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	TAMPA ELECTRIC	
PLANT NAME	BIG BEND	
UNIT NUMBER	4	
CITY	TAMPA	
STATE	FLORIDA	
REGULATORY CLASSIFICATION	A	
PARTICULATE EMISSION LIMITATION - NG/J	13.	(0.030 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	*****	
GROSS UNIT GENERATING CAPACITY - MW	455	
NET UNIT GENERATING CAPACITY W/FGD - MW	419	
NET UNIT GENERATING CAPACITY WO/FGD - MW	435	
EQUIVALENT SCRUBBED CAPACITY - MW	455	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	775.33	(1643000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	130.6	(267 F)
STACK HEIGHT - M	149.	(490 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	7.3	(24.0 FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	****	
AVERAGE HEAT CONTENT - J/G	24411.	(10495 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		8000-12600
AVERAGE ASH CONTENT - %	10.50	
RANGE ASH CONTENT - %	7.3-13.7	
AVERAGE MOISTURE CONTENT - %	11.00	
RANGE MOISTURE CONTENT - %	5.5-30.0	
AVERAGE SULFUR CONTENT - %	3.50	
RANGE SULFUR CONTENT - %	0.1-0.2	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	0.04-0.20	
*** PARTICLE CONTROL		
** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	N/A	
** FABRIC FILTER		
NUMBER	0	
** ESP		
NUMBER	2	
TYPE	COLD SIDE	
SUPPLIER	BELCO	
INLET FLUE GAS CAPACITY - CU.M/S	1038.2	(2200000 ACFM)
INLET FLUE GAS TEMPERATURE - C	171.1	(340 F)
PRESSURE DROP - KPA	0.1	(1. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.7	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	

TAMPA ELECTRIC: BIG BEND 4 (CONT.)

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	SALEABLE PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	RESEARCH-COTTRELL
A-E FIRM	STONE & WEBSTER
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.80
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	90.00
ENERGY CONSUMPTION - %	3.5
CURRENT STATUS	1
COMMERCIAL START-UP	2/1985
INITIAL START-UP	12/1984
CONTRACT AWARDED	4/1980

** DESIGN AND OPERATING PARAMETERS

DESIGN CHLORIDE CONTENT - %	*****

** QUENCHER/PRESATURATOR

CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR

** ABSORBER

NUMBER	4
NUMBER OF SPARES	1
GENERIC TYPE	COMBINATION TOWER
SPECIFIC TYPE	SPRAY/PACKED
TRADE NAME/COMMON TYPE	N/A
SUPPLIER	RESEARCH-COTTRELL
DIMENSIONS - FT	36.0 DIA X 80.0
SHELL GENERIC MATERIAL	HIGH ALLOY
SHELL SPECIFIC MATERIAL	IRON BASE/NICKEL-CHROMIUM-COPPER-MOLYBDENUM
SHELL MATERIAL TRADE NAME/COMMON TYPE	ALLOY 904L
LINER GENERIC MATERIAL	NONE
LINER SPECIFIC MATERIAL	N/A
LINER MATERIAL TRADE NAME/COMMON TYPE	N/A
GAS CONTACTING DEVICE TYPE	VERTICAL CROSS CHANNEL FIXED GRID PACKING
NUMBER OF CONTACTING ZONES	5
DISTANCE BETWEEN GAS CONTACTING ZONES - CM	61.0 (24.0IN)
L/G RATIO - L/CU.M	12.3 (92.0 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	0.9 (3.5 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/SEC	2.8 (9.1 FT/S)
INLET GAS FLOW - CU. M/S	267.41 (566666 ACFM)
SO2 REMOVAL EFFICIENCY - %	90.0

** MIST ELIMINATOR

PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
NUMBER PER SYSTEM	2
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
CONFIGURATION	VERTICAL
NUMBER OF STAGES	2
PRESSURE DROP - KPA	0.3 (1.2 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPROPYLENE
WASH WATER SOURCE	FRESH
WASH FREQUENCY	INTERMITTENT
WASH RATE - L/S	22.0 (349 GAL/MIN)

** REHEATER

GENERIC TYPE	INDIRECT HOT AIR
SPECIFIC TYPE	EXTERNAL HEAT EXCHANGER
TRADE NAME/COMMON TYPE	STEAM TUBE BUNDLE
TEMPERATURE INCREASE - C	16.7 (30 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TAMPA ELECTRIC: BIG BEND 4 (CONT.)

CONSTRUCTION MATERIAL SPECIFIC TYPE	ASTM A-214
** FANS	
NUMBER	4
NUMBER OF SPARES	1
DESIGN	CENTRIFUGAL
SUPPLIER	WESTINGHOUSE
FUNCTION	BOOSTER
APPLICATION	NR
SERVICE	DRY
FLUE GAS TEMPERATURE - C	171.1 (340 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	INLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	OUTLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
** DUCTWORK	
LOCATION	MIXING CHAMBER
SHELL GENERIC MATERIAL TYPE	HIGH ALLOY
SHELL SPECIFIC MATERIAL TYPE	IRON BASE/NICKEL-CHROMIUM-COPPER-MOLYBDENUM
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED
DEVICE TYPE	NR
MANUFACTURER	KENNEDY VAN SAUN
NUMBER	2
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	25.4 (28 TPH)
PRODUCT QUALITY - % SOLIDS	40.0
** TANKS	
SERVICE	NUMBER
-----	-----
ABSORBER RECYCLE	4
REAGENT PREP PRODUCT	2
PRESATURATOR/QUENCHER	2
** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER & PACKING SPRAY	12
FLUE GAS COOLING	8
REAGENT FEED	4
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	VACUUM FILTER
NUMBER	2
NUMBER OF SPARES	1
CAPACITY	1100 TON/DAY

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TAMPA ELECTRIC: BIG BEND 4 (CONT.)

SHELL GENERIC MATERIAL TYPE	CARBON STEEL
FEED STREAM CHARACTERISTICS	30% SOLIDS
OUTLET STREAM CHARACTERISTICS	90% SOLIDS
*** SALEABLE BYPRODUCTS	
NATURE	GYPSUM
FULL LOAD QUANTITY - M T/H	36.28 (40.00 TPH)
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	FORCED OXIDATION
DEVICE	NR
PROPRIETARY PROCESS	N/A
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
SITE TREATMENT	N/A
** PROCESS CONTROL AND INSTRUMENTATION	
CHEMICAL PARAMETERS	SO2 WITH PH BACKUP & DENSITY
CONTROL LEVELS	PH 6.0-6.5
MONITOR LOCATION	IN LINE
PROCESS CONTROL MANNER	AUTOMATIC
PROCESS CHEMISTRY MODE	FEEDBACK/FEED FORWARD
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
EVAPORATION WATER LOSS - LITER/S	25.2 (400 GPM)
POND SEEPAGE/RUNOFF WATER LOSS - LITERS/S	24
MAKEUP WATER ADDITION - LITERS/S	31.5 (500 GPM)

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

12/84	SYSTEM							744	

** PROBLEMS/SOLUTIONS/COMMENTS

UTILITY ANNOUNCED THAT INITIAL OPERATIONS OF THE FGD SYSTEM ON BIG BEND 4 COMMENCED ON DECEMBER 5, 1984.

1/85	SYSTEM							744	

2/85	SYSTEM							672	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE PLANT WAS DECLARED COMMERCIAL ON FEBRUARY 25, 1985.

3/85	SYSTEM							744	

4/85	SYSTEM							720	

5/85	SYSTEM							744	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TAMPA ELECTRIC: BIG BEND 4 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT DURING THE EARLY PART OF 1985 THE UNIT DID NOT HAVE TO REDUCE LOAD DUE TO THE FGD SYSTEM AND WAS IN COMPLIANCE THE ENTIRE YEAR, ACHIEVING ALMOST A 90% SO2 REMOVAL EFFICIENCY. HOWEVER, THE SYSTEM SUPPLIER WAS STILL TRYING TO MEET DESIGN WARRANTIES REGARDING SO2 REMOVAL, CLOSED-LOOP OPERATION, AND GYPSUM QUALITY.

6/85	SYSTEM	720
7/85	SYSTEM	744
8/85	SYSTEM	744
9/85	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT DURING THE MONTHS OF JUNE THROUGH SEPTEMBER NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED. THE UNIT IS SCHEDULED TO COME OFF LINE IN OCTOBER FOR SCHEDULED MAINTENANCE.

10/85	SYSTEM	744
11/85	SYSTEM	720
12/85	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE FOURTH QUARTER, 1985, THE UNIT AND FGD SYSTEM WERE OFF-LINE 3 WEEKS IN OCTOBER FOR SCHEDULED MAINTENANCE. DURING THIS OUTAGE PERIOD, REPAIRS WERE MADE TO THE ABSORBER OUTLET DUCTWORK NEAR THE INDIRECT RE-HEAT DUCTWORK. ALLOY C-276 WILL BE "WALL PAPERED" TO THE DUCTWORK. THIS WORK IS SCHEDULED TO BE COMPLETED DURING THE NEXT SPRING OUTAGE PERIOD.

THE UNIT REMAINED IN COMPLIANCE WITH SO2 EMISSIONS STANDARDS THROUGH ALL BUT 24 HOURS OF THE MONTH. THE FGD SYSTEM LOGGED MANY HOURS OF 4-MODULE OPERATION DURING THE PERIOD.

MOST OF THE PROBLEMS/MAINTENANCE REPORTED DURING THE PERIOD WERE ASSOCIATED WITH THE MIST ELIMINATOR OPERATION.

SOME RECYCLE PUMP MAINTENANCE WORK WAS PERFORMED DURING SEPTEMBER.

SCRUBBER RECYCLE NOZZLES UNDERWENT CLEANING DURING THE MONTH. NEW RECYCLE PUMP HEADER DIRECTIONAL FLOW NOZZLES WERE INSTALLED.

DURING THE MONTH THE ABSORBERS WERE CLEANED ON A ROTATING BASIS. ONE OF THE ABSORBER ACCESS DOORS REQUIRED MAINTENANCE/REPAIR OF THE HINGES.

THE UNIT MAINTAINED SO2 COMPLIANCE FOR ALL BUT 5.3 HOURS DURING OCTOBER. 4-MODULE FGD SYSTEM OPERATIONS CONTINUED THROUGH THE PERIOD.

MIST ELIMINATOR CLEANING WAS REQUIRED FREQUENTLY THROUGHOUT THE MONTH. A MIST ELIMINATOR REPLACEMENT TOOK PLACE IN OCTOBER. SOME MIST ELIMINATOR SPRAY NOZZLES AND A NOZZLE HEADER REQUIRED MAINTENANCE WORK.

RECYCLE PUMP HEADER CLEANING WAS PERFORMED DURING THE MONTH.

SO2 COMPLIANCE WAS MAINTAINED FOR ALL BUT 6.8 HOURS DURING NOVEMBER. 4-MODULE OPERATION CONTINUED THROUGH THE PERIOD. THE UTILITY REPORTED SOME MODULE DOWNTIME ATTRIBUTED TO AN UNSPECIFIED EMERGENCY VALVE

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TAMPA ELECTRIC: BIG BEND 4 (CONT.)

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS	FACTOR

CLEANING/REPLACEMENT.

CLEANING OF THE MIST ELIMINATORS WAS PERFORMED AND SOME CLEANING AND SPRAY NOZZLE MAINTENANCE WORK WAS COMPLETED DURING NOVEMBER.

THE ABSORBERS WERE CLEANED DURING THE MONTH ON A ROTATING BASIS.

THE UNIT MAINTAINED SO2 COMPLIANCE FOR ALL BUT 16.6 HOURS THROUGH DECEMBER. 4-MODULE OPERATION CONTINUED THROUGH THE MONTH (3 ARE REQUIRED FOR FULL LOAD OPERATION AS DESIGNED).

MIST ELIMINATOR CLEANING WAS THE ONLY PROBLEM/MAINTENANCE ITEM IDENTIFIED BY THE UTILITY FOR DECEMBER.

1/86	SYSTEM									774
2/86	SYSTEM									672
3/86	SYSTEM									774
4/86	SYSTEM									720
5/86	SYSTEM									774
6/86	SYSTEM									720
7/86	SYSTEM									774
8/86	SYSTEM									774
9/86	SYSTEM									720
10/86	SYSTEM									774
11/86	SYSTEM									720
12/86	SYSTEM									774

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE YEAR 1986. THE UNIT HAD A FOUR WEEK SCHEDULED OUTAGE WHICH WAS TO BE FEBRUARY 17-MARCH 17 BUT HAD TO BE EXTENDED TO APRIL 7 DUE TO ADDITIONAL NEEDED REPAIRS. DURING THIS PERIOD, REPAIRS WERE MADE TO THE C-276 LINING IN THE ABSORBER OUTLET DUCTWORK.

1/87	SYSTEM									744
2/87	SYSTEM									672
3/87	SYSTEM									744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR UNIT OR FGD-RELATED OUTAGES WERE ENCOUNTERED THE FIRST QUARTER OF 1987.

4/87	SYSTEM									720
5/87	SYSTEM									744
6/87	SYSTEM									720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TAMPA ELECTRIC: BIG BEND 4 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT WAS OFF-LINE APRIL 11 THROUGH JUNE 2
FOR A SCHEDULED 7 WEEK MAINTENANCE OUTAGE.

7/87	SYSTEM									744
8/87	SYSTEM									744
9/87	SYSTEM									720
10/87	SYSTEM									744
11/87	SYSTEM									720
12/87	SYSTEM									744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO OTHER FGD-RELATED OR UNIT OUTAGES WERE
ENCOUNTERED FOR THE REMAINDER OF THE YEAR. THE UNIT OPERATED A TOTAL OF
7258 HOURS IN 1987.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	TENNESSEE VALLEY AUTHORITY	
PLANT NAME	PARADISE	
UNIT NUMBER	1	
CITY	PARADISE	
STATE	KENTUCKY	
REGULATORY CLASSIFICATION	C	
PARTICULATE EMISSION LIMITATION - NG/J	47.	(0.110 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	387.	(0.900 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	2558	
GROSS UNIT GENERATING CAPACITY - MW	704	
NET UNIT GENERATING CAPACITY W/FGD - MW	650	
NET UNIT GENERATING CAPACITY WO/FGD - MW	668	
EQUIVALENT SCRUBBED CAPACITY - MW	704	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	BABCOCK & WILCOX	
BOILER TYPE	CYCLONE	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	1014.58	(2150000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	148.9	(300 F)
STACK HEIGHT - M	183.	(600 FT)
STACK SHELL	NR	
STACK TOP DIAMETER - M	7.9	(26.0 FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	29075.	(12500 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		****
AVERAGE ASH CONTENT - %	17.30	
RANGE ASH CONTENT - %	****	
AVERAGE MOISTURE CONTENT - %	10.00	
RANGE MOISTURE CONTENT - %	****	
AVERAGE SULFUR CONTENT - %	3.20	
RANGE SULFUR CONTENT - %	****	
AVERAGE CHLORIDE CONTENT - %	0.10	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** ESP		
NUMBER	1	
** PARTICLE SCRUBBER		
NUMBER	6	
NUMBER OF SPARES	1	
GENERIC TYPE	VENTURI TOWER	
SPECIFIC TYPE	VARIABLE-THROAT/TOP-ENTRY PLUMB BOB	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	STAINLESS STEEL	
SHELL SPECIFIC MATERIAL	AUSTENITIC	
LINER GENERIC MATERIAL	NONE	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	NONE	
*** FGD SYSTEM		
** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	
PROCESS TYPE	LIMESTONE	
SYSTEM SUPPLIER	GE ENVIRONMENTAL SERVICES	
A-E FIRM	IN-HOUSE	
DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	RETROFIT	
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	94.20	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	84.00	
ENERGY CONSUMPTION - %	2.6	

TENNESSEE VALLEY AUTHORITY: PARADISE 1 (CONT.)

CURRENT STATUS	1	
COMMERCIAL START-UP	7/1983	
INITIAL START-UP	5/1983	
CONTRACT AWARDED	3/1979	
** DESIGN AND OPERATING PARAMETERS		
DESIGN CHLORIDE CONTENT - %	*****	
** QUENCHER/PRESATURATOR		
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** ABSORBER		
NUMBER	6	
NUMBER OF SPARES	1	
GENERIC TYPE	COMBINATION TOWER	
SPECIFIC TYPE	VENTURI/SPRAY	
TRADE NAME/COMMON TYPE	N/A	
SHELL GENERIC MATERIAL	STAINLESS STEEL	
SHELL SPECIFIC MATERIAL	AUSTENITIC	
SHELL MATERIAL TRADE NAME/COMMON TYPE	TYPE 317L	
LINER GENERIC MATERIAL	NONE	
LINER SPECIFIC MATERIAL	N/A	
LINER MATERIAL TRADE NAME/COMMON TYPE	N/A	
GAS CONTACTING DEVICE TYPE	NONE	
NUMBER OF CONTACTING ZONES	3	
L/G RATIO - L/CU.M	11.4	(85.0 GAL/1000 ACF)
SO2 REMOVAL EFFICIENCY - %	84.2	
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR	
GENERIC TYPE	IMPINGEMENT	
SPECIFIC TYPE	BAFFLE	
TRADE NAME/COMMON TYPE	CLOSED VANE	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** REHEATER		
GENERIC TYPE	WASTE HEAT RECOVERY	
SPECIFIC TYPE	GAS-FLUID	
TRADE NAME/COMMON TYPE	TUBE BUNDLE	
TEMPERATURE INCREASE - C	27.8	(50 F)
CONSTRUCTION MATERIAL GENERIC TYPE	STAINLESS STEEL	
CONSTRUCTION MATERIAL SPECIFIC TYPE	AUSTENITIC	
** FANS		
DESIGN	CENTRIFUGAL	
FUNCTION	BOOSTER	
APPLICATION	INDUCED DRAFT	
SERVICE	DRY	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** DAMPERS		
FUNCTION	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	
** DUCTWORK		
SHELL GENERIC MATERIAL TYPE	NR	
SHELL SPECIFIC MATERIAL TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	
** REAGENT PREPARATION EQUIPMENT		
FUNCTION	WET BALL MILL	
DEVICE	COMPARTMENTED	
DEVICE TYPE	NR	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: PARADISE 1 (CONT.)

NUMBER	3	
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	3.6	(4 TPH)
** TANKS		
SERVICE	NUMBER	
-----	-----	
REAGENT PREP PRODUCT	****	
ABSORBER RECYCLE	****	
SCRUBBER RECYCLE	****	
NR	****	
** PUMPS		
SERVICE	NUMBER	
-----	-----	
NA	****	
** SOLIDS CONCENTRATING/DEWATERING		
DEVICE	VACUUM FILTER	
NUMBER	3	
NUMBER OF SPARES	1	
FEED STREAM CHARACTERISTICS	40% SOLIDS	
OUTLET STREAM CHARACTERISTICS	80% SOLIDS	
** SOLIDS CONCENTRATING/DEWATERING		
DEVICE	THICKENER	
NUMBER	1	
FEED STREAM CHARACTERISTICS	8% SOLIDS	
OUTLET STREAM CHARACTERISTICS	40% SOLIDS	
*** SALEABLE BYPRODUCTS		
NATURE	NONE	
DISPOSITION	N/A	
*** SLUDGE		
** TREATMENT		
METHOD	FORCED OXIDATION	
DEVICE	REACTION TANK	
PROPRIETARY PROCESS	N/A	
** DISPOSAL		
NATURE	FINAL	
TYPE	LANDFILL	
SITE TREATMENT	NONE	
** WATER BALANCE		
WATER LOOP TYPE	CLOSED	
** FGD SPARE CAPACITY INDICES		
ABSORBER - %	20.0	
** FGD SPARE COMPONENT INDICES		
ABSORBER	1.0	

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS	Factor

5/83	SYSTEM									744
6/83	SYSTEM									720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: PARADISE 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM COMMENCED OPERATION IN MAY AND IS CURRENTLY IN THE START UP PHASE OF OPERATION.

7/83	SYSTEM	744
8/83	SYSTEM	744
9/83	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

BOTH UNITS 1 AND 2 ARE CURRENTLY IN THE SHAKEDOWN/DEBUGGING PHASE OF OPERATION. THE UTILITY REPORTED THAT CONTRACT TESTING AND STATE CERTIFICATION TESTING ARE CURRENTLY BEING CONDUCTED.

THE UTILITY REPORTED BYPASS DAMPER PROBLEMS AT UNITS 1 AND 2 DURING THE THIRD QUARTER OF 1983.

DUCTWORK GAS TURNING VANES COLLAPSED DURING THE THIRD QUARTER.

PLUGGING PROBLEMS OCCURRED WITHIN THE FORCED-OX SYSTEM DURING THIS PERIOD. SLURRY WAS BACKING UP INTO THE SPARGER LINES FORCING A SHUT DOWN FOR CLEANING.

THICKENER PROBLEMS WERE ALSO EXPERIENCED DURING THE THIRD QUARTER. THE RAKE ARMS WERE BREAKING DUE TO UNEXPECTED HIGH PARTICLE SIZES AND THE RAPID SETTLING OF SOLIDS.

THE UTILITY REPORTED MIST ELIMINATOR PROBLEMS DURING THE PERIOD DUE TO PLUGGING PINCH VALVES AND IMPROPERLY WORKING DRAINS.

10/83	SYSTEM	744
11/83	SYSTEM	720
12/83	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER OF 1983. THE MIST ELIMINATOR AND THICKENER PROBLEMS EXPERIENCED DURING THE THIRD QUARTER WERE STILL PRESENT BUT TO A LESSER DEGREE.

THE MIST ELIMINATOR PLUGGING PROBLEMS EXPERIENCED DURING THE THIRD QUARTER WERE BELIEVED TO BE THE RESULT OF IMPROPER WASHING.

THE THICKENER RAKE ARM PROBLEM EXPERIENCED DURING THE THIRD QUARTER WAS SOLVED BY REMOVING SOLIDS FROM THE THICKENER MORE FREQUENTLY AND BY READJUSTING THE TORQUE MEASURING DEVICE TO RESPOND TO TORQUE ON THE RAKE ARM TRUSSES RATHER THAN THE RAKE ARMS. SOLIDS SETTLING IN A CONICAL SHAPE WERE NOT DISTRIBUTING AN EVEN LOAD TO THE RAKE ARMS AND THUS MAXIMUM TORQUE WAS NOT REACHED. AS A RESULT, THE RAKE ARMS WERE BREAKING.

1/84	SYSTEM	744
2/84	SYSTEM	696
3/84	SYSTEM	744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: PARADISE 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE FIRST QUARTER, ELECTRICAL PROBLEMS RESULTED IN RAW FLUE GAS ENTERING THE NOREL PLASTIC MIST ELIMINATORS WITHOUT QUENCHING. THE MIST ELIMINATOR MELTED AND FORCED THE UTILITY TO BYPASS.

4/84	SYSTEM	720
5/84	SYSTEM	744
6/84	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

NEW MIST ELIMINATORS WERE INSTALLED DURING THE SECOND QUARTER OF 1984. THEY WERE SUPPLIED BY MUNTERS AND ARE CAPABLE OF WITHSTANDING RAW FLUE GAS TEMPERATURES OF 350 DEGREES F.

7/84	SYSTEM	744
8/84	SYSTEM	744
9/84	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY EXPERIENCED PROBLEMS WITH CORROSION IN THE CARBON STEEL SECTION OF THE REHEAT U-TUBE BUNDLES. AIR TRAPPED WITHIN THE BUNDLES COULD NOT BE REMOVED AND THE RESULTING LOWERED TEMPERATURE CAUSED CORROSION. THE UTILITY ATTEMPTED TO REMOVE THE AIR BY PURGING THE TUBES WITH STEAM AND BACK FILLING WITH WATER. THEY ALSO TRIED PULLING A VACUUM ON THE TUBES AND BACK FILLING WITH WATER. THE TUBES HAVE SINCE BEEN REPLACED WITH STAINLESS STEEL AND HAVE VENTED WATER BOXES. THIS HAS ENABLED THEM TO INCREASE REHEAT TEMPERATURES FROM 150 TO 170 DEGREES F. TWO OF THE SIX MODULES AT UNIT 1 NOW HAVE STAINLESS STEEL U-TUBES WITH VENTED WATER BOXES.

PROBLEMS WERE EXPERIENCED WITH THE LOUVER TYPE BYPASS DAMPERS DURING THE FIRST THREE QUARTERS OF 1984. DUE TO HIGH FLUE GAS VELOCITY, THE STAINLESS STEEL SEAL STRIPS BROKE OFF. THE UTILITY MADE AN ATTEMPT TO WELD FIX PLATES TO THE DAMPERS WHICH WAS UNSUCCESSFUL. THE LOUVER TYPE DAMPERS WILL NOW BE REPLACED WITH THE GUILLLOTINE TYPE.

THE UTILITY REPORTED THAT THE SLUDGE DEWATERING SYSTEM WILL BE CONVERTED TO A WET PUMP SYSTEM WITH WET STACKING SIMILAR TO THAT DEVELOPED AT WIDOWS CREEK. SLUDGE WILL BE PUMPED DIRECTLY TO A DISPOSAL AREA WITHOUT TREATMENT BY THICKENING OR VACUUM FILTRATION.

THE UTILITY REPORTED THAT NO MAJOR FGD SYSTEM OUTAGES OCCURRED DURING THE FIRST THREE QUARTERS OF 1984. MODULES ARE ROUTINELY TAKEN OUT OF SERVICE IN ROTATION FOR APPROXIMATELY ONE WEEK AND MAINTENANCE WORK OR MODIFICATIONS ARE MADE.

10/84	SYSTEM	744
11/84	SYSTEM	720
12/84	SYSTEM	744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: PARADISE 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE MIST ELIMINATORS INSTALLED AT PARADISE 1 HAVE ONLY 2 PASSES(SEE PARADISE 2 COMMENTS) AND NO PLUGGING PROBLEMS HAVE BEEN ENCOUNTERED. DAMPER REPAIRS ARE SCHEDULED TO TAKE PLACE DURING THE UNIT OUTAGE WHICH WILL RUN FROM MARCH THRU AUGUST. THE UNIT WILL BE DOWN FOR MAJOR TUBE REPLACEMENT.

1/85	SYSTEM	744
2/85	SYSTEM	672
3/85	SYSTEM	744
4/85	SYSTEM	720
5/85	SYSTEM	744
6/85	SYSTEM	720
7/85	SYSTEM	744
8/85	SYSTEM	744
9/85	SYSTEM	720
10/85	SYSTEM	744
11/85	SYSTEM	720
12/85	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM	774
2/86	SYSTEM	672
3/86	SYSTEM	774
4/86	SYSTEM	720
5/86	SYSTEM	774
6/86	SYSTEM	720
7/86	SYSTEM	774
8/86	SYSTEM	774
9/86	SYSTEM	720
10/86	SYSTEM	774
11/86	SYSTEM	720
12/86	SYSTEM	774

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987
 TENNESSEE VALLEY AUTHORITY: PARADISE 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE FRP MIST ELIMINATORS INSTALLED IN 1984 WERE MADE OF A POOR GRADE OF MATERIAL ACCORDING TO THE UTILITY. ALTHOUGH MUNTERS FRP MIST ELIMINATORS WERE REPORTED TO HAVE BEEN INSTALLED, ANOTHER BRAND WAS EVENTUALLY PURCHASED DUE TO LOWER BIDDING. THE UTILITY HAS SINCE RENEGOTIATED WITH THE MANUFACTURER TO REPLACE THESE MIST ELIMINATORS WITH ONES CONSTRUCTED OF 316/317 STAINLESS STEEL. REPLACEMENT WORK BEGAN IN 1986 AND IS EXPECTED TO BE COMPLETED SOME TIME IN 1988. TO DATE, MOST OF THE MODULES HAVE HAD THE LOWER STAGE REPLACED WITH ONLY THE UPPER STAGE STILL REMAINING TO BE COMPLETED.

NO MAJOR FGD-RELATED OUTAGES WERE REPORTED BY THE UTILITY FOR THE YEAR 1986. FGD SYSTEM AVAILABILITY FOR THE YEAR WAS APPROXIMATELY 100%.

1/87	SYSTEM									744
2/87	SYSTEM									672
3/87	SYSTEM									744
4/87	SYSTEM									720
5/87	SYSTEM									744
6/87	SYSTEM									720
7/87	SYSTEM									744
8/87	SYSTEM									744
9/87	SYSTEM									720
10/87	SYSTEM									744
11/87	SYSTEM									720
12/87	SYSTEM									744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED CORROSION PROBLEMS WITH THE INCONEL 625 HOT WATER TUBE BUNDLE REHEAT SYSTEM LOCATED AT THE INLET TO THE ABSORBERS.

HOT WATER FROM THE INLET SIDE OF THE ABSORBER IS USED TO REHEAT THE EXITING FLUE GAS. NEW BUNDLES WERE ORDERED FROM ALLEGHENY LUDLUM THAT WILL BE MADE OF A MATERIAL CALLED ALGXN FOR INSTALLATION SOMETIME IN 1988.

THE SECOND STAGE MIST ELIMINATOR REPLACEMENT WORK CONTINUED THROUGHOUT 1987. THE UTILITY PLANS TO HAVE ALL THE EXISTING MIST ELIMINATORS REPLACED WITH NEW 316L MIST ELIMINATORS BY THE END OF 1988.

THE UTILITY REPORTED THAT THE UNIT WAS OFF-LINE FOR 6 WEEKS IN THE SPRING AND FALL OF 1987 FOR SCHEDULED BOILER/TURBINE MAINTENANCE WORK. DURING THESE TIMES, REPAIRS WERE MADE TO THE MIST ELIMINATOR AND REHEAT SYSTEM.

DO NOT MICROFILM
THIS COPY

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	TENNESSEE VALLEY AUTHORITY	
PLANT NAME	PARADISE	
UNIT NUMBER	2	
CITY	PARADISE	
STATE	KENTUCKY	
REGULATORY CLASSIFICATION	C	
PARTICULATE EMISSION LIMITATION - NG/J	47.	(0.110 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	387.	(0.900 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	2558	
GROSS UNIT GENERATING CAPACITY - MW	704	
NET UNIT GENERATING CAPACITY W/FGD - MW	650	
NET UNIT GENERATING CAPACITY WO/FGD - MW	668	
EQUIVALENT SCRUBBED CAPACITY - MW	704	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	BABCOCK & WILCOX	
BOILER TYPE	CYCLONE	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	1014.58	(2150000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	148.9	(300 F)
STACK HEIGHT - M	183.	(600 FT)
STACK SHELL	NR	
STACK TOP DIAMETER - M	7.9	(26.0 FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	29075.	(12500 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		****
AVERAGE ASH CONTENT - %	10.00	
RANGE ASH CONTENT - %	****	
AVERAGE MOISTURE CONTENT - %	10.00	
RANGE MOISTURE CONTENT - %	****	
AVERAGE SULFUR CONTENT - %	3.20	
RANGE SULFUR CONTENT - %	****	
AVERAGE CHLORIDE CONTENT - %	0.10	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** ESP		
NUMBER	1	
** PARTICLE SCRUBBER		
NUMBER	6	
NUMBER OF SPARES	1	
GENERIC TYPE	VENTURI TOWER	
SPECIFIC TYPE	VARIABLE-THROAT/TOP-ENTRY PLUMB BOB	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	STAINLESS STEEL	
SHELL SPECIFIC MATERIAL	AUSTENITIC	
LINER GENERIC MATERIAL	NONE	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	NONE	
*** FGD SYSTEM		
** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	
PROCESS TYPE	LIMESTONE	
SYSTEM SUPPLIER	GE ENVIRONMENTAL SERVICES	
A-E FIRM	IN-HOUSE	
DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	RETROFIT	
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	94.20	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	84.00	
ENERGY CONSUMPTION - %	2.6	

TENNESSEE VALLEY AUTHORITY: PARADISE 2 (CONT.)

CURRENT STATUS	1	
COMMERCIAL START-UP	12/1983	
INITIAL START-UP	7/1983	
CONTRACT AWARDED	3/1979	
** DESIGN AND OPERATING PARAMETERS		
DESIGN CHLORIDE CONTENT - %	*****	
** QUENCHER/PRESATURATOR		
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** ABSORBER		
NUMBER	6	
NUMBER OF SPARES	1	
GENERIC TYPE	COMBINATION TOWER	
SPECIFIC TYPE	VENTURI/SPRAY	
TRADE NAME/COMMON TYPE	N/A	
SHELL GENERIC MATERIAL	STAINLESS STEEL	
SHELL SPECIFIC MATERIAL	AUSTENITIC	
SHELL MATERIAL TRADE NAME/COMMON TYPE	TYPE 317L	
LINER GENERIC MATERIAL	NONE	
LINER SPECIFIC MATERIAL	N/A	
LINER MATERIAL TRADE NAME/COMMON TYPE	N/A	
GAS CONTACTING DEVICE TYPE	NONE	
NUMBER OF CONTACTING ZONES	3	
L/G RATIO - L/CU.M	11.4	(85.0 GAL/1000 ACF)
SO2 REMOVAL EFFICIENCY - %	84.2	
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR	
GENERIC TYPE	IMPINGEMENT	
SPECIFIC TYPE	BAFFLE	
TRADE NAME/COMMON TYPE	CLOSED VANE	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** REHEATER		
GENERIC TYPE	WASTE HEAT RECOVERY	
SPECIFIC TYPE	GAS-FLUID	
TRADE NAME/COMMON TYPE	TUBE BUNDLE	
TEMPERATURE INCREASE - C	27.8	(50 F)
CONSTRUCTION MATERIAL GENERIC TYPE	STAINLESS STEEL	
CONSTRUCTION MATERIAL SPECIFIC TYPE	AUSTENITIC	
** FANS		
DESIGN	CENTRIFUGAL	
FUNCTION	BOOSTER	
APPLICATION	INDUCED DRAFT	
SERVICE	DRY	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** DAMPERS		
FUNCTION	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	
** DUCTWORK		
SHELL GENERIC MATERIAL TYPE	NR	
SHELL SPECIFIC MATERIAL TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	
** REAGENT PREPARATION EQUIPMENT		
FUNCTION	WET BALL MILL	
DEVICE	COMPARTMENTED	
DEVICE TYPE	NR	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: PARADISE 2 (CONT.)

NUMBER	3	
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	3.6	(4 TPH)
** TANKS		
SERVICE	NUMBER	
-----	-----	
REAGENT PREP PRODUCT	****	
ABSORBER RECYCLE	****	
SCRUBBER RECYCLE	****	
NR	****	
** PUMPS		
SERVICE	NUMBER	
-----	-----	
NA	****	
** SOLIDS CONCENTRATING/DEWATERING		
DEVICE	VACUUM FILTER	
NUMBER	3	
NUMBER OF SPARES	1	
FEED STREAM CHARACTERISTICS	40% SOLIDS	
OUTLET STREAM CHARACTERISTICS	80% SOLIDS	
** SOLIDS CONCENTRATING/DEWATERING		
DEVICE	THICKENER	
NUMBER	1	
FEED STREAM CHARACTERISTICS	8% SOLIDS	
OUTLET STREAM CHARACTERISTICS	40% SOLIDS	
*** SALEABLE BYPRODUCTS		
NATURE	NONE	
DISPOSITION	N/A	
*** SLUDGE		
** TREATMENT		
METHOD	FORCED OXIDATION	
DEVICE	REACTION TANK	
PROPRIETARY PROCESS	N/A	
** DISPOSAL		
NATURE	FINAL	
TYPE	LANDFILL	
SITE TREATMENT	NONE	
** WATER BALANCE		
WATER LOOP TYPE	CLOSED	
** FGD SPARE CAPACITY INDICES		
ABSORBER - %	20.0	
** FGD SPARE COMPONENT INDICES		
ABSORBER	1.0	

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL	PER BOILER	FGD	CAP.
						SO2 PART.	HOURS	HOURS	FACTOR

7/83	SYSTEM							744	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: PARADISE 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT INITIAL START-UP FOR THE FGD SYSTEM AT UNIT 2 COMMENCED IN JULY.

8/83	SYSTEM									744

9/83	SYSTEM									720

** PROBLEMS/SOLUTIONS/COMMENTS

THICKENER PROBLEMS WERE EXPERIENCED DURING THE THIRD QUARTER. THE RAKE ARMS WERE BREAKING DUE TO UNEXPECTED HIGH PARTICLE SIZES AND THE RAPID SETTLING OF SOLIDS.

PLUGGING PROBLEMS OCCURRED WITHIN THE FORCED-OX SYSTEM DURING THIS PERIOD. SLURRY WAS BACKING UP INTO THE SPARGER LINES FORCING A SHUT DOWN FOR CLEANING.

DUCTWORK GAS TURNING VANES COLLAPSED DURING THE THIRD QUARTER.

THE UTILITY REPORTED BYPASS DAMPER PROBLEMS AT UNITS 1 AND 2 DURING THE THIRD QUARTER OF 1983.

BOTH UNITS 1 AND 2 ARE CURRENTLY IN THE SHAKEDOWN/DEBUGGING PHASE OF OPERATION. THE UTILITY REPORTED THAT CONTRACT TESTING AND STATE CERTIFICATION TESTING ARE CURRENTLY BEING CONDUCTED.

THE UTILITY REPORTED MIST ELIMINATOR PROBLEMS DURING THE PERIOD DUE TO PLUGGING PINCH VALVES AND IMPROPERLY WORKING DRAINS.

10/83	SYSTEM									744

11/83	SYSTEM									720

12/83	SYSTEM									744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER. THE MIST ELIMINATOR AND THICKENER PROBLEMS EXPERIENCED DURING THE THIRD QUARTER WERE STILL PRESENT BUT TO A LESSER DEGREE.

THE MIST ELIMINATOR PLUGGING PROBLEMS EXPERIENCED DURING THE THIRD QUARTER WERE BELIEVED TO BE THE RESULT OF IMPROPER WASHING.

THE THICKENER RAKE ARM PROBLEM EXPERIENCED DURING THIRD QUARTER OF 1983 WAS SOLVED BY REMOVING SOLIDS FROM THE THICKENER MORE FREQUENTLY AND BY READJUSTING THE TORQUE MEASURING DEVICE TO RESPOND TO TORQUE ON THE RAKE ARM TRUSSES RATHER THAN THE RAKE ARMS. SOLIDS SETTLING IN A CONICAL SHAPE WERE NOT DISTRIBUTING AN EVEN LOAD TO THE RAKE ARMS AND THEIR MAXIMUM TORQUE WAS NOT REACHED. AS A RESULT, THE ARMS WERE BREAKING.

THE UTILITY REPORTED THAT UNIT 2 WAS CERTIFIED IN COMPLIANCE DURING DECEMBER.

1/84	SYSTEM									744

2/84	SYSTEM									696

3/84	SYSTEM									744

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE FIRST QUARTER, ELECTRICAL PROBLEMS RESULTED IN RAW FLUE GAS ENTERING THE NOREL PLASTIC MIST ELIMINATORS WITHOUT QUENCHING. THE MIST ELIMINATOR MELTED AND FORCED THE UTILITY TO BYPASS. NEW CEILCOTE MIST ELIMINATORS WILL BE INSTALLED AT UNIT 2 DURING THE LAST QUARTER OF 1984.

4/84	SYSTEM	720
5/84	SYSTEM	744
6/84	SYSTEM	720
7/84	SYSTEM	744
8/84	SYSTEM	744
9/84	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY EXPERIENCED PROBLEMS WITH CORROSION IN THE CARBON STEEL SECTION OF THE REHEAT U-TUBE BUNDLES. AIR TRAPPED WITHIN THE BUNDLES COULD NOT BE REMOVED AND THE RESULTING LOWERED TEMPERATURE CAUSED CORROSION. THE UTILITY ATTEMPTED TO REMOVE THE AIR BY PURGING THE TUBES WITH STEAM AND BACK FILLING WITH WATER. THEY ALSO TRIED PULLING A VACUUM ON THE TUBES AND BACK FILLING WITH WATER. THE TUBES HAVE SINCE BEEN REPLACED WITH STAINLESS STEEL AND HAVE VENTED WATER BOXES. THIS HAS ENABLED THEM TO INCREASE REHEAT TEMPERATURES FROM 150 TO 170 DEGREES F.

PROBLEMS WERE EXPERIENCED WITH THE LOUVER TYPE BYPASS DAMPERS DURING THE FIRST THREE QUARTERS OF 1984. DUE TO HIGH FLUE GAS VELOCITY, THE STAINLESS STEEL SEAL STRIPS BROKE OFF. THE UTILITY MADE AN ATTEMPT TO WELD FIX PLATES TO THE DAMPERS WHICH WAS UNSUCCESSFUL. THE LOUVER TYPE DAMPERS WILL NOW BE REPLACED WITH THE GUILLOTINE TYPE.

THE UTILITY REPORTED THAT THE SLUDGE DEWATERING SYSTEM WILL BE CONVERTED TO A WET PUMP SYSTEM WITH WET STACKING SIMILAR TO THAT DEVELOPED AT WIDOWS CREEK. SLUDGE WILL BE PUMPED DIRECTLY TO A DISPOSAL AREA WITHOUT TREATMENT BY THICKENING OR VACUUM FILTRATION.

THE UTILITY REPORTED THAT NO MAJOR FGD SYSTEM OUTAGES OCCURRED DURING THE FIRST THREE QUARTERS OF 1984. MODULES ARE ROUTINELY TAKEN OUT OF SERVICE IN ROTATION FOR APPROXIMATELY ONE WEEK AND MAINTENANCE WORK OF MODIFICATIONS ARE MADE.

10/84	SYSTEM	744
11/84	SYSTEM	720
12/84	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

FINAL INSTALLATION OF THE NEW CEILCOTE(FRP) MIST ELIMINATORS TOOK PLACE DURING THE FOURTH QUARTER. THE UTILITY NOW REPORTS EXPERIENCING PLUGGING PROBLEMS WITH THE NEW MIST ELIMINATORS. THE ORIGINAL MIST ELIMINATORS HAD 2 PASSES WHEREAS THE NEW ONES HAVE 3 PASSES. THE UTILITY STATED THEY ARE HAVING PROBLEMS WASHING THE THIRD PASS. THEY PLAN TO REDESIGN THEIR MIST ELIMINATOR WASH SYSTEM. RUBBER PINCH VALVES ON THE WASH SYSTEM WERE ALSO REPLACED WITH BALL VALVE TYPES TO HELP CONSERVE WATER. THE OLD TYPE VALVES LEAKED. THE NEXT MAJOR UNIT OUTAGE IS SCHEDULED TO TAKE PLACE BETWEEN AUGUST 24, TO THE END OF THE YEAR. THE UNIT WILL BE DOWN FOR

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: PARADISE 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR

MAJOR TUBE REPLACEMENT.

1/85	SYSTEM							744		
2/85	SYSTEM							672		
3/85	SYSTEM							744		
4/85	SYSTEM							720		
5/85	SYSTEM							744		
6/85	SYSTEM							720		
7/85	SYSTEM							744		
8/85	SYSTEM							744		
9/85	SYSTEM							720		
10/85	SYSTEM							744		
11/85	SYSTEM							720		
12/85	SYSTEM							744		

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM							774		
2/86	SYSTEM							672		
3/86	SYSTEM							774		
4/86	SYSTEM							720		
5/86	SYSTEM							774		
6/86	SYSTEM							720		
7/86	SYSTEM							774		
8/86	SYSTEM							774		
9/86	SYSTEM							720		
10/86	SYSTEM							774		
11/86	SYSTEM							720		
12/86	SYSTEM							774		

** PROBLEMS/SOLUTIONS/COMMENTS

THE FRP MIST ELIMINATORS INSTALLED IN 1984 WERE MADE OF A POOR GRADE OF MATERIAL ACCORDING TO THE UTILITY. ALTHOUGH MUNTERTS FRP MIST ELIMINATORS WERE REPORTED TO HAVE BEEN INSTALLED, ANOTHER BRAND WAS EVENTUALLY PURCHASED DUE TO LOWER BIDDING. THE UTILITY HAS SINCE RENEGOTIATED WITH THE MANUFACTURER TO REPLACE THESE MIST ELIMINATORS WITH ONES CONSTRUCTED OF 316/317 STAINLESS STEEL. REPLACEMENT WORK BEGAN IN 1986 AND IS EXPECTED TO BE COMPLETED SOMETIME IN 1988. TO DATE, MOST OF THE MODULES HAVE HAD

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: PARADISE 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

THE LOWER STAGE REPLACED WITH ONLY THE UPPER STAGE STILL REMAINING TO BE COMPLETED.

NO MAJOR FGD-RELATED OUTAGES WERE REPORTED BY THE UTILITY FOR THE YEAR 1986. FGD SYSTEM AVAILABILITY FOR THE YEAR WAS APPROXIMATELY 100%.

1/87	SYSTEM	744
2/87	SYSTEM	672
3/87	SYSTEM	744
4/87	SYSTEM	720
5/87	SYSTEM	744
6/87	SYSTEM	720
7/87	SYSTEM	744
8/87	SYSTEM	744
9/87	SYSTEM	720
10/87	SYSTEM	744
11/87	SYSTEM	720
12/87	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED CORROSION PROBLEMS WITH THE INCONEL HOT WATER TUBE BUNDLE REHEAT SYSTEM LOCATED AT THE INLET TO THE ABSORBERS. HOT WATER FROM THE INLET SIDE OF THE ABSORBERS IS USED TO REHEAT THE EXIT FLUE GAS. NEW BUNDLES ORDERED FROM ALLEGHENY LUDLUM WILL BE CONSTRUCTED OF A MATERIAL CALLED ALGXN FOR INSTALLATION SOMETIME IN 1988.

THE SECOND STAGE MIST ELIMINATOR REPLACEMENT WORK CONTINUED THROUGHOUT 1987. THE UTILITY PLANS TO HAVE ALL THE MIST ELIMINATORS REPLACED WITH NEW 316L MIST ELIMINATORS BY THE END OF 1988.

THE UTILITY REPORTED THAT THE UNIT WAS OFF-LINE IN THE SPRING OF 1987 FOR APPROXIMATELY 7 WEEKS. DURING THIS SCHEDULED BOILER/TURBINE OUTAGE PERIOD, THE UNLINED CARBON STEEL SLURRY STORAGE TANK WAS LINED WITH NEOPRENE RUBBER. NO OTHER MAJOR SCHEDULED OR FGD-RELATED FORCED UNIT OUTAGES WERE ENCOUNTERED FOR THE REMAINDER OF THE YEAR.

LC NOT MICROFILM
1978 2000

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	TENNESSEE VALLEY AUTHORITY
PLANT NAME	SHAWNEE
UNIT NUMBER	9
CITY	PADUCAH
STATE	KENTUCKY
REGULATORY CLASSIFICATION	*****
PARTICULATE EMISSION LIMITATION - NG/J	***** (***** LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	***** (***** LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	***** (***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	*****
GROSS UNIT GENERATING CAPACITY - MW	10
NET UNIT GENERATING CAPACITY W/FGD - MW	*****
NET UNIT GENERATING CAPACITY WO/FGD - MW	*****
EQUIVALENT SCRUBBED CAPACITY - MW	10
** UNIT DATA - BOILER AND STACK	
BOILER SUPPLIER	****
BOILER TYPE	PULVERIZED COAL
BOILER SERVICE LOAD	BASE
DESIGN BOILER FLUE GAS FLOW - CU.M/S	***** (***** ACFM)
BOILER FLUE GAS TEMPERATURE - C	***** (**** F)
STACK HEIGHT - M	***** (**** FT)
STACK SHELL	****
STACK TOP DIAMETER - M	***** (**** FT)
** FUEL DATA	
FUEL TYPE	COAL
FUEL GRADE	****
AVERAGE HEAT CONTENT - J/G	***** (***** BTU/LB)
RANGE HEAT CONTENT - BTU/LB	****
AVERAGE ASH CONTENT - %	*****
RANGE ASH CONTENT - %	****
AVERAGE MOISTURE CONTENT - %	*****
RANGE MOISTURE CONTENT - %	****
AVERAGE SULFUR CONTENT - %	4.00
RANGE SULFUR CONTENT - %	****
AVERAGE CHLORIDE CONTENT - %	0.15
RANGE CHLORIDE CONTENT - %	.05 - .25
*** PARTICLE CONTROL	
** ESP	
NUMBER	1
*** FGD SYSTEM	
** GENERAL DATA	
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	SPRAY DRYING
PROCESS TYPE	LIME/SPRAY DRYING
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	EPRI/TVA/ONTARIO HYDRO
DEVELOPMENT LEVEL	DEMONSTRATION
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.00
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	97.00
CURRENT STATUS	1
INITIAL START-UP	3/1987
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
** ABSORBER	
NUMBER	1
** REHEATER	
GENERIC TYPE	NONE

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: SHAWNEE 9 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR
3/87	SYSTEM						744 9999 999.9
** PROBLEMS/SOLUTIONS/COMMENTS							
TVA CONSTRUCTED A 10-MW SPRAY DRYER/ESP PILOT PLANT TO TREAT FLUE FROM A BOILER FIRING MEDIUM- AND HIGH-SULFUR COALS AND TO EVALUATE THE FEASIBILITY OF RETROFITTING SPRAY DRYERS FOR FLUE GAS DESULFURIZATION (FGD) AT EXISTING POWER PLANTS. THE UTILITY BEGAN OPERATION OF THE UNIT IN MARCH, 1987. EPRI AND ONTARIO HYDRO ARE CONFUNDING THE PROJECT. TESTING IS SCHEDULED TO CONTINUE THROUGH 1989. THE OBJECTIVES OF THIS TEST PROGRAM ARE TO: 1) MEASURE SO2 REMOVAL IN THE SPRAY DRYER AND ESP AS A FUNCTION OF MAJOR OPERATING VARIABLES, 2) EVALUATE THE EFFECTS ON AN EXISTING ESP OF RETROFITTING A SPRAY DRYER FGD SYSTEM UPSTREAM, AND 3) EVALUATE THE OPERABILITY OF A HIGH-SULFUR SPRAY DRYER FGD SYSTEM.							
4/87	SYSTEM						720 9999 999.9
5/87	SYSTEM						744 9999 999.9
6/87	SYSTEM						720 9999 999.9
7/87	SYSTEM						744 9999 999.9
8/87	SYSTEM						744 9999 999.9
9/87	SYSTEM						720 9999 999.9
10/87	SYSTEM						744 9999 999.9
11/87	SYSTEM						720 9999 999.9
12/87	SYSTEM						744 9999 999.9

** PROBLEMS/SOLUTIONS/COMMENTS

THE FOLLOWING POINTS ARE A SUMMARY OF INFORMATION REPORTED ON THE SHAWNEE SPRAY DRYER TEST FACILITY FOR THE YEAR 1987: 1) SO2 REMOVAL FOR THE SYSTEM DURING 1987 WAS REPORTED TO BE 81-92% FOR COAL WITH 4.0% SULFUR, AN INLET TEMPERATURE OF 290-320 DEGREES FAHRENHEIT AND A REAGENT RATIO OF 1.6. 2) PARTICULATE REMOVAL WAS REPORTED TO BE 99.7% FOR THE PERIOD. 3) THE ESP ACHIEVED 8-14% OF SO2 REMOVAL. 4) SPRAY DRYER SCALING PROBLEMS WERE ENCOUNTERED DURING THE PERIOD WHICH WERE ATTRIBUTED TO LOW ATOMIZER SPEEDS, LOW TEMPERATURES, AND LOW SLURRY SOLIDS CONTENT.

DO NOT REGRUELM
THIS CASE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	TENNESSEE VALLEY AUTHORITY	
PLANT NAME	WIDOWS CREEK	
UNIT NUMBER	7	
CITY	BRIDGEPORT	
STATE	ALABAMA	
REGULATORY CLASSIFICATION	C	
PARTICULATE EMISSION LIMITATION - NG/J	52.	(0.120 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	1978	
GROSS UNIT GENERATING CAPACITY - MW	575	
NET UNIT GENERATING CAPACITY W/FGD - MW	527	
NET UNIT GENERATING CAPACITY WO/FGD - MW	540	
EQUIVALENT SCRUBBED CAPACITY - MW	575	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	****	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	*****	(***** ACFM)
BOILER FLUE GAS TEMPERATURE - C	*****	(**** F)
STACK HEIGHT - M	*****	(**** FT)
STACK SHELL	NR	
STACK TOP DIAMETER - M	*****	(**** FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	25819.	(11100 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		****
AVERAGE ASH CONTENT - %	17.00	
RANGE ASH CONTENT - %	****	
AVERAGE MOISTURE CONTENT - %	*****	
RANGE MOISTURE CONTENT - %	****	
AVERAGE SULFUR CONTENT - %	3.70	
RANGE SULFUR CONTENT - %	****	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** ESP		
NUMBER	1	
** PARTICLE SCRUBBER		
NUMBER	4	
GENERIC TYPE	VENTURI TOWER	
SPECIFIC TYPE	VARIABLE-THROAT/VERTICALLY-ADJUSTABLE ROD DECKS	
TRADE NAME/COMMON NAME	ROD SCRUBBER	
SHELL GENERIC MATERIAL	NR	
SHELL SPECIFIC MATERIAL	NR	
LINER GENERIC MATERIAL	NR	
LINER SPECIFIC MATERIAL	NR	
GAS CONTACTING DEVICE TYPE	NONE	
*** FGD SYSTEM		
** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	
PROCESS TYPE	LIMESTONE	
SYSTEM SUPPLIER	COMBUSTION ENGINEERING	
A-E FIRM	IN-HOUSE	
DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	RETROFIT	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	80.00	
ENERGY CONSUMPTION - %	2.3	
CURRENT STATUS	1	
COMMERCIAL START-UP	9/1981	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 7 (CONT.)

INITIAL START-UP	3/1981	
CONTRACT AWARDED	10/1977	
** DESIGN AND OPERATING PARAMETERS		
DESIGN CHLORIDE CONTENT - %	*****	
** QUENCHER/PRESATURATOR		
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** ABSORBER		
NUMBER	4	
GENERIC TYPE	SPRAY TOWER	
SPECIFIC TYPE	OPEN COUNTERCURRENT SPRAY	
TRADE NAME/COMMON TYPE	N/A	
SUPPLIER	COMBUSTION ENGINEERING	
SHELL GENERIC MATERIAL	NR	
SHELL SPECIFIC MATERIAL	NR	
SHELL MATERIAL TRADE NAME/COMMON TYPE	NR	
LINER GENERIC MATERIAL	NR	
LINER SPECIFIC MATERIAL	NR	
LINER MATERIAL TRADE NAME/COMMON TYPE	NR	
GAS CONTACTING DEVICE TYPE	NONE	
INLET GAS TEMPERATURE - C	48.9	(120 F)
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRECOLLECTOR	
NUMBER PER SYSTEM	4	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
TRADE NAME/COMMON TYPE	NR	
CONFIGURATION	HORIZONTAL	
NUMBER OF STAGES	1	
NUMBER OF PASSES PER STAGE	1	
DISTANCE BETWEEN STAGES - CM	0.76	(0.3 IN)
VANE ANGLES - DEGREES	45	
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC	
CONSTRUCTION MATERIAL SPECIFIC TYPE	FIBER-REINFORCED POLYESTER	
** REHEATER		
NUMBER	4	
GENERIC TYPE	IN-LINE	
SPECIFIC TYPE	NR	
TRADE NAME/COMMON TYPE	NR	
TEMPERATURE INCREASE - C	27.8	(50 F)
INLET FLUE GAS TEMPERATURE - C	48.9	(120 F)
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** FANS		
NUMBER	4	
DESIGN	CENTRIFUGAL	
FUNCTION	BOOSTER	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** DAMPERS		
FUNCTION	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	
** DUCTWORK		
SHELL GENERIC MATERIAL TYPE	NR	
SHELL SPECIFIC MATERIAL TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 7 (CONT.)

** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED
DEVICE TYPE	NR
** TANKS	
SERVICE	NUMBER
-----	-----
SCRUBBER RECYCLE	4
ABSORBER RECYCLE	5
REAGENT PREP PRODUCT	1
** PUMPS	
SERVICE	NUMBER
-----	-----
LIMESTONE SLURRY FEED	4
SCRUBBER RECIRCULATION	8
ABSORBER RECIRCULATION	12
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	NR
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	FORCED OXIDATION
DEVICE	NA
PROPRIETARY PROCESS	NA
** DISPOSAL	
NATURE	FINAL
TYPE	POND
SITE TREATMENT	NONE

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

3/81	SYSTEM								744	

** PROBLEMS/SOLUTIONS/COMMENTS

INITIAL OPERATIONS OF THE WIDOWS CREEK 7 FGD SYSTEM BEGAN IN MARCH, 1981.
THE SYSTEM IS PRESENTLY IN A SHAKEDOWN/DEBUGGING PHASE WITH COMMERCIAL
OPERATIONS EXPECTED IN EARLY SEPTEMBER.

4/81	SYSTEM								720	

5/81	SYSTEM								744	

6/81	SYSTEM								720	

** PROBLEMS/SOLUTIONS/COMMENTS

INITIAL SHAKEDOWN/DEBUGGING OPERATIONS CONTINUED THROUGH THE SECOND
QUARTER 1981.

7/81	SYSTEM								744	

8/81	SYSTEM								744	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 7 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

9/81	SYSTEM						720			
	** PROBLEMS/SOLUTIONS/COMMENTS									
	ACCEPTANCE TESTING OF THE WIDOWS CREEK 7 FGD SYSTEM BEGAN IN MID-SEPTEMBER									
10/81	SYSTEM						744			
11/81	SYSTEM						720			
12/81	SYSTEM						744			
	** PROBLEMS/SOLUTIONS/COMMENTS									
	DURING THE FOURTH QUARTER THE SYSTEM WAS IN THE START UP DEBUGGING PHASE OF OPERATION. THE ACCEPTANCE TEST WAS PERFORMED DURING THIS PERIOD.									
	THE HELIX ON THE TROMMEL SCREEN, WHICH IS LOCATED AT THE DISCHARGE END OF THE BALL MILL, WAS INSTALLED DURING THE PERIOD.									
1/82	SYSTEM						744			
2/82	SYSTEM						672			
3/82	SYSTEM						744			
	** PROBLEMS/SOLUTIONS/COMMENTS									
	MINOR MODIFICATIONS TO THE PIPING AND SYSTEM CONTROL WERE MADE DURING THE FIRST QUARTER OF 1982. THE ENTIRE WIDOWS CREEK PLANT HAS SEEN LIMITED OPERATION DUE TO LACK OF POWER DEMAND.									
	PRESENTLY, THE UTILITY IS GETTING A PERMIT TO CONDUCT FORCED OXIDATION TESTS. BOTH WET AND DRY GYPSUM STACKING WILL BE INVESTIGATED.									
4/82	SYSTEM						720			
5/82	SYSTEM						744			
6/82	SYSTEM						720			
	** PROBLEMS/SOLUTIONS/COMMENTS									
	THE UTILITY REPORTED THAT NO MAJOR FGD RELATED PROBLEMS WERE ENCOUNTERED DURING THE SECOND QUARTER. THE BOILER WAS OPERATED AT LOW LOAD DURING THIS PERIOD DUE TO A LACK OF POWER DEMAND.									
7/82	SYSTEM						744			
8/82	SYSTEM						744			
9/82	SYSTEM						720			
10/82	SYSTEM						744			
11/82	SYSTEM						720			
12/82	SYSTEM						744			
1/83	SYSTEM						744			
2/83	SYSTEM						672			
3/83	SYSTEM						744			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 7 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER BOILER HOURS	FGD CAP. HOURS FACTOR
4/83	SYSTEM							720	
5/83	SYSTEM							744	
6/83	SYSTEM							720	
** PROBLEMS/SOLUTIONS/COMMENTS									
SINCE JUNE 1982 THE WIDOWS CREEK 7 FGD SYSTEM HAS EXPERIENCED PLUGGING PROBLEMS IN THE MIST ELIMINATORS. ALTHOUGH TVA HAS NOT ISOLATED AN ULTIMATE CAUSE IT IS SUSPECTED THAT THE PROBLEM RESULTS FROM AN UNDER-DESIGNED MIST ELIMINATOR (WITH RESPECT TO GAS FLOW).									
7/83	SYSTEM							744	
8/83	SYSTEM							744	
9/83	SYSTEM							720	
** PROBLEMS/SOLUTIONS/COMMENTS									
MIST ELIMINATOR PLUGGING PROBLEMS CONTINUED DURING THE THIRD QUARTER OF 1983.									
THE UTILITY REPORTED A SOLIDS BUILD-UP PROBLEM IN BOTH THE ABSORBER AND VENTURI VESSELS DUE TO A POORLY OPERATING OVERFLOW SYSTEM.									
PROBLEMS WITH THE REAGENT MIXING SYSTEM WERE REPORTED DURING THE THIRD QUARTER. RADIAL TYPE MIXERS WERE REPLACED WITH THE AXIAL TYPE.									
10/83	SYSTEM							744	
11/83	SYSTEM							720	
12/83	SYSTEM							744	
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER OF 1983.									
1/84	SYSTEM							744	
2/84	SYSTEM							696	
3/84	SYSTEM							744	
4/84	SYSTEM							720	
5/84	SYSTEM							744	
6/84	SYSTEM							720	
7/84	SYSTEM							744	
8/84	SYSTEM							744	
9/84	SYSTEM							720	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 7 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY EXPERIENCED CORROSION PROBLEMS WITH THE REHEATER CARBON STEEL FIN TUBES AT UNIT 7. STAINLESS STEEL FIN TUBES ARE BEING CONSIDERED FOR REPLACEMENT.

THE UTILITY REPORTED THAT A FORCED OXIDATION SYSTEM WILL BE EMPLOYED AT WIDOWS CREEK 7 AND 8 FOR SLUDGE TREATMENT. A SPARGER NETWORK AT THE BOTTOM OF THE THICKENER TANK WILL BE INSTALLED AND AN AGITATOR WILL BE UTILIZED FOR SOLID SUSPENSION.

10/84	SYSTEM	744
11/84	SYSTEM	720
12/84	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER OF 1984. WORK CONTINUED ON THE FORCED OXIDATION SYSTEM. OPERATIONS ARE SCHEDULED TO COMMENCE IN NOVEMBER.

1/85	SYSTEM	744
2/85	SYSTEM	672
3/85	SYSTEM	744
4/85	SYSTEM	720
5/85	SYSTEM	744
6/85	SYSTEM	720
7/85	SYSTEM	744
8/85	SYSTEM	744
9/85	SYSTEM	720
10/85	SYSTEM	744
11/85	SYSTEM	720
12/85	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM	774
2/86	SYSTEM	672
3/86	SYSTEM	774
4/86	SYSTEM	720
5/86	SYSTEM	774
6/86	SYSTEM	720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 7 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR
7/86	SYSTEM							774		
8/86	SYSTEM							774		
9/86	SYSTEM							720		
10/86	SYSTEM							774		
11/86	SYSTEM							720		
12/86	SYSTEM							774		

** PROBLEMS/SOLUTIONS/COMMENTS

COMBUSTION ENGINEERING BEGAN REPLACING THE ORIGINAL INSTALLED CE-FRP CHEVRONS IN 1986. THE BADLY WORN MIST ELIMINATORS WILL BE REPLACED WITH THE SAME MATERIAL. THE REPLACEMENT WORK IS SCHEDULED TO BE COMPLETED SOMETIME IN 1987.

THE IN-LINE STEAM REHEAT TUBE BUNDLES ARE IN THE PROCESS OF BEING REPLACED. THE WORK COMMENCED IN LATE 1986 AND IS SCHEDULED TO BE COMPLETED BY THE SPRING OF 1987. THE NEW BUNDLES WILL BE CONSTRUCTED OF 316 STEEL. THE COR-TEN CARBON STEEL OUTLET DUCT WAS ALSO BADLY CORRODED DUE TO POOR REHEAT PERFORMANCE. THIS DUCT HAD TO BE PATCHED AND MAY LATER BE CLADDED WITH STAINLESS STEEL.

THE UTILITY REPORTED THAT THE FORCED-OXIDATION SYSTEM ON UNIT 7 BEGAN OPERATION IN MID-1986 AND OPERATED SUCCESSFULLY FOR THE REMAINDER OF THE YEAR. NO MAJOR UNIT OR FGD OUTAGES WERE REPORTED BY THE UTILITY.

1/87	SYSTEM							744		
2/87	SYSTEM							672		
3/87	SYSTEM							744		
4/87	SYSTEM							720		
5/87	SYSTEM							744		
6/87	SYSTEM							720		
7/87	SYSTEM							744		
8/87	SYSTEM							744		
9/87	SYSTEM							720		
10/87	SYSTEM							744		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT ALL MIST ELIMINATOR AND IN-LINE STEAM BUNDLE REHEAT REPLACEMENT WORK WAS COMPLETED DURING A SCHEDULED SPRING OUTAGE IN 1987. IN ADDITION TO THESE REPAIRS, THE ABSORBER OUTLET DUCT WORK WAS CLADDED WITH 316L STAINLESS STEEL. NO PROBLEMS WERE ENCOUNTERED AFTER STARTUP FOLLOWING THE SPRING OUTAGE PERIOD UNTIL THE FALL OF 1987.

11/87	SYSTEM							720		
12/87	SYSTEM							744		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 7 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT WAS TAKEN OUT OF SERVICE IN OCTOBER OF 1987 FOR SCHEDULED REPAIRS TO THE COMBUSTION CONTROL SYSTEM. THE UNIT REMAINED OFF-LINE FOR THE REST OF THE YEAR. REPAIRS TO THE COMBUSTION CONTROL SYSTEM ARE EXPECTED TO BE FINISHED BY JUNE 1988.

DO NOT MICROFILM
THIS COPY

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	TENNESSEE VALLEY AUTHORITY	
PLANT NAME	WIDOWS CREEK	
UNIT NUMBER	8	
CITY	STEVENS	
STATE	ALABAMA	
REGULATORY CLASSIFICATION	C	
PARTICULATE EMISSION LIMITATION - NG/J	52.	(0.120 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	*****	
GROSS UNIT GENERATING CAPACITY - MW	550	
NET UNIT GENERATING CAPACITY W/FGD - MW	516	
NET UNIT GENERATING CAPACITY WO/FGD - MW	542	
EQUIVALENT SCRUBBED CAPACITY - MW	550	
 ** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	764.48	(1620000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	137.8	(280 F)
STACK HEIGHT - M	152.	(500 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	*****	(***** FT)
 ** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	27470.	(11810 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		11360-12330
AVERAGE ASH CONTENT - %	11.70	
RANGE ASH CONTENT - %	9.2-12.7	
AVERAGE MOISTURE CONTENT - %	7.70	
RANGE MOISTURE CONTENT - %	5.1-9.5	
AVERAGE SULFUR CONTENT - %	3.30	
RANGE SULFUR CONTENT - %	1.3-3.8	
AVERAGE CHLORIDE CONTENT - %	0.07	
RANGE CHLORIDE CONTENT - %	****	
 *** PARTICLE CONTROL		
 ** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
 ** PARTICLE SCRUBBER		
NUMBER	4	
NUMBER OF SPARES	0	
INITIAL START-UP DATE	5/1977	
GENERIC TYPE	VENTURI TOWER	
SPECIFIC TYPE	VARIABLE-THROAT/SIDE-MOVABLE BLADES	
TRADE NAME/COMMON NAME	N/A	
SUPPLIER	TVA/POLYCON	
DIMENSIONS - FT	23.0 X 28.0	
SHELL GENERIC MATERIAL	CARBON STEEL	
SHELL SPECIFIC MATERIAL	HIGH STRENGTH LOW ALLOY 'HSLA'	
LINER GENERIC MATERIAL	STAINLESS STEEL; INORGANIC 'IN CONVERGENT SECTION	
LINER SPECIFIC MATERIAL	AUSTENITIC; SILICON CARBIDE	
GAS CONTACTING DEVICE TYPE	VENTURI THROAT	
NUMBER OF CONTACTING ZONES	1	
LIQUID RECIRCULATION RATE - LITER/S	212.9	(3380 GPM)
L/G RATIO - LITER/CU.M	1.1	(8.3 GAL/1000ACF)
PH CONTROL ADDITIVE	LIMESTONE	
PRESSURE DROP - KPA	2.5	(10.0 IN-H2O)
INLET GAS FLOW RATE - CU.M/S	191.1	(405000 ACFM)
INLET GAS TEMPERATURE - C	137.8	(280 F)
SO2 REMOVAL EFFICIENCY - %	10.0	
PARTICLE REMOVAL EFFICIENCY - %	98.5	

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	TENNESSEE VALLEY AUTHORITY
A-E FIRM	NONE
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	RETROFIT
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	98.50
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	80.00
ENERGY CONSUMPTION - %	4.7
CURRENT STATUS	1
COMMERCIAL START-UP	1/1978
INITIAL START-UP	5/1977
CONTRACT AWARDED	2/1973

** DESIGN AND OPERATING PARAMETERS

DESIGN CHLORIDE CONTENT - %	*****
OPER. & MAINT. REQUIREMENT - MANHR/DAY	56.0

** QUENCHER/PRESATURATOR

NUMBER	0

** ABSORBER

NUMBER	4
NUMBER OF SPARES	0
GENERIC TYPE	PACKED TOWER
SPECIFIC TYPE	GRID PACKING
TRADE NAME/COMMON TYPE	N/A
SUPPLIER	POLYCON
DIMENSIONS - FT	30.0 X 16.0 X 34.0
SHELL GENERIC MATERIAL	CARBON STEEL; STAINLESS STEEL
SHELL SPECIFIC MATERIAL	HIGH STRENGTH LOW ALLOY 'HSLA!'; AUSTENITIC
SHELL MATERIAL TRADE NAME/COMMON TYPE	COR-TEN; TYPE 316L
LINER GENERIC MATERIAL	ORGANIC
LINER SPECIFIC MATERIAL	SYNTHETIC RUBBER
LINER MATERIAL TRADE NAME/COMMON TYPE	NEOPRENE LS-576
GAS CONTACTING DEVICE TYPE	FIXED GRIDS
NUMBER OF CONTACTING ZONES	5
LIQUID RECIRCULATION RATE - LITER/S	1310. (20800 GPM)
L/G RATIO - L/CU.M	8.0 (60.0 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	0.5 (2.0 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/SEC	2.3 (7.5 FT/S)
INLET GAS FLOW - CU. M/S	163.61 (346700 ACFM)
INLET GAS TEMPERATURE - C	51.7 (125 F)
SO2 REMOVAL EFFICIENCY - %	70.0

** MIST ELIMINATOR

PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
NUMBER PER SYSTEM	4
NUMBER OF SPARES PER SYSTEM	0
NUMBER PER MODULE	1
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
CONFIGURATION	VERTICAL
NUMBER OF STAGES	1
NUMBER OF PASSES PER STAGE	4
FREEBOARD DISTANCE - M	4.27 (14.0 FT)
DISTANCE BETWEEN VANES - CM	3.8 (1.50 IN)
PRESSURE DROP - KPA	0.2 (1.0 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/S	2.7 (9.0 FT/S)
CONSTRUCTION MATERIAL GENERIC TYPE	STAINLESS STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AUSTENITIC
WASH WATER SOURCE	RIVER WATER
WASH FREQUENCY	CONTINUOUS

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

** REHEATER	
NUMBER	4
NUMBER OF SPARES	0
NUMBER PER MODULE	1
GENERIC TYPE	INDIRECT HOT AIR
SPECIFIC TYPE	EXTERNAL HEAT EXCHANGER
TRADE NAME/COMMON TYPE	STEAM TUBE BUNDLE
TEMPERATURE INCREASE - C	27.8 (50 F)
INLET FLUE GAS TEMPERATURE - C	51.7 (125 F)
OUTLET FLUE GAS TEMPERATURE - C	79.4 (175 F)
NUMBER OF HEAT EXCHANGER BANKS	20
NUMBER OF TUBES PER BUNDLE	80
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL; COPPER 'FINS!
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
** FANS	
NUMBER	4
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
SUPPLIER	GREEN FUEL ECONOMIZER
FUNCTION	UNIT
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	191.12 (405000 ACFM)
FLUE GAS TEMPERATURE - C	137.8 (280 F)
PRESSURE DROP - KPA	9.8 (32.0 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL; HIGH ALLOY 'BLADE WEAR PLATES!
** DAMPERS	
GENERIC TYPE	GUILLOTINE
SPECIFIC TYPE	BOTTOM-ENTRY GUILLOTINE
MODULATION	OPEN 'INOPERATIVE!
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL/HIGH ALLOY
CONSTRUCTION MATERIAL SPECIFIC TYPE	HIGH STRENGTH LOW ALLOY 'HSLA!; NICKEL BASE/CHRO
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
GENERIC TYPE	GUILLOTINE
SPECIFIC TYPE	BOTTOM-ENTRY GUILLOTINE
MODULATION	OPEN 'INOPERATIVE!
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL/HIGH ALLOY
CONSTRUCTION MATERIAL SPECIFIC TYPE	HIGH STRENGTH LOW ALLOY 'HSLA!; NICKEL BASE/CHRO
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
GENERIC TYPE	GUILLOTINE
SPECIFIC TYPE	BOTTOM-ENTRY GUILLOTINE
MODULATION	CLOSED 'INOPERATIVE!
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL/HIGH ALLOY
CONSTRUCTION MATERIAL SPECIFIC TYPE	HIGH STRENGTH LOW ALLOY 'HSLA!; NICKEL BASE/CHRO
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	INLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	HIGH STRENGTH LOW ALLOY 'HSLA!
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	OUTLET
SHELL GENERIC MATERIAL TYPE	STAINLESS STEEL
SHELL SPECIFIC MATERIAL TYPE	AUSTENITIC
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED
DEVICE TYPE	NR
MANUFACTURER	KENNEDY VAN SAUN
NUMBER	1
NUMBER OF SPARES	0
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	36.3 (40 TPH)
PRODUCT QUALITY - % SOLIDS	40.0
** TANKS	
SERVICE	NUMBER
-----	-----
ABSORBER RECYCLE	4
SCRUBBER RECYCLE	4
REAGENT PREP PRODUCT	1
WASTE SLURRY BLEED	1
REHEATER DRAIN	****
** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER RECIRCULATION	10
POND RETURN	****
RIVER WATER TRANSFER	****
VENTURI RECIRCULATION	6
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	NONE
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	FORCED OXIDATION
DEVICE	N/A
PROPRIETARY PROCESS	N/A
** DISPOSAL	
NATURE	FINAL
TYPE	POND
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	PIPELINE
SITE TREATMENT	CLAY LINING
SITE DIMENSIONS	110 ACRES X 30 FT DEEP
SITE CAPACITY - CU.M	4035900 (3300.0 ACRE-FT)
SITE SERVICE LIFE - YRS	5
** PROCESS CONTROL AND INSTRUMENTATION	
PROCESS STREAM	INLET TO ABSORBER
CHEMICAL PARAMETERS	PH
PHYSICAL VARIABLES	PERCENT SOLIDS, PRESSURE DROP, SO2
CONTROL LEVELS	PH SET AT 5.9, 10% SOLIDS IN ABSORBER
MONITOR LOCATION	PH-ABSORBER RECYCLE LINE
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
** CHEMICALS AND CONSUMPTION	
FUNCTION	ABSORBENT
NAME	LIMESTONE
PRINCIPAL CONSTITUENT	CAC03
UTILIZATION - %	65.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

POINT OF ADDITION	BALL MILL
** FGD SPARE CAPACITY INDICES	
ABSORBER - %	0.0
BALL MILL - %	0.0
** FGD SPARE COMPONENT INDICES	
ABSORBER	0.0
BALL MILL	0.0

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO ₂ PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

5/77	SYSTEM	1.5	2.6		1.5		744	426	11	40.9

** PROBLEMS/SOLUTIONS/COMMENTS

STARTUP AND SHAKEDOWN PROCEDURES OFFICIALLY BEGAN ON APRIL 30, 1977. SCRUBBING OPERATIONS BEGAN ON MAY 16 WHEN FLUE GAS WAS PASSED THROUGH A AND B TRAINS.

6/77	SYSTEM	10.9	18.0		10.9		720	438	79	36.3

** PROBLEMS/SOLUTIONS/COMMENTS

C AND D TRAINS WERE STILL UNDERGOING PRESCRUBBING PREPARATIONS THROUGH JUNE. BECAUSE OF BOILER RELATED PROBLEMS SUFFICIENT STEAM WAS NOT AVAILABLE TO OPERATE THE FLUE GAS REHEATERS.

7/77	SYSTEM	24.7	28.1		24.7		744	654	184	49.6

8/77	A	20.0	22.8		20.0					
	B	40.0	45.7		40.0					
	C	36.7	42.0		36.7					
	D	8.3	9.5		8.3					
	SYSTEM	26.3	30.0		26.3		744	651	195	47.5

** PROBLEMS/SOLUTIONS/COMMENTS

27 SEPARATE INSTRUMENTATION FAILURES OCCURRED DURING THE PERIOD. THE PROBLEMS WERE ASSOCIATED WITH FLOW METERS, VARIABLE-SPEED CONTROLS, SO₂ MONITORS, PH MONITORS, AND SOLIDS MONITORS. AUTOMATIC SCRUBBER CONTROLS WERE INOPERATIVE. SCRUBBING OPERATIONS HAVE BEEN CONDUCTED MANUALLY BASED ON PERIODIC SAMPLING.

MAJOR PROBLEMS HAVE BEEN ASSOCIATED WITH THE GUILLOTINE BYPASS AND DOUBLE LOUVER SEAL-OFF GAS DAMPERS. SO₂ REACTS WITH RUBBER SEALS. DETERIORATION RESULTS IN SO₂ AND FLYASH LEAKING. SUBSEQUENT FAILURE OF THE AUTOMATIC GEAR BOXES NECESSITATES MANUAL DAMPER OPERATIONS. IT HAS NOT BEEN POSSIBLE TO ENTIRELY ISOLATE MODULES FOR REPAIR WORK BECAUSE OF THIS LEAKAGE.

LOW ESP PARTICULATE REMOVAL EFFICIENCY HAS RESULTED IN HIGH FAN ROTOR EROSION, MOTOR BURNOUTS AND LUBRICATION PROBLEMS.

THERE WAS EVIDENCE OF SCALE ACCUMULATION IN THE SCRUBBING SYSTEM, HOWEVER, THIS WAS NOT SEVERE.

EROSION HAS OCCURRED IN THE CERAMIC VENTURI THROAT LININGS. THIS IS ALSO A RESULT OF THE POOR ESP EFFICIENCY.

RUBBER LINING FAILURES HAVE OCCURRED IN THE VENTURIS, ABSORBERS AND TANKS. IT IS BELIEVED THAT THESE WERE APPLICATION-RELATED FAILURES. THE RUBBER IN THE ABSORBER SECTION OF ALL FOUR TRAINS HAS DETACHED IN VARIOUS PLACES. THE SUPPLIER HAS REPAIRED THE DEFECTIVE SECTIONS.

SOFT SCALE FORMATION MAY RESULT FROM IMPROPER STOICHIOMETRIC RATIOS. STOICHIOMETRIC RATIOS OF 2.0, 3.0 AND 6.0 HAVE OCCURRED PERIODICALLY

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

BECAUSE OF MANUAL CONTROL AND OPERATOR JUDGEMENTS. IDEALLY THE RATIO SHOULD FALL IN THE 1.4 TO 1.6 RANGE.

THE BALL MILL HAS NOT BEEN ABLE TO OPERATE AT DESIGN CAPACITY. THE BALL MILL HAS A DESIGN CAPACITY OF GRINDING 50 TPH BUT HAS ONLY BEEN ABLE TO PRODUCE 35 TPH OF LIMESTONE SLURRY.

9/77	A	33.3	21.1	17.8				
	B	72.7	68.2	57.8				
	C	97.4	97.0	82.1				
	D	98.4	98.2	83.1				
	SYSTEM	75.5	71.1	60.2	720	609	433	45.5

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THIS MONTH THE BOILER WAS OPERATED AT A REDUCED LOAD OF ABOUT 300 MW. AT THIS REDUCED LOAD, ONLY 3 TRAINS WERE REQUIRED TO HANDLE ALL OF THE BOILER FLUE GAS.

SOME SCALING WAS DISCOVERED IN THE ABSORBER COLUMN AND ENTRAINMENT SEPARATOR OUTLET OF ONE TRAIN.

SERIOUS EROSION PROBLEMS CONTINUE WITH THE ID FAN ROTORS.

THE UNIT WENT OFF LINE SEPTEMBER 30 FOR A SCHEDULED OUTAGE TO REPAIR BOILER TUBES. DURING THE OUTAGE, AN ATTEMPT WILL BE MADE TO CORRECT MANY OF THE MECHANICAL PROBLEMS.

10/77	SYSTEM	100.0		0.0	744	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

UNIT 8 WAS OFF-LINE FOR THE ENTIRE MONTH DURING A SCHEDULED OUTAGE FOR REPAIR OF BOILER TUBES. DURING THIS PERIOD, MANY MECHANICAL AND INSTRUMENTAL SCRUBBER PROBLEMS WERE CORRECTED.

11/77	A		85.5	49.0				
	B		89.8	51.5				
	C		99.8	57.2				
	D		75.8	43.5				
	SYSTEM	57.0	87.7	50.3	720	413	362	36.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS BROUGHT BACK IN SERVICE ON NOVEMBER 11 FOLLOWING THE SCHEDULED BOILER OUTAGE (AVAILABILITY WAS CALCULATED FROM NOVEMBER 11 THROUGH NOVEMBER 30).

ALL ID FANS HAVE BEEN REBUILT IN AN ATTEMPT TO CORRECT THE CORROSION AND DRIVE MOTOR PROBLEMS.

GAS LEAKAGE FROM THE DAMPERS WAS CORRECTED BY WELDING A COVER PLATE OVER THE SEAL DOORS. THE SUPPLIER IS CURRENTLY WORKING ON A NEW DESIGN FOR DAMPERS.

INSTRUMENTATION PROBLEMS CONTINUE TO HAMPER PROPER SCRUBBER OPERATION.

12/77	A	59.3	98.1	56.1				
	B	55.9	97.9	56.0				
	C	58.7	97.2	55.6				
	D	57.7	95.4	54.6				
	SYSTEM	57.9	97.2	56.0	744	426	414	42.9

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF-LINE FROM DECEMBER 20 TO DECEMBER 31 FOR REPAIRS OF A BOILER TUBE LEAK.

DURING THE BOILER OUTAGE, AN INSPECTION WAS MADE OF THE SCRUBBER MODULES.

THE RUBBER LINER WAS FOUND TO BE MISSING IN SEVERAL AREAS OF ALL FOUR MODULES AND WAS REPAIRED DURING THE OUTAGE.

1/78	A	90.2	98.5	81.9				
	B	86.7	94.5	78.5				
	C	84.6	91.9	76.4				
	D	88.8	97.0	80.6				
	SYSTEM	87.6	95.5	79.4	744	618	590	60.1

** PROBLEMS/SOLUTIONS/COMMENTS

ALL FOUR SCRUBBER MODULES RETURNED TO SERVICE THIS MONTH FOLLOWING REPAIR WORK ON THE RUBBER LINER DURING THE RECENT BOILER OUTAGE.

MINOR PROBLEMS WERE ENCOUNTERED WITH FREEZING AND BURSTING OF PIPING.

FEED HOPPERS AT THE LIMESTONE STORAGE AREA HAVE BEEN PLUGGING DUE TO FROZEN GRAVEL.

THE BALL MILL SUMP PUMP LINERS HAVE BEEN WEARING OUT.

SOME PLUGGING OF THE VENTURI SPRAY NOZZLES WAS ENCOUNTERED DURING JANUARY.

INSTRUMENTATION CONTINUES TO BE A MAJOR PROBLEM WITH OPERATION OF THE SCRUBBER.

2/78	A	25.5	29.3	25.5				
	B	69.4	68.4	59.7				
	C	67.8	63.1	55.1				
	D	56.5	53.6	46.8				
	SYSTEM	54.8	53.6	46.8	672	586	314	49.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE OUTAGE TIME FOR TRAINS A AND B WAS REQUIRED TO REPLACE THE RUBBER LINERS IN THE DOWNCOMER AREA WITH STAINLESS STEEL. C AND D TRAINS WILL WILL RECEIVE THE SAME MODIFICATION.

3/78	A	81.9	90.8	78.6				
	B	48.4	53.4	46.2				
	C	26.8	30.9	26.8				
	D	81.6	90.5	78.3				
	SYSTEM	59.7	66.4	57.5	744	644	428	43.7

** PROBLEMS/SOLUTIONS/COMMENTS

TRAIN B WAS OUT OF SERVICE MARCH 1 THROUGH MARCH 13 TO INSTALL STAINLESS STEEL IN THE ABSORBER AND VENTURI DOWNCOMER AREAS.

STAINLESS STEEL COVERS WERE INSTALLED AROUND TWO EXPANSION JOINTS ON TRAIN C IN ORDER TO PREVENT FLUE GAS LEAKAGE.

A STAINLESS STEEL PLATE WAS WELDED OVER THE ENTRY DOOR OPENINGS TO TRAIN OUTLET AND BYPASS GUILLotine DAMPERS FOR THE PURPOSE OF ELIMINATING GAS LEAKAGE.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR
TRAIN C WAS OUT OF SERVICE MARCH 14 THROUGH MARCH 29 TO INSTALL STAINLESS STEEL ABSORBER AND VENTURI DOWNCOMER AREAS.									
SEVERAL LIFTER BARS ON THE FEED AND DISCHARGE ENDS OF THE BALL MILL WERE FOUND TO BE BADLY WORN.									
THE UTILITY HAS HAD WEAR PROBLEMS WITH THE SLURRY SUMP PUMP LINERS AT THE BALL MILL.									
4/78	A	80.0	88.8		66.6				
	B	67.7	85.8		64.4				
	C	90.0	100.0		80.0				
	D	38.1	50.8		38.1				
	SYSTEM	69.0	81.4		62.3		720	540	448 44.4

** PROBLEMS/SOLUTIONS/COMMENTS

DURING A BRIEF INSPECTION OF THE SCRUBBING SYSTEM IN EARLY APRIL, SOLIDS DEPOSITION WAS NOTICED IN THE MIST ELIMINATOR SECTION OF ALL TRAINS DUE TO PLUGGING THAT HAD OCCURRED IN SEVERAL OF THE MIST ELIMINATOR SPRAY NOZZLE. TRAIN D WAS OUT OF SERVICE FOR 17 DAYS WHILE THE MIST ELIMINATOR WAS DISASSEMBLED AND CLEANED.

A STAINLESS STEEL LINER WAS INSTALLED ON THE SLOPING SECTIONS OF THE ABSORBER AND VENTURI OF TRAIN D.

STAINLESS STEEL PLATES WERE INSTALLED OVER THE ENTRY DOOR OPENINGS TO TRAIN D INLET, OUTLET AND BYPASS GUILLOTINE DAMPERS TO REDUCE GAS LEAKAGE.

STAINLESS STEEL COVERS WERE INSTALLED AROUND THE FIVE EXPANSION JOINTS ON TRAIN D, TWO EXPANSION JOINTS ON TRAIN A, AND ONE EXPANSION JOINT ON TRAIN B TO REDUCE GAS LEAKAGE.

THERE CONTINUES TO BE A WEAR PROBLEM WITH PUMP LINERS AT THE BALL MILL. NO CAUSE OR SOLUTION OF THE PROBLEM HAS BEEN ASCERTAINED AS YET.

5/78	A		52.0		34.0				
	B		100.0		68.7				
	C		100.0		69.9				
	D		100.0		66.1				
	SYSTEM	97.2	88.0		59.7		744	486	444 44.4

** PROBLEMS/SOLUTIONS/COMMENTS

BEGINNING MAY 1978 AVAILABILITY CALCULATIONS EXCLUDED UNAVAILABLE HOURS RESULTING FROM THE ID FAN SINCE THE ID FAN IS INTENDED PRIMARILY FOR MAINTAINING BOILER FURNACE DRAFT. FGD SYSTEM AVAILABILITY CALCULATORS DO INCLUDE UNAVAILABLE HOURS RESULTING FROM THE LIMESTONE PREPARATION FACILITY.

ON MAY 29 A SMALL PERFORATION IN THE RIVERSIDE VERTICAL WALL OF THE ABSORBER VESSEL WAS DISCOVERED (LEAKING SLURRY). FURTHER EXAMINATION SHOWED THAT A STRIP OF LOOSE NEOPRENE HAD ALLOWED SLURRY TO CORRODE AND/OR ERODE THE BARE CARBON STEEL VESSEL. BECAUSE OF THE SMALL SIZE OF THE LEAK, NO ATTEMPT WILL BE MADE TO PROVIDE A PERMANENT PATCH UNTIL THE NEXT EXTENDED OUTAGE OF TRAIN A. THERE WAS NO EVIDENCE OF ANY CORROSIVE OR EROSION ATTACK ON THE NEWLY-APPLIED STAINLESS STEEL ON THE SLOPING PORTIONS OF THE VESSEL.

6/78	A		100.0		70.1				
	B		100.0		73.8				
	C		100.0		71.7				
	D		100.0		70.7				
	SYSTEM	91.7	100.0		71.6		720	472	518 39.8

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

SEVERE FAILURE OF THE BALL MILL OUTBOARD FLANGED JOURNAL BOLTS RESULTED IN A LOSS OF SLURRY PRODUCTION SEVERAL TIMES DURING JUNE.

7/78	A		96.9		75.3				
	B		98.8		76.7				
	C		90.7		70.4				
	D		100.0		88.8				
	SYSTEM	91.7	96.6		77.8	744	578	579	53.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE BUCKET ELEVATOR SUPPLYING LIMESTONE TO THE BALL MILL FAILED ON JULY 21 APPARENTLY, THE CHAIN CARRYING THE BUCKETS GOT OFF TRACK DAMAGING SEVERAL BUCKETS BEFORE THE CONDITION WAS DISCOVERED. REPAIRS WERE NOT COMPLETED UNTIL JULY 24.

BECAUSE OF THE NECESSITY FOR KEEPING UNIT 8 ON-LINE, THE SCRUBBER WAS RUN WITHOUT LIMESTONE ADDITION(THERE IS AN APPROXIMATE 8-HOUR RESERVE OF GROUND LIMESTONE WHEN THE SLURRY STORAGE TANK IS FULL).

SINCE THERE IS NO RESERVE BUCKET ELEVATOR, AN OPENING WAS CUT IN THE TOP OF THE BALL MILL FEED HOPPER AND A CHUTE WAS INSTALLED EXTENDING OUTWARD FROM THE OPENING TO ALLOW LOADING A LIMESTONE INTO THE BALL MILL FEED HOPPER USING A CRANE WITH A CLAMSHELL LOADER. THIS WILL ALLOW CONTINUED OPERATION OF THE BALL MILL IN THE EVENT OF FUTURE BUCKET ELEVATOR FAILURES

8/78	A		100.0		87.8				
	B		56.9		49.2				
	C		58.6		50.7				
	D		95.6		82.7				
	SYSTEM	91.4	77.8		67.6	744	643	503	44.6

** PROBLEMS/SOLUTIONS/COMMENTS

ABSORBER SPRAY NOZZLE CONES CONTINUE TO DROP TO THE TOP GRID, DISTORTING SPRAY PATTERNS. INSPECTIONS ON AUGUST 18 SHOWED CONSIDERABLE TOP GRID WEAR OF THE 316 STAINLESS STEEL GRIDS, PROBABLY AGGRAVATED BY LOSS OF NOZZLE CONES. FOUR SPRAYCO 1969F 5-INCH ORIFICE NOZZLES WERE BORROWED FROM THE SHAWNEE STEAM PLANT TEST FACILITY AND INSTALLED IN ABSORBER B ON AUGUST 18 FOR EVALUATION AS POSSIBLE CANDIDATES FOR REPLACING NOZZLES IN CURRENT USE. THESE SPRAYCO NOZZLES HAVE SUBSTANTIAL INTERNAL DEFLECTORS AND ARE EXPECTED TO DEMONSTRATE IMPROVED PERFORMANCE.

SPRAYING SYSTEMS COMPANY WILL ALSO LEND FOUR OF THEIR 5-INCH SCRUBBER NOZZLES FOR TESTING. THESE ARE EXPECTED TO ARRIVE IN SEPTEMBER.

9/78	A		100.0		76.1				
	B		100.0		82.9				
	C		29.0		20.6				
	D		83.9		59.4				
	SYSTEM	98.7	78.2		59.8	720	510	430	39.5

** PROBLEMS/SOLUTIONS/COMMENTS

REPAIRS ON THE BUCKET ELEVATOR WERE COMPLETED ON SEPTEMBER 24.

10/78	A		100.0		23.0				
	B		100.0		19.9				
	C		100.0		22.2				
	D		0.0		0.0				
	SYSTEM	22.4	75.0		16.3	744	146	121	10.1

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE LIMESTONE BUCKET ELEVATOR FAILED ON OCTOBER 4. THE ELEVATOR HAD BEEN LAST REPAIRED ON SEPTEMBER 24. THE BUCKET ELEVATOR FAILURES ARE CAUSED BY THE DRIVE SPROCKETS BECOMING LOOSE ALLOWING THE CHAINS TO WORK OFF OF THE SPROCKET AND THE HOUSING NOT BEING PLUMB.

SHORT-TERM PLANS ARE TO REBUILD THE BUCKET ELEVATOR DURING THE SCHEDULED BOILER OUTAGE. THE LONG-TERM SOLUTION IS TO REPLACE THE BUCKET ELEVATOR WITH CONVEYORS.

11/78	SYSTEM		0.0		720	0	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS DOWN FOR A SCHEDULED SCRUBBER/BOILER OUTAGE IN NOVEMBER.

A FIRE ON NOVEMBER 28 IN TRAIN A ABSORBER CAUSED BY WELDING DESTROYED THE TURBULENT CONTACT ABSORBER (TCA) SPHERES INSTALLED DURING THE PRESENT OUTAGE.

12/78	A		0.0		0.0			
	B		100.0		15.2			
	C		100.0		11.8			
	D		100.0		15.3			
	SYSTEM	67.7	75.0		10.6	744	37	79 2.4

** PROBLEMS/SOLUTIONS/COMMENTS

CLEANUP OF THE FIRE-DAMAGED TRAIN A ABSORBER WAS COMPLETED ON DECEMBER 5.

THE BUCKET ELEVATOR REPAIRS CONTINUED IN DECEMBER. A PORTABLE CONVEYOR IS BEING USED TO SUPPLY LIMESTONE UNTIL THE BUCKET ELEVATOR REPAIRS ARE COMPLETE.

1/79	SYSTEM	75.0		0.0		744	0	0

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT REMAINED OUT OF SERVICE BECAUSE OF TURBINE ROTOR PROBLEMS.

FOLLOWING THE NOVEMBER 28 FIRE, THE DECISION WAS MADE NOT TO RESTORE THE DAMAGED NEOPRENE ABSORBER VESSEL LINING, BUT TO REPLACE IT WITH 316L STAINLESS STEEL. TWO PRINCIPAL REASONS FOR NOT RESTORING THE RUBBER WERE HIGH COST AND A STATEMENT BY THE RUBBER APPLICATOR THAT HE COULD NOT GUARANTEE ANY RUBBER APPLIED TO THE VESSELS WITH THE AMBIENT TEMPERATURE BELOW ABOUT 55 F. STAINLESS STEEL (TYPE 316L) IS CHEAPER (APPLIED COST) THAN RUBBER QUICKER TO APPLY, AND HAS BEEN DEMONSTRATED AT WIDOWS CREEK STEAM PLANT TO BE VERY DURABLE FOR APPLICATION WITHIN THE ABSORBER VESSEL.

AN ESTIMATED 4,200 SQUARE FEET OF DAMAGED RUBBER WAS REMOVED AND 3/16-INCH THICK 316L STAINLESS STEEL WAS PURCHASED FOR REPLACEMENT. THIS ARRIVED AT THE PLANT ON JANUARY 16. PREPARATION OF THE ABSORBER VESSEL INTERIOR FOR INSTALLATION OF THE STAINLESS STEEL CONTINUED DURING JANUARY. SINCE TRAIN A ABSORBER STAINLESS STEEL GRID (DIRECTLY BELOW THE SPRAY NOZZLES) WAS DESTROYED BY THE FIRE, THE LOWER STAINLESS STEEL GRID FROM TRAIN B WAS REMOVED AND INSTALLED AS THE TOP GRID IN TRAIN A. A NEW COMPLEMENT OF FIBERGLASS-REINFORCED PLASTIC (FRP) ABSORBER VESSEL GRIDS WAS ORDERED AND WAS SCHEDULED TO ARRIVE ONSITE DURING FEBRUARY.

2/79	A		0.0		0.0			
	B		100.0		70.5			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
	C		100.0		68.6					
	D		100.0		52.4					
	SYSTEM	66.4	75.0		47.9		672	314	323	25.6

** PROBLEMS/SOLUTIONS/COMMENTS

TRAIN D BECAME AVAILABLE FEBRUARY 10 FOR THE INSTALLATION OF FORCED-OXIDATION TEST EQUIPMENT. BY FEBRUARY 10, INSTALLATION WAS COMPLETED ON PUMPS, TANKS, VACUUM FILTERS, AND MODIFICATION OF THE ABSORBER AND VENTURI AGITATOR CONTROL CIRCUITS. BY LATE FEBRUARY, ERECTION OF THE ELECTRICAL/CONTROL BUILDING AND INSTALLATION OF FLOCCULENT PIPING WAS BEGUN. CONSTRUCTION OF THE FACILITY IS EXPECTED TO BE COMPLETED IN MARCH.

NEW AGITATORS WERE INSTALLED ON THE TRAIN D ABSORBER AND VENTURI CIRCULATION TANKS. THE NEW, MORE POWERFUL AGITATORS ARE NEEDED FOR THE FORCED-OXIDATION TESTS.

3/79	A		78.6		69.6					
	B		100.0		93.0					
	C		100.0		92.7					
	D		100.0		91.7					
	SYSTEM	99.6	94.7		86.8		744	659	646	62.1

** PROBLEMS/SOLUTIONS/COMMENTS

REPAIRS OF DAMAGE RESULTING FROM THE FIRE IN TRAIN A LAST NOVEMBER WERE COMPLETED BY MARCH 1, 1979. TRAIN A REMAINED OUT OF SERVICE UNTIL MARCH 8 TO REBUILD THE INDUCED-DRAFT FAN-A FLUID DRIVE.

BECAUSE THE REPLACEMENT FIBERGLASS-REINFORCED PLASTIC (FRP) GRATING DID NOT ARRIVE AT THE PLANT BY MARCH 1, 1979, ORDINARY CARBON STEEL FLOOR GRATING WAS INSTALLED FOR THE MARCH 8 STARTUP. INSPECTIONS LATE IN MARCH REVEALED THAT CORROSION AND EROSION HAD DESTROYED APPROXIMATELY 70-80% OF THE CARBON STEEL GRATING.

4/79	A		100.0		85.0					
	B		100.0		77.9					
	C		100.0		75.8					
	D		100.0		81.5					
	SYSTEM	96.4	100.0		80.1		720	519	577	46.8

** PROBLEMS/SOLUTIONS/COMMENTS

FOLLOWING THE BALLMILL TEST ON MARCH 21, 1979, WHERE SLURRY BEGAN TO OVERFLOW OUT THE FEED END OF THE MILL, THE CLASSIFIERS WERE EXAMINED FOR POSSIBLE PLUGGING. ONE CLASSIFIER LINER WAS WORN, AND THE CYCLONE INLET PIPE WAS PARTIALLY PLUGGED WITH SLURRY. REPAIRS WERE MADE, AND THE BALL MILL RESUMED OPERATION WITH NO OVERFLOW PROBLEMS. WHEN THE CYCLONE LINERS ARE WORN OR THE CYCLONES ARE PARTIALLY PLUGGED, TOO MUCH MATERIAL IS RETURNED TO THE MILL CAUSING OVERFLOW OF SLURRY OUT THE FEED END OF THE MILL.

5/79	A	100.0	97.5		83.6					
	B	100.0	59.3		50.8					
	C	100.0	100.0		89.7					
	D	100.0	100.0		87.9					
	SYSTEM	100.0	89.2		78.0		744	638	580	54.9

** PROBLEMS/SOLUTIONS/COMMENTS

THE VENTURI HEADERS AND NOZZLES HAVE PLUGGED WITH SCALE AND SOLIDS. A NEW VENTURI HEADER HAS BEEN INSTALLED AND IS BEING TESTED ON TRAIN B. THE NEW HEADER CONSISTS OF SIX 5-INCH FULL-CONE NOZZLES WITH A 3-INCH DISCHARGE ORIFICE. THE HEADER IS INSTALLED OVER THE VENTURI THROAT TO PROVIDE GOOD THROAT COVERAGE. IF THE NEW HEADER PROVES SUCCESSFUL, NEW HEADERS WILL BE

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

 INSTALLED IN ALL VENTURIS.

6/79	A	100.0	93.6	75.7				
	B	100.0	89.9	72.6				
	C	100.0	91.1	73.6				
	D	99.6	93.8	75.8				
	SYSTEM	99.9	92.1	74.4	720	582	536	51.4

** PROBLEMS/SOLUTIONS/COMMENTS

THE NEW HEADER IN TRAIN B PROVED SATISFACTORY SO NEW HEADERS WILL BE INSTALLED ON ALL FOUR VENTURIS.

OPTIMIZATION TESTS ON THE UNIT 8 SCRUBBER HAVE BEGUN AND WILL BE COMPLETED BY THE END OF OCTOBER. THE TESTS WILL INCLUDE TESTING THE ADDITIONAL FIBERGLASS REINFORCED PLASTIC GRIDS, NEW ABSORBER FULL-CONE SPRAY NOZZLES, POLYPROPYLENE GRID-TYPE PACKING, AND TURBULENT CONTACT ABSORBER SPHERES.

THE 99.5% PARTICLE REMOVAL EFFICIENCY REPORTED FOR JUNE WAS THE AVERAGE OF TWO EFFICIENCY TESTS RUN AS PART OF THE SCRUBBER OPTIMIZATION TESTS.

7/79	A	100.0	100.0	44.6				
	B	100.0	100.0	41.8				
	C	100.0	100.0	42.5				
	D	100.0	89.4	35.0				
	SYSTEM	100.0	100.0	41.0	744	291	305	23.7

** PROBLEMS/SOLUTIONS/COMMENTS

CORROSION WAS FOUND IN THE REHEAT TUBES IN TRAIN A. MATERIAL COLLECTED ON THE TUBES CONSISTED OF FLY ASH AND FERROUS CORROSION PRODUCTS. CHLORIDE AND SLURRY SOLIDS WERE ALSO DETECTED. THE CHLORIDE COULD HAVE BEEN DEPOSITED DURING THE FIRE IN TRAIN A IN NOVEMBER 1978. THE NEOPRENE SCRUBBER LINING CONTAINS CHLORIDE WHICH IS LIBERATED WHEN BURNED. A DETAILED ANALYSIS OF THE TUBE CORROSION IS BEING PERFORMED.

THE 99.01% PARTICLE REMOVAL EFFICIENCY REPORTED FOR JULY WAS AN AVERAGE OF THE EFFICIENCY TESTS RUN AS A PART OF THE SCRUBBER OPTIMIZATION TESTS.

8/79	A	99.2	100.0	74.3				
	B	100.0	100.0	80.6				
	C	96.2	94.9	70.2				
	D	96.1	100.0	74.9				
	SYSTEM	97.9	99.0	75.0	744	550	558	48.0

** PROBLEMS/SOLUTIONS/COMMENTS

THE BALL MILL WAS OUT OF SERVICE BECAUSE OF BROKEN BOLTS WHICH SECURE THE INBOARD BEARING JOURNAL TO THE BALL MILL. THE BOLTS WERE REPLACED AND THE DISCHARGE END OF THE MILL WAS CLEANED. BOLT HOLES WERE REAMED TO ACCOMMODATE THE LARGER DIAMETER BOLTS AND LOCK NUTS WERE USED.

THE SCRUBBER OPTIMIZATION TEST CONTINUED DURING AUGUST.

9/79	A	100.0	100.0	71.7				
	B	100.0	100.0	75.0				
	C	95.0	96.7	65.6				
	D	94.4	100.0	72.8				
	SYSTEM	97.4	99.2	71.3	720	488	513	43.8

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE LIMESTONE BUCKET ELEVATOR, WHICH FEEDS LIMESTONE INTO THE BALL MILL SURGE HOPPER, FAILED ON SEPTEMBER 28. THE FAILURE, WHICH HAS OCCURRED BEFORE, WAS CAUSED BY LIMESTONE PARTICLE BUILDUP ON THE BUCKETS AND IN THE BOTTOM OF THE HOUSING, RESULTING IN THE ELEVATOR JAMMING AND BREAKING OF THE BUCKET GUIDE CHAINS. THE ELEVATOR WILL BE REPLACED WITH BELT CONVEYOR IN THE SUMMER OF 1980.

10/79	A	58.3	72.7	51.1				
	B	100.0	95.8	67.3				
	C	100.0	95.2	66.9				
	D	93.4	100.0	70.3				
	SYSTEM	87.9	90.9	63.9	744	523	476	3.8

** PROBLEMS/SOLUTIONS/COMMENTS

A PORTABLE CONVEYOR WAS USED TO SUPPLY LIMESTONE TO THE BALL MILL WHILE THE BUCKET WAS BEING REPAIRED.

THE REPAIR OF THE BUCKET ELEVATOR CONSISTED OF THE REPLACEMENT OF 25 BUCKETS, REPLACEMENT OF 50 FEET OF DRIVE CHAIN ON EACH SIDE OF THE BUCKETS AND REMOVAL OF LIMESTONE ACCUMULATIONS ON ALL SURFACES WITH HIGH-PRESSURE WATER. THE BUCKET ELEVATOR WAS RETURNED TO SERVICE ON OCTOBER 6, 1979.

11/79	A	96.9	87.5	63.9				
	B	100.0	100.0	78.6				
	C	90.0	83.3	60.8				
	D	80.3	92.2	67.4				
	SYSTEM	91.8	90.8	67.7	720	526	487	36.3

** PROBLEMS/SOLUTIONS/COMMENTS

CONSTRUCTION OF AN ON-SITE AREA IN WHICH TO STACK GYPSUM WAS COMPLETED DURING EARLY NOVEMBER AND STACKING (LANDFILL) OPERATIONS BEGAN ON NOVEMBER 15. THE TRAIN D SCRUBBER SLUDGE IS OXIDIZED BY AIR SPARGING, DEWATERED, AND TRANSPORTED TO THE SITE IN TRUCKS. THE GYPSUM PILE IS FORMED WITH A BULLDOZER, AND RUNOFF AND LEACHATE ARE MONITORED FROM LEACHATE WELLS, A LEACHATE POND, AND A RUNOFF POND. THE GYPSUM IS TO BE STACKED AS HIGH AS 10 FEET.

12/79	A	87.6	83.6	67.7				
	B	100.0	100.0	85.6				
	C	100.0	64.0	51.9				
	D	95.8	65.7	53.2				
	SYSTEM	95.9	78.3	64.6	744	603	481	37.5

** PROBLEMS/SOLUTIONS/COMMENTS

ON DECEMBER 29, 1979 OPTIMIZATION TESTS WERE COMPLETED. THE DATA OBTAINED WILL BE ANALYZED TO DETERMINE THE BEST MODIFICATIONS THAT CAN BE INSTALLED TO INCREASE THE SO2 REMOVAL ON THE SCRUBBER.

1/80	A	70.4	79.8	39.2				
	B	83.5	100.0	56.3				
	C	100.0	100.0	55.5				
	D	28.3	54.7	26.9				
	SYSTEM	70.6	83.6	44.5	744	366	331	23.9

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 S02 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JANUARY THE UNIT 8 BOILER EXPERIENCED LOW AVAILABILITY, CAUSING THE FORCED OXIDATION TESTS TO BE DISCONTINUED UNTIL AFTER THE SCHEDULED MAINTENANCE OUTAGE WHICH WILL BEGIN IN SEPTEMBER 1980. THE FORCED OXIDATION TESTS ARE EXPECTED TO RESUME IN JANUARY 1981.

2/80	A	80.0	88.6	72.7				
	B	86.5	90.2	74.0				
	C	91.1	97.6	80.0				
	D	87.6	98.2	80.6				
	SYSTEM	86.3	93.7	76.8	696	571	535	43.6

** PROBLEMS/SOLUTIONS/COMMENTS

BY FEBRUARY 27, 1980, THE DIFFERENTIAL PRESSURE ACROSS THE TRAIN C ABSORBER HAD REACHED 19 INCHES WATER GAGE. THE HIGH ABSORBER DIFFERENTIAL PRESSURE WAS CAUSED BY PLUGGING OF TURBULENT CONTACT ABSORBER (TCA) SPHERES WHICH WERE INSTALLED DURING SCRUBBER OPTIMIZATION TESTS. THE TCA SPHERES WILL BE REMOVED IN MARCH.

3/80	A	93.6	88.0	85.4				
	B	93.0	90.6	87.9				
	C	71.9	73.3	71.1				
	D	93.3	63.9	62.0				
	SYSTEM	86.0	79.0	76.6	744	722	570	50.4

** PROBLEMS/SOLUTIONS/COMMENTS

ON MARCH 3 THE TCA SPHERES INSTALLED IN TRAIN C AS PART OF THE OPTIMIZATION TESTS WERE REMOVED. THE SPHERES HAD BECOME PLUGGED, RESULTING IN AN ABSORBER DIFFERENTIAL PRESSURE OF 20 INCHES WATER GAGE. THE SPHERES HAD BEEN IN USE SINCE NOVEMBER 17, 1979.

4/80	A	96.8	82.7	46.5				
	B	97.2	79.5	44.7				
	C	96.3	90.4	50.8				
	D	95.0	70.9	39.9				
	SYSTEM	96.3	80.9	45.5	720	405	328	30.3

** PROBLEMS/SOLUTIONS/COMMENTS

THE SCRUBBER SLURRY SPRAY NOZZLES WERE CLEANED AS PART OF A SCHEDULED MAINTENANCE OUTAGE.

BALL MILL LINERS AND LIFTER BARS WERE REPLACED IN APRIL DURING A SCHEDULED MAINTENANCE OUTAGE.

5/80	A	99.2	74.5	56.2				
	B	96.1	80.9	61.0				
	C	96.1	87.7	66.1				
	D	96.1	75.2	56.7				
	SYSTEM	96.9	79.6	60.0	744	561	447	38.3

** PROBLEMS/SOLUTIONS/COMMENTS

ON MAY 16 THE LIMESTONE BUCKET ELEVATOR FAILED CAUSING UNIT 8 TO BE REMOVED FROM SERVICE FOR SIX HOURS.

THE SCRUBBER SLURRY SPRAY NOZZLES ON THE B, C AND D MODULES WERE CLEANED DURING MAY. THE CLEANING KEPT THE SYSTEM OFF LINE FOR 23 HOURS.

THE UNIT 8 BALL MILL MALFUNCTIONED ON MAY 28, DUE TO FAILURE OF INLET

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

BEARING BOLTS.

6/80	A	100.0	5.3	100.0	4.9					
	B	100.0	100.0	100.0	91.8					
	C	99.6	93.9	99.5	86.3					
	D	100.0	98.6	100.0	90.6					
	SYSTEM	99.9	74.5	99.8	68.3		720	661	492	44.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING JUNE THE BALL MILL REMAINED OUT OF SERVICE FOR MAJOR REPAIRS THAT INCLUDED REPAIR OF THE BALL MILL SHELL (CRACKS PRESENT). THE UNIT 7 SCRUBBER BALL MILL WAS USED IN PLACE OF THE UNIT 8 BALL MILL.

7/80	A	100.0	79.9	100.0	71.6					
	B	96.9	75.1	95.6	67.3					
	C	96.9	88.3	96.2	79.2					
	D	100.0	48.7	100.0	43.7					
	SYSTEM	98.5	73.0	98.0	65.5		744	667	487	43.7

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT 8 BALL MILL SHELL WAS SHIPPED TO THE FACTORY FOR REPAIRS ON JULY 24.

CLEANING OF THE SLURRY SPRAY NOZZLES REMAINS A SIGNIFICANT SCRUBBER MAINTENANCE ITEM.

8/80	SYSTEM						744			
9/80	SYSTEM						720			

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION FOR THE MONTHS OF AUGUST AND SEPTEMBER IS NOT AVAILABLE AT THIS TIME.

10/80	SYSTEM						744			
11/80	SYSTEM						720			
12/80	SYSTEM						744			

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION FOR THE FOURTH QUARTER 1980 IS NOT AVAILABLE AT THIS TIME.

1/81	SYSTEM						744	0		0.0
2/81	SYSTEM						672	0		0.0
3/81	SYSTEM						744	0		0.0

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE FIRST QUARTER 1981 THE BOILER WAS OUT OF SERVICE DUE TO A MAJOR OVERHAUL. THE UNIT IS EXPECTED TO BE ON LINE IN LATE MAY OR EARLY JUNE.

4/81	SYSTEM						720	0		0.0
5/81	SYSTEM						744	0		0.0
6/81	SYSTEM						720	0		0.0

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

MAJOR OVERHAUL OF BOILER (BOILER TUBE REPAIRS) CONTINUED THROUGHOUT THE SECOND QUARTER 1981.

7/81	SYSTEM	744	0	0.0
8/81	SYSTEM	744	0	0.0
9/81	SYSTEM	720	0	0.0

** PROBLEMS/SOLUTIONS/COMMENTS

WIDOWS CREEK UNIT 8 REMAINED OFF LINE THROUGHOUT THE THIRD QUARTER 1981 AS THE BOILER OVERHAUL CONTINUED.

10/81	SYSTEM	744		
11/81	SYSTEM	720		
12/81	SYSTEM	744		

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE FOURTH QUARTER THE UTILITY REPORTED THAT NO MAJOR PROBLEMS WERE ENCOUNTERED. SOME GENERAL MAINTENANCE WAS PERFORMED DURING THE PERIOD.

1/82	SYSTEM	744		
2/82	SYSTEM	672		
3/82	SYSTEM	744		

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE FIRST QUARTER OF 1982 THE UTILITY REPORTED THAT NO MAJOR PROBLEMS WERE ENCOUNTERED. SOME GENERAL MAINTENANCE WAS PERFORMED DURING THE PERIOD. THE ENTIRE WIDOWS CREEK PLANT HAS LATELY SEEN LIMITED OPERATION DUE TO LACK OF POWER DEMAND.

4/82	SYSTEM	720		
5/82	SYSTEM	744		
6/82	SYSTEM	720		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD RELATED PROBLEMS WERE ENCOUNTERED DURING THE SECOND QUARTER. THE BOILER WAS OPERATED AT LOW LOAD DURING THIS PERIOD DUE TO A LACK OF POWER DEMAND.

7/82	SYSTEM	744		
8/82	SYSTEM	744		
9/82	SYSTEM	720		
10/82	SYSTEM	744		
11/82	SYSTEM	720		
12/82	SYSTEM	744		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
1/83	SYSTEM							744			
2/83	SYSTEM							672			
3/83	SYSTEM							744			
4/83	SYSTEM							720			
5/83	SYSTEM							744			
6/83	SYSTEM							720			
** PROBLEMS/SOLUTIONS/COMMENTS											
SINCE JUNE 1982 THE WIDOWS CREEK 8 FGD SYSTEM HAS OPERATED WITH PROBLEMS EXPERIENCED ON PUMPS, NOZZELS, ETC. TVA HAS MANAGED TO KEEP THE DECAYING FGD SYSTEM OPERATING WITH EXTENSIVE OPERATING AND MAINTENANCE EFFORTS. HOWEVER, THE FGD SYSTEM WILL BE REMOVED FROM SERVICE MODULE BY MODULE BE- GINING IN JULY FOR EXTENSIVE OVERHAUL AND REBUILDING WORK.											
THE FORCED OXIDATION R&D WORK IS CONTINUING AT WIDOWS CREEK. A FULL SCALE GYPSUM STACKING PROJECT HAS BEEN UNDERWAY FOR SOME TIME AND THE RESULTS HAVE BEEN FAVORABLE FROM TVA'S PERSPECTIVE.											
7/83	SYSTEM							744			
** PROBLEMS/SOLUTIONS/COMMENTS											
RUBBER PIPING LINERS WERE REPLACED DURING JULY.											
8/83	SYSTEM							744			
9/83	SYSTEM							720			
** PROBLEMS/SOLUTIONS/COMMENTS											
A MAJOR REWORKING TOOK PLACE AT UNIT 8 BEGINNING IN AUGUST 1983 AND CON- TINUING THROUGH THE THIRD QUARTER.											
INCLUDED IN THE REWORKING WAS THE REPLACEMENT OF VENTURI AND ABSORBER SPRA HEADERS AND SPRAY NOZZLES.											
PUMPS WERE ALSO REPLACED DURING THE PERIOD.											
ABSORBER GRIDS WERE REPLACED AND STAINLESS STEEL ABSORBER VESSEL LINERS WERE INSTALLED DURING THE PERIOD. THE OUTER ABSORBER LAGGING WAS ALSO RE- PLACED WITH STAINLESS STEEL.											
BYPASS DAMPERS AND THEIR ASSOCIATED DUCT WORK WERE REPLACED DURING THE PERIOD DUE TO LEAKING PROBLEMS.											
NEW STEAM TRAPS WERE INSTALLED TO PREVENT LEAKS WITHIN THE INDIRECT REHEAT SYSTEM.											
NEW ABSORBER FORCED DRAFT FANS WERE INSTALLED DURING THE THIRD QUARTER.											
10/83	SYSTEM							744			
11/83	SYSTEM							720			
12/83	SYSTEM							744			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART. HOURS	PER BOILER HOURS	FGD CAP. HOURS	FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT UNIT 8 WAS PLACED BACK IN SERVICE DURING THE FOURTH QUARTER AND THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED.

1/84	SYSTEM	744
2/84	SYSTEM	696
3/84	SYSTEM	744
4/84	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT UNIT 8 WAS TAKEN OUT OF SERVICE DURING APRIL 1984 DUE TO BURNT OUT BEARINGS IN THE TURBINE GENERATOR. THE OUTAGE CONTINUED THROUGH THE THIRD QUARTER. THE UNIT IS SCHEDULED TO BE PLACED BACK IN SERVICE DURING THE FOURTH QUARTER OF 1984.

5/84	SYSTEM	744
6/84	SYSTEM	720
7/84	SYSTEM	744
8/84	SYSTEM	744
9/84	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT A FORCED OXIDATION SYSTEM WILL BE EMPLOYED AT WIDOWS CREEK 7 AND 8 FOR SLUDGE TREATMENT. A SPARGER NETWORK AT THE BOTTOM OF THE THICKENER TANK WILL BE INSTALLED AND AN AGITATOR WILL BE UTILIZED FOR SOLID SUSPENSION.

10/84	SYSTEM	744
11/84	SYSTEM	720
12/84	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER OF 1984. WORK CONTINUED ON THE FORCED OXIDATION SYSTEM. OPERATIONS ARE SCHEDULED TO COMMENCE IN NOVEMBER.

1/85	SYSTEM	744
2/85	SYSTEM	672
3/85	SYSTEM	744
4/85	SYSTEM	720
5/85	SYSTEM	744
6/85	SYSTEM	720
7/85	SYSTEM	744
8/85	SYSTEM	744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

9/85	SYSTEM							720			
10/85	SYSTEM							744			
11/85	SYSTEM							720			
12/85	SYSTEM							744			

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMTAION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM							774			
2/86	SYSTEM							672			
3/86	SYSTEM							774			
4/86	SYSTEM							720			
5/86	SYSTEM							774			
6/86	SYSTEM							720			
7/86	SYSTEM							774			
8/86	SYSTEM							774			
9/86	SYSTEM							720			
10/86	SYSTEM							774			
11/86	SYSTEM							720			
12/86	SYSTEM							774			

** PROBLEMS/SOLUTIONS/COMMENTS

UTILITY REPORTED THAT THE FORCED-OXIDATION SYSTEM ON UNIT 8 BEGAN OPERATION IN MID 1986 AND OPERATED SUCCESSFULLY FOR THE REMAINDER OF THE YEAR. NO MAJOR UNIT OR FGD OUTAGES WERE REPORTED BY THE UTILITY.

1/87	SYSTEM							744			
2/87	SYSTEM							672			
3/87	SYSTEM							744			
4/87	SYSTEM							720			
5/87	SYSTEM							744			
6/87	SYSTEM							720			
7/87	SYSTEM							744			
8/87	SYSTEM							744			
9/87	SYSTEM							720			
10/87	SYSTEM							744			
11/87	SYSTEM							720			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TENNESSEE VALLEY AUTHORITY: WIDOWS CREEK 8 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR

12/87	SYSTEM								744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OR SCHEDULED UNIT OUTAGES WERE ENCOUNTERED DURING THE YEAR 1987.

DO NOT MICROFILM
1978-1979

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	TEXAS MUNICIPAL POWER AGENCY	
PLANT NAME	GIBBONS CREEK	
UNIT NUMBER	1	
CITY	CARLOS	
STATE	TEXAS	
REGULATORY CLASSIFICATION	D	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	400	
GROSS UNIT GENERATING CAPACITY - MW	443	
NET UNIT GENERATING CAPACITY W/FGD - MW	400	
NET UNIT GENERATING CAPACITY WO/FGD - MW	406	
EQUIVALENT SCRUBBED CAPACITY - MW	400	

** UNIT DATA - BOILER AND STACK

BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	766.13	(1623500 ACFM)
BOILER FLUE GAS TEMPERATURE - C	93.3	(200 F)
STACK HEIGHT - M	142.	(465 FT)
STACK SHELL	REINFORCED CONCRETE	
STACK TOP DIAMETER - M	*****	(***** FT)

** FUEL DATA

FUEL TYPE	COAL	
FUEL GRADE	LIGNITE	
AVERAGE HEAT CONTENT - J/G	11304.	(4860 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		3900-6500
AVERAGE ASH CONTENT - %	25.00	
RANGE ASH CONTENT - %	10.0-38.6	
AVERAGE MOISTURE CONTENT - %	35.00	
RANGE MOISTURE CONTENT - %	29.0-45.0	
AVERAGE SULFUR CONTENT - %	1.06	
RANGE SULFUR CONTENT - %	0.8-2.3	
AVERAGE CHLORIDE CONTENT - %	0.01	
RANGE CHLORIDE CONTENT - %	0.00-0.07	

*** PARTICLE CONTROL

** ESP

NUMBER	2	
TYPE	COLD SIDE	
SUPPLIER	LODGE-COTTRELL	
INLET FLUE GAS CAPACITY - CU.M/S	766.1	(1623500 ACFM)
INLET FLUE GAS TEMPERATURE - C	148.3	(299 F)
PRESSURE DROP - KPA	0.2	(1. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.8	

** PARTICLE SCRUBBER

NUMBER	0
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON NAME	N/A
SHELL GENERIC MATERIAL	N/A
SHELL SPECIFIC MATERIAL	N/A
LINER GENERIC MATERIAL	N/A
LINER SPECIFIC MATERIAL	N/A
GAS CONTACTING DEVICE TYPE	N/A

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
SYSTEM SUPPLIER	COMBUSTION ENGINEERING
A-E FIRM	TIPPETT & GEE

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS MUNICIPAL POWER AGENCY: GIBBONS CREEK 1 (CONT.)

DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	NEW	
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.87	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	87.36	
ENERGY CONSUMPTION - %	1.4	
CURRENT STATUS	1	
COMMERCIAL START-UP	10/1983	
INITIAL START-UP	11/1982	
CONTRACT AWARDED	1/1977	
** DESIGN AND OPERATING PARAMETERS		
DESIGN CHLORIDE CONTENT - %	*****	
SPACE REQUIREMENTS - SQ M	12949.5	(139392 SQ FT)
OPER. & MAINT. REQUIREMENT - MANHR/DAY	48.0	
** QUENCHER/PRESATURATOR		
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** ABSORBER		
NUMBER	3	
NUMBER OF SPARES	1	
GENERIC TYPE	SPRAY TOWER	
SPECIFIC TYPE	OPEN COUNTERCURRENT SPRAY	
TRADE NAME/COMMON TYPE	N/A	
SUPPLIER	COMBUSTION ENGINEERING	
DIMENSIONS - FT	29.0 X 37.0	
SHELL GENERIC MATERIAL	STAINLESS STEEL	
SHELL SPECIFIC MATERIAL	AUSTENITIC	
SHELL MATERIAL TRADE NAME/COMMON TYPE	TYPE 316L	
LINER GENERIC MATERIAL	NONE	
LINER SPECIFIC MATERIAL	N/A	
LINER MATERIAL TRADE NAME/COMMON TYPE	N/A	
GAS CONTACTING DEVICE TYPE	NONE	
LIQUID RECIRCULATION RATE - LITER/S	5393.	(85600 GPM)
GAS-SIDE PRESSURE DROP - KPA	0.2	(0.9 IN-H2O)
SUPERFICAL GAS VELOCITY - M/SEC	3.8	(12.6 FT/S)
INLET GAS FLOW - CU. M/S	766.13	(1623500 ACFM)
INLET GAS TEMPERATURE - C	60.0	(140 F)
SO2 REMOVAL EFFICIENCY - %	87.3	
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR	
NUMBER PER SYSTEM	1	
GENERIC TYPE	IMPINGEMENT	
SPECIFIC TYPE	BAFFLE	
TRADE NAME/COMMON TYPE	CLOSED VANE	
CONFIGURATION	VERTICAL	
NUMBER OF STAGES	2	
NUMBER OF PASSES PER STAGE	1	
FREEBOARD DISTANCE - M	2.44	(8.0 FT)
DISTANCE BETWEEN VANES - CM	5.1	(2.00 IN)
VANE ANGLES - DEGREES	45	
PRESSURE DROP - KPA	0.2	(0.9 IN-H2O)
SUPERFICAL GAS VELOCITY - M/S	2.7	(9.0 FT/S)
CONSTRUCTION MATERIAL GENERIC TYPE	STAINLESS STEEL	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
WASH RATE - L/S	37.8	(600 GAL/MIN)
** REHEATER		
NUMBER	3	
GENERIC TYPE	IN-LINE	
SPECIFIC TYPE	STEAM	
TRADE NAME/COMMON TYPE	NR	
INLET FLUE GAS FLOW RATE - CU. M/S	766.13	(1623500 ACFM)
INLET FLUE GAS TEMPERATURE - C	93.3	(200 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110	

TEXAS MUNICIPAL POWER AGENCY: GIBBONS CREEK 1 (CONT.)

** FANS	
NUMBER	2
NUMBER OF SPARES	0
DESIGN	AXIAL
SUPPLIER	COMBUSTION ENGINEERING; MITSUBISHI HEAVY INDUST
FUNCTION	NR
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	960.79 (2036000 ACFM)
FLUE GAS TEMPERATURE - C	148.3 (299 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	REHEATER/ESP OUTLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	CARBON STEEL
LINER SPECIFIC MATERIAL TYPE	AISI 1110
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED
DEVICE TYPE	NR
MANUFACTURER	COMBUSTION ENGINEERING/KENNEDY VAN SAUN
NUMBER	1
** TANKS	
SERVICE	NUMBER
-----	-----
ABSORBER RECYCLE	3
NR	1
REAGENT PREP PRODUCT	1
** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER SPRAY	15
ABSORBER BLEED	3
THICKENER UNDERFLOW	2
WASH	2
MILL CIRCUIT	2
RECIRCULATION	2
ADDITIVE FEED	3
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	2
NUMBER OF SPARES	0
CONFIGURATION	CYLINDRICAL
DIMENSIONS - FT	190.0 DIA X 90.0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
FEED STREAM CHARACTERISTICS	10% SOLIDS
OUTLET STREAM CHARACTERISTICS	25% SOLIDS
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	VACUUM FILTER
NUMBER	3
NUMBER OF SPARES	0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
FEED STREAM CHARACTERISTICS	10% SOLIDS
OUTLET STREAM CHARACTERISTICS	25% SOLIDS

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS MUNICIPAL POWER AGENCY: GIBBONS CREEK 1 (CONT.)

*** SALEABLE BYPRODUCTS

NATURE	NONE
DISPOSITION	N/A

*** SLUDGE

** TREATMENT

METHOD	FIXATION
DEVICE	PUG MILL
PROPRIETARY PROCESS	CONVERSION SYSTEMS 'POZ-O-TEC!
INLET FLOW RATE - LITER/S	16.4 (260 GPM)
INLET QUALITY - %	25.0

** DISPOSAL

NATURE	FINAL
TYPE	LANDFILL
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	TRUCK
SITE TREATMENT	NONE

** PROCESS CONTROL AND INSTRUMENTATION

CHEMICAL PARAMETERS	SO2 INLET GAS, STACK SO2
MONITOR LOCATION	INLET TO ABSORBER STACK
PROCESS CONTROL MANNER	AUTOMATIC
PROCESS CHEMISTRY MODE	FEEDBACK

** WATER BALANCE

WATER LOOP TYPE	CLOSED
MAKEUP WATER ADDITION - LITERS/S	36.5 (580 GPM)

** FGD SPARE CAPACITY INDICES

ABSORBER - %	50.0

** FGD SPARE COMPONENT INDICES

ABSORBER	1.0

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. HOURS	FGD CAP. FACTOR

11/82	SYSTEM								720		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT INITIAL START-UP OF THE FGD SYSTEM OCCURRED DURING NOVEMBER, 1982.

12/82	SYSTEM								744		

1/83	SYSTEM								744		

2/83	SYSTEM								672		

3/83	SYSTEM								744		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE PERIOD OF NOVEMBER, 1982 THROUGH MARCH, 1983.

4/83	SYSTEM								720		

5/83	SYSTEM								744		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS MUNICIPAL POWER AGENCY: GIBBONS CREEK 1 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART. HOURS	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR
6/83	SYSTEM						720
** PROBLEMS/SOLUTIONS/COMMENTS							
THE UTILITY REPORTED THE FGD SYSTEM SUCCESSFULLY PASSED COMPLIANCE TESTING IN APRIL. NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED THROUGHOUT THE PERIOD.							
7/83	SYSTEM						744
8/83	SYSTEM						744
9/83	SYSTEM						720
** PROBLEMS/SOLUTIONS/COMMENTS							
THE UTILITY REPORTED THAT THE UNIT AND FGD SYSTEM ARE STILL OPERATING IN A SHAKEDOWN PHASE. PROBLEMS REPORTED INCLUDE REHEATER CORROSION AND MIST ELIMINATOR PLUGGING.							
10/83	SYSTEM						744
11/83	SYSTEM						720
12/83	SYSTEM						744
** PROBLEMS/SOLUTIONS/COMMENTS							
THE UTILITY REPORTED THAT THE ONLY MAJOR OUTAGE DURING THE FOURTH QUARTER WAS FOR A 10 DAY PRE-INSPECTION OF THE UNIT AND FGD SYSTEM DURING NOVEMBER. THE BOILER BOTTOM ASH SYSTEM AND ABSORBER REHEATERS WERE INSPECTED. THE MAIN UNIT OUTAGE IS SCHEDULED TO TAKE PLACE NEXT YEAR FROM FEBRUARY 17 THROUGH MARCH 17.							
THE UTILITY REPORTED REHEATER TUBE CORROSION DURING THE FOURTH QUARTER. TWO REHEATERS HAVE FAILED SINCE THE START UP OF THE FGD SYSTEM. THE CARBON STEEL REHEATER TUBES CORRODE ONLY AT THE ELBOWS. THE UTILITY IS PRESENTLY CONSIDERING REMOVING THE DISTRIBUTION VANES WHICH DEFLECT FLUE GAS AWAY FROM THE ELBOWS. BECAUSE OF THE DISTRIBUTION VANES, THE ELBOWS TEND TO HAVE HIGHER AMOUNTS OF CONDENSATION AND SOLIDS BUILD UP WHICH HELP AID CORROSION.							
OTHER PROBLEMS REPORTED INCLUDE HARD AND SOFT SCALE FORMATION ON THE MIST ELIMINATORS AND GREATER THAN DESIGN PRESSURE DIFFERENTIALS ACROSS THE ABSORBER MODULES. THE UTILITY REPORTS HAVING TO CLEAN SCALE FROM MIST ELIMINATORS APPROXIMATELY ONCE EVERY TWO WEEKS PER MODULE.							
1/84	SYSTEM						744
2/84	SYSTEM						696
3/84	SYSTEM						744
** PROBLEMS/SOLUTIONS/COMMENTS							
A SIX WEEK UNIT OUTAGE WAS REPORTED FOR THE PERIOD OF FEBRUARY 18 TO MARCH 27, 1984. DURING THIS TIME, NEW VENT PIPES WERE REPLACED IN THE DUCT WORK THE VENT PIPES HAD CORRODED DUE TO CONDENSATION AND ACIDIC CONDITIONS.							
THE UTILITY REPORTED THAT MIST ELIMINATOR BULK ENTRAINMENT CLEANING WAS PERFORMED DURING THE FEBRUARY-MARCH OUTAGE. IT WAS ALSO REPORTED THAT THIS TYPE OF CLEANING IS NECESSARY ON A MONTHLY BASIS.							

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

THE THICKENER TANK LINER AND RAKE WERE REPLACED DURING THE FEBRUARY-MARCH OUTAGE. THE FIBERGLASS LINER HAD DEVELOPED LEAKS AND THE RAKE BROKE DUE TO HIGH SOLIDS BUILD UP.

WARRANTY WORK WAS PERFORMED ON SLURRY SPRAY PUMP REDUCTION GEARS DURING THE FEBRUARY-MARCH OUTAGE. AN OVERHEATING OF THE REDUCTION GEAR OIL WOULD NOT ALLOW PROPER LUBRICATION.

4/84 SYSTEM 720

5/84 SYSTEM 744

6/84 SYSTEM 720

7/84 SYSTEM 744

8/84 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE 'MODULE A' REHEATER WAS REPLACED DURING AUGUST DUE TO CORROSION.

9/84 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD SYSTEM WAS DOWN APPROXIMATELY 50% OF THE TIME DURING THE THIRD QUARTER OF 1984 DUE TO SLURRY SPRAY PUMP PROBLEMS. REPLACEMENT HUBS WERE INSTALLED TO CORRECT AN IMPELLER PROBLEM AND THEY EVENTUALLY CAME LOOSE AT THE ATTACHMENT TO THE IMPELLER SHAFT. THE HUBS WERE SENT BACK TO THE MANUFACTURER. LOOSENING OF THE SHAFT'S RUBBER LINER IS ALSO REPORTED AS A COMMONLY OCCURRING PROBLEM.

THE UTILITY IS PRESENTLY TESTING A SCALE INHIBITOR IN HOPES OF REDUCING THE FREQUENCY OF SCALE CLEANING AND THUS INCREASE AVAILABILITY. THE ANTI-SCALEANT, REFERRED TO AS P-70 IS A POLYACRYLATE POLYMER WHICH INTERFERES WITH THE GROWTH PATTERN OF CALCIUM SULFATE CRYSTALS IN A SUPER SATURATED SOLUTION. THE CRYSTALS ARE THEORETICALLY DEFORMED AND SOFTENED. TESTING WILL BEGIN ON A CLEAN MODULE, AND THUS CONCLUSIVE RESULTS HAVE NOT BEEN REPORTED.

10/84 SYSTEM 744

11/84 SYSTEM 720

12/84 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

A MAJOR UNIT OUTAGE OCCURRED ON DECEMBER 8 AND CONTINUED FOR THE REMAINDER OF THE QUARTER DUE TO A FAILED GENERATOR. THE UNIT IS EXPECTED TO REMAIN OFF-LINE FOR MOST OF THE FIRST QUARTER OF 1985 UNTIL THE GENERATOR CAN BE REPLACED.

THE ENTIRE CONTROL SYSTEM FOR THE FGD WAS REPLACED DURING THE FOURTH QUARTER. NEW PH PROBES AND TRANSMITTERS WERE INSTALLED FOR THE SYSTEM. THE PH PROBES WERE LOCATED IN THE SIDE OF THE REACTION TANKS NEAR THE SUCTION SIDE OF THE SPRAY PUMPS. THE ADDITIVE MAKEUP NOW UTILIZES AN ON/OFF TYPE CONTROL VALVE VERSUS THE MODULATING TYPE ONCE USED. THE PH SET POINT FOR THE SYSTEM IS 5.8. EARLY TEST RESULTS INDICATE THESE CHANGES HAVE GREATLY IMPROVED REAGENT UTILIZATION WHICH IS NOW MEASURED TO BE APPROXIMATELY 90%.

UTILITY REPORTED THAT THEY HAD TO LINE THE BOTTOM OF THREE REACTION TANKS

TEXAS MUNICIPAL POWER AGENCY: GIBBONS CREEK 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

WITH 6 INCHES OF CONCRETE BECAUSE THE SLURRY WAS ERODING THE CARBON STEEL
 BOTTOMS.

THE ABSORBER OUTLET DUCT IMMEDIATELY FOLLOWING THE REHEATERS IS CORRODED.
 THE UTILITY IS CONSIDERING CLADDING THE CARBON STEEL DUCTWORK IN THIS AREA
 WITH 316L STAINLESS STEEL WHICH HAS BEEN VERY SUCCESSFUL IN OTHER DUCT
 AREAS.

1/85	SYSTEM	744
2/85	SYSTEM	672
3/85	SYSTEM	744
4/85	SYSTEM	720
5/85	SYSTEM	744
6/85	SYSTEM	720
7/85	SYSTEM	744
8/85	SYSTEM	744
9/85	SYSTEM	720
10/85	SYSTEM	744
11/85	SYSTEM	720
12/85	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

DUE TO BUDGET REDUCTIONS, THE UTILITY REPORTED THE CANCELLATION OF THE
 RADION ADIPIC ACID TEST AND DECIDED NOT TO CLAD THE REHEATER OUTLET
 DUCTWORK WITH 316L STAINLESS STEEL. CORROSION PROBLEMS IN THIS DUCTWORK
 ARE HOPED TO BE ELIMINATED BY UPGRADING REHEATER CONTROLS AND CONTROLLING
 SYSTEM PH TO LIMIT PLUGGING PROBLEMS WITH THE INLINE STEAM REHEATER TUBES.

THE UTILITY ALSO ANNOUNCED THAT THE ABSORBER MODULE DOWNCOMERS HAVE BECOME
 ERODED AND WILL NEED REPLACEMENT. ALL THREE MODULES WILL BE REPAIRED NEXT
 APRIL DURING A SCHEDULED OUTAGE. NO MAJOR FGD-RELATED OUTAGES WERE
 REPORTED FOR 1985; HOWEVER, THE UNIT WAS DOWN IN APRIL (4 WEEKS) AND
 NOVEMBER (10 DAYS) FOR SCHEDULED BOILER/TURBINE MAINTENANCE OUTAGES.

1/86	SYSTEM	774
2/86	SYSTEM	672
3/86	SYSTEM	774
4/86	SYSTEM	720
5/86	SYSTEM	774
6/86	SYSTEM	720
7/86	SYSTEM	774
8/86	SYSTEM	774
9/86	SYSTEM	720
10/86	SYSTEM	774

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS MUNICIPAL POWER AGENCY: GIBBONS CREEK 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

11/86 SYSTEM 720

12/86 SYSTEM 774

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THEY HAVE INSTALLED \$25,000 OF EQUIPMENT TO CONDUCT ADIPIC ACID TESTING. THE TESTS WILL BEGIN SOMETIME IN JULY OF 1987.

THE UTILITY REPORTED THAT THE CHEVRON MIST ELIMINATORS ARE CRACKING AND WILL SOON NEED REPLACEMENT. VARIOUS DESIGN TYPES ARE SCHEDULED TO BE TESTED IN THE SUMMER OF 1987 WITH FINAL INSTALLATION BEING COMPLETED BY APRIL 1988. THE UTILITY IS HOPING THAT THE NEW MIST ELIMINATORS WILL BE MORE EFFICIENT BUT HAVE THE SAME OR LOWER PRESSURE DROP AS THE ORIGINAL INSTALLED CHEVRONS. THIS WILL HOPEFULLY PERMIT WET STACK OPERATIONS (I.E. NO REHEAT). THIS WILL NOT INTERFERE WITH THEIR OPACITY MONITORS.

THE NEW REHEAT OPERATION CHANGES HAVE BEEN A SUCCESS. THE UTILITY HAS BEEN ABLE TO LOWER THEIR STEAM CONSUMPTION AND STILL MAINTAIN GOOD REHEAT LEVELS. THE UTILITY IS NOW CONSIDERING THE OPTION OF USING NO REHEAT BASED ON HOW WELL THE NEW CHEVRON MIST ELIMINATORS TEST OUT.

THE UTILITY REPORTED THAT THE DOWNCOMER MODIFICATION WORK SCHEDULED FOR APRIL AND MAY WAS NOT BEGUN DUE TO COSTS. THE DOWNCOMERS ARE PRESENTLY BEING PATCHED INSTEAD OF BEING REPLACED WITH STAINLESS STEEL. NO MAJOR FGD-RELATED OUTAGES FOR 1986 WERE REPORTED.

1/87 SYSTEM 744

2/87 SYSTEM 672

3/87 SYSTEM 744

4/87 SYSTEM 720

5/87 SYSTEM 744

6/87 SYSTEM 720

7/87 SYSTEM 744

8/87 SYSTEM 744

9/87 SYSTEM 720

10/87 SYSTEM 744

11/87 SYSTEM 720

12/87 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY TO DECEMBER 1987.

DO NOT MICROFILM
THIS PAGE

SECTION 13
 DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	TEXAS UTILITIES	
PLANT NAME	MARTIN LAKE	
UNIT NUMBER	1	
CITY	TATUM	
STATE	TEXAS	
REGULATORY CLASSIFICATION	D	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	3000	
GROSS UNIT GENERATING CAPACITY - MW	793	
NET UNIT GENERATING CAPACITY W/FGD - MW	750	
NET UNIT GENERATING CAPACITY WO/FGD - MW	760	
EQUIVALENT SCRUBBED CAPACITY - MW	595	
*** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	1494.51	(3167000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	168.3	(335 F)
STACK HEIGHT - M	137.	(450 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	*****	(***** FT)
*** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	LIGNITE	
AVERAGE HEAT CONTENT - J/G	17166.	(7380 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		6972-7894
AVERAGE ASH CONTENT - %	*****	
RANGE ASH CONTENT - %	8.0-12.0	
AVERAGE MOISTURE CONTENT - %	33.00	
RANGE MOISTURE CONTENT - %	29.0-37.9	
AVERAGE SULFUR CONTENT - %	0.90	
RANGE SULFUR CONTENT - %	0.7-1.5	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
** ESP		
NUMBER	1	
NUMBER OF SPARES	0	
TYPE	COLD SIDE	
SUPPLIER	RESEARCH-COTTRELL	
INLET FLUE GAS CAPACITY - CU.M/S	1494.5	(3167000 ACFM)
INLET FLUE GAS TEMPERATURE - C	168.3	(335 F)
PRESSURE DROP - KPA	0.5	(2. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.4	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
*** FGD SYSTEM		

TEXAS UTILITIES: MARTIN LAKE 1 (CONT.)

**** GENERAL DATA**
 SALEABLE PRODUCT/THROWAWAY PRODUCT THROWAWAY PRODUCT
 SO2 REMOVAL MODE WET SCRUBBING
 PROCESS TYPE LIMESTONE
 PROCESS ADDITIVES NONE
 SYSTEM SUPPLIER RESEARCH-COTTRELL
 A-E FIRM C.T. MAIN
 DEVELOPMENT LEVEL FULL SCALE
 NEW/RETROFIT NEW
 UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - % 99.40
 UNIT DESIGN SO2 REMOVAL EFFICIENCY - % 71.00
 ENERGY CONSUMPTION - % 1.3
 CURRENT STATUS 1
 COMMERCIAL START-UP 10/1977
 INITIAL START-UP 4/1977
 CONTRACT AWARDED 5/1976

**** DESIGN AND OPERATING PARAMETERS**
 DESIGN COAL SULFUR CONTENT - % 1.50
 DESIGN CHLORIDE CONTENT - % *****

**** QUENCHER/PRESATURATOR**
 NUMBER 6
 TYPE CYCLONIC SPRAY CHAMBER
 SUPPLIER RESEARCH-COTTRELL
 INLET GAS TEMPERATURE - C 168.3 (335 F)
 CONSTRUCTION MATERIAL GENERIC TYPE CARBON STEEL
 CONSTRUCTION MATERIAL SPECIFIC TYPE AISI 1110

**** ABSORBER**
 NUMBER 6
 NUMBER OF SPARES 0
 GENERIC TYPE COMBINATION TOWER
 SPECIFIC TYPE SPRAY/PACKED
 TRADE NAME/COMMON TYPE N/A
 SUPPLIER RESEARCH-COTTRELL
 DIMENSIONS - FT 28 DIA X 100 HIGH
 SHELL GENERIC MATERIAL CARBON STEEL
 SHELL SPECIFIC MATERIAL AISI 1110
 SHELL MATERIAL TRADE NAME/COMMON TYPE N/A
 LINER GENERIC MATERIAL ORGANIC
 LINER SPECIFIC MATERIAL GLASS FLAKE-FILLED POLYESTER
 LINER MATERIAL TRADE NAME/COMMON TYPE FLAKELINE 103
 GAS CONTACTING DEVICE TYPE VERTICAL CROSS CHANNEL FIXED GRID PACKING
 NUMBER OF CONTACTING ZONES 4
 DISTANCE BETWEEN GAS CONTACTING ZONES - CM 91.4 (36.0IN)
 L/G RATIO - L/CU.M 13.4 (99.9 GAL/1000 ACF)
 GAS-SIDE PRESSURE DROP - KPA 1.1 (4.5 IN-H2O)
 SUPERFICIAL GAS VELOCITY - M/SEC 2.7 (9.0 FT/S)
 SO2 REMOVAL EFFICIENCY - % 95.0

**** MIST ELIMINATOR**
 PRE-MIST ELIMINATOR/MIST ELIMINATOR PRIMARY COLLECTOR
 NUMBER PER SYSTEM 6
 NUMBER OF SPARES PER SYSTEM 0
 NUMBER PER MODULE 1
 GENERIC TYPE IMPINGEMENT
 SPECIFIC TYPE BAFFLE
 TRADE NAME/COMMON TYPE CLOSED VANE
 CONFIGURATION HORIZONTAL
 NUMBER OF STAGES 2
 NUMBER OF PASSES PER STAGE 3
 PRESSURE DROP - KPA 0.2 (1.0 IN-H2O)
 SUPERFICIAL GAS VELOCITY - M/S 2.4 (8.0 FT/S)
 CONSTRUCTION MATERIAL GENERIC TYPE ORGANIC
 CONSTRUCTION MATERIAL SPECIFIC TYPE POLYPROPYLENE
 WASH WATER SOURCE FRESH
 WASH RATE - L/S 7.9 (126 GAL/MIN)

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 1 (CONT.)

** REHEATER	
GENERIC TYPE	BYPASS
SPECIFIC TYPE	COLD SIDE
TRADE NAME/COMMON TYPE	N/A
PERCENT GAS BYPASSED - AVG	25.0
TEMPERATURE INCREASE - C	22.2 (40 F)
INLET FLUE GAS TEMPERATURE - C	60.0 (140 F)
OUTLET FLUE GAS TEMPERATURE - C	82.2 (180 F)
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** FANS	
NUMBER	4
DESIGN	CENTRIFUGAL
FUNCTION	UNIT
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	375.48 (795680 ACFM)
FLUE GAS TEMPERATURE - C	168.3 (335 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
NUMBER	6
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	MOSSER; FORNEY ENGINEERING
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	6
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	MOSSER
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	STAINLESS STEEL
LINER SPECIFIC MATERIAL TYPE	AUSTENITIC
** DAMPERS	
NUMBER	1
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	STAINLESS STEEL
LINER SPECIFIC MATERIAL TYPE	AUSTENITIC
** DAMPERS	
NUMBER	4
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	4
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A

TEXAS UTILITIES: MARTIN LAKE 1 (CONT.)

** DUCTWORK	
LOCATION	INLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	OUTLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
** DUCTWORK	
LOCATION	BYPASS
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED
DEVICE TYPE	TUBE MILL
MANUFACTURER	KENNEDY VAN SAUN
NUMBER	4
** TANKS	
SERVICE	NUMBER
-----	-----
ABSORBER RECYCLE	3
PRESATURATOR/QUENCHER	6
LIMESTONE SLURRY	1
WET WELL	4
MILL SLURRY SUMP	****
** PUMPS	
SERVICE	NUMBER
-----	-----
QUENCHER FEED	12
SLURRY FEED	2
ABSORBER RECIRCULATION	9
ABSORBER PACKING	9
MILL SLURRY	8
THICKENER UNDERFLOW	3
MAIN WATER RECYCLE 'THICKENER OVERFL	3
AREA SUMP PUMPS	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	CENTRIFUGE
NUMBER	3
FEED STREAM SOURCE	THICKENER UNDERFLOW
FEED STREAM CHARACTERISTICS	35% SOLIDS
OUTLET STREAM CHARACTERISTICS	65% SOLIDS
OUTLET STREAM DISPOSITION	TO FLY ASH MIXING
OVERFLOW STREAM DISPOSITION	TO LIMESTONE SLURRY PREPARATION
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	1
NUMBER OF SPARES	0
DIMENSIONS - FT	140.0 DIA X 12.0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL 'WALLS!; INORGANIC 'BOTTOM!
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER 'WALLS!; MAT-REINFO
FEED STREAM SOURCE	ABSORBER BLEED
FEED STREAM CHARACTERISTICS	10-12% SOLIDS
OUTLET STREAM CHARACTERISTICS	35% SOLIDS

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 1 (CONT.)

OUTLET STREAM DISPOSITION	TO CENTRIFUGE
OVERFLOW STREAM DISPOSITION	TO LIMESTONE SLURRY PREPARATION
*** SALEABLE BYPRODUCTS	
NATURE	GYPSUM
DISPOSITION	MARKETED
*** SLUDGE	
** TREATMENT	
METHOD	STABILIZATION
DEVICE	MULLER-TYPE BLENDER
PROPRIETARY PROCESS	NONE
INLET QUALITY - %	65.0
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	RAIL
SITE TREATMENT	NONE
** PROCESS CONTROL AND INSTRUMENTATION	
CHEMICAL PARAMETERS	PH
PHYSICAL VARIABLES	LIQUID LEVEL, LIQUID & GAS FLOW
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
MAKEUP WATER ADDITION - LITERS/S	34.7 (550 GPM)
** CHEMICALS AND CONSUMPTION	
FUNCTION	ABSORBENT
NAME	LIMESTONE
PRINCIPAL CONSTITUENT	95% CaCO3
UTILIZATION - %	95.0
POINT OF ADDITION	BALL MILL
** FGD SPARE CAPACITY INDICES	
ABSORBER - %	0.0
** FGD SPARE COMPONENT INDICES	
ABSORBER	0.0

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

11/77	SYSTEM									720
2/78	SYSTEM									672
3/78	SYSTEM									900

** PROBLEMS/SOLUTIONS/COMMENTS

CERTIFICATION WAS RECEIVED FROM THE EPA DURING THE PERIOD. THE BOILER AND FGD SYSTEM OPERATED THROUGHOUT THE PERIOD.

THE UTILITY IS STILL HAVING SOME PROBLEMS WITH THE SLUDGE HANDLING SYSTEM SOME FORCED OUTAGE TIME OCCURRED.

4/78	SYSTEM									720
5/78	SYSTEM									744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS TAKEN OFF LINE IN APRIL FOR AN ANNUAL TWO WEEK OUTAGE.

GENERATOR PROBLEMS WERE ENCOUNTERED IN MAY CAUSING THE UNIT TO BE TAKEN OFF LINE THROUGH THE END OF THE MONTH.

6/78	SYSTEM							720	

7/78	SYSTEM							744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE DAMPERS FOR EACH ABSORBER MODULE WERE NOT FUNCTIONING PROPERLY. IT HAS BEEN IMPOSSIBLE TO ISOLATE INDIVIDUAL MODULES FOR REPAIRS (THE ENTIRE SYSTEM WOULD HAVE TO BE SHUT DOWN IF REPAIRS WERE REQUIRED ON ONLY ONE MODULE).

THE UNIT IS NOW CONSIDERED TO BE OPERATING COMMERCIALY. OPERATIONS HAVE BEEN SATISFACTORY. DEPENDING ON THE LIGNITE BURNED THE SCRUBBER CAN BE OPERATED WITH ONLY FOUR OR SIX TOWERS ON LINE AND STILL BE IN COMPLIANCE.

THERE HAVE BEEN PROBLEMS WITH THE PH METERS. THE METERS HAVE NOT OPERATE PROPERLY FOR SOME TIME NOW.

THE UTILITY HAS GENERALLY ONLY HAD TO PERFORM GENERAL MAINTENANCE ON THE SCRUBBER TOWERS.

8/78	SYSTEM							744	

9/78	SYSTEM							720	

** PROBLEMS/SOLUTIONS/COMMENTS

ISOLATION DAMPER PROBLEMS CONTINUED.

THE UNIT CONTINUES TO REQUIRE EXCESSIVE MAINTENANCE. FGD SYSTEM ACCEPTANCE TEST WERE PERFORMED BY THE UTILITY DURING AUGUST. RESULTS ARE NOT YET AVAILABLE.

FLOW MEASUREMENT INSTRUMENTATION HAS BEEN FAILING.

OPACITY HAS OCCASIONALLY BEEN HIGHER THAN EXPECTED (20-25%) RESULTING FROM ESP PROBLEMS.

10/78	SYSTEM							744	

11/78	SYSTEM							720	

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM PROBLEMS WERE REPORTED FOR THE OCTOBER-NOVEMBER PERIOD.

OUTAGES ARE PRIMARILY A RESULT OF ESP PROBLEMS. THE UTILITY IS RELUCTANT TO OPERATE SCRUBBERS WHEN THE ESP SHOWS HIGH OPACITY FOR FEAR OF PLUGGING PROBLEMS.

12/78	SYSTEM							744	

1/79	SYSTEM							744	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS SHUT DOWN WHILE THE BOTTOM ASH POND WAS CLEANED OUT. THE UTILITY HAS BEEN DUMPING SLUDGE INTO THE BOTTOM ASH POND WHICH WAS DESIGNED FOR BOTTOM ASH ONLY. ALSO SLUDGE IS PRODUCED FASTER THAN IT CAN BE REMOVED BY RAIL CAR. THE ACTUAL PROBLEM IS REPORTEDLY IN THE DEWATERING SYSTEM. HEAVY RAIN FALL HAS AGGREGATED THE SLUDGE DISPOSAL PROBLEM BY FOULING THE THICKENER OPERATIONS AND BY THREATENING POND OVERFLOW.

SOME MIST ELIMINATOR WASH PROBLEMS WERE ENCOUNTERED.

THE FGD SYSTEM REPORTEDLY FUNCTIONED ACCEPTABLY WHEN OPERATED DURING DECEMBER AND JANUARY.

COAL HANDLING WAS A SERIOUS PROBLEM DUE TO FREEZING OF THE COAL IN THE HOPPERS. THIS PROBLEM EFFECTED ALL UNITS AT MARTIN LAKE FORCING THE UTILITY'S GAS AND OIL UNITS TO CARRY THE POWER LOAD. ALL OF THE MARTIN LAKE UNITS WERE DOWN FOR AN EXTENDED PERIOD IN LATE JANUARY.

THERE IS EVIDENCE THAT THE SULFUR CONTENT IN THE COAL IS INCREASING AS THE MATERIAL IS MINED DEEPER. IF THE SULFUR CONTENT CONTINUES TO INCREASE ADDITIONAL SCRUBBER TOWERS MAY HAVE TO BE INSTALLED.

2/79	SYSTEM	672
3/79	SYSTEM	744
4/79	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

UNIT 1 IS NOW IN FULL OPERATION ALTHOUGH A SLUDGE DISPOSAL PROBLEM STILL EXISTS.

THE UTILITY HAS REPLACED THE LOUVER DAMPERS WITH GUILLOTINE DAMPERS WHICH SEEM TO WORK BETTER. HOWEVER, THEY STILL HAVE PROBLEMS WITH THE GUILLOTINE DAMPERS FAILING TO SEAL WHEN THEY BECOME SCALED.

THERE HAVE BEEN REPORTS OF TOWER LEAKS RESULTING FROM LINER FAILURE BUT THE PROBLEM IS NOT SERIOUS.

5/79	SYSTEM	744
6/79	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE SLUDGE DISPOSAL SYSTEM IS STILL CAUSING SOME OPERATING PROBLEMS. THE PROBLEMS REPORTED LAST QUARTER WERE CAUSED BY HEAVY RAINS WHICH FORCED THE THICKENERS OUT OF SERVICE.

THE FGD SYSTEM OPERATED THROUGHOUT MOST OF THE REPORT PERIOD.

7/79	SYSTEM	744
8/79	SYSTEM	744
9/79	SYSTEM	720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

ENGINEERING WORK IS IN PROGRESS TO ADD TWO NEW SCRUBBING TOWERS TO EACH MARTIN LAKE UNIT. THIS IS BEING DONE FOR THREE REASONS:

- 1) THE LIGNITE CURRENTLY DELIVERED HAS A GREATER SULFUR CONTENT THAN THAT FOR WHICH THE FGD SYSTEM WAS ORIGINALLY DESIGNED.
- 2) THE BOILER FLUE GAS FLOW IS GREATER THAN THAT FOR WHICH THE FGD SYSTEM WAS ORIGINALLY DESIGNED.
- 3) AS A RESULT OF CURRENT FGD SYSTEM MAINTENANCE REQUIREMENTS THE UTILITY FEELS IT IS BEST THAT ONE SPARE MODULE BE AVAILABLE SO THAT AT LEAST ONE CAN BE DOWN FOR CLEANING AT ALL TIMES.

THE TWO NEW TOWERS FOR EACH UNIT WILL BE DESIGNED FOR A LARGER CAPACITY THAN THE ORIGINAL TOWERS.

DURING THE THIRD QUARTER THE UTILITY REPORTED THE SYSTEM OPERATED WELL. HOWEVER EXCESSIVE MAINTENANCE WAS REQUIRED. THE SLUDGE DISPOSAL SYSTEM PROBLEMS PLAGUING THE UNIT HAVE BEEN SOLVED.

10/79	SYSTEM	744
11/79	SYSTEM	720
12/79	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

PLUGGING PROBLEMS HAVE BEEN ENCOUNTERED DURING THE FOURTH QUARTER REQUIRING HEAVY MAINTENANCE.

1/80	SYSTEM	744
2/80	SYSTEM	696
3/80	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

PLUGGING PROBLEMS CONTINUED IN THE FIRST QUARTER OF 1980, PARTICULARLY IN THE WETTED FILM CONTACT AREA AND THE MIST ELIMINATOR SECTION. THE MIST ELIMINATOR PLUGGING WAS RECENTLY SOLVED BY SWITCHING BACK TO LAKE WATER FOR MIST ELIMINATOR WASH FROM AN ASH POND WATER WASH THE UTILITY HAD BEEN TESTING.

THE FRP STRUCTURAL WORK IS BECOMING A PROBLEM. MUCH OF THE FRP SUPPORT WORK HAS HAD TO BE REPLACED WITH STAINLESS STEEL.

THE UTILITY HAS PLANS TO INSTALL TWO NEW SCRUBBING TOWERS IN EARLY 1982. THE NEW TOWERS HAVE BECOME NECESSARY DUE TO THE INCREASING LIGNITE SULFUR CONTENT AND THE NEED FOR SPARE SCRUBBER CAPACITY.

4/80	SYSTEM	720
5/80	SYSTEM	744
6/80	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

HIGH MAINTENANCE PROBLEMS REPORTED IN PREVIOUS MONTHS CONTINUED THROUGHOUT THE SECOND QUARTER OF 1980. THE ABSORBERS ARE STILL EXPERIENCING PLUGGING PROBLEMS.

7/80	SYSTEM	744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

CORROSION IN THE SCRUBBER MODULES WAS A PROBLEM DURING JULY.

THE FOUNDATION FOR THE TWO NEW SCRUBBING TOWERS WAS COMPLETED DURING THE MONTH.

8/80	SYSTEM								744	

9/80	SYSTEM								720	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD SYSTEM OPERATED WITHOUT ANY MAJOR PROBLEMS DURING AUGUST AND SEPTEMBER.

10/80	SYSTEM								744	

11/80	SYSTEM								720	

12/80	SYSTEM								744	

** PROBLEMS/SOLUTIONS/COMMENTS

NO OPERATIONAL PROBLEMS WERE REPORTED FOR THE MARTIN LAKE 1 FGD SYSTEM DURING THE FOURTH QUARTER 1980.

1/81	SYSTEM								744	

2/81	SYSTEM								672	

3/81	SYSTEM								744	

** PROBLEMS/SOLUTIONS/COMMENTS

NO OPERATIONAL PROBLEMS WERE REPORTED FOR THE MARTIN LAKE 1 FGD SYSTEM DURING THE FIRST QUARTER OF 1981. MAINTENANCE WORK IS CONTINUING ON THE NEW ABSORBER MODULES.

4/81	SYSTEM								720	

5/81	SYSTEM								744	

6/81	SYSTEM								720	

** PROBLEMS/SOLUTIONS/COMMENTS

NO OPERATIONAL PROBLEMS WERE REPORTED FOR THE MARTIN LAKE 1 FGD SYSTEM DURING THE SECOND QUARTER 1981. UTILITY IS STILL IN PROCESS OF ADDING TWO ADDITIONAL ABSORBER MODULES (1 ADDITIONAL TRAIN) TO PRESENT FGD SYSTEM DUE TO EXCESSIVE SULFUR CONTENT OF PRESENT LIGNITE COAL SOURCE.

7/81	SYSTEM								744	

8/81	SYSTEM								744	

9/81	SYSTEM								720	

** PROBLEMS/SOLUTIONS/COMMENTS

WORK CONTINUED DURING THE THIRD QUARTER 1981 ON THE INSTALLATION OF THE ADDITIONAL ABSORBER TRAIN. THE INSTALLATION IS EXPECTED TO BE COMPLETED BY THE SPRING OF 1982.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

10/81 SYSTEM 744

11/81 SYSTEM 720

12/81 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

WORK CONTINUED DURING THE FOURTH QUARTER 1981 ON THE INSTALLATION OF THE ADDITIONAL ABSORBER TRAIN. UNTIL THE ADDITIONAL MODULE IS ADDED, THE UNIT WILL BE OPERATED AT REDUCED LOAD.

1/82 SYSTEM 744

2/82 SYSTEM 672

3/82 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

WORK CONTINUED DURING THE FIRST QUARTER 1982 ON THE INSTALLATION OF THE ADDITIONAL ABSORBER TRAIN. THE ADDITIONAL TRAIN IS NOW SCHEDULED TO START-UP IN JUNE.

4/82 SYSTEM 720

5/82 SYSTEM 744

6/82 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE SECOND QUARTER THE UNIT WAS TAKEN OFF-LINE FOR THE ANNUAL SPRING OUTAGE. DURING THIS TIME THE ADDITIONAL ABSORBER TRAIN WAS TIED INTO THE SYSTEM.

7/82 SYSTEM 744

8/82 SYSTEM 744

9/82 SYSTEM 720

10/82 SYSTEM 744

11/82 SYSTEM 720

12/82 SYSTEM 744

1/83 SYSTEM 744

2/83 SYSTEM 672

3/83 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE PAST NINE MONTHS THE MARTIN LAKE SYSTEMS EXPERIENCED SCALING AND PLUGGING PROBLEMS WITH MIST ELIMINATORS AND SPRAY PACKED TOWERS. THE UTILITY IS PRESENTLY TESTING FORCED OXIDATION AS A POSSIBLE SOLUTION.

THE MARTIN LAKE SYSTEMS ARE ALSO HAVING LINER FAILURES IN THEIR SPRAY PACKED TOWERS.

4/83 SYSTEM 720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR
5/83	SYSTEM						744		
6/83	SYSTEM						720		
** PROBLEMS/SOLUTIONS/COMMENTS									
A TOTAL OF 34,600 MAN-HOURS WERE SPENT ON THE MARTIN LAKE FGD SYSTEMS DURING THE MONTHS OF MAY AND JUNE ALONE FOR SERVICING AND THE IMPLEMENTATION OF VARIOUS TEST PROGRAMS.									
ABSORBER TOWERS WERE UPGRADED BY THE ADDITION OF FLOWRATE INSTRUMENTATION.									
FLOW VANES WERE INSTALLED AT THE INLET OF THE ABSORBERS TO BETTER GAS DISTRIBUTION.									
UTILITY IS CONDUCTING WET/DRY INTERFACE CORROSION TESTS IN THEIR BYPASS DUCTING FOR RESEARCH-COTTRELL.									
THE UTILITY CONTINUED TO REPORT PROBLEMS WITH ABSORBER LINING FAILURES AND MIST ELIMINATOR PLUGGING. THE UTILITY IS PRESENTLY CONDUCTING MIST ELIMINATOR WASH, FORCED OXIDATION, AND LINER TEST PROGRAMS TO HELP SOLVE THESE TWO MAJOR PROBLEMS AREAS.									
7/83	SYSTEM						744		
8/83	SYSTEM						744		
9/83	SYSTEM						720		
** PROBLEMS/SOLUTIONS/COMMENTS									
THE MARTIN LAKE FGD SYSTEMS STILL CONTINUE TO HAVE MATERIALS OF CONSTRUCTION AND SYSTEM CHEMISTRY PROBLEMS. EPRI AND RADIAN ARE CURRENTLY DOING A JOINT STUDY ON THE MARTIN LAKE SYSTEMS TO DETERMINE POSSIBLE SOLUTIONS TO THESE PROBLEM AREAS.									
10/83	SYSTEM						744		
11/83	SYSTEM						720		
12/83	SYSTEM						744		
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UNIT 1 FGD SYSTEM WAS FORCED OFF-LINE DURING THE END OF DECEMBER DUE TO FREEZING PROBLEMS. ALTHOUGH THE FGD SYSTEM WAS DOWN FOR APPROXIMATELY 2 DAYS, THE UNIT OPERATED DUE TO POWER SHORTAGES IN THE GRID.									
EPRI AND RADIAN TESTING WAS CONCLUDED DURING THE PERIOD. THE TEST RESULTS FROM THIS STUDY ARE PENDING.									
1/84	SYSTEM						744		
2/84	SYSTEM						696		
3/84	SYSTEM						744		
4/84	SYSTEM						720		
5/84	SYSTEM						744		
6/84	SYSTEM						720		
7/84	SYSTEM						744		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

8/84	SYSTEM						744		
	** PROBLEMS/SOLUTIONS/COMMENTS								
	THE FGD SYSTEM PASSED PERFORMANCE TESTING CONDUCTED DURING THE PERIOD OF MAY THROUGH AUGUST 1984.								
9/84	SYSTEM						720		
	** PROBLEMS/SOLUTIONS/COMMENTS								
	NO MAJOR FGD-RELATED OUTAGES WERE REPORTED AT MARTIN LAKE 1 DURING THE FIRST THREE QUARTERS OF 1984.								
	THE UTILITY CONTINUES TO EXPERIENCE MAINTENANCE PROBLEMS. TWO MODULES ARE OUT OF SERVICE AT ALL TIMES FOR MAINTENANCE, HOWEVER, OVERALL FGD SYSTEM PERFORMANCE IS NOT GREATLY EFFECTED.								
10/84	SYSTEM						744		
11/84	SYSTEM						720		
12/84	SYSTEM						744		
	** PROBLEMS/SOLUTIONS/COMMENTS								
	UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER 1984. THE UNIT WAS IN COMPLIANCE 95 PERCENT OF THE TIME DURING THE PERIOD.								
1/85	SYSTEM						744		
2/85	SYSTEM						672		
3/85	SYSTEM						744		
4/85	SYSTEM						720		
5/85	SYSTEM						744		
6/85	SYSTEM						720		
7/85	SYSTEM						744		
8/85	SYSTEM						744		
9/85	SYSTEM						720		
10/85	SYSTEM						744		
11/85	SYSTEM						720		
12/85	SYSTEM						744		
	** PROBLEMS/SOLUTIONS/COMMENTS								
	THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED FOR THE YEAR 1985. FGD SYSTEM COMPLIANCE WAS APPROXIMATELY 95% OR GREATER DURING THE YEAR.								
1/86	SYSTEM						744		
2/86	SYSTEM						672		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 1 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
3/86	SYSTEM							774			
4/86	SYSTEM							720			
5/86	SYSTEM							774			
6/86	SYSTEM							720			
7/86	SYSTEM							774			
8/86	SYSTEM							774			
9/86	SYSTEM							720			
10/86	SYSTEM							774			
11/86	SYSTEM							720			
12/86	SYSTEM							744			

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE YEAR 1986. THE UNIT WAS IN COMPLIANCE 99% OF THE TIME DURING THE YEAR.

1/87	SYSTEM							744			
2/87	SYSTEM							672			
3/87	SYSTEM							744			
4/87	SYSTEM							720			
5/87	SYSTEM							744			
6/87	SYSTEM							720			
7/87	SYSTEM							744			
8/87	SYSTEM							744			
9/87	SYSTEM							720			
10/87	SYSTEM							744			
11/87	SYSTEM							720			
12/87	SYSTEM							744			

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO FGD-RELATED UNIT OUTAGES WERE ENCOUNTERED DURING 1987. THE UNIT WAS OFF-LINE TWICE DURING THE YEAR FOR SCHEDULED MAINTENANCE OUTAGES. EACH OUTAGE LASTED FOR APPROXIMATELY 2 TO 3 WEEKS AND OCCURRED IN THE SPRING AND FALL OF THE YEAR. ROUTINE MAINTENANCE WAS PERFORMED ON THE FGD SYSTEM DURING THESE OUTAGES.

DO NOT MICROWAVE
THIS PAPER

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	TEXAS UTILITIES	
PLANT NAME	MARTIN LAKE	
UNIT NUMBER	2	
CITY	TATUM	
STATE	TEXAS	
REGULATORY CLASSIFICATION	D	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	3000	
GROSS UNIT GENERATING CAPACITY - MW	793	
NET UNIT GENERATING CAPACITY W/FGD - MW	750	
NET UNIT GENERATING CAPACITY WO/FGD - MW	760	
EQUIVALENT SCRUBBED CAPACITY - MW	595	

** UNIT DATA - BOILER AND STACK

BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	1494.51	(3167000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	168.3	(335 F)
STACK HEIGHT - M	137.	(450 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	*****	(***** FT)

** FUEL DATA

FUEL TYPE	COAL	
FUEL GRADE	LIGNITE	
AVERAGE HEAT CONTENT - J/G	17166.	(7380 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		6972-7894
AVERAGE ASH CONTENT - %	*****	
RANGE ASH CONTENT - %	8.0-12.0	
AVERAGE MOISTURE CONTENT - %	33.00	
RANGE MOISTURE CONTENT - %	29.0-37.9	
AVERAGE SULFUR CONTENT - %	0.90	
RANGE SULFUR CONTENT - %	0.7-1.5	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	

*** PARTICLE CONTROL

** MECHANICAL COLLECTOR

NUMBER	0
TYPE	NONE

** ESP

NUMBER	1	
NUMBER OF SPARES	0	
TYPE	COLD SIDE	
SUPPLIER	RESEARCH-COTTRELL	
INLET FLUE GAS CAPACITY - CU.M/S	1494.5	(3167000 ACFM)
INLET FLUE GAS TEMPERATURE - C	168.3	(335 F)
PRESSURE DROP - KPA	0.5	(2. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.4	

** PARTICLE SCRUBBER

NUMBER	0
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON NAME	N/A
SHELL GENERIC MATERIAL	N/A
SHELL SPECIFIC MATERIAL	N/A
LINER GENERIC MATERIAL	N/A
LINER SPECIFIC MATERIAL	N/A
GAS CONTACTING DEVICE TYPE	N/A

*** FGD SYSTEM

TEXAS UTILITIES: MARTIN LAKE 2 (CONT.)

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	RESEARCH-COTTRELL
A-E FIRM	C.T. MAIN
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.40
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	71.00
ENERGY CONSUMPTION - %	1.3
CURRENT STATUS	1
COMMERCIAL START-UP	5/1978
INITIAL START-UP	5/1978
CONTRACT AWARDED	5/1976

** DESIGN AND OPERATING PARAMETERS

DESIGN COAL SULFUR CONTENT - %	1.50
DESIGN CHLORIDE CONTENT - %	*****

** QUENCHER/PRESATURATOR

NUMBER	6
TYPE	CYCLONIC SPRAY CHAMBER
SUPPLIER	RESEARCH-COTTRELL
INLET GAS TEMPERATURE - C	168.3 (335 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110

** ABSORBER

NUMBER	6
NUMBER OF SPARES	0
GENERIC TYPE	COMBINATION TOWER
SPECIFIC TYPE	SPRAY/PACKED
TRADE NAME/COMMON TYPE	N/A
SUPPLIER	RESEARCH-COTTRELL
DIMENSIONS - FT	28 DIA X 100 HIGH
SHELL GENERIC MATERIAL	CARBON STEEL
SHELL SPECIFIC MATERIAL	AISI 1110
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A
LINER GENERIC MATERIAL	ORGANIC
LINER SPECIFIC MATERIAL	GLASS FLAKE-FILLED POLYESTER
LINER MATERIAL TRADE NAME/COMMON TYPE	FLAKELINE 103
GAS CONTACTING DEVICE TYPE	VERTICAL CROSS CHANNEL FIXED GRID PACKING
NUMBER OF CONTACTING ZONES	4
DISTANCE BETWEEN GAS CONTACTING ZONES - CM	91.4 (36.0IN)
L/G RATIO - L/CU.M	13.4 (99.9 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	1.1 (4.5 IN-H2O)
SUPERFICAL GAS VELOCITY - M/SEC	2.7 (9.0 FT/S)
SO2 REMOVAL EFFICIENCY - %	95.0

** MIST ELIMINATOR

PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
NUMBER PER SYSTEM	6
NUMBER OF SPARES PER SYSTEM	0
NUMBER PER MODULE	1
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
CONFIGURATION	HORIZONTAL
NUMBER OF STAGES	2
NUMBER OF PASSES PER STAGE	3
PRESSURE DROP - KPA	0.2 (1.0 IN-H2O)
SUPERFICAL GAS VELOCITY - M/S	2.4 (8.0 FT/S)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPROPYLENE
WASH WATER SOURCE	FRESH
WASH RATE - L/S	7.9 (126 GAL/MIN)

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 2 (CONT.)

** REHEATER	
GENERIC TYPE	BYPASS
SPECIFIC TYPE	COLD SIDE
TRADE NAME/COMMON TYPE	N/A
PERCENT GAS BYPASSED - AVG	25.0
TEMPERATURE INCREASE - C	22.2 (40 F)
INLET FLUE GAS TEMPERATURE - C	60.0 (140 F)
OUTLET FLUE GAS TEMPERATURE - C	82.2 (180 F)
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** FANS	
NUMBER	4
DESIGN	CENTRIFUGAL
FUNCTION	UNIT
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	375.48 (795680 ACFM)
FLUE GAS TEMPERATURE - C	168.3 (335 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
NUMBER	6
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	MOSSER; FORNEY ENGINEERING
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	6
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	MOSSER
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	STAINLESS STEEL
LINER SPECIFIC MATERIAL TYPE	AUSTENITIC
** DAMPERS	
NUMBER	1
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	STAINLESS STEEL
LINER SPECIFIC MATERIAL TYPE	AUSTENITIC
** DAMPERS	
NUMBER	4
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	4
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A

TEXAS UTILITIES: MARTIN LAKE 2 (CONT.)

** DUCTWORK	
LOCATION	INLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	OUTLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
** DUCTWORK	
LOCATION	BYPASS
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED
DEVICE TYPE	TUBE MILL
MANUFACTURER	KENNEDY VAN SAUN
NUMBER	4
** TANKS	
SERVICE	NUMBER
-----	-----
ABSORBER RECYCLE	3
PRESATURATOR/QUENCHER	6
LIMESTONE SLURRY	1
WET WELL	4
MILL SLURRY SUMP	****
** PUMPS	
SERVICE	NUMBER
-----	-----
QUENCHER FEED	12
SLURRY FEED	2
ABSORBER RECIRCULATION	9
ABSORBER PACKING	9
MILL SLURRY	8
THICKENER UNDERFLOW	3
MAIN WATER RECYCLE 'THICKENER OVERFL	3
AREA SUMP PUMPS	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	CENTRIFUGE
NUMBER	3
FEED STREAM SOURCE	THICKENER UNDERFLOW
FEED STREAM CHARACTERISTICS	35% SOLIDS
OUTLET STREAM CHARACTERISTICS	65% SOLIDS
OUTLET STREAM DISPOSITION	TO FLY ASH MIXING
OVERFLOW STREAM DISPOSITION	TO LIMESTONE SLURRY PREPARATION
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	1
NUMBER OF SPARES	0
DIMENSIONS - FT	140.0 DIA X 12.0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL 'WALLS!; INORGANIC 'BOTTOM!
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER 'WALLS!; MAT-REINFO
FEED STREAM SOURCE	ABSORBER BLEED
FEED STREAM CHARACTERISTICS	10-12% SOLIDS
OUTLET STREAM CHARACTERISTICS	35% SOLIDS

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 2 (CONT.)

OUTLET STREAM DISPOSITION	TO CENTRIFUGE
OVERFLOW STREAM DISPOSITION	TO LIMESTONE SLURRY PREPARATION
*** SALEABLE BYPRODUCTS	
NATURE	GYPSUM
DISPOSITION	MARKETED
*** SLUDGE	
** TREATMENT	
METHOD	STABILIZATION
DEVICE	MULLER-TYPE BLENDER
PROPRIETARY PROCESS	NONE
INLET QUALITY - %	65.0
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	RAIL
SITE TREATMENT	NONE
** PROCESS CONTROL AND INSTRUMENTATION	
CHEMICAL PARAMETERS	PH
PHYSICAL VARIABLES	LIQUID LEVEL, LIQUID & GAS FLOW
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
MAKEUP WATER ADDITION - LITERS/S	34.7 (550 GPM)
** CHEMICALS AND CONSUMPTION	
FUNCTION	ABSORBENT
NAME	LIMESTONE
PRINCIPAL CONSTITUENT	95% CaCO3
UTILIZATION - %	95.0
POINT OF ADDITION	BALL MILL
** FGD SPARE CAPACITY INDICES	
ABSORBER - %	0.0
** FGD SPARE COMPONENT INDICES	
ABSORBER	0.0

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS	Factor

5/78 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT BEGAN OPERATIONS IN MAY 1978. THE COMPLIANCE TESTING IS SCHEDULED FOR AUGUST.

6/78 SYSTEM 720

7/78 SYSTEM 744

8/78 SYSTEM 744

9/78 SYSTEM 720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS TESTED FOR COMPLIANCE WITH ALL SIX MODULES IN THE GAS STREAM DURING THE FIRST PART OF AUGUST. TEST RESULTS HAVE NOT YET BEEN PUBLISHED. NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED.

THE ESP PROBLEMS AT UNIT 1 HAVE NOT BEEN EXPERIENCED AT THIS UNIT.

10/78 SYSTEM 744

11/78 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

COMPLIANCE TEST RESULTS ARE STILL BEING REVIEWED AND RESULTS ARE NOT YET AVAILABLE.

12/78 SYSTEM 744

1/79 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

COAL HANDLING WAS A SERIOUS PROBLEM DUE TO FREEZING OF THE COAL IN THE HOPPERS. THIS PROBLEM EFFECTED ALL UNITS AT MARTIN LAKE FORCING THE UTILITY'S GAS AND OIL UNITS TO CARRY THE LOAD. ALL OF THE MARTIN LAKE UNITS WERE DOWN FOR AN EXTENDED PERIOD IN LATE JANUARY.

THE FGD UNIT REPORTEDLY FUNCTIONED ACCEPTABLY WHEN OPERATED DURING DECEMBER AND JANUARY.

THE FGD SYSTEM WAS SHUT DOWN WHILE THE BOTTOM ASH POND WAS CLEANED OUT. THE UTILITY HAS BEEN DUMPING SLUDGE INTO THE BOTTOM ASH POND WHICH WAS DESIGNED FOR BOTTOM ASH ONLY. ALSO SLUDGE IS PRODUCED FASTER THAN IT CAN BE REMOVED BY RAIL CAR. THE ACTUAL PROBLEM IS REPORTEDLY IN THE DEWATERING SYSTEM. HEAVY RAIN FALL HAS AGGRAVATED THE SLUDGE DISPOSAL PROBLEM BY FOULING THE THICKENER OPERATIONS AND BY THREATENING POND OVERFLOW.

SOME MIST ELIMINATOR PROBLEMS WERE ENCOUNTERED DURING DECEMBER AND JANUARY.

THERE IS EVIDENCE THAT THE SULFUR CONTENT IN THE COAL IS INCREASING AS THE MATERIAL IS MINED DEEPER. IF THE SULFUR CONTENT CONTINUES TO INCREASE ADDITIONAL SCRUBBER TOWERS MAY HAVE TO BE INSTALLED.

2/79 SYSTEM 672

3/79 SYSTEM 744

4/79 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTS THAT OPERATIONAL PROBLEMS HAVE INCLUDED ABSORBER LINER FAILURES AND TOWER LEAKS.

UNIT 2 IS NOW IN FULL OPERATION ALTHOUGH A SLUDGE DISPOSAL PROBLEM STILL EXISTS.

THE UTILITY HAS REPLACED THE LOUVER DAMPERS WITH GUILLOTINE DAMPERS WHICH SEEM TO WORK BETTER. HOWEVER, THEY STILL HAVE PROBLEMS WITH THE GUILLOTINE DAMPERS FAILING TO SEAL WHEN THEY BECOME SCALED.

5/79 SYSTEM 744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

6/79 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE SLUDGE DISPOSAL SYSTEM IS STILL CAUSING SOME OPERATING PROBLEMS. THE PROBLEMS REPORTED LAST QUARTER WERE CAUSED BY HEAVY RAINS WHICH FORCED THE THICKENERS OUT OF SERVICE.

THE FGD SYSTEM OPERATED THROUGHOUT MOST OF THE PERIOD.

7/79 SYSTEM 744

8/79 SYSTEM 744

9/79 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

ENGINEERING WORK IS IN PROGRESS TO ADD TWO NEW SCRUBBING TOWERS TO EACH MARTIN LAKE UNIT. THIS IS BEING DONE FOR THREE REASONS:

- 1) THE LIGNITE CURRENTLY DELIVERED HAS A GREATER SULFUR CONTENT THAN THAT FOR WHICH THE FGD SYSTEM WAS ORIGINALLY DESIGNED.
- 2) THE BOILER FLUE GAS FLOW IS GREATER THAN THAT FOR WHICH THE FGD SYSTEM WAS ORIGINALLY DESIGNED.
- 3) AS A RESULT OF CURRENT FGD SYSTEM MAINTENANCE REQUIREMENTS THE UTILITY FEELS IT IS BEST THAT ONE SPARE MODULE BE AVAILABLE SO THAT AT LEAST ONE CAN BE DOWN FOR CLEANING AT ALL TIMES.

THE TWO NEW TOWERS FOR EACH UNIT WILL BE DESIGNED FOR A LARGER CAPACITY THAN THE ORIGINAL TOWERS.

DURING THE THIRD QUARTER THE UTILITY REPORTED THE SYSTEM OPERATED WELL. HOWEVER EXCESSIVE MAINTENANCE WAS REPORTED. THE SLUDGE DISPOSAL SYSTEM PROBLEMS PLAGUING THE UNIT WERE SOLVED.

10/79 SYSTEM 744

11/79 SYSTEM 720

12/79 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

PLUGGING PROBLEMS HAVE BEEN ENCOUNTERED DURING THE FOURTH QUARTER REQUIRING HEAVY MAINTENANCE.

1/80 SYSTEM 744

2/80 SYSTEM 696

3/80 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

PLUGGING PROBLEMS CONTINUED IN THE FIRST QUARTER OF 1980, PARTICULARLY IN THE WETTED FILM CONTACT AREA AND THE MIST ELIMINATOR SECTION. THE MIST ELIMINATOR PLUGGING WAS RECENTLY SOLVED BY SWITCHING BACK TO LAKE WATER FOR MIST ELIMINATOR WASH FROM AN ASH POND WATER WASH THE UTILITY HAD BEEN TESTING.

THE FRP STRUCTURAL WORK IS BECOMING A PROBLEM. MUCH OF THE FRP SUPPORT WORK HAS HAD TO BE REPLACED WITH STAINLESS STEEL.

THE UTILITY HAS PLANS TO INSTALL TWO NEW SCRUBBING TOWERS IN EARLY 1983.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 2 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART. HOURS	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR

THE NEW TOWERS HAVE BECOME NECESSARY DUE TO THE INCREASING LIGNITE SULFUR CONTENT AND THE NEED FOR SPARE SCRUBBER CAPACITY.							
4/80	SYSTEM						720
5/80	SYSTEM						744
6/80	SYSTEM						720
** PROBLEMS/SOLUTIONS/COMMENTS							
HIGH MAINTENANCE PROBLEMS REPORTED IN PREVIOUS MONTHS CONTINUED THROUGHOUT THE SECOND QUARTER OF 1980. THE ABSORBERS ARE STILL EXPERIENCING PLUGGING PROBLEMS.							
7/80	SYSTEM						744
** PROBLEMS/SOLUTIONS/COMMENTS							
CORROSION IN THE SCRUBBER MODULES WAS A PROBLEM DURING JULY.							
THE FOUNDATION FOR THE TWO NEW SCRUBBING TOWERS WAS COMPLETED DURING THE MONTH.							
8/80	SYSTEM						744
9/80	SYSTEM						720
** PROBLEMS/SOLUTIONS/COMMENTS							
THE UTILITY REPORTED THAT THE FGD SYSTEM OPERATED WITHOUT ANY MAJOR PROBLEMS DURING AUGUST AND SEPTEMBER.							
10/80	SYSTEM						744
11/80	SYSTEM						720
12/80	SYSTEM						744
** PROBLEMS/SOLUTIONS/COMMENTS							
NO OPERATIONAL PROBLEMS WERE REPORTED FOR THE MARTIN LAKE 2 FGD SYSTEM DURING THE FOURTH QUARTER 1980.							
1/81	SYSTEM						744
2/81	SYSTEM						672
3/81	SYSTEM						744
** PROBLEMS/SOLUTIONS/COMMENTS							
NO OPERATIONAL PROBLEMS WERE REPORTED FOR THE MARTIN LAKE 2 FGD SYSTEM DURING THE FIRST QUARTER OF 1981. MAINTENANCE WORK IS CONTINUING ON THE NEW ABSORBER MODULES.							
4/81	SYSTEM						720
5/81	SYSTEM						744
6/81	SYSTEM						720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 2 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO OPERATIONAL PROBLEMS WERE REPORTED FOR THE MARTIN LAKE 2 FGD SYSTEM DURING THE SECOND QUARTER 1981. UTILITY IS STILL IN PROCESS OF ADDING TWO ADDITIONAL ABSORBER MODULES (1 ADDITIONAL TRAIN) TO PRESENT FGD SYSTEM DUE TO EXCESSIVE SULFUR CONTENT OF PRESENT LIGNITE COAL SOURCE.

7/81	SYSTEM						744		
8/81	SYSTEM						744		
9/81	SYSTEM						720		

** PROBLEMS/SOLUTIONS/COMMENTS

WORK CONTINUED DURING THE THIRD QUARTER 1981 ON THE INSTALLATION OF THE ADDITIONAL ABSORBER TRAIN. THE INSTALLATION IS EXPECTED TO BE COMPLETED BY THE SPRING OF 1983.

10/81	SYSTEM						744		
11/81	SYSTEM						720		
12/81	SYSTEM						744		

** PROBLEMS/SOLUTIONS/COMMENTS

WORK CONTINUED DURING THE FOURTH QUARTER 1981 ON THE INSTALLATION OF THE ADDITIONAL ABSORBER TRAIN. UNTIL THE ADDITIONAL MODULE IS ADDED, THE UNIT WILL BE OPERATED AT REDUCED LOAD.

1/82	SYSTEM						744		
2/82	SYSTEM						672		
3/82	SYSTEM						744		

** PROBLEMS/SOLUTIONS/COMMENTS

WORK CONTINUED DURING THE FIRST QUARTER 1982 ON THE INSTALLATION OF THE ADDITIONAL ABSORBER TRAIN.

4/82	SYSTEM						720		
5/82	SYSTEM						744		
6/82	SYSTEM						720		

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE SECOND QUARTER. WORK CONTINUED ON THE INSTALLATION OF THE ADDITIONAL ABSORBER TRAIN WHICH IS EXPECTED TO BE ON-LINE IN MARCH 1983.

7/82	SYSTEM						744		
8/82	SYSTEM						744		
9/82	SYSTEM						720		
10/82	SYSTEM						744		
11/82	SYSTEM						720		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 2 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD CAP. HOURS FACTOR
12/82	SYSTEM						744		
1/83	SYSTEM						744		
2/83	SYSTEM						672		
3/83	SYSTEM						744		
** PROBLEMS/SOLUTIONS/COMMENTS									
DURING THE PAST NINE MONTHS THE MARTIN LAKE SYSTEMS EXPERIENCED SCALING AND PLUGGING PROBLEMS WITH MIST ELIMINATORS AND SPRAY PACKED TOWERS. THE UTILITY IS PRESENTLY TESTING FORCED OXIDATION AS A POSSIBLE SOLUTION.									
THE MARTIN LAKE SYSTEMS ARE ALSO HAVING LINER FAILURES IN THEIR SPRAY PACKED TOWERS.									
4/83	SYSTEM						720		
5/83	SYSTEM						744		
6/83	SYSTEM						720		
** PROBLEMS/SOLUTIONS/COMMENTS									
A TOTAL OF 34,600 MAN-HOURS WERE SPENT ON THE MARTIN LAKE FGD SYSTEMS DURING THE MONTHS OF MAY AND JUNE ALONE FOR SERVICING AND THE IMPLEMENTATION OF VARIOUS TEST PROGRAMS.									
ABSORBER TOWERS WERE UPGRADED BY THE ADDITION OF FLOWRATE INSTRUMENTATION.									
FLOW VANES WERE INSTALLED AT THE INLET OF THE ABSORBERS TO BETTER GAS DISTRIBUTION.									
UTILITY IS CONDUCTING WET/DRY INTERFACE CORROSION TEST IN THEIR BYPASS DUCTING FOR RESEARCH-COTTRELL.									
THE UTILITY CONTINUED TO REPORT PROBLEMS WITH ABSORBER LINING FAILURES AND MIST ELIMINATOR PLUGGING. THE UTILITY IS PRESENTLY CONDUCTING MIST ELIMINATOR WASH, FORCED OXIDATION, AND LINER TEST PROGRAMS TO HELP SOLVE THESE TWO MAJOR PROBLEMS AREAS.									
7/83	SYSTEM						744		
8/83	SYSTEM						744		
9/83	SYSTEM						720		
** PROBLEMS/SOLUTIONS/COMMENTS									
THE MARTIN LAKE FGD SYSTEMS STILL CONTINUE TO HAVE MATERIALS OF CONSTRUCTION AND SYSTEM CHEMISTRY PROBLEMS. EPRI AND RADIAN ARE CURRENTLY DOING A JOINT STUDY ON THE MARTIN LAKE SYSTEMS TO DETERMINE POSSIBLE SOLUTIONS TO THESE PROBLEM AREAS.									
10/83	SYSTEM						744		
11/83	SYSTEM						720		
12/83	SYSTEM						744		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER OF 1983.

EPRI AND RADIATION TESTING WAS CONCLUDED DURING THE PERIOD. THE TEST RESULTS FROM THIS STUDY ARE PENDING.

1/84	SYSTEM	744
2/84	SYSTEM	696
3/84	SYSTEM	744
4/84	SYSTEM	720
5/84	SYSTEM	740
6/84	SYSTEM	720
7/84	SYSTEM	744
8/84	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM PASSED PERFORMANCE TESTING CONDUCTED DURING THE PERIOD OF MAY THROUGH AUGUST 1984.

9/84	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY CONTINUED TO EXPERIENCE MAINTENANCE PROBLEMS. TWO MODULES ARE OUT OF SERVICE AT ALL TIMES FOR MAINTENANCE, HOWEVER, OVERALL FGD SYSTEM PERFORMANCE IS NOT GREATLY EFFECTED.

NO MAJOR FGD-RELATED OUTAGES WERE REPORTED AT MARTIN LAKE 2 DURING THE FIRST THREE QUARTERS OF 1984.

10/84	SYSTEM	744
11/84	SYSTEM	720
12/84	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER 1984. THE UNIT WAS IN COMPLIANCE 95 PERCENT OF THE TIME DURING THE PERIOD.

1/85	SYSTEM	744
2/85	SYSTEM	672
3/85	SYSTEM	744
4/85	SYSTEM	720
5/85	SYSTEM	744
6/85	SYSTEM	720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 2 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR

7/85	SYSTEM							744		
8/85	SYSTEM							744		
9/85	SYSTEM							720		
10/85	SYSTEM							744		
11/85	SYSTEM							720		
12/85	SYSTEM							744		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED FOR THE YEAR 1985. FGD SYSTEM COMPLIANCE WAS APPROXIMATELY 95% OR GREATER DURING THE YEAR.

1/86	SYSTEM							774		
2/86	SYSTEM							672		
3/86	SYSTEM							774		
4/86	SYSTEM							720		
5/86	SYSTEM							774		
6/86	SYSTEM							720		
7/86	SYSTEM							774		
8/86	SYSTEM							774		
9/86	SYSTEM							720		
10/86	SYSTEM							774		
11/86	SYSTEM							720		
12/86	SYSTEM							774		

** PROBLEMS/SOLUTIONS/COMMENTS

UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE YEAR 1986. THE UNIT WAS IN COMPLIANCE 99% OF THE TIME DURING THE YEAR.

1/87	SYSTEM							744		
2/87	SYSTEM							672		
3/87	SYSTEM							744		
4/87	SYSTEM							720		
5/87	SYSTEM							744		
6/87	SYSTEM							720		
7/87	SYSTEM							744		
8/87	SYSTEM							744		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 2 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER BOILER HOURS	FGD CAP. HOURS FACTOR
9/87	SYSTEM							720	
10/87	SYSTEM							744	
11/87	SYSTEM							720	
12/87	SYSTEM							744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO FGD-RELATED UNIT OUTAGES WERE ENCOUNTERED DURING 1987. THE UNIT WAS OFF-LINE TWICE DURING THE YEAR FOR SCHEDULED MAINTENANCE OUTAGES. EACH OUTAGE LASTED FOR APPROXIMATELY 2 TO 3 WEEKS AND OCCURRED IN THE SPRING AND FALL OF THE YEAR. ROUTINE MAINTENANCE WAS PERFORMED ON THE FGD SYSTEM DURING THESE OUTAGES.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	TEXAS UTILITIES	
PLANT NAME	MARTIN LAKE	
UNIT NUMBER	3	
CITY	TATUM	
STATE	TEXAS	
REGULATORY CLASSIFICATION	D	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	3000	
GROSS UNIT GENERATING CAPACITY - MW	793	
NET UNIT GENERATING CAPACITY W/FGD - MW	750	
NET UNIT GENERATING CAPACITY WO/FGD - MW	760	
EQUIVALENT SCRUBBED CAPACITY - MW	595	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	1494.51	(3167000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	168.3	(335 F)
STACK HEIGHT - M	137.	(450 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	*****	(***** FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	LIGNITE	
AVERAGE HEAT CONTENT - J/G	17166.	(7380 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		6972-7894
AVERAGE ASH CONTENT - %	*****	
RANGE ASH CONTENT - %	8.0-12.0	
AVERAGE MOISTURE CONTENT - %	33.00	
RANGE MOISTURE CONTENT - %	29.0-37.9	
AVERAGE SULFUR CONTENT - %	0.90	
RANGE SULFUR CONTENT - %	0.7-1.5	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
** ESP		
NUMBER	1	
NUMBER OF SPARES	0	
TYPE	COLD SIDE	
SUPPLIER	RESEARCH-COTTRELL	
INLET FLUE GAS CAPACITY - CU.M/S	1494.5	(3167000 ACFM)
INLET FLUE GAS TEMPERATURE - C	168.3	(335 F)
PRESSURE DROP - KPA	0.5	(2. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.4	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
*** FGD SYSTEM		

TEXAS UTILITIES: MARTIN LAKE 3 (CONT.)

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	RESEARCH-COTTRELL
A-E FIRM	C.T. MAIN
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.40
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	71.00
ENERGY CONSUMPTION - %	1.3
CURRENT STATUS	1
COMMERCIAL START-UP	2/1979
INITIAL START-UP	2/1979
CONTRACT AWARDED	5/1976

** DESIGN AND OPERATING PARAMETERS

DESIGN COAL SULFUR CONTENT - %	1.50
DESIGN CHLORIDE CONTENT - %	*****

** QUENCHER/PRESATURATOR

NUMBER	6
TYPE	CYCLONIC SPRAY CHAMBER
SUPPLIER	RESEARCH-COTTRELL
INLET GAS TEMPERATURE - C	168.3 (335 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110

** ABSORBER

NUMBER	6
NUMBER OF SPARES	0
GENERIC TYPE	COMBINATION TOWER
SPECIFIC TYPE	SPRAY/PACKED
TRADE NAME/COMMON TYPE	N/A
SUPPLIER	RESEARCH-COTTRELL
DIMENSIONS - FT	28 DIA X 100 HIGH
SHELL GENERIC MATERIAL	CARBON STEEL
SHELL SPECIFIC MATERIAL	AISI 1110
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A
LINER GENERIC MATERIAL	ORGANIC
LINER SPECIFIC MATERIAL	GLASS FLAKE-FILLED POLYESTER
LINER MATERIAL TRADE NAME/COMMON TYPE	FLAKELINE 103
GAS CONTACTING DEVICE TYPE	VERTICAL CROSS CHANNEL FIXED GRID PACKING
NUMBER OF CONTACTING ZONES	4
DISTANCE BETWEEN GAS CONTACTING ZONES - CM	91.4 (36.0 IN)
L/G RATIO - L/CU.M	13.4 (99.9 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	1.1 (4.5 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/SEC	2.7 (9.0 FT/S)
SO2 REMOVAL EFFICIENCY - %	95.0

** MIST ELIMINATOR

PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
NUMBER PER SYSTEM	6
NUMBER OF SPARES PER SYSTEM	0
NUMBER PER MODULE	1
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
CONFIGURATION	HORIZONTAL
NUMBER OF STAGES	2
NUMBER OF PASSES PER STAGE	3
PRESSURE DROP - KPA	0.2 (1.0 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/S	2.4 (8.0 FT/S)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPROPYLENE
WASH WATER SOURCE	FRESH
WASH RATE - L/S	7.9 (126 GAL/MIN)

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 3 (CONT.)

** REHEATER	
GENERIC TYPE	BYPASS
SPECIFIC TYPE	COLD SIDE
TRADE NAME/COMMON TYPE	N/A
PERCENT GAS BYPASSED - AVG	25.0
TEMPERATURE INCREASE - C	77.8 (140 F)
INLET FLUE GAS TEMPERATURE - C	60.0 (140 F)
OUTLET FLUE GAS TEMPERATURE - C	82.2 (180 F)
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** FANS	
NUMBER	4
DESIGN	CENTRIFUGAL
FUNCTION	UNIT
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	375.48 (795680 ACFM)
FLUE GAS TEMPERATURE - C	168.3 (335 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
NUMBER	6
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	MOSSER; FORNEY ENGINEERING
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	6
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	MOSSER
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	STAINLESS STEEL
LINER SPECIFIC MATERIAL TYPE	AUSTENITIC
** DAMPERS	
NUMBER	1
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	STAINLESS STEEL
LINER SPECIFIC MATERIAL TYPE	AUSTENITIC
** DAMPERS	
NUMBER	4
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	4
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A

TEXAS UTILITIES: MARTIN LAKE 3 (CONT.)

** DUCTWORK	
LOCATION	INLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	OUTLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
** DUCTWORK	
LOCATION	BYPASS
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	COMPARTMENTED
DEVICE TYPE	TUBE MILL
MANUFACTURER	KENNEDY VAN SAUN
NUMBER	4
** TANKS	
SERVICE	NUMBER
-----	-----
ABSORBER RECYCLE	3
PRESATURATOR/QUENCHER	6
LIMESTONE SLURRY	1
WET WELL	4
MILL SLURRY SUMP	****
** PUMPS	
SERVICE	NUMBER
-----	-----
QUENCHER FEED	12
SLURRY FEED	2
ABSORBER RECIRCULATION	9
ABSORBER PACKING	9
MILL SLURRY	8
THICKENER UNDERFLOW	3
MAIN WATER RECYCLE 'THICKENER OVERFL	3
AREA SUMP PUMPS	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	CENTRIFUGE
NUMBER	3
FEED STREAM SOURCE	THICKENER UNDERFLOW
FEED STREAM CHARACTERISTICS	35% SOLIDS
OUTLET STREAM CHARACTERISTICS	65% SOLIDS
OUTLET STREAM DISPOSITION	TO FLY ASH MIXING
OVERFLOW STREAM DISPOSITION	TO LIMESTONE SLURRY PREPARATION
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	1
NUMBER OF SPARES	0
DIMENSIONS - FT	140.0 DIA X 12.0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL 'WALLS!; INORGANIC 'BOTTOM!
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER 'WALLS!; MAT-REINFO
FEED STREAM SOURCE	ABSORBER BLEED
FEED STREAM CHARACTERISTICS	10-12% SOLIDS
OUTLET STREAM CHARACTERISTICS	35% SOLIDS

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 3 (CONT.)

OUTLET STREAM DISPOSITION	TO CENTRIFUGE
OVERFLOW STREAM DISPOSITION	TO LIMESTONE SLURRY PREPARATION
*** SALEABLE BYPRODUCTS	
NATURE	GYPSUM
DISPOSITION	MARKETED
*** SLUDGE	
** TREATMENT	
METHOD	STABILIZATION
DEVICE	MULLER-TYPE BLENDER
PROPRIETARY PROCESS	NONE
INLET QUALITY - %	65.0
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	RAIL
SITE TREATMENT	NONE
** PROCESS CONTROL AND INSTRUMENTATION	
CHEMICAL PARAMETERS	PH
PHYSICAL VARIABLES	LIQUID LEVEL, LIQUID & GAS FLOW
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
MAKEUP WATER ADDITION - LITERS/S	34.7 (550 GPM)
** CHEMICALS AND CONSUMPTION	
FUNCTION	ABSORBENT
NAME	LIMESTONE
PRINCIPAL CONSTITUENT	95% CaCO ₃
UTILIZATION - %	95.0
POINT OF ADDITION	BALL MILL
** FGD SPARE CAPACITY INDICES	
ABSORBER - %	0.0
** FGD SPARE COMPONENT INDICES	
ABSORBER	0.0

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO ₂ PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

3/79	SYSTEM						744			

4/79	SYSTEM						720			

** PROBLEMS/SOLUTIONS/COMMENTS

MARTIN LAKE UNIT 3 BECAME OPERATIONAL DURING MARCH. NO OPERATIONAL DETAILS WERE AVAILABLE.

5/79	SYSTEM						744			

6/79	SYSTEM						720			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 3 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS IN OPERATION DURING THIS PERIOD ALTHOUGH OPERATIONAL DATA WERE NOT AVAILABLE.

THE SLUDGE DISPOSAL SYSTEM IS EXPERIENCING SOME OPERATIONAL PROBLEMS.

7/79	SYSTEM	744
8/79	SYSTEM	744
9/79	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

ENGINEERING WORK IS IN PROGRESS TO ADD TWO NEW SCRUBBING TOWERS TO EACH MARTIN LAKE UNIT. THIS IS BEING DONE FOR THREE REASONS:

- 1) THE LIGNITE CURRENTLY DELIVERED HAS A GREATER SULFUR CONTENT THAN THAT FOR WHICH THE FGD SYSTEM WAS ORIGINALLY DESIGNED.
- 2) THE BOILER FLUE GAS FLOW IS GREATER THAN THAT FOR WHICH THE FGD SYSTEM WAS ORIGINALLY DESIGNED.
- 3) AS A RESULT OF CURRENT FGD SYSTEM MAINTENANCE REQUIREMENTS THE UTILITY FEELS IT IS BEST THAT ONE SPARE MODULE BE AVAILABLE SO THAT AT LEAST ONE CAN BE DOWN FOR CLEANING AT ALL TIMES.

THE TWO NEW TOWERS FOR EACH UNIT WILL BE DESIGNED FOR A LARGER CAPACITY THAN THE ORIGINAL TOWERS.

DURING THE THIRD QUARTER THE UTILITY REPORTED THAT THE FGD SYSTEM OPERATED WITHOUT ANY MAJOR OPERATIONAL PROBLEMS, HOWEVER, EXCESSIVE MAINTENANCE WAS REQUIRED. THE SLUDGE DISPOSAL PROBLEMS PLAGUING THE UNIT HAVE BEEN SOLVED

10/79	SYSTEM	744
11/79	SYSTEM	720
12/79	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

PLUGGING PROBLEMS HAVE BEEN ENCOUNTERED DURING THE FOURTH QUARTER REQUIRING HEAVY MAINTENANCE.

1/80	SYSTEM	744
2/80	SYSTEM	696
3/80	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

PLUGGING PROBLEMS CONTINUED IN THE FIRST QUARTER OF 1980. PARTICULARLY IN THE WETTED FILM CONTACT AREA AND THE MIST ELIMINATOR SECTION. THE MIST ELIMINATOR PLUGGING WAS RECENTLY SOLVED BY SWITCHING BACK TO LAKE WATER FOR MIST ELIMINATOR WASH FROM AN ASH POND WATER WASH THE UTILITY HAD BEEN TESTING.

THE FRP STRUCTURAL WORK IS BECOMING A PROBLEM. MUCH OF THE FRP SUPPORT WORK HAS HAD TO BE REPLACED WITH STAINLESS STEEL.

THE UTILITY HAS PLANS TO INSTALL TWO NEW SCRUBBING TOWERS IN EARLY 1983. THE NEW TOWERS HAVE BECOME NECESSARY DUE TO THE INCREASING LIGNITE SULFUR CONTENT AND THE NEED FOR SPARE SCRUBBER CAPACITY.

4/80	SYSTEM	720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
5/80	SYSTEM							744		
6/80	SYSTEM							720		
** PROBLEMS/SOLUTIONS/COMMENTS										
HIGH MAINTENANCE PROBLEMS REPORTED IN PREVIOUS MONTHS CONTINUED THROUGHOUT THE SECOND QUARTER OF 1980. THE ABSORBERS ARE STILL EXPERIENCING PLUGGING PROBLEMS.										
7/80	SYSTEM							744		
** PROBLEMS/SOLUTIONS/COMMENTS										
CORROSION IN THE SCRUBBER MODULES WAS A PROBLEM DURING JULY.										
THE FOUNDATION FOR THE TWO NEW SCRUBBING TOWERS WAS COMPLETED DURING THE MONTH.										
8/80	SYSTEM							744		
9/80	SYSTEM							720		
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT THE FGD SYSTEM OPERATED WITHOUT ANY MAJOR PROBLEMS DURING AUGUST AND SEPTEMBER.										
10/80	SYSTEM							744		
11/80	SYSTEM							720		
12/80	SYSTEM							744		
** PROBLEMS/SOLUTIONS/COMMENTS										
NO OPERATIONAL PROBLEMS WERE REPORTED FOR THE MARTIN LAKE 3 FGD SYSTEM DURING THE FOURTH QUARTER 1980.										
1/81	SYSTEM							744		
2/81	SYSTEM							672		
3/81	SYSTEM							744		
** PROBLEMS/SOLUTIONS/COMMENTS										
NO OPERATIONAL PROBLEMS WERE REPORTED FOR THE MARTIN LAKE 3 FGD SYSTEM DURING THE FIRST QUARTER OF 1981. MAINTENANCE WORK IS CONTINUING ON THE NEW ABSORBER MODULES.										
4/81	SYSTEM							720		
5/81	SYSTEM							744		
6/81	SYSTEM							720		
** PROBLEMS/SOLUTIONS/COMMENTS										
NO OPERATIONAL PROBLEMS WERE REPORTED FOR THE MARTIN LAKE 3 FGD SYSTEM DURING THE SECOND QUARTER 1981. UTILITY IS STILL IN PROCESS OF ADDING TWO ADDITIONAL ABSORBER MODULES (1 ADDITIONAL TRAIN) TO PRESENT FGD SYSTEM DUE TO EXCESSIVE SULFUR CONTENT OF PRESENT LIGNITE COAL SOURCE.										

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
7/81	SYSTEM						744			
8/81	SYSTEM						744			
9/81	SYSTEM						720			
** PROBLEMS/SOLUTIONS/COMMENTS										
WORK CONTINUED DURING THE THIRD QUARTER 1981 ON THE INSTALLATION OF THE ADDITIONAL ABSORBER TRAIN. THE INSTALLATION IS EXPECTED TO BE COMPLETED BY THE FALL OF 1982.										
10/81	SYSTEM						744			
11/81	SYSTEM						720			
12/81	SYSTEM						744			
** PROBLEMS/SOLUTIONS/COMMENTS										
WORK CONTINUED DURING THE FOURTH QUARTER 1981 ON THE INSTALLATION OF THE ADDITIONAL ABSORBER TRAIN. UNTIL THE ADDITIONAL MODULE IS ADDED, THE UNIT WILL BE OPERATED AT REDUCED LOAD.										
1/82	SYSTEM						744			
2/82	SYSTEM						672			
3/82	SYSTEM						744			
** PROBLEMS/SOLUTIONS/COMMENTS										
WORK CONTINUED DURING THE FIRST QUARTER 1982 ON THE INSTALLATION OF THE ADDITIONAL ABSORBER TRAIN.										
4/82	SYSTEM						720			
5/82	SYSTEM						744			
6/82	SYSTEM						720			
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING THE SECOND QUARTER THE UNIT WAS TAKEN OFF-LINE FOR THE ANNUAL SPRING OUTAGE. DURING THIS TIME THE ADDITIONAL ABSORBER TRAIN WAS TIED INTO THE SYSTEM.										
7/82	SYSTEM						744			
8/82	SYSTEM						744			
9/82	SYSTEM						720			
10/82	SYSTEM						744			
11/82	SYSTEM						720			
12/82	SYSTEM						744			
1/83	SYSTEM						744			
2/83	SYSTEM						672			
3/83	SYSTEM						744			

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE PAST NINE MONTHS THE MARTIN LAKE SYSTEMS EXPERIENCED SCALING AND PLUGGING PROBLEMS WITH THEIR MIST ELIMINATORS AND SPRAY PACKED TOWERS. THE UTILITY IS PRESENTLY TESTING FORCED OXIDATION AS A POSSIBLE SOLUTION.

THE MARTIN LAKE SYSTEMS ARE ALSO HAVING LINER FAILURES IN THEIR SPRAY PACKED TOWERS.

4/83	SYSTEM						720		
5/83	SYSTEM						744		
6/83	SYSTEM						720		

** PROBLEMS/SOLUTIONS/COMMENTS

A TOTAL OF 34,600 MAN-HOURS WERE SPENT ON THE MARTIN LAKE FGD SYSTEMS DURING THE MONTHS OF MAY AND JUNE ALONE FOR SERVICING AND THE IMPLEMENTATION OF VARIOUS TEST PROGRAMS.

ABSORBER TOWERS WERE UPGRADED BY THE ADDITION OF FLOWRATE INSTRUMENTATION. FLOW VANES WERE INSTALLED AT THE INLET OF THE ABSORBERS TO BETTER GAS DISTRIBUTION.

UTILITY IS CONDUCTING WET/DRY INTERFACE CORROSION TESTS IN THEIR BYPASS DUCTING FOR RESEARCH-COTTRELL.

THE UTILITY CONTINUED TO REPORT PROBLEMS WITH ABSORBER LINING FAILURES AND MIST ELIMINATOR PLUGGING. THE UTILITY IS PRESENTLY CONDUCTING MIST ELIMINATOR WASH, FORCED OXIDATION, AND LINER TEST PROGRAMS TO HELP SOLVE THESE TWO MAJOR PROBLEMS AREAS.

7/83	SYSTEM						744		
8/83	SYSTEM						744		
9/83	SYSTEM						720		

** PROBLEMS/SOLUTIONS/COMMENTS

THE MARTIN LAKE FGD SYSTEMS STILL CONTINUE TO HAVE MATERIALS OF CONSTRUCTION AND SYSTEM CHEMISTRY PROBLEMS. EPRI AND RADIAN ARE CURRENTLY DOING A JOINT STUDY ON THE MARTIN LAKE SYSTEMS TO DETERMINE POSSIBLE SOLUTIONS TO THESE PROBLEM AREAS.

10/83	SYSTEM						744		
11/83	SYSTEM						720		
12/83	SYSTEM						744		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT 3 FGD SYSTEM WAS FORCED OFF-LINE DURING THE END OF NOVEMBER DUE TO FREEZING PROBLEMS. ALTHOUGH THE FGD SYSTEM WAS DOWN FOR APPROXIMATELY 2 DAYS, THE UNIT OPERATED DUE TO POWER SHORTAGES IN THE GRID.

EPRI AND RADIAN TESTING WAS CONCLUDED DURING THE PERIOD. THE TEST RESULTS FROM THIS STUDY ARE PENDING.

1/84	SYSTEM						744		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 3 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD CAP. HOURS FACTOR
2/84	SYSTEM						696		
3/84	SYSTEM						744		
4/84	SYSTEM						720		
5/84	SYSTEM						744		
6/84	SYSTEM						720		
7/84	SYSTEM						744		
8/84	SYSTEM						744		
** PROBLEMS/SOLUTIONS/COMMENTS									
THE FGD SYSTEM PASSED PERFORMANCE TESTING CONDUCTED DURING THE PERIOD OF MAY THROUGH AUGUST 1984.									
9/84	SYSTEM						720		
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY CONTINUED TO EXPERIENCE MAINTENANCE PROBLEMS. TWO MODULES ARE OUT OF SERVICE AT ALL TIMES FOR MAINTENANCE, HOWEVER, OVERALL FGD SYSTEM PERFORMANCE IS NOT GREATLY EFFECTED.									
NO MAJOR FGD-RELATED OUTAGES WERE REPORTED AT MARTIN LAKE 3 DURING THE FIRST THREE QUARTERS OF 1984.									
10/84	SYSTEM						744		
11/84	SYSTEM						720		
12/84	SYSTEM						744		
** PROBLEMS/SOLUTIONS/COMMENTS									
UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER 1984. THE UNIT WAS IN COMPLIANCE 95 PERCENT OF THE TIME DURING THE PERIOD.									
1/85	SYSTEM						744		
2/85	SYSTEM						672		
3/85	SYSTEM						744		
4/85	SYSTEM						720		
5/85	SYSTEM						744		
6/85	SYSTEM						720		
7/85	SYSTEM						744		
8/85	SYSTEM						744		
9/85	SYSTEM						720		
10/85	SYSTEM						744		
11/85	SYSTEM						720		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

12/85	SYSTEM								744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED FOR THE YEAR 1985. FGD SYSTEM COMPLIANCE WAS APPROXIMATELY 95% OR GREATER DURING THE YEAR.

1/86	SYSTEM								774	
2/86	SYSTEM								672	
3/86	SYSTEM								774	
4/86	SYSTEM								720	
5/86	SYSTEM								774	
6/86	SYSTEM								720	
7/86	SYSTEM								774	
8/86	SYSTEM								774	
9/86	SYSTEM								720	
10/86	SYSTEM								774	
11/86	SYSTEM								720	
12/86	SYSTEM								774	

** PROBLEMS/SOLUTIONS/COMMENTS

UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE YEAR 1986. THE UNIT WAS IN COMPLIANCE 99% OF THE TIME DURING THE YEAR.

1/87	SYSTEM								744	
2/87	SYSTEM								672	
3/87	SYSTEM								744	
4/87	SYSTEM								720	
5/87	SYSTEM								744	
6/87	SYSTEM								720	
7/87	SYSTEM								744	
8/87	SYSTEM								744	
9/87	SYSTEM								720	
10/87	SYSTEM								744	
11/87	SYSTEM								720	
12/87	SYSTEM								744	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MARTIN LAKE 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO FGD-RELATED UNIT OUTAGES WERE ENCOUNTERED DURING 1987. THE UNIT WAS OFF-LINE TWICE DURING THE YEAR FOR SCHEDULED MAINTENANCE OUTAGES. EACH OUTAGE LASTED FOR APPROXIMATELY 2 TO 3 WEEKS AND OCCURRED IN THE SPRING AND FALL OF THE YEAR. ROUTINE MAINTENANCE WAS PERFORMED ON THE FGD SYSTEM DURING THESE OUTAGES.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	TEXAS UTILITIES	
PLANT NAME	MONTICELLO	
UNIT NUMBER	3	
CITY	MT. PLEASANT	
STATE	TEXAS	
REGULATORY CLASSIFICATION	D	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	301.	(0.700 LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	1900	
GROSS UNIT GENERATING CAPACITY - MW	793	
NET UNIT GENERATING CAPACITY W/FGD - MW	750	
NET UNIT GENERATING CAPACITY WO/FGD - MW	765	
EQUIVALENT SCRUBBED CAPACITY - MW	793	

*** UNIT DATA - BOILER AND STACK

BOILER SUPPLIER	BABCOCK & WILCOX	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	1650.71	(3498000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	168.3	(335 F)
STACK HEIGHT - M	183.	(600 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	*****	(***** FT)

*** FUEL DATA

FUEL TYPE	COAL	
FUEL GRADE	LIGNITE	
AVERAGE HEAT CONTENT - J/G	*****	(***** BTU/LB)
RANGE HEAT CONTENT - BTU/LB		6500-7500
AVERAGE ASH CONTENT - %	18.90	
RANGE ASH CONTENT - %	****	
AVERAGE MOISTURE CONTENT - %	31.90	
RANGE MOISTURE CONTENT - %	****	
AVERAGE SULFUR CONTENT - %	0.50	
RANGE SULFUR CONTENT - %	0.5-1.5	
AVERAGE CHLORIDE CONTENT - %	0.04	
RANGE CHLORIDE CONTENT - %	****	

*** PARTICLE CONTROL

*** MECHANICAL COLLECTOR

NUMBER	0
TYPE	NONE

*** ESP

NUMBER	2	
NUMBER OF SPARES	0	
TYPE	COLD SIDE	
SUPPLIER	C.E. WALTHER	
INLET FLUE GAS CAPACITY - CU.M/S	825.4	(1749000 ACFM)
INLET FLUE GAS TEMPERATURE - C	168.3	(335 F)
PRESSURE DROP - KPA	0.4	(2. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.5	

*** PARTICLE SCRUBBER

NUMBER	0
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON NAME	N/A
SHELL GENERIC MATERIAL	N/A
SHELL SPECIFIC MATERIAL	N/A
LINER GENERIC MATERIAL	N/A
LINER SPECIFIC MATERIAL	N/A
GAS CONTACTING DEVICE TYPE	N/A

*** FGD SYSTEM

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MONTICELLO 3 (CONT.)

** GENERAL DATA	
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	GE ENVIRONMENTAL SERVICES
A-E FIRM	C.T. MAIN
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.50
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	74.00
ENERGY CONSUMPTION - %	1.9
CURRENT STATUS	1
COMMERCIAL START-UP	10/1978
INITIAL START-UP	5/1978
CONTRACT AWARDED	0/1976
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
OPER. & MAINT. REQUIREMENT - MANHR/DAY	92.0
** QUENCHER/PRESATURATOR	
NUMBER	0
** ABSORBER	
NUMBER	3
NUMBER OF SPARES	0
GENERIC TYPE	SPRAY TOWER
SPECIFIC TYPE	OPEN COUNTERCURRENT SPRAY
TRADE NAME/COMMON TYPE	N/A
SUPPLIER	GE ENVIRONMENTAL SERVICES
SHELL GENERIC MATERIAL	CARBON STEEL
SHELL SPECIFIC MATERIAL	AISI 1110
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A
LINER GENERIC MATERIAL	ORGANIC
LINER SPECIFIC MATERIAL	GLASS FLAKE-FILLED POLYESTER; MAT-REINFORCED POL
LINER MATERIAL TRADE NAME/COMMON TYPE	FLAKELINE 103; CEILCRETE 2500AR
GAS CONTACTING DEVICE TYPE	NONE
NUMBER OF CONTACTING ZONES	1
LIQUID RECIRCULATION RATE - LITER/S.	4000. (63490 GPM)
L/G RATIO - L/CU.M	7.3 (54.5 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	0.5 (2.0 IN-H2O)
SUPERFICAL GAS VELOCITY - M/SEC	3.0 (10.0 FT/S)
INLET GAS FLOW - CU. M/S	550.24 (1166000 ACFM)
INLET GAS TEMPERATURE - C	168.3 (335 F)
SO2 REMOVAL EFFICIENCY - %	74.0
PARTICLE REMOVAL EFFICIENCY - %	0.0
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
NUMBER PER SYSTEM	3
NUMBER OF SPARES PER SYSTEM	0
NUMBER PER MODULE	1
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	OPEN VANE 'SLAT'
CONFIGURATION	HORIZONTAL
NUMBER OF STAGES	1
NUMBER OF PASSES PER STAGE	4
SUPERFICAL GAS VELOCITY - M/S	3.0 (10.0 FT/S)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPROPYLENE
WASH WATER SOURCE	FRESH
WASH FREQUENCY	CONTINUOUS/INTERMITTENT
WASH RATE - L/S	15.9 (252 GAL/MIN)
** REHEATER	
NUMBER	2
NUMBER OF SPARES	0
GENERIC TYPE	INDIRECT HOT AIR

TEXAS UTILITIES: MONTICELLO 3 (CONT.)

SPECIFIC TYPE	EXTERNAL HEAT EXCHANGER
TRADE NAME/COMMON TYPE	STEAM TUBE BUNDLE
PERCENT GAS BYPASSED - AVG	50.0
TEMPERATURE INCREASE - C	10.0 (18 F)
INLET FLUE GAS FLOW RATE - CU. M/S	1284.04 (2721000 ACFM)
INLET FLUE GAS TEMPERATURE - C	60.6 (141 F)
OUTLET FLUE GAS FLOW RATE - CU. M/S	1588.46 (3366100 ACFM)
OUTLET FLUE GAS TEMPERATURE - C	70.6 (159 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
** FANS	
NUMBER	3
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
SUPPLIER	BUFFALO FORGE
FUNCTION	UNIT
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	550.24 (1166000 ACFM)
FLUE GAS TEMPERATURE - C	168.3 (335 F)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
GENERIC TYPE	GUILLOTINE
SPECIFIC TYPE	NR
MANUFACTURER	ANDCO
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	NR
CONSTRUCTION MATERIAL GENERIC TYPE	STAINLESS STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AUSTENITIC
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
MANUFACTURER	NR
CONSTRUCTION MATERIAL GENERIC TYPE	STAINLESS STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AUSTENITIC
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	INLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	OUTLET
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	INORGANIC
LINER SPECIFIC MATERIAL TYPE	HYDRAULICALLY-BONDED MORTAR
** DUCTWORK	
LOCATION	BYPASS
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MONTICELLO 3 (CONT.)

** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
MANUFACTURER	KENNEDY VAN SAUN
NUMBER	2
NUMBER OF SPARES	1
** TANKS	
SERVICE	NUMBER
-----	-----
REAGENT PREP PRODUCT	1
ABSORBER RECYCLE	3
SO2 REMOVAL AREA SUMP	****
** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER RECIRCULATION	12
SLURRY FEED	****
CLEAR WATER PUMPS	****
SUMP PUMP	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	NONE
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	BLEED
DEVICE	POND
PROPRIETARY PROCESS	NONE
** DISPOSAL	
NATURE	FINAL
TYPE	POND
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	PIPELINE
SITE TREATMENT	CLAY LINING
** PROCESS CONTROL AND INSTRUMENTATION	
CHEMICAL PARAMETERS	PH, SO2 CONCENTRATION
PHYSICAL VARIABLES	DENSITY
MONITOR TYPE	UNILOC, DUPONT, K-RAY
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
MAKEUP WATER ADDITION - LITERS/S	34.4 (546 GPM)
** CHEMICALS AND CONSUMPTION	
FUNCTION	ABSORBENT
NAME	LIMESTONE
** FGD SPARE CAPACITY INDICES	
ABSORBER - %	0.0
** FGD SPARE COMPONENT INDICES	
ABSORBER	0.0

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MONTICELLO 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR
5/78	SYSTEM								744	
	** PROBLEMS/SOLUTIONS/COMMENTS									
	THE TEXAS AIR CONTROL BOARD REPORTED THAT THE TEXAS UTILITIES 750 MW MONTICELLO UNIT 3 BEGAN FGD OPERATIONS DURING EARLY MAY. AS OF YET THE UNIT HAS NOT RUN AT FULL LOAD BUT IS EXPECTED TO DO SO BY THE END OF AUGUST.									
6/78	SYSTEM								720	
7/78	SYSTEM								744	
	** PROBLEMS/SOLUTIONS/COMMENTS									
	THE UNIT IS NOT AT FULL LOAD YET. THE UNIT IS OPERATING AT NO MORE THAN A 300 MW LOAD (OF THE 750 MW TOTAL). ONE OF THE THREE FGD MODULES IS FULLY OPERATIONAL. ANOTHER ONE IS PARTIALLY OPERATIONAL, WHILE THE THIRD IS NOT OPERATING AT ALL.									
8/78	SYSTEM								744	
9/78	SYSTEM								720	
	** PROBLEMS/SOLUTIONS/COMMENTS									
	THE COMPLIANCE TEST HAS NOT YET TAKEN PLACE. THE FGD SYSTEM IS OPERATIONAL. INSTRUMENTATION INDICATES THAT THE UNIT IS IN COMPLIANCE.									
10/78	SYSTEM								744	
11/78	SYSTEM								720	
	** PROBLEMS/SOLUTIONS/COMMENTS									
	CONTINUOUS NOX, O2, AND SO2 MONITORS ARE A PROBLEM AREA.									
	THE SLUDGE IS CURRENTLY NOT FIXATED. IT IS BEING PUMPED DIRECTLY TO THE POND.									
	THE FGD SYSTEM IS FULLY OPERATIONAL. A PRELIMINARY TEST WAS PERFORMED ON DECEMBER 14. RESULTS OF THE TEST ARE NOT YET AVAILABLE.									
12/78	SYSTEM								744	
1/79	SYSTEM								744	
	** PROBLEMS/SOLUTIONS/COMMENTS									
	THE FGD SYSTEM REPORTEDLY HAS BEEN PERFORMING WELL.									
	THE ESP IS NOT OPERATING WELL. COLLECTION EFFICIENCY IS UNEXPECTEDLY LOW. AMMONIA INJECTION HAS BEEN TRIED TO IMPROVE REMOVAL EFFICIENCY. THE PROBLEM REPORTEDLY IS THE RESULT OF STRUCTURAL DAMAGE. THE UNIT DID NOT PASS THE EPA OPACITY TEST.									
2/79	SYSTEM								672	
3/79	SYSTEM								744	
4/79	SYSTEM								720	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MONTICELLO 3 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT IS CURRENTLY DOWN FOR A SCHEDULED OVERHAUL. THE TOWERS HAVE BEEN INSPECTED AND NO SCALING WAS FOUND.

SOME MINOR RECYCLE PUMP LINER PROBLEMS HAVE BEEN REPORTED.

DUE TO HIGH ASH LEVELS SOME PLATES IN THE ESP WERE FORCED OUT OF ALIGNMENT CAUSING AN OPACITY PROBLEM.

THE NEXT COMPLIANCE TEST IS SCHEDULED FOR THE WEEK OF JUNE 18.

5/79	SYSTEM						744
6/79	SYSTEM						720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS IN OPERATION DURING THIS PERIOD ALTHOUGH OPERATIONAL DATA WERE NOT AVAILABLE.

7/79	SYSTEM						744
8/79	SYSTEM						744
9/79	SYSTEM						720

** PROBLEMS/SOLUTIONS/COMMENTS

THE ESP WAS REBUILT AND SINCE THE INITIATION OF GAS CONDITIONING WITH AMMONIA THE OPACITY PROBLEM HAS BEEN MINIMIZED.

DURING THE THIRD QUARTER THE UNIT OPERATED WITHOUT ANY MAJOR PROBLEMS. SOME MINOR ABSORBER RECYCLE PUMP LINER FAILURES HAVE BEEN ENCOUNTERED.

10/79	SYSTEM						744
11/79	SYSTEM						720
12/79	SYSTEM						744

** PROBLEMS/SOLUTIONS/COMMENTS

NO PROBLEMS HAVE BEEN ENCOUNTERED DURING THE FOURTH QUARTER. SINCE GAS CONDITIONING WITH AMMONIA BEGAN, THE OPACITY HAS BEEN ACCEPTABLE.

1/80	SYSTEM						744
2/80	SYSTEM						696
3/80	SYSTEM						744

** PROBLEMS/SOLUTIONS/COMMENTS

NO PROBLEMS WERE ENCOUNTERED DURING THE FIRST QUARTER OF 1980.

4/80	SYSTEM						720
5/80	SYSTEM						744
6/80	SYSTEM						720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MONTICELLO 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE MONTICELLO 3 SCRUBBING SYSTEM PERFORMED WELL THROUGHOUT THE SECOND QUARTER OF 1980. THE TEXAS AIR CONTROL BOARD REPORTED THAT IT HAD RECEIVE VERY FEW EXCESS EMISSIONS REPORTS FROM THE STATION DURING THE APRIL-JUNE PERIOD.

7/80 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING JULY.

8/80 SYSTEM 744

9/80 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE RECYCLE PUMP LININGS HAVE BEEN A CONTINUAL PROBLEM DURING AUGUST AND SEPTEMBER. AT ONE TIME DURING THE TWO MONTH PERIOD THREE RECYCLE PUMP LINERS FAILED.

THE FGD SYSTEM HAS REPORTEDLY PERFORMED WELL AND IS IN COMPLIANCE MORE THAN 95% OF THE TIME.

10/80 SYSTEM 744

11/80 SYSTEM 720

12/80 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE MONTICELLO 3 FGD SYSTEM CONTINUED TO OPERATE DURING THE FOURTH QUARTER 1980 WITH NO MAJOR OPERATIONAL PROBLEMS REPORTED FOR THE THREE MONTH PERIOD.

1/81 SYSTEM 744

2/81 SYSTEM 672

3/81 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

MINOR PROBLEMS WITH THE RECYCLE PUMP WERE ENCOUNTERED THROUGHOUT THE FIRST QUARTER 1981.

4/81 SYSTEM 720

5/81 SYSTEM 744

6/81 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

NO PROBLEMS WERE ENCOUNTERED DURING THE SECOND QUARTER 1981. FGD SYSTEM PERFORMANCE WAS REPORTED AS BEING VERY GOOD.

7/81 SYSTEM 744

8/81 SYSTEM 744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MONTICELLO 3 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD CAP. HOURS FACTOR
9/81	SYSTEM						720		
	** PROBLEMS/SOLUTIONS/COMMENTS								
	IT WAS REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED AT MONTICELLO 3 DURING THE THIRD QUARTER 1981.								
10/81	SYSTEM						744		
11/81	SYSTEM						720		
12/81	SYSTEM						744		
	** PROBLEMS/SOLUTIONS/COMMENTS								
	NO PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER 1981.								
1/82	SYSTEM						744		
2/82	SYSTEM						672		
3/82	SYSTEM						744		
	** PROBLEMS/SOLUTIONS/COMMENTS								
	NO FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FIRST QUARTER 1982. FGD PERFORMANCE WAS REPORTED AS BEING UNUSUALLY VERY GOOD.								
4/82	SYSTEM						720		
5/82	SYSTEM						744		
6/82	SYSTEM						720		
	** PROBLEMS/SOLUTIONS/COMMENTS								
	NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE SECOND QUARTER.								
7/82	SYSTEM						744		
8/82	SYSTEM						744		
9/82	SYSTEM						720		
10/82	SYSTEM						744		
11/82	SYSTEM						720		
12/82	SYSTEM						744		
1/83	SYSTEM						744		
2/83	SYSTEM						672		
3/83	SYSTEM						744		
	** PROBLEMS/SOLUTIONS/COMMENTS								
	EXCEPT FOR RECYCLE PUMP FAILURES AND PROBLEMS WITH WATER CARRY-OVER FROM MIST ELIMINATORS, THE FGD SYSTEM OPERATED FLAWLESSLY THROUGHOUT THE NINE MONTH PERIOD. THE APPROXIMATE FGD SYSTEM AVAILABILITY FOR THIS PERIOD AS REPORTED BY THE TEXAS AIR CONTROL BOARD WAS NEARLY 100%.								
4/83	SYSTEM						720		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MONTICELLO 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
5/83	SYSTEM						744			
6/83	SYSTEM						720			
** PROBLEMS/SOLUTIONS/COMMENTS										
EXCEPT FOR THE CONTINUED PROBLEMS WITH RECYCLE PUMP LINER FAILURES, NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED THROUGHOUT THE PERIOD.										
7/83	SYSTEM						744			
8/83	SYSTEM						744			
9/83	SYSTEM						720			
** PROBLEMS/SOLUTIONS/COMMENTS										
EXCEPT FOR MIST ELIMINATOR CARRYOVER PROBLEMS, NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE THIRD PERIOD.										
DUE TO EXCESSIVE CARRYOVER FROM THE MIST ELIMINATORS, STACK CONDENSATE COLLECTED TO THE EXTENT THAT THE WEIGHT OF THE WATER BLEW OPEN THE STACK FLUE ACCESS DOOR. ONLY MINOR DAMAGE WAS REPORTED TO THE STACK AND REPAIRS WERE COMPLETED WITHIN A SINGLE DAY. IT WAS REPORTED THAT THE CARRYOVER CONTAINED SLURRY WHICH PLUGGED THE DRAINS LOCATED AT THE BASE OF THE STACK.										
10/83	SYSTEM						744			
11/83	SYSTEM						720			
12/83	SYSTEM						744			
** PROBLEMS/SOLUTIONS/COMMENTS										
THE MONTICELLO 3 FGD SYSTEM WAS OFF-LINE 5 DAYS IN DECEMBER FOR MIST ELIMINATOR REPLACEMENT. THE REPLACEMENT OF MIST ELIMINATORS IN ALL THREE SPRAY TOWERS WAS NECESSITATED DUE TO HARD SCALE BUILD UP. THE COST TO REPLACE THE MIST ELIMINATORS IN ALL THREE TOWERS WAS APPROXIMATELY \$300,000. THE UTILITY BELIEVES THIS WAS A ONE-TIME OCCURRENCE CAUSED BY A UNMONITORED PEAK IN THE SYSTEM CHEMISTRY.										
1/84	SYSTEM						744			
2/84	SYSTEM						696			
3/84	SYSTEM						744			
4/84	SYSTEM						720			
5/84	SYSTEM						744			
6/84	SYSTEM						720			
7/84	SYSTEM						744			
8/84	SYSTEM						744			
9/84	SYSTEM						720			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MONTICELLO 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

MINOR PUMP LINING PROBLEMS WERE EXPERIENCED DURING THE FIRST THREE
 QUARTERS OF 1984.

MIST ELIMINATOR PACKING REPAIRS WERE MADE DURING THE FIRST THREE QUARTERS
 OF 1984.

NO MAJOR FGD-RELATED OUTAGES WERE REPORTED AT MONTICELLO 3 DURING THE
 FIRST THREE QUARTERS OF 1984.

10/84	SYSTEM	744
11/84	SYSTEM	720
12/84	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
 DURING THE FOURTH QUARTER 1984. THE UNIT WAS IN COMPLIANCE 99 PERCENT
 OF THE TIME DURING THE PERIOD.

1/85	SYSTEM	744
2/85	SYSTEM	672
3/85	SYSTEM	744
4/85	SYSTEM	720
5/85	SYSTEM	744
6/85	SYSTEM	720
7/85	SYSTEM	744
8/85	SYSTEM	744
9/85	SYSTEM	720
10/85	SYSTEM	744
11/85	SYSTEM	720
12/85	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED
 FOR THE YEAR 1985. FGD SYSTEM COMPLIANCE WAS APPROXIMATELY 95% OR
 GREATER DURING THE YEAR.

1/86	SYSTEM	774
2/86	SYSTEM	672
3/86	SYSTEM	774
4/86	SYSTEM	720
5/86	SYSTEM	774
6/86	SYSTEM	720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MONTICELLO 3 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR

7/86	SYSTEM						774
8/86	SYSTEM						774
9/86	SYSTEM						720
10/86	SYSTEM						774
11/86	SYSTEM						720
12/86	SYSTEM						774
** PROBLEMS/SOLUTIONS/COMMENTS							
UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE YEAR 1986. THE UNIT WAS IN COMPLIANCE 99% OF THE TIME DURING THE YEAR.							
1/87	SYSTEM						744
** PROBLEMS/SOLUTIONS/COMMENTS							
THE UTILITY REPORTED THAT NO FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE MONTH OF JANUARY.							
2/87	SYSTEM						672
** PROBLEMS/SOLUTIONS/COMMENTS							
THE UTILITY REPORTED THAT THE UNIT WAS OFF-LINE FOR 2 WEEKS IN FEBRUARY FOR SCHEDULED MAINTENANCE. DURING THIS OUTAGE, THE UTILITY MADE IMPROVEMENTS TO THE ABSORBER MIST ELIMINATORS AND SPRAY WASH SYSTEM.							
3/87	SYSTEM						744
4/87	SYSTEM						720
5/87	SYSTEM						744
6/87	SYSTEM						720
7/87	SYSTEM						744
8/87	SYSTEM						744
9/87	SYSTEM						720
** PROBLEMS/SOLUTIONS/COMMENTS							
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE PERIOD MARCH THROUGH SEPTEMBER 1987.							
10/87	SYSTEM						744
** PROBLEMS/SOLUTIONS/COMMENTS							
THE UTILITY REPORTED THAT THE UNIT WAS OFF-LINE 2 WEEKS IN OCTOBER FOR A SCHEDULED BOILER/TURBINE MAINTENANCE OUTAGE.							
11/87	SYSTEM						720
12/87	SYSTEM						744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: MONTICELLO 3 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED OR UNIT OUTAGES WERE ENCOUNTERED DURING THE MONTHS OF
NOVEMBER OR DECEMBER.

DO NOT MICROFILM
THIS COPY

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	TEXAS UTILITIES
PLANT NAME	SANDOW
UNIT NUMBER	4
CITY	ROCKDALE
STATE	TEXAS
REGULATORY CLASSIFICATION	D
PARTICULATE EMISSION LIMITATION - NG/J	43. (0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516. (1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	***** (***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	940
GROSS UNIT GENERATING CAPACITY - MW	595
NET UNIT GENERATING CAPACITY W/FGD - MW	545
NET UNIT GENERATING CAPACITY WO/FGD - MW	559
EQUIVALENT SCRUBBED CAPACITY - MW	405
** UNIT DATA - BOILER AND STACK	COMBUSTION ENGINEERING
BOILER SUPPLIER	PULVERIZED COAL
BOILER TYPE	BASE
BOILER SERVICE LOAD	***** (***** ACFM)
DESIGN BOILER FLUE GAS FLOW - CU.M/S	168.3 (335 F)
BOILER FLUE GAS TEMPERATURE - C	***** (**** FT)
STACK HEIGHT - M	NR
STACK SHELL	***** (**** FT)
STACK TOP DIAMETER - M	
** FUEL DATA	COAL
FUEL TYPE	LIGNITE
FUEL GRADE	***** (***** BTU/LB)
AVERAGE HEAT CONTENT - J/G	****
RANGE HEAT CONTENT - BTU/LB	13.00
AVERAGE ASH CONTENT - %	****
RANGE ASH CONTENT - %	35.00
AVERAGE MOISTURE CONTENT - %	****
RANGE MOISTURE CONTENT - %	1.60
AVERAGE SULFUR CONTENT - %	****
RANGE SULFUR CONTENT - %	*****
AVERAGE CHLORIDE CONTENT - %	****
RANGE CHLORIDE CONTENT - %	
*** PARTICLE CONTROL	
** ESP	
NUMBER	1
TYPE	COLD SIDE
SUPPLIER	C.E. WALTHER
** PARTICLE SCRUBBER	
NUMBER	0
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON NAME	N/A
SHELL GENERIC MATERIAL	N/A
SHELL SPECIFIC MATERIAL	N/A
LINER GENERIC MATERIAL	N/A
LINER SPECIFIC MATERIAL	N/A
GAS CONTACTING DEVICE TYPE	N/A
*** FGD SYSTEM	
** GENERAL DATA	
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
PROCESS ADDITIVES	DIBASIC ACID
SYSTEM SUPPLIER	COMBUSTION ENGINEERING
A-E FIRM	BROWN & ROOT
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.70

TEXAS UTILITIES: SANDOW 4 (CONT.)

UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	75.00	
ENERGY CONSUMPTION - %	2.4	
CURRENT STATUS	1	
COMMERCIAL START-UP	1/1981	
INITIAL START-UP	12/1980	
CONTRACT AWARDED	0/1978	
** DESIGN AND OPERATING PARAMETERS		
DESIGN CHLORIDE CONTENT - %	*****	
SPACE REQUIREMENTS - SQ M	4046.7	(43560 SQ FT)
** QUENCHER/PRESATURATOR		
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** ABSORBER		
NUMBER	4	
NUMBER OF SPARES	1	
GENERIC TYPE	SPRAY TOWER	
SPECIFIC TYPE	OPEN COUNTERCURRENT SPRAY	
TRADE NAME/COMMON TYPE	N/A	
SUPPLIER	COMBUSTION ENGINEERING	
SHELL GENERIC MATERIAL	NR	
SHELL SPECIFIC MATERIAL	NR	
SHELL MATERIAL TRADE NAME/COMMON TYPE	NR	
LINER GENERIC MATERIAL	NR	
LINER SPECIFIC MATERIAL	NR	
LINER MATERIAL TRADE NAME/COMMON TYPE	NR	
GAS CONTACTING DEVICE TYPE	NONE	
INLET GAS TEMPERATURE - C	160.0	(320 F)
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
TRADE NAME/COMMON TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
** FANS		
DESIGN	NR	
FUNCTION	NR	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** DAMPERS		
FUNCTION	NR	
GENERIC TYPE	NR	
SPECIFIC TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	
** DUCTWORK		
SHELL GENERIC MATERIAL TYPE	NR	
SHELL SPECIFIC MATERIAL TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	
** REAGENT PREPARATION EQUIPMENT		
FUNCTION	WET BALL MILL	
DEVICE	NR	
DEVICE TYPE	NR	
** PUMPS		
SERVICE	NUMBER	
-----	-----	
NR	****	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: SANDOW 4 (CONT.)

** SOLIDS CONCENTRATING/DEWATERING
DEVICE NR

*** SALEABLE BYPRODUCTS
NATURE NONE
DISPOSITION N/A

*** SLUDGE

** TREATMENT
METHOD FORCED OXIDATION
DEVICE NR
PROPRIETARY PROCESS N/A

** DISPOSAL
NATURE FINAL
TYPE POND
SITE TREATMENT NONE

** WATER BALANCE
WATER LOOP TYPE CLOSED

** FGD SPARE CAPACITY INDICES
ABSORBER - % 0.0

** FGD SPARE COMPONENT INDICES
ABSORBER 0.0

-----PERFORMANCE DATA-----
PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
SO2 PART. HOURS HOURS HOURS FACTOR

12/80 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

OPERATIONS AT SANDOW 4 COMMENCED IN DECEMBER 1980. THE SYSTEM IS PRESENTL
IN THE SHAKEDOWN/DEBUGGING PHASE OF OPERATION.

1/81 SYSTEM 744

2/81 SYSTEM 672

3/81 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD PROBLEMS HAVE BEEN EXPERIENCED
SINCE STARTUP. HOWEVER, APPRECIABLE AMOUNTS OF COAL WERE NOT FIRED UNTIL
MARCH.

4/81 SYSTEM 720

5/81 SYSTEM 744

6/81 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE SECOND QUARTER 1981 THE UTILITY REPORTED THAT NO MAJOR FGD-
RELATED PROBLEMS WERE ENCOUNTERED.

7/81 SYSTEM 744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: SANDOW 4 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
8/81	SYSTEM								744		
9/81	SYSTEM								720		
** PROBLEMS/SOLUTIONS/COMMENTS											
AS OF THE END OF SEPTEMBER, THE ONLY MAJOR OPERATIONAL PROBLEM REPORTED FOR THE SANDOW 4 FGD SYSTEM HAS BEEN EXCESSIVE MIST ELIMINATOR PLUGGING.											
SANDOW 4 IS EXPECTED TO GO OFF-LINE IN MID-OCTOBER FOR AN OVERHAUL.											
10/81	SYSTEM								744		
11/81	SYSTEM								720		
12/81	SYSTEM								744		
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER OF 1981.											
1/82	SYSTEM								744		
2/82	SYSTEM								672		
3/82	SYSTEM								744		
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UTILITY REPORTED THAT ONLY GENERAL CLEANING WAS REQUIRED DURING THE FIRST QUARTER OF 1982. NO FORCED OUTAGES WERE ENCOUNTERED DURING THIS PERIOD.											
THE UTILITY STILL REPORTS ENCOUNTERING PROBLEMS WITH MIST ELIMINATOR PLUGGING.											
4/82	SYSTEM								720		
5/82	SYSTEM								744		
6/82	SYSTEM								720		
7/82	SYSTEM								744		
8/82	SYSTEM								744		
9/82	SYSTEM								720		
10/82	SYSTEM								744		
11/82	SYSTEM								720		
12/82	SYSTEM								744		
1/83	SYSTEM								744		
2/83	SYSTEM								672		
3/83	SYSTEM								744		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: SANDOW 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE PERIOD OF APRIL 1982 TO MARCH 1983.

4/83 SYSTEM 720

5/83 SYSTEM 744

6/83 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE PERIOD OF APRIL 1982 TO JUNE 1983.

7/83 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT WAS IN A SCHEDULED OVERHAUL DURING JULY
HOWEVER, THE FGD SYSTEM WAS 100 PERCENT AVAILABLE.

8/83 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

TWO SHORT FORCED OUTAGES WERE REPORTED DURING AUGUST DUE TO THE FAILURE OF
SPRAY HEADERS.

9/83 SYSTEM 720

10/83 SYSTEM 744

11/83 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
DURING THE PERIOD OF SEPTEMBER THROUGH NOVEMBER 1983.

12/83 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

A SCHEDULED 2-WEEK BOILER OVERHAUL TOOK PLACE IN DECEMBER. DURING THIS
TIME, MIST ELIMINATOR PLUGGING REPAIRS WERE MADE AND PLUGGED SPRAY NOZZLES
WERE CLEANED.

1/84 SYSTEM 744

2/84 SYSTEM 696

3/84 SYSTEM 744

4/84 SYSTEM 720

5/84 SYSTEM 744

6/84 SYSTEM 720

7/84 SYSTEM 744

8/84 SYSTEM 744

9/84 SYSTEM 720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: SANDOW 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE FIRST THREE QUARTERS OF 1984.

10/84	SYSTEM	744
11/84	SYSTEM	720
12/84	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE FOURTH QUARTER OF 1984.

1/85	SYSTEM	744
2/85	SYSTEM	672
3/85	SYSTEM	744
4/85	SYSTEM	720
5/85	SYSTEM	744
6/85	SYSTEM	720
7/85	SYSTEM	744
8/85	SYSTEM	744
9/85	SYSTEM	720
10/85	SYSTEM	744
11/85	SYSTEM	720
12/85	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM	774
2/86	SYSTEM	672
3/86	SYSTEM	774
4/86	SYSTEM	720
5/86	SYSTEM	774
6/86	SYSTEM	720
7/86	SYSTEM	774
8/86	SYSTEM	774
9/86	SYSTEM	720
10/86	SYSTEM	774
11/86	SYSTEM	720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

TEXAS UTILITIES: SANDOW 4 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

12/86 SYSTEM 774

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1986.

1/87 SYSTEM 744

2/87 SYSTEM 672

3/87 SYSTEM 744

4/87 SYSTEM 720

5/87 SYSTEM 744

6/87 SYSTEM 720

7/87 SYSTEM 744

8/87 SYSTEM 744

9/87 SYSTEM 720

10/87 SYSTEM 744

11/87 SYSTEM 720

12/87 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO FGD SYSTEM-RELATED FORCED UNIT OUTAGES WERE ENCOUNTERED IN 1987. THE UNIT HAD A 2-WEEK SCHEDULED OUTAGE IN MARCH AND A 1-WEEK SCHEDULED OUTAGE IN SEPTEMBER FOR ROUTINE BOILER/TURBINE MAINTENANCE.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	UNITED POWER ASSOCIATION	
PLANT NAME	STANTON	
UNIT NUMBER	10	
CITY	STANTON	
STATE	NORTH DAKOTA	
REGULATORY CLASSIFICATION	D	
PARTICULATE EMISSION LIMITATION - NG/J	4.	(0.010 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	175	
GROSS UNIT GENERATING CAPACITY - MW	60	
NET UNIT GENERATING CAPACITY W/FGD - MW	56	
NET UNIT GENERATING CAPACITY WO/FGD - MW	57	
EQUIVALENT SCRUBBED CAPACITY - MW	50	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	98.19	(208074 ACFM)
BOILER FLUE GAS TEMPERATURE - C	132.2	(270 F)
STACK HEIGHT - M	77.	(254 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	4.6	(15.0 FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	LIGNITE	
AVERAGE HEAT CONTENT - J/G	16282.	(7000 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		5976-7367
AVERAGE ASH CONTENT - %	6.90	
RANGE ASH CONTENT - %	4.9-11.8	
AVERAGE MOISTURE CONTENT - %	35.00	
RANGE MOISTURE CONTENT - %	28.0-37.9	
AVERAGE SULFUR CONTENT - %	0.77	
RANGE SULFUR CONTENT - %	0.3-1.9	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
** FABRIC FILTER		
NUMBER	1	
SUPPLIER	RESEARCH-COTTRELL	
INLET FLUE GAS TEMPERATURE - C	76.7	(170 F)
PRESSURE DROP - KPA	1.0	(4.0 IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.0	
TYPICAL GAS/CLOTH RATIO - M/MIN	0.5	(1.6 FT/MIN)
** ESP		
NUMBER	0	
TYPE	NONE	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	

UNITED POWER ASSOCIATION: STANTON 10 (CONT.)

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	SPRAY DRYING
PROCESS TYPE	LIME/SPRAY DRYING
SYSTEM SUPPLIER	RESEARCH-COTTRELL
A-E FIRM	BLACK & VEATCH
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.80
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	72.70
ENERGY CONSUMPTION - %	1.7
CURRENT STATUS	1
COMMERCIAL START-UP	11/1982
INITIAL START-UP	7/1982
CONTRACT AWARDED	1/1980

** DESIGN AND OPERATING PARAMETERS

DESIGN CHLORIDE CONTENT - %	*****

** QUENCHER/PRESATURATOR

CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR

** ABSORBER

NUMBER	1
NUMBER OF SPARES	0
GENERIC TYPE	SPRAY DRYER
SPECIFIC TYPE	NR
TRADE NAME/COMMON TYPE	ROTARY ATOMIZER
SUPPLIER	KOMLINE & SANDERSON
DIMENSIONS - FT	63.0 X 38.0 72.0
SHELL GENERIC MATERIAL	CARBON STEEL
SHELL SPECIFIC MATERIAL	AISI 1110
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A
LINER GENERIC MATERIAL	NONE
LINER SPECIFIC MATERIAL	N/A
LINER MATERIAL TRADE NAME/COMMON TYPE	N/A
GAS CONTACTING DEVICE TYPE	NONE
NUMBER OF CONTACTING ZONES	1
INLET GAS FLOW - CU. M/S	134.96 (286000 ACFM)
INLET GAS TEMPERATURE - C	161.7 (323 F)
SO2 REMOVAL EFFICIENCY - %	91.0
PARTICLE REMOVAL EFFICIENCY - %	99.8

** MIST ELIMINATOR

PRE-MIST ELIMINATOR/MIST ELIMINATOR	NONE
NUMBER PER SYSTEM	0
GENERIC TYPE	N/A
SPECIFIC TYPE	N/A
TRADE NAME/COMMON TYPE	N/A
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR

** REHEATER

NUMBER	0
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON TYPE	N/A
CONSTRUCTION MATERIAL GENERIC TYPE	NONE
CONSTRUCTION MATERIAL SPECIFIC TYPE	N/A

** FANS

DESIGN	NR
FUNCTION	NR
APPLICATION	INDUCED DRAFT
SERVICE	DRY
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UNITED POWER ASSOCIATION: STANTON 10 (CONT.)

** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	SLAKER
DEVICE	NR
DEVICE TYPE	NR
** PUMPS	
SERVICE	NUMBER
-----	-----
NR	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	0
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	VACUUM FILTER
NUMBER	0
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	CENTRIFUGE
NUMBER	0
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	UNSTABILIZED
DEVICE	N/A
PROPRIETARY PROCESS	N/A
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	PIPELINE
SITE TREATMENT	CLAY LINING
** PROCESS CONTROL AND INSTRUMENTATION	
PHYSICAL VARIABLES	TEMPERATURE,SO2
PROCESS CONTROL MANNER	AUTOMATIC
PROCESS CHEMISTRY MODE	FEED FORWARD
** WATER BALANCE	
WATER LOOP TYPE	OPEN

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UNITED POWER ASSOCIATION: STANTON 10 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
7/82	SYSTEM								744	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE FGD SYSTEM INITIAL STARTUP WAS IN JULY 1982 AND IS CURRENTLY STILL IN THE SHAKEDOWN AND DEBUGGING PHASE OF OPERATION.										
8/82	SYSTEM								744	
9/82	SYSTEM								720	
10/82	SYSTEM								744	
11/82	SYSTEM								720	
12/82	SYSTEM								744	
1/83	SYSTEM								744	
2/83	SYSTEM								672	
3/83	SYSTEM								744	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED EXPERIENCING A NUMBER OF PROBLEMS WITH ROTARY ATOMIZERS. GEAR BOXES HAVE BURNED OUT DUE TO BALANCING PROBLEMS AND MOTOR HAVE NOT PROVIDED ADEQUATE ATOMIZATION. THE FGD SYSTEM HAS YET TO COMPLETE EITHER PERFORMANCE OR COMPLIANCE TESTING.										
4/83	SYSTEM								720	
5/83	SYSTEM								744	
6/83	SYSTEM								720	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THE CANCELLATION OF ITS SCHEDULED JULY 11 PERFORMANCE TEST BECAUSE OF ATOMIZER PROBLEMS. THE NEW TENTATIVE DATE IS SCHEDULED FOR SOMETIME IN OCTOBER. COMMERCIAL OPERATIONS ARE PLANNED TO TAKE PLACE IN DECEMBER.										
7/83	SYSTEM	99.9	100.0	100.0	99.0		744	737	737	
8/83	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	
** PROBLEMS/SOLUTIONS/COMMENTS										
NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING JULY AND AUGUST 1983.										
9/83	SYSTEM	2.9	100.0	100.0	2.8		720	20	20	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT FREQUENT PLUGGING AT THE TOP OF THE ATOMIZERS OCCURRED DURING THE THIRD QUARTER.										
THE UTILITY REPORTED A UNIT OUTAGE BEGINNING SEPTEMBER 1 AND CONTINUING INTO OCTOBER.										
10/83	SYSTEM	88.3	100.0	100.0	86.5		744	643	744	
11/83	SYSTEM	88.3	100.0	100.0	86.5		720	622	720	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UNITED POWER ASSOCIATION: STANTON 10 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

12/83	SYSTEM	88.3	100.0	100.0	86.5		744	643	744	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE FGD SYSTEM WAS OUT OF SERVICE 258.5 HRS DURING THE FOURTH QUARTER OF 1983 DUE TO AN ANNUAL OUTAGE.										
1/84	SYSTEM	93.9	100.0	100.0	92.5		744	689	689	
2/84	SYSTEM	94.5	100.0	100.0	93.1		696	648	648	
3/84	SYSTEM	93.9	100.0	100.0	92.5		744	689	689	
4/84	SYSTEM	99.9	100.0	100.0	93.8		720	675	675	
5/84	SYSTEM	99.6	100.0	100.0	93.5		744	696	696	
6/84	SYSTEM	99.9	100.0	100.0	93.8		720	675	675	
** PROBLEMS/SOLUTIONS/COMMENTS										
NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING THE FIRST TWO QUARTERS OF 1984.										
7/84	SYSTEM	100.0	98.9	100.0	90.3		744	679	672	
8/84	SYSTEM	100.0	98.9	100.0	90.3		744	679	672	
9/84	SYSTEM	100.0	100.0	100.0	93.3		720	657	672	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE THIRD QUARTER OF 1984.										
10/84	SYSTEM	69.1	100.0	100.0	67.7		744	504	504	
11/84	SYSTEM	0.0			0.0		720	0	0	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT THE UNIT AND FGD SYSTEM WERE DOWN FROM OCTOBER 20 THROUGH NOVEMBER 30 FOR A SCHEDULED MAINTAINENCE OUTAGE.										
12/84	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE MONTH OF DECEMBER.										
1/85	SYSTEM	100.0	100.0	100.0	96.0		744	714	714	
2/85	SYSTEM	100.0	100.0	100.0	97.3		672	654	654	
3/85	SYSTEM	100.0	100.0	100.0	90.2		744	671	671	
4/85	SYSTEM	99.9	100.0	100.0	99.7		720	718	718	
5/85	SYSTEM	100.0	100.0	100.0	100.0		744	744	744	
6/85	SYSTEM	100.0	100.0	100.0	95.6		720	688	688	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UNITED POWER ASSOCIATION: STANTON 10 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE MONTHS
 OF JANUARY THROUGH JUNE.

7/85	SYSTEM	100.0	100.0	100.0	100.0	744	744	744
8/85	SYSTEM	100.0	100.0	100.0	99.9	744	744	743
9/85	SYSTEM	100.0	100.0	100.0	98.6	720	710	710
10/85	SYSTEM	100.0	100.0	100.0	66.6	744	496	496
11/85	SYSTEM	100.0	100.0	100.0	100.0	720	720	720
12/85	SYSTEM	100.0	100.0	100.0	97.1	744	722	722

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED BY THE UTILITY FOR THE
 SECOND HALF OF 1985.

1/86	SYSTEM	100.0	100.0	100.0	99.8	744	743	743
2/86	SYSTEM	100.0	99.3	99.3	98.6	672	668	663
3/86	SYSTEM	100.0	100.0	100.0	99.9	744	743	743

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE FIRST QUARTER OF
 1986.

4/86	SYSTEM	99.9	100.0	100.0	99.7	720	718	718
5/86	SYSTEM	100.0	100.0	100.0	93.5	744	696	696
6/86	SYSTEM					720		

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE SECOND QUARTER OF
 1986. THE UNIT WAS SHUT DOWN THE ENTIRE MONTH OF JUNE FOR A SCHEDULED
 OUTAGE.

7/86	SYSTEM	96.8	100.0	100.0	91.6	744	681	681
8/86	SYSTEM	100.0	100.0	100.0	100.0	744	744	744
9/86	SYSTEM	100.0	100.0	100.0	100.0	720	720	720

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE THIRD QUARTER OF
 1986.

10/86	SYSTEM	100.0	100.0	100.0	100.0	744	745	744
11/86	SYSTEM	100.0	100.0	100.0	95.4	720	687	687
12/86	SYSTEM	100.0	100.0	100.0	95.8	744	712	712

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UNITED POWER ASSOCIATION: STANTON 10 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE FOURTH QUARTER OF 1986.

1/87	SYSTEM	100.0	100.0	100.0	100.0	744	744	744
2/87	SYSTEM	100.0	100.0	100.0	100.0	672	672	672
3/87	SYSTEM	100.0	100.0	100.0	92.2	744	686	686

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD SYSTEM-RELATED PROBLEMS WERE REPORTED FOR THE PERIOD JANUARY THROUGH FEBRUARY.

4/87	SYSTEM					720	9999	999.9
5/87	SYSTEM					744	9999	999.9
6/87	SYSTEM					720	9999	999.9
7/87	SYSTEM					744	9999	999.9
8/87	SYSTEM					744	9999	999.9
9/87	SYSTEM					720	9999	999.9
10/87	SYSTEM					744	9999	999.9
11/87	SYSTEM					720	9999	999.9
12/87	SYSTEM					744	9999	999.9

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION ON STATION 10 WAS NOT AVAILABLE FOR THE PERIOD APRIL THROUGH DECEMBER, 1987.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	UTAH POWER & LIGHT	
PLANT NAME	HUNTER	
UNIT NUMBER	1	
CITY	CASTLE DALE	
STATE	UTAH	
REGULATORY CLASSIFICATION	C	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	301.	(0.700 LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	393	
GROSS UNIT GENERATING CAPACITY - MW	430	
NET UNIT GENERATING CAPACITY W/FGD - MW	400	
NET UNIT GENERATING CAPACITY WO/FGD - MW	407	
EQUIVALENT SCRUBBED CAPACITY - MW	369	
 ** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	822.05	(1742000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	130.0	(266 F)
STACK HEIGHT - M	183.	(600 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	7.3	(24.0 FT)
 ** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	26749.	(11500 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		10000-12600
AVERAGE ASH CONTENT - %	12.90	
RANGE ASH CONTENT - %	6.8-20.1	
AVERAGE MOISTURE CONTENT - %	7.60	
RANGE MOISTURE CONTENT - %	3.6-16.9	
AVERAGE SULFUR CONTENT - %	0.52	
RANGE SULFUR CONTENT - %	0.41-0.90	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	
 *** PARTICLE CONTROL		
 ** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
 ** ESP		
NUMBER	2	
NUMBER OF SPARES	0	
TYPE	COLD SIDE	
SUPPLIER	BUELL DIVISION, ENVIROTECH	
INLET FLUE GAS CAPACITY - CU.M/S	443.1	(939000 ACFM)
INLET FLUE GAS TEMPERATURE - C	127.8	(262 F)
PRESSURE DROP - KPA	0.1	(0. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.6	
 ** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
 *** FGD SYSTEM		

UTAH POWER & LIGHT: HUNTER 1 (CONT.)

** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	
PROCESS TYPE	LIME	
PROCESS ADDITIVES	NONE	
SYSTEM SUPPLIER	GE ENVIRONMENTAL SERVICES	
A-E FIRM	STEARNS-ROGER	
DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	NEW	
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.50	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	80.00	
ENERGY CONSUMPTION - %	1.6	
CURRENT STATUS	1	
COMMERCIAL START-UP	5/1979	
INITIAL START-UP	3/1979	
CONTRACT AWARDED	12/1976	
** DESIGN AND OPERATING PARAMETERS		
DESIGN COAL SULFUR CONTENT - %	0.55	
DESIGN COAL HEAT CONTENT - J/G	29075.0	(12500 BTU/LB)
DESIGN COAL ASH CONTENT - %	9.00	
DESIGN MOISTURE CONTENT - %	6.00	
DESIGN CHLORIDE CONTENT - %	*****	
OPER. & MAINT. REQUIREMENT - MANHR/DAY	160.0	
** QUENCHER/PRESATURATOR		
NUMBER	0	
** ABSORBER		
NUMBER	4	
NUMBER OF SPARES	0	
GENERIC TYPE	SPRAY TOWER	
SPECIFIC TYPE	OPEN COUNTERCURRENT SPRAY	
TRADE NAME/COMMON TYPE	N/A	
SUPPLIER	GE ENVIRONMENTAL SERVICES	
DIMENSIONS - FT	27.5 DIAMETER X 35.5 HIGH	
SHELL GENERIC MATERIAL	CARBON STEEL	
SHELL SPECIFIC MATERIAL	AISI 1110	
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A	
LINER GENERIC MATERIAL	ORGANIC	
LINER SPECIFIC MATERIAL	GLASS FLAKE-FILLED POLYESTER	
LINER MATERIAL TRADE NAME/COMMON TYPE	NR	
GAS CONTACTING DEVICE TYPE	NONE	
NUMBER OF CONTACTING ZONES	1	
LIQUID RECIRCULATION RATE - LITER/S	1178.	(18700 GPM)
L/G RATIO - L/CU.M	5.7	(42.9 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	0.6	(2.5 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/SEC	3.7	(12.0 FT/S)
INLET GAS FLOW - CU. M/S	205.51	(435500 ACFM)
INLET GAS TEMPERATURE - C	130.0	(266 F)
SO2 REMOVAL EFFICIENCY - %	80.0	
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR	
NUMBER PER SYSTEM	4	
NUMBER OF SPARES PER SYSTEM	0	
NUMBER PER MODULE	1	
GENERIC TYPE	IMPINGEMENT	
SPECIFIC TYPE	BAFFLE	
TRADE NAME/COMMON TYPE	CLOSED VANE	
CONFIGURATION	HORIZONTAL	
NUMBER OF STAGES	1	
NUMBER OF PASSES PER STAGE	4	
FREEBOARD DISTANCE - M	3.66	(12.0 FT)
DISTANCE BETWEEN VANES - CM	7.6	(3.00 IN)
PRESSURE DROP - KPA	0.2	(1.0 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC	
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPROPYLENE	
WASH WATER SOURCE	FRESH & SUPERNATANT	
WASH FREQUENCY	CONTINUOUS	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 1 (CONT.)

WASH RATE - L/S	9.5	(150 GAL/MIN)
** REHEATER		
NUMBER	1	
NUMBER OF SPARES	0	
NUMBER PER MODULE	1	
GENERIC TYPE	INDIRECT HOT AIR	
SPECIFIC TYPE	EXTERNAL HEAT EXCHANGER	
TRADE NAME/COMMON TYPE	STEAM TUBE BUNDLE	
PERCENT GAS BYPASSED - AVG	15.0	
TEMPERATURE INCREASE - C	26.7	(48 F)
INLET FLUE GAS TEMPERATURE - C	43.3	(110 F)
OUTLET FLUE GAS TEMPERATURE - C	70.0	(158 F)
NUMBER OF HEAT EXCHANGER BANKS	1	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL 'HEADER!; STAINLESS STEEL 'TUBES!;	
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110; NR; NR	
** FANS		
NUMBER	2	
NUMBER OF SPARES	0	
SUPPLIER	WESTINGHOUSE	
FUNCTION	UNIT	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** FANS		
NUMBER	2	
NUMBER OF SPARES	0	
DESIGN	CENTRIFUGAL	
SUPPLIER	WESTINGHOUSE	
FUNCTION	BOOSTER	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
FLUE GAS FLOW RATE - CU.M/S	411.02	(871000 ACFM)
FLUE GAS TEMPERATURE - C	130.0	(266 F)
PRESSURE DROP - KPA	2.8	(9.1 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** FANS		
NUMBER	1	
NUMBER OF SPARES	0	
SUPPLIER	WESTINGHOUSE	
FUNCTION	REHEATER	
APPLICATION	INDUCED DRAFT	
SERVICE	DRY	
FLUE GAS FLOW RATE - CU.M/S	135.91	(288000 ACFM)
PRESSURE DROP - KPA	2.7	(9.0 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** FANS		
NUMBER	2	
NUMBER OF SPARES	0	
SUPPLIER	WESTINGHOUSE	
FUNCTION	UNIT	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** DAMPERS		
NUMBER	2	
FUNCTION	SHUT-OFF	
GENERIC TYPE	GUILLLOTINE	
SPECIFIC TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	

UTAH POWER & LIGHT: HUNTER 1 (CONT.)

** DAMPERS	
NUMBER	2
FUNCTION	SHUT-OFF
GENERIC TYPE	GUILLOTINE
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DAMPERS	
NUMBER	4
FUNCTION	CONTROL
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DAMPERS	
NUMBER	8
FUNCTION	SHUT-OFF/CONTROL
GENERIC TYPE	GUILLOTINE/LOUVER
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL/STAINLESS STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	HIGH STRENGTH LOW ALLOY 'HSLA!'; AUSTENITIC
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DAMPERS	
NUMBER	2
FUNCTION	CONTROL
GENERIC TYPE	BUTTERFLY
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DAMPERS	
NUMBER	5
FUNCTION	CONTROL
GENERIC TYPE	LOUVER/BUTTERFLY
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	FAN DISCHARGE
CONFIGURATION	RECTANGLE
DIMENSIONS	15 X 18 X 13
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	INLET MANIFOLD
CONFIGURATION	CIRCLE
DIMENSIONS	18 D X 172.5 L
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 1 (CONT.)

** DUCTWORK	
LOCATION	INLET
CONFIGURATION	RECTANGLE
DIMENSIONS	8 X 16 X 7
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	OUTLET
CONFIGURATION	RECTANGLE
DIMENSIONS	8.5 X 13 X 2
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	OUTLET MANIFOLD
CONFIGURATION	CIRCLE
DIMENSIONS	16.75 D X 165 L
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	HIGH ALLOY
LINER SPECIFIC MATERIAL TYPE	NICKEL BASE/CHROMIUM-IRON-MOLYBDENUM
** DUCTWORK	
LOCATION	BYPASS REHEAT
CONFIGURATION	CIRCLE
DIMENSIONS	6 D X 60 L
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	HIGH ALLOY
LINER SPECIFIC MATERIAL TYPE	NICKEL BASE/CHROMIUM-IRON-MOLYBDENUM
** DUCTWORK	
LOCATION	REHEAT
CONFIGURATION	RECTANGLE TO CIRCLE
DIMENSIONS	9 X 7.5 TO 11.5 D X 83 L
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	SLAKER
DEVICE	DETENTION
DEVICE TYPE	N/A
NUMBER	1
NUMBER OF SPARES	0
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	2.7 (3 TPH)
** TANKS	
SERVICE	NUMBER
-----	-----
THICKENER TRANSFER	1
SLAKER TRANSFER	1
ABSORBER RECYCLE	4
PROCESS SUMP	****
THICKENER SUMP	****
FLOCCULATION SYSTEM	****
** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER RECIRCULATION	16
THICKENER UNDERFLOW	2
THICKENER OVERFLOW	2
LIME SLURRY	2

UTAH POWER & LIGHT: HUNTER 1 (CONT.)

THICKENER SUMP

2

** SOLIDS CONCENTRATING/DEWATERING

DEVICE
 NUMBER
 NUMBER OF SPARES
 CONFIGURATION
 DIMENSIONS - FT
 CAPACITY
 SHELL GENERIC MATERIAL TYPE
 SHELL SPECIFIC MATERIAL TYPE
 LINER GENERIC MATERIAL TYPE
 LINER SPECIFIC MATERIAL TYPE
 FEED STREAM SOURCE
 FEED STREAM CHARACTERISTICS
 OUTLET STREAM CHARACTERISTICS
 OVERFLOW STREAM CHARACTERISTICS
 OUTLET STREAM DISPOSITION
 OVERFLOW STREAM DISPOSITION

THICKENER
 1
 0
 CYLINDER
 60 DIA X 12 HIGH
 250000
 CARBON STEEL
 AISI 1110
 ORGANIC
 NR
 ABSORBER BLEED, FILTER RECYCLE
 543 GPM, 7% SOLIDS
 100 GPM, 30% SOLIDS
 400 GPM, 150 PPM SOLIDS
 FILTER
 ABSORBER

** SOLIDS CONCENTRATING/DEWATERING

DEVICE
 NUMBER
 NUMBER OF SPARES
 CONFIGURATION
 DIMENSIONS - FT
 SHELL GENERIC MATERIAL TYPE
 SHELL SPECIFIC MATERIAL TYPE
 LINER GENERIC MATERIAL TYPE
 LINER SPECIFIC MATERIAL TYPE
 BELT GENERIC MATERIAL TYPE
 BELT SPECIFIC MATERIAL TYPE
 FEED STREAM SOURCE
 FEED STREAM CHARACTERISTICS
 OUTLET STREAM CHARACTERISTICS
 OUTLET STREAM DISPOSITION
 OVERFLOW STREAM DISPOSITION

VACUUM FILTER
 2
 0
 CYLINDER
 6 DIA X 10 LONG
 CARBON STEEL
 AISI 1110
 ORGANIC
 NYLON
 ORGANIC
 NYLON
 THICKENER UNDERFLOW
 100 GPM, 30% SOLIDS
 50% SOLIDS
 TRUCK TO LANDFILL
 THICKENER

*** SALEABLE BYPRODUCTS

NATURE
 DISPOSITION

NONE
 N/A

*** SLUDGE

** TREATMENT

METHOD
 DEVICE
 PROPRIETARY PROCESS

STABILIZATION
 PUG MILL
 N/A

** DISPOSAL

NATURE
 TYPE
 LOCATION
 SITE TRANSPORTATION METHOD

FINAL
 LANDFILL
 OFF-SITE
 TRUCK

** PROCESS CONTROL AND INSTRUMENTATION

PROCESS STREAM
 CHEMICAL PARAMETERS
 CONTROL LEVELS
 MONITOR TYPE
 PROCESS CONTROL MANNER

ABSORBER RECYCLE TO SPRAYS
 PH
 5.8-6.2
 UNILOC FLOW-THROUGH
 AUTOMATIC

** WATER BALANCE

WATER LOOP TYPE

CLOSED

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 1 (CONT.)

** CHEMICALS AND CONSUMPTION
 FUNCTION
 NAME
 UTILIZATION - %
 POINT OF ADDITION

ABSORBENT
 LIME
 90.0
 SLAKER

** FGD SPARE CAPACITY INDICES
 ABSORBER - %

0.0

** FGD SPARE COMPONENT INDICES
 ABSORBER

0.0

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
5/79	SYSTEM		78.6		32.8		744	311	244	

** PROBLEMS/SOLUTIONS/COMMENTS

INITIAL FGD OPERATIONS BEGAN IN MAY 1979.

THE FIGURES REPORTED BY UTAH POWER AND LIGHT ARE NOT CONSISTENT WITH THE FIGURES AS DEFINED BY PEDCO FOR THIS REPORT. IN THIS SURVEY "FGD SYSTEM HOURS" IS THE AVERAGE OF THE MODULAR HOURS ACCUMULATED BY EACH ABSORBER DURING A GIVEN MONTH. UP&L DEFINES "FGD SYSTEM HOURS" AS ACCUMULATED HOUR WHEN ANY OR ALL OF THE ABSORBERS IS IN OPERATION DURING A GIVEN MONTH. TH OPERABILITY AND UTILIZATION FIGURES REPORTED ARE BASED UPON "FGD SYSTEM HOURS" AS DEFINED BY UP&L AND THEREFORE MAY YIELD DEPENDABILITY FACTORS THAT ARE NOT COMPARABLE WITH OTHER DEPENDABILITY FACTORS INCLUDED IN THIS SURVEY.

6/79	SYSTEM		98.0		96.9		720	713	698	
7/79	SYSTEM		100.0		99.1		744	738	738	
8/79	SYSTEM		100.0		100.0		744	744	744	
9/79	SYSTEM		100.0		100.0		720	720	720	

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR OPERATIONAL PROBLEMS WERE REPORTED BY THE UTILITY FOR THIS UNIT DURING THE THIRD QUARTER OF 1979.

10/79	SYSTEM		100.0		95.6		744	711	711	
11/79	SYSTEM		100.0		91.1		720	656	656	
12/79	SYSTEM		100.0		98.2		744	731	731	
1/80	SYSTEM		100.0		95.9		744	713	713	
2/80	SYSTEM		100.0		86.8		696	604	604	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THERE WERE NO MAJOR FGD PROBLEMS ENCOUNTERED FROM OCTOBER 1979 THROUGH FEBRUARY 1980.

3/80	SYSTEM		57.8		56.9		744	732	423	

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM WAS FORCED OUT OF SERVICE IN MARCH BECAUSE THE THICKENER RAKE SHAFT FAILED AND THE TANK HAD TO BE DRAINED. THIS OUTAGE KEPT THE SYSTEM DOWN FOR APPROXIMATELY 309 HOURS.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 1 (CONT.)

-----PERFORMANCE DATA-----								
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS HOURS	FGD CAP. HOURS FACTOR
4/80	SYSTEM		100.0		60.1		720 433	433
5/80	SYSTEM		100.0		64.0		744 476	476
** PROBLEMS/SOLUTIONS/COMMENTS								
THE LOW FGD HOURS DURING APRIL AND MAY RESULTED FROM THE ANNUAL OUTAGE FOR GENERAL FGD SYSTEM MAINTENANCE.								
6/80	SYSTEM		100.0		97.9		720 705	705
** PROBLEMS/SOLUTIONS/COMMENTS								
NO FGD SYSTEM PROBLEMS WERE REPORTED FOR JUNE.								
7/80	SYSTEM		100.0		100.0		744 744	744
** PROBLEMS/SOLUTIONS/COMMENTS								
NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING JULY.								
8/80	SYSTEM	100.0					744 744	
9/80	SYSTEM	100.0					720 713	
** PROBLEMS/SOLUTIONS/COMMENTS								
THE UTILITY REPORTED THAT NO MAJOR FGD PROBLEMS WERE ENCOUNTERED DURING THE MONTHS OF AUGUST AND SEPTEMBER.								
10/80	SYSTEM		100.0		96.5		744 718	718
11/80	SYSTEM		80.0		76.4		720 687	550
** PROBLEMS/SOLUTIONS/COMMENTS								
OUTAGE TIME DURING NOVEMBER WAS THE RESULT OF A THICKENER RAKE FAILURE. THE SYSTEM WAS OFF LINE APPROXIMATELY SIX DAYS.								
12/80	SYSTEM		96.6		96.2		744 741	715
** PROBLEMS/SOLUTIONS/COMMENTS								
DURING DECEMBER 25 HOURS OF OUTAGE TIME WAS CAUSED BY A LIME SLAKER PROBLEM.								
1/81	SYSTEM		100.0		92.7		744 690	690
2/81	SYSTEM		100.0		94.6		672 636	636
** PROBLEMS/SOLUTIONS/COMMENTS								
DURING JANUARY AND FEBRUARY NO MAJOR PROBLEMS WERE ENCOUNTERED WITH THE FGD SYSTEM.								
3/81	SYSTEM		100.0		30.5		744 227	227
** PROBLEMS/SOLUTIONS/COMMENTS								
DURING MARCH THE BOILER AND THE SYSTEM WERE OUT OF SERVICE FOR APPROXIMATELY 517 HOURS DUE TO A SCHEDULED OVERHAUL.								
4/81	SYSTEM		100.0		65.7		720 473	473

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 1 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
5/81	SYSTEM		100.0		90.4			744	673	673	
6/81	SYSTEM		100.0		89.1			720	642	642	
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE SECOND QUARTER 1981.											
7/81	SYSTEM							744			
8/81	SYSTEM							744			
9/81	SYSTEM							720			
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE THIRD QUARTER 1981.											
10/81	SYSTEM							744			
11/81	SYSTEM							720			
12/81	SYSTEM							744			
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER 1981.											
1/82	SYSTEM							744			
2/82	SYSTEM							672			
3/82	SYSTEM							744			
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FIRST QUARTER 1982. THE UTILITY PLANS TO SHUTDOWN IN APRIL FOR SCHEDULED OVERHAUL.											
4/82	SYSTEM							720			
5/82	SYSTEM							744			
6/82	SYSTEM							720			
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UNIT WAS OFF-LINE FOR 4 WEEKS IN APRIL FOR A SCHEDULED BOILER/FGD OVERHAUL. THE UTILITY REPORTED NO OTHER MAJOR BOILER/FGD RELATED OUTAGES FOR THE SECOND QUARTER 1982.											
THE UTILITY REPORTED THAT THE UNIT IS EXPERIENCING REHEAT PROBLEMS. THE INDIRECT HOT AIR STEAM REHEAT SYSTEM IS NOT PRODUCING ADEQUATE REHEAT. THE UTILITY IS PRESENTLY BAFFLED AS TO THE REASON FOR ITS INADEQUACY.											
THE UTILITY ALSO REPORTED THAT THE UNIT IS EXPERIENCING FLYASH BUILDUP AND SCALING IN THE OUTLET DUCTWORK TO THE STACK.											
7/82	SYSTEM							744			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 1 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
8/82	SYSTEM								744		
9/82	SYSTEM								720		
10/82	SYSTEM								744		
11/82	SYSTEM								720		
12/82	SYSTEM								744		
1/83	SYSTEM								744		
2/83	SYSTEM								672		
3/83	SYSTEM								744		
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UTILITY REPORTED THAT IT NOW BELIEVES ITS REHEAT PROBLEM IS DUE TO PLUGGED MIST ELIMINATORS AND NOT THE REHEATERS THEMSELVES. THE MIST ELIMINATORS BECOME PLUGGED AND SUBSEQUENTLY ALLOW INCREASED AMOUNTS OF MOISTURE TO BE CARRIED-OVER FOR WHICH THE REHEAT SYSTEM WAS NOT ORIGINALLY DESIGNED TO ACCOMMODATE. THE UTILITY NOW MONITORS THE MIST ELIMINATORS CLOSELY FOR PLUGGING AND CLEANS THEM WHENEVER IT HAS EXTENDED OUTAGE PERIODS.											
THE UNIT IS SCHEDULED FOR A MAJOR OUTAGE TO BEGIN SOMETIME IN APRIL FOR TURBINE OVERHAUL. DURING THIS PERIOD, THE MIST ELIMINATORS WILL BE WASHED AND CLEANED.											
4/83	SYSTEM								720		
5/83	SYSTEM								744		
6/83	SYSTEM								720		
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UTILITY REPORTED THAT THE UNIT WAS DOWN FOR A PERIOD OF 7 WEEKS FOR A SCHEDULED TURBINE OVERHAUL. THE OUTAGE PERIOD STARTED AT THE END OF APRIL DURING THE OUTAGE THE MIST ELIMINATORS WERE CLEANED WITH FIRE HOSES.											
7/83	SYSTEM								744		
8/83	SYSTEM								744		
9/83	SYSTEM								720		
** PROBLEMS/SOLUTIONS/COMMENTS											
THE UTILITY REPORTED THAT NO FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE THIRD QUARTER OF 1983. TOTAL UNIT OUTAGE TIME WAS APPROXIMATELY 64 HOURS AND TOOK PLACE ALL IN THE MONTH OF JULY.											
10/83	SYSTEM								744		
11/83	SYSTEM								720		
12/83	SYSTEM								744		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE FOURTH QUARTER OF 1983.

1/84	SYSTEM	744
2/84	SYSTEM	696
3/84	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED A SIX WEEK SCHEDULED OUTAGE DURING THE FIRST QUARTER OF 1984. NO FORCED OUTAGES WERE REPORTED.

4/84	SYSTEM	720
5/84	SYSTEM	744
6/84	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

A THICKENER RAKE FAILURE WAS REPORTED DURING THE SECOND QUARTER OF 1984. HOWEVER NO FGD SYSTEM OPERATING TIME WAS LOST. SLUDGE WAS TRUCKED TO A WASTE PILE DURING THIS TIME.

7/84	SYSTEM	744
8/84	SYSTEM	744
9/84	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

TWO INCIDENCES OF LIMESTONE SLAKER FAILURE WERE REPORTED DURING THE THIRD QUARTER OF 1984. TOTAL OUTAGE TIME WAS 29 HOURS AND OVERALL FGD SYSTEM AVAILABILITY WAS 80%.

10/84	SYSTEM	744
11/84	SYSTEM	720
12/84	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS NOT AVAILABLE FOR THE FOURTH QUARTER OF 1984.

1/85	SYSTEM	744
2/85	SYSTEM	672
3/85	SYSTEM	744
4/85	SYSTEM	720
5/85	SYSTEM	744
6/85	SYSTEM	720
7/85	SYSTEM	744
8/85	SYSTEM	744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

9/85	SYSTEM					720
10/85	SYSTEM					744
11/85	SYSTEM					720
12/85	SYSTEM					744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM					774
2/86	SYSTEM					672

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED OUTAGES WERE REPORTED FOR THE MONTHS OF JANUARY OR FEBRUARY 1986.

3/86	SYSTEM					774
4/86	SYSTEM					720
5/86	SYSTEM					774
6/86	SYSTEM					720

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE SAME OUTAGE PERIOD, THE UTILITY REPLACED 3 MIST ELIMINATORS ON UNIT 1. THE NEWER MIST ELIMINATORS HAVE A LOWER PRESSURE DROP AND A HIGHER COLLECTION EFFICIENCY AS COMPARED TO THE ORIGINAL INSTALLED UNITS. THE UTILITY WAS HAVING PROBLEMS WITH SLURRY "BLOW-BY" DUE TO HIGH FLUE GAS VELOCITIES. THE RESULT WAS LARGE SCALE DEPOSITS IN THE OUTLET DUCTWORK. THE NEW MIST ELIMINATORS WERE SUPPLIED BY COCH. A NEW WASH SYSTEM WAS ALSO INSTALLED WITH THE MIST ELIMINATORS.

UNIT 1 WAS OFF-LINE 14 WEEKS FROM MARCH 22 TO THE END OF JUNE 1986 FOR SCRUBBER OUTLET DUCTWORK REPLACEMENT. THE PRE-KRETE G-8 LINER WAS REPLACED WITH 1/16 INCH HASTELLOY C-276. APPROXIMATELY 16,000 SQUARE FEET OF DUCTWORK WAS RELINED. THE MATERIAL WAS SUPPLIED BY CABOT AND THE INSTALLATION BY WESTERN CONSTRUCTION. THE UTILITY HAD BEEN REPLACING THE PRE-KRETE ONCE EVERY 4 YEARS. THE REPLACEMENT COST FOR THE C-276 WAS APPROXIMATELY \$1 MILLION FOR UNIT 1.

7/86	SYSTEM					774
8/86	SYSTEM					774
9/86	SYSTEM					720
10/86	SYSTEM					774
11/86	SYSTEM					720
12/86	SYSTEM					774

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE MONTHS OF JULY - DECEMBER 1986. THE DUCTWORK INSTALLED IN JUNE WAS INSPECTED IN DECEMBER AND NO SIGNS OF EROSION/CORROSION WERE EVIDENT.

1/87	SYSTEM	744
2/87	SYSTEM	672
3/87	SYSTEM	744
4/87	SYSTEM	720
5/87	SYSTEM	744
6/87	SYSTEM	720
7/87	SYSTEM	744
8/87	SYSTEM	744
9/87	SYSTEM	720
10/87	SYSTEM	744
11/87	SYSTEM	720
12/87	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE SCHEDULED MAINTENANCE OUTAGE THE UTILITY REPLACED THE ABSORBER INLET AND OUTLET GUILLOTINE DAMPERS ON 2 TOWERS.

DURING THE SCHEDULED MAINTENANCE OUTAGE THE UTILITY REPLACED 2 LEVELS OF RECYCLE SPRAY PIPING IN 4 TOWERS.

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING 1987. THE UNIT WAS OFF-LINE FOR APPROXIMATELY 4 WEEKS IN JUNE FOR SCHEDULED MAINTENANCE.

NOI MICROFILM
THIS COPY

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	UTAH POWER & LIGHT	
PLANT NAME	HUNTER	
UNIT NUMBER	2	
CITY	CASTLE DALE	
STATE	UTAH	
REGULATORY CLASSIFICATION	C	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	301.	(0.700 LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	393	
GROSS UNIT GENERATING CAPACITY - MW	430	
NET UNIT GENERATING CAPACITY W/FGD - MW	400	
NET UNIT GENERATING CAPACITY WO/FGD - MW	407	
EQUIVALENT SCRUBBED CAPACITY - MW	369	
 ** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	822.05	(1742000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	130.0	(266 F)
STACK HEIGHT - M	183.	(600 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	7.3	(24.0 FT)
 ** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	26749.	(11500 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		10000-12600
AVERAGE ASH CONTENT - %	12.90	
RANGE ASH CONTENT - %	6.8-20.1	
AVERAGE MOISTURE CONTENT - %	7.60	
RANGE MOISTURE CONTENT - %	3.6-16.9	
AVERAGE SULFUR CONTENT - %	0.52	
RANGE SULFUR CONTENT - %	0.41-0.90	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	
 *** PARTICLE CONTROL		
 ** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
 ** ESP		
NUMBER	2	
NUMBER OF SPARES	0	
TYPE	COLD SIDE	
SUPPLIER	BUELL DIVISION, ENVIROTECH	
INLET FLUE GAS CAPACITY - CU.M/S	443.1	(939000 ACFM)
INLET FLUE GAS TEMPERATURE - C	127.8	(262 F)
PRESSURE DROP - KPA	0.1	(0. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.6	
 ** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
 *** FGD SYSTEM		

UTAH POWER & LIGHT: HUNTER 2 (CONT.)

** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	
PROCESS TYPE	LIME	
PROCESS ADDITIVES	NONE	
SYSTEM SUPPLIER	GE ENVIRONMENTAL SERVICES	
A-E FIRM	STEARNS-ROGER	
DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	NEW	
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.50	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	80.00	
ENERGY CONSUMPTION - %	1.6	
CURRENT STATUS	1	
COMMERCIAL START-UP	6/1980	
INITIAL START-UP	6/1980	
CONTRACT AWARDED	4/1976	
** DESIGN AND OPERATING PARAMETERS		
DESIGN COAL SULFUR CONTENT - %	0.55	
DESIGN COAL HEAT CONTENT - J/G	29075.0	(12500 BTU/LB)
DESIGN COAL ASH CONTENT - %	9.00	
DESIGN MOISTURE CONTENT - %	6.00	
DESIGN CHLORIDE CONTENT - %	*****	
OPER. & MAINT. REQUIREMENT - MANHR/DAY	160.0	
** QUENCHER/PRESATURATOR		
NUMBER	0	
** ABSORBER		
NUMBER	4	
NUMBER OF SPARES	0	
GENERIC TYPE	SPRAY TOWER	
SPECIFIC TYPE	OPEN COUNTERCURRENT SPRAY	
TRADE NAME/COMMON TYPE	N/A	
SUPPLIER	GE ENVIRONMENTAL SERVICES	
DIMENSIONS - FT	27.5 DIAMETER X 35.5 HIGH	
SHELL GENERIC MATERIAL	CARBON STEEL	
SHELL SPECIFIC MATERIAL	AISI 1110	
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A	
LINER GENERIC MATERIAL	ORGANIC	
LINER SPECIFIC MATERIAL	GLASS FLAKE-FILLED POLYESTER	
LINER MATERIAL TRADE NAME/COMMON TYPE	NR	
GAS CONTACTING DEVICE TYPE	NONE	
NUMBER OF CONTACTING ZONES	1	
LIQUID RECIRCULATION RATE - LITER/S	1178.	(18700 GPM)
L/G RATIO - L/CU.M	5.7	(42.9 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	0.6	(2.5 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/SEC	3.7	(12.0 FT/S)
INLET GAS FLOW - CU. M/S	205.51	(435500 ACFM)
INLET GAS TEMPERATURE - C	130.0	(266 F)
SO2 REMOVAL EFFICIENCY - %	80.0	
** MIST ELIMINATOR		
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR	
NUMBER PER SYSTEM	4	
NUMBER OF SPARES PER SYSTEM	0	
NUMBER PER MODULE	1	
GENERIC TYPE	IMPINGEMENT	
SPECIFIC TYPE	BAFFLE	
TRADE NAME/COMMON TYPE	CLOSED VANE	
CONFIGURATION	HORIZONTAL	
NUMBER OF STAGES	1	
NUMBER OF PASSES PER STAGE	4	
FREEBOARD DISTANCE - M	3.66	(12.0 FT)
DISTANCE BETWEEN VANES - CM	7.6	(3.00 IN)
PRESSURE DROP - KPA	0.2	(1.0 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC	
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPROPYLENE	
WASH WATER SOURCE	FRESH & SUPERNATANT	
WASH FREQUENCY	CONTINUOUS	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 2 (CONT.)

WASH RATE - L/S	9.5	(150 GAL/MIN)
** REHEATER		
NUMBER	1	
NUMBER OF SPARES	0	
NUMBER PER MODULE	1	
GENERIC TYPE	INDIRECT HOT AIR	
SPECIFIC TYPE	EXTERNAL HEAT EXCHANGER	
TRADE NAME/COMMON TYPE	STEAM TUBE BUNDLE	
PERCENT GAS BYPASSED - AVG	15.0	
TEMPERATURE INCREASE - C	26.7	(48 F)
INLET FLUE GAS TEMPERATURE - C	43.3	(110 F)
OUTLET FLUE GAS TEMPERATURE - C	70.0	(158 F)
NUMBER OF HEAT EXCHANGER BANKS	1	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL 'HEADER!; STAINLESS STEEL 'TUBES!;	
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110; NR; NR	
** FANS		
NUMBER	2	
NUMBER OF SPARES	0	
SUPPLIER	WESTINGHOUSE	
FUNCTION	UNIT	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** FANS		
NUMBER	2	
NUMBER OF SPARES	0	
DESIGN	CENTRIFUGAL	
SUPPLIER	WESTINGHOUSE	
FUNCTION	BOOSTER	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
FLUE GAS FLOW RATE - CU.M/S	411.02	(871000 ACFM)
FLUE GAS TEMPERATURE - C	130.0	(266 F)
PRESSURE DROP - KPA	2.8	(9.1 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** FANS		
NUMBER	1	
NUMBER OF SPARES	0	
SUPPLIER	WESTINGHOUSE	
FUNCTION	REHEATER	
APPLICATION	INDUCED DRAFT	
SERVICE	DRY	
FLUE GAS FLOW RATE - CU.M/S	135.91	(288000 ACFM)
PRESSURE DROP - KPA	2.7	(9.0 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** FANS		
NUMBER	2	
NUMBER OF SPARES	0	
SUPPLIER	WESTINGHOUSE	
FUNCTION	UNIT	
APPLICATION	FORCED DRAFT	
SERVICE	DRY	
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL	
** DAMPERS		
NUMBER	2	
FUNCTION	SHUT-OFF	
GENERIC TYPE	GUILLLOTINE	
SPECIFIC TYPE	NR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR	
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR	
LINER GENERIC MATERIAL TYPE	NR	
LINER SPECIFIC MATERIAL TYPE	NR	

UTAH POWER & LIGHT: HUNTER 2 (CONT.)

** DAMPERS	
NUMBER	2
FUNCTION	SHUT-OFF
GENERIC TYPE	GUILLOTINE
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DAMPERS	
NUMBER	4
FUNCTION	CONTROL
GENERIC TYPE	LOUVER
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DAMPERS	
NUMBER	8
FUNCTION	SHUT-OFF/CONTROL
GENERIC TYPE	GUILLOTINE/LOUVER
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL/STAINLESS STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	HIGH STRENGTH LOW ALLOY 'HSLA!'; AUSTENITIC
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DAMPERS	
NUMBER	2
FUNCTION	CONTROL
GENERIC TYPE	BUTTERFLY
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DAMPERS	
NUMBER	5
FUNCTION	CONTROL
GENERIC TYPE	LOUVER/BUTTERFLY
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	FAN DISCHARGE
CONFIGURATION	RECTANGLE
DIMENSIONS	15 X 18 X 13
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	INLET MANIFOLD
CONFIGURATION	CIRCLE
DIMENSIONS	18 D X 172.5 L
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 2 (CONT.)

** DUCTWORK	
LOCATION	INLET
CONFIGURATION	RECTANGLE
DIMENSIONS	8 X 16 X 7
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	OUTLET
CONFIGURATION	RECTANGLE
DIMENSIONS	8.5 X 13 X 2
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
LOCATION	OUTLET MANIFOLD
CONFIGURATION	CIRCLE
DIMENSIONS	16.75 D X 165 L
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	HIGH ALLOY
LINER SPECIFIC MATERIAL TYPE	NICKEL BASE/CHROMIUM-IRON-MOLYBDENUM
** DUCTWORK	
LOCATION	BYPASS REHEAT
CONFIGURATION	CIRCLE
DIMENSIONS	6 D X 60 L
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	HIGH ALLOY
LINER SPECIFIC MATERIAL TYPE	NICKEL BASE/CHROMIUM-IRON-MOLYBDENUM
** DUCTWORK	
LOCATION	REHEAT
CONFIGURATION	RECTANGLE TO CIRCLE
DIMENSIONS	9 X 7.5 TO 11.5 D X 83 L
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	SLAKER
DEVICE	DETENTION
DEVICE TYPE	N/A
NUMBER	1
NUMBER OF SPARES	0
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	2.7 (3 TPH)
** TANKS	
SERVICE	NUMBER
-----	-----
THICKENER TRANSFER	1
SLAKER TRANSFER	1
ABSORBER RECYCLE	4
PROCESS SUMP	****
THICKENER SUMP	****
FLOCCULATION SYSTEM	****
** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER RECIRCULATION	16
THICKENER UNDERFLOW	2
THICKENER OVERFLOW	2
LIME SLURRY	2

UTAH POWER & LIGHT: HUNTER 2 (CONT.)

THICKENER SUMP	2
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	1
NUMBER OF SPARES	0
CONFIGURATION	CYLINDER
DIMENSIONS - FT	60 DIA X 12 HIGH
CAPACITY	250000
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	NR
FEED STREAM SOURCE	ABSORBER BLEED, FILTER RECYCLE
FEED STREAM CHARACTERISTICS	543 GPM, 7% SOLIDS
OUTLET STREAM CHARACTERISTICS	100 GPM, 30% SOLIDS
OVERFLOW STREAM CHARACTERISTICS	400 GPM, 150 PPM SOLIDS
OUTLET STREAM DISPOSITION	FILTER
OVERFLOW STREAM DISPOSITION	ABSORBER
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	VACUUM FILTER
NUMBER	2
NUMBER OF SPARES	0
CONFIGURATION	CYLINDER
DIMENSIONS - FT	6 DIA X 10 LONG
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	NYLON
BELT GENERIC MATERIAL TYPE	ORGANIC
BELT SPECIFIC MATERIAL TYPE	NYLON
FEED STREAM SOURCE	THICKENER UNDERFLOW
FEED STREAM CHARACTERISTICS	100 GPM, 30% SOLIDS
OUTLET STREAM CHARACTERISTICS	50% SOLIDS
OUTLET STREAM DISPOSITION	TRUCK TO LANDFILL
OVERFLOW STREAM DISPOSITION	THICKENER
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	STABILIZATION
DEVICE	PUG MILL
PROPRIETARY PROCESS	N/A
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
LOCATION	OFF-SITE
SITE TRANSPORTATION METHOD	TRUCK
** PROCESS CONTROL AND INSTRUMENTATION	
PROCESS STREAM	ABSORBER RECYCLE TO SPRAYS
CHEMICAL PARAMETERS	PH
CONTROL LEVELS	5.8-6.2
MONITOR TYPE	UNILOC FLOW-THROUGH
PROCESS CONTROL MANNER	AUTOMATIC
** WATER BALANCE	
WATER LOOP TYPE	CLOSED

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 2 (CONT.)

** CHEMICALS AND CONSUMPTION	
FUNCTION	ABSORBENT
NAME	LIME
UTILIZATION - %	90.0
POINT OF ADDITION	SLAKER
** FGD SPARE CAPACITY INDICES	
ABSORBER - %	0.0
** FGD SPARE COMPONENT INDICES	
ABSORBER	0.0

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO ₂ PART.	PER BOILER HOURS	FGD CAP. HOURS	FGD CAP. FACTOR
0/80	SYSTEM								

** PROBLEMS/SOLUTIONS/COMMENTS

THE FIGURES REPORTED BY UTAH POWER AND LIGHT ARE NOT CONSISTENT WITH THE FIGURES AS DEFINED BY PEDCO FOR THIS REPORT. IN THIS SURVEY "FGD SYSTEM HOURS" IS THE AVERAGE OF THE MODULAR HOURS ACCUMULATED BY EACH ABSORBER DURING A GIVEN MONTH. UP&L DEFINES "FGD SYSTEM HOURS" AS ACCUMULATED HOUR WHEN ANY OR ALL OF THE ABSORBERS IS IN OPERATION DURING A GIVEN MONTH. TH OPERABILITY AND UTILIZATION FIGURES REPORTED ARE BASED UPON "FGD SYSTEM HOURS" AS DEFINED BY UP&L AND THEREFORE MAY YIELD DEPENDABILITY FACTORS THAT ARE NOT COMPARABLE WITH OTHER DEPENDABILITY FACTORS INCLUDED IN THIS SURVEY.

6/80	SYSTEM	100.0		99.5			720	717	717

** PROBLEMS/SOLUTIONS/COMMENTS

INITIAL OPERATIONS AT HUNTER 2 BEGAN IN JUNE AND THE FGD SYSTEM WAS DECLARED COMMERCIAL. NO MAJOR STARTUP PROBLEMS WITH THE FGD SYSTEM WERE ENCOUNTERED.

7/80	SYSTEM	100.0		98.9			744	736	736

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING JULY.

8/80	SYSTEM	99.7					744	743	

9/80	SYSTEM	100.0					720	720	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD PROBLEMS WERE ENCOUNTERED DURING AUGUST AND SEPTEMBER.

10/80	SYSTEM	100.0		70.1			744	521	521

11/80	SYSTEM	100.0		98.3			720	708	708

12/80	SYSTEM	100.0		99.8			744	742	742

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER 1980.

1/81	SYSTEM	100.0		88.8			744	661	661

2/81	SYSTEM	100.0		96.3			672	647	647

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 2 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR
3/81	SYSTEM	100.0			99.4		744	740	740
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT NO MAJOR FGD RELATED PROBLEMS WERE ENCOUNTERED DURING THE FIRST QUARTER 1981.									
4/81	SYSTEM	100.0			99.6		720	717	717
5/81	SYSTEM	100.0			62.9		744	468	468
6/81	SYSTEM	100.0			90.8		720	653	653
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT NO FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE SECOND QUARTER 1981.									
7/81	SYSTEM						744		
8/81	SYSTEM						744		
9/81	SYSTEM						720		
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE THIRD QUARTER 1981.									
10/81	SYSTEM						744		
11/81	SYSTEM						720		
12/81	SYSTEM						744		
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER 1982.									
1/82	SYSTEM						744		
2/82	SYSTEM						672		
3/82	SYSTEM						744		
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FIRST QUARTER 1982. THE NEXT SCHEDULED OUTAGE FOR OVERHAUL WILL BE SOMETIME IN MAY OR JUNE.									
4/82	SYSTEM						720		
5/82	SYSTEM						744		
6/82	SYSTEM						720		
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UNIT WAS OFF-LINE FROM MAY 27 TO JUNE 10 FOR A SCHEDULED BOILER/FGD OVERHAUL. THE UTILITY REPORTED NO OTHER MAJOR BOILER/FGD RELATED OUTAGES FOR THE SECOND QUARTER 1982.									

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

THE UTILITY REPORTED THAT THE UNIT IS EXPERIENCING REHEAT PROBLEMS. THE INDIRECT HOT AIR STEAM REHEAT SYSTEM IS NOT PRODUCING ADEQUATE REHEAT. THE UTILITY IS PRESENTLY BAFFLED AS TO THE REASON FOR ITS INADEQUACY.

THE UTILITY ALSO REPORTED THAT THE UNIT IS EXPERIENCING FLYASH BUILDUP AND SCALING IN THE OUTLET DUCTWORK TO THE STACK.

7/82	SYSTEM	744
8/82	SYSTEM	744
9/82	SYSTEM	720
10/82	SYSTEM	744
11/82	SYSTEM	720
12/82	SYSTEM	744
1/83	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT IT NOW BELIEVES ITS REHEAT PROBLEM IS DUE TO PLUGGED MIST ELIMINATORS AND NOT THE REHEATERS THEMSELVES. THE MIST ELIMINATORS BECOME PLUGGED AND SUBSEQUENTLY ALLOW INCREASED AMOUNTS OF MOISTURE TO BE CARRIED-OVER FOR WHICH THE REHEAT SYSTEM WAS NOT ORIGINALLY DESIGNED TO ACCOMMODATE. THE UTILITY NOW MONITORS THE MIST ELIMINATORS CLOSELY FOR PLUGGING AND CLEANS THEM WHENEVER IT HAS EXTENDED OUTAGE PERIODS.

THE UTILITY REPORTED THAT THE UNIT WAS SHUTDOWN DURING THE ENTIRE MONTH OF JANUARY FOR SCHEDULED TURBINE OVERHAUL. DURING THIS OUTAGE, THE UTILITY WASHED AND CLEANED THE MIST ELIMINATORS.

2/83	SYSTEM	672
3/83	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE MONTHS OF FEBRUARY AND MARCH.

4/83	SYSTEM	720
5/83	SYSTEM	744
6/83	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE MIST ELIMINATOR SCALE BUILDUP PROBLEM ON THE HUNTER 1 AND 2 FGD SYSTEMS HAS ALSO BEEN COMPOUNDED BY THE USE OF SATURATED WASH WATER. THE WASH WATER WAS FOUND TO HAVE HIGH CONCENTRATION OF CALCIUM SULFITE. THE UTILITY NOW MONITORS CLOSELY THE SULFITE CONCENTRATION IN THE WASH WATER.

7/83	SYSTEM	744
8/83	SYSTEM	744
9/83	SYSTEM	720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 2 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE THIRD QUARTER OF 1983. FORCED UNIT OUTAGES ALL TOOK PLACE DURING THE MONTHS OF AUGUST AND SEPTEMBER. THE TOTAL HOURS OF OUTAGE TIME FOR THESE MONTHS WAS APPROXIMATELY 47 AND 32, RESPECTIVELY.

10/83	SYSTEM	744
11/83	SYSTEM	720
12/83	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE FOURTH QUARTER OF 1983.

1/84	SYSTEM	744
2/84	SYSTEM	696
3/84	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED A SIX WEEK SCHEDULED OUTAGE DURING THE FIRST QUARTER OF 1984. NO FORCED OUTAGES WERE REPORTED.

4/84	SYSTEM	720
5/84	SYSTEM	744
6/84	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD RELATED OUTAGES WERE REPORTED DURING THE SECOND QUARTER OF 1984.

7/84	SYSTEM	744
8/84	SYSTEM	744
9/84	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD RELATED OUTAGES WERE REPORTED DURING THE THIRD QUARTER OF 1984.

10/84	SYSTEM	744
11/84	SYSTEM	720
12/84	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS NOT AVAILABLE FOR THE FOURTH QUARTER OF 1984.

1/85	SYSTEM	744
2/85	SYSTEM	672

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 2 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER BOILER HOURS	FGD CAP. HOURS FACTOR
3/85	SYSTEM							744	
4/85	SYSTEM							720	
5/85	SYSTEM							744	
6/85	SYSTEM							720	
7/85	SYSTEM							744	
8/85	SYSTEM							744	
9/85	SYSTEM							720	
10/85	SYSTEM							744	
11/85	SYSTEM							720	
12/85	SYSTEM							744	

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM							774	
2/86	SYSTEM							672	
3/86	SYSTEM							774	
4/86	SYSTEM							720	
5/86	SYSTEM							774	
6/86	SYSTEM							720	
7/86	SYSTEM							774	
8/86	SYSTEM							774	

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED OUTAGES WERE REPORTED FOR THE MONTHS OF JANUARY - AUGUST 1986.

9/86	SYSTEM							720	
10/86	SYSTEM							774	
11/86	SYSTEM							720	

** PROBLEMS/SOLUTIONS/COMMENTS

DURING THE SAME OUTAGE PERIOD, THE UTILITY REPLACED 2 MIST ELIMINATORS ON UNIT 2. THE NEWER MIST ELIMINATORS HAVE A LOWER PRESSURE DROP AND A HIGHER COLLECTION EFFICIENCY AS COMPARED TO THE ORIGINAL INSTALLED UNITS. THE UTILITY WAS HAVING PROBLEMS WITH SLURRY "BLOW-BY" DUE TO HIGH FLUE GAS VELOCITIES. THE RESULT WAS LARGE SCALE DEPOSITS IN THE OUTLET DUCT-WORK. THE NEW MIST ELIMINATORS WERE SUPPLIED BY COCH. A NEW WASH SYSTEM WAS ALSO INSTALLED WITH THE MIST ELIMINATORS.

UNIT 2 WAS OFF-LINE 8 WEEKS FROM THE MIDDLE OF SEPTEMBER TO THE MIDDLE

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 2 (CONT.)

-----PERFORMANCE DATA-----							
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER FGD CAP. HOURS HOURS HOURS FACTOR

OF NOVEMBER 1986 FOR SCRUBBER OUTLET DUCTWORK REPLACEMENT. THE PRE-KRETE G-8 LINER WAS REPLACED WITH 1/16 INCH HASTELLOY C-276. APPROXIMATELY 16,000 SQUARE FEET OF DUCTWORK WAS RELINED. THE MATERIAL WAS SUPPLIED BY CABOT AND THE INSTALLATION BY WESTERN CONSTRUCTION. THE UTILITY HAD BEEN REPLACING THE PRE-KRETE ONCE EVERY 4 YEARS. THE REPLACEMENT COST FOR THE C-276 WAS APPROXIMATELY \$1 MILLION FOR UNIT 2.

12/86	SYSTEM						774

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE MONTH OF DECEMBER 1986.

1/87	SYSTEM						744
2/87	SYSTEM						672
3/87	SYSTEM						744
4/87	SYSTEM						720
5/87	SYSTEM						744
6/87	SYSTEM						720
7/87	SYSTEM						744
8/87	SYSTEM						744
9/87	SYSTEM						720
10/87	SYSTEM						744
11/87	SYSTEM						720
12/87	SYSTEM						744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING 1987. THE UNIT WAS OFF-LINE FOR APPROXIMATELY 4 WEEKS IN FEBRUARY FOR ROUTINE BOILER/TURBINE MAINTENANCE. DURING THIS OUTAGE THE UTILITY REPLACED THE INLET AND OUTLET GUILLOTINE DAMPERS ON ONE TOWER.

DO NOT MICROFILM
THIS COPY

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	UTAH POWER & LIGHT	
PLANT NAME	HUNTER	
UNIT NUMBER	3	
CITY	CASTLE DALE	
STATE	UTAH	
REGULATORY CLASSIFICATION	B	
PARTICULATE EMISSION LIMITATION - NG/J	13.	(0.030 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	1600	
GROSS UNIT GENERATING CAPACITY - MW	424	
NET UNIT GENERATING CAPACITY W/FGD - MW	400	
NET UNIT GENERATING CAPACITY WO/FGD - MW	411	
EQUIVALENT SCRUBBED CAPACITY - MW	424	

** UNIT DATA - BOILER AND STACK

BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	701.72	(1487000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	*****	(**** F)
STACK HEIGHT - M	183.	(600 FT)
STACK SHELL	NR	
STACK TOP DIAMETER - M	7.3	(24.0 FT)

** FUEL DATA

FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	29075.	(12500 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		12200-12700
AVERAGE ASH CONTENT - %	10.00	
RANGE ASH CONTENT - %	9.0-12.0	
AVERAGE MOISTURE CONTENT - %	6.50	
RANGE MOISTURE CONTENT - %	****	
AVERAGE SULFUR CONTENT - %	0.55	
RANGE SULFUR CONTENT - %	****	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	

*** PARTICLE CONTROL

** ESP

NUMBER	1
TYPE	COLD SIDE
PARTICLE REMOVAL EFFICIENCY - %	99.5

** PARTICLE SCRUBBER

NUMBER	0
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON NAME	N/A
SHELL GENERIC MATERIAL	N/A
SHELL SPECIFIC MATERIAL	N/A
LINER GENERIC MATERIAL	N/A
LINER SPECIFIC MATERIAL	N/A
GAS CONTACTING DEVICE TYPE	N/A

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
SYSTEM SUPPLIER	GE ENVIRONMENTAL SERVICES
A-E FIRM	STEARNS-ROGER
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.50
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	90.00

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 3 (CONT.)

ENERGY CONSUMPTION - %	2.6
CURRENT STATUS	1
COMMERCIAL START-UP	6/1983
INITIAL START-UP	4/1983
CONTRACT AWARDED	10/1979
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
** QUENCHER/PRESATURATOR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** ABSORBER	
GENERIC TYPE	SPRAY TOWER
SPECIFIC TYPE	OPEN COUNTERCURRENT SPRAY
TRADE NAME/COMMON TYPE	N/A
SHELL GENERIC MATERIAL	NR
SHELL SPECIFIC MATERIAL	NR
SHELL MATERIAL TRADE NAME/COMMON TYPE	NR
LINER GENERIC MATERIAL	NR
LINER SPECIFIC MATERIAL	NR
LINER MATERIAL TRADE NAME/COMMON TYPE	NR
GAS CONTACTING DEVICE TYPE	NONE
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
TRADE NAME/COMMON TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** REHEATER	
GENERIC TYPE	NR
SPECIFIC TYPE	NR
TRADE NAME/COMMON TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** FANS	
DESIGN	CENTRIFUGAL
FUNCTION	UNIT
APPLICATION	FORCED DRAFT
SERVICE	DRY
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	WET BALL MILL
DEVICE	NR
DEVICE TYPE	NR

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 3 (CONT.)

** PUMPS	
SERVICE	NUMBER
-----	-----
NA	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	VACUUM FILTER
NUMBER	1
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	1
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	STABILIZATION
DEVICE	PUG MILL
PROPRIETARY PROCESS	N/A
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
SITE TRANSPORTATION METHOD	TRUCK
SITE TREATMENT	NONE
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
SOURCE OF MAKEUP WATER	COOLING TOWER BLOWDOWN

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

4/83	SYSTEM							720		
5/83	SYSTEM							744		
6/83	SYSTEM							720		

** PROBLEMS/SOLUTIONS/COMMENTS

THE FGD SYSTEM COMMENCED OPERATION IN APRIL AND WAS REPORTED COMMERCIAL IN JUNE.

DUE TO IMPROPER DESIGN OF THE BYPASS DAMPERS AND THE MIST ELIMINATOR MATERIALS OF CONSTRUCTION, THE MIST ELIMINATORS WERE MELTED IN MAY. THE BYPASS DAMPERS OPENED TOO SLOWLY AND THE MIST ELIMINATORS, CONSTRUCTED OF NORYL GRADE EN-180, WERE DESIGNED FOR TEMPERATURES NOT TO EXCEED 180 DEGREES F.

7/83	SYSTEM							744		
8/83	SYSTEM							744		
9/83	SYSTEM							720		

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE THIRD QUARTER OF 1983. HOWEVER, FORCED UNIT OUTAGES OCCURRED DURING EACH MONTH. THE TOTAL HOURS OF OUTAGE TIME FOR THE MONTHS OF JULY, AUGUST, AND SEPTEMBER WERE 179, 154, AND 160 RESPECTIVELY.

SCALE BUILDUP IN THE MIST ELIMINATORS AND ASSOCIATED DUCTWORK WAS REPORTED BY THE UTILITY. FIRST INSPECTIONS INDICATE THAT THE BUILDUP OF SCALE IS DUE TO AN INADEQUATE SPRAY WASH SYSTEM. THOSE SECTIONS CLOSE TO SPRAY NOZZLES ARE CLEAN. HOWEVER, SOME PORTIONS ARE SEEING NO WASH WATER AND SUBSEQUENTLY ARE ACCUMULATING SCALE BUILDUP.

10/83	SYSTEM						744		
11/83	SYSTEM						720		
12/83	SYSTEM						744		

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE FOURTH QUARTER OF 1983.

1/84	SYSTEM						744		
2/84	SYSTEM						696		
3/84	SYSTEM						744		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED A 30.5 HOUR OUTAGE DURING THE FIRST QUARTER OF 1984 DUE TO THE REPLACEMENT OF 1300 FEET OF CORRODING SLURRY TRANSFER LINE.

4/84	SYSTEM						720		
5/84	SYSTEM						744		
6/84	SYSTEM						720		

** PROBLEMS/SOLUTIONS/COMMENTS

TWO 4.5 HOUR OUTAGES OCCURRED DURING THE SECOND QUARTER OF 1984 DUE TO THE REPLACEMENT OF 1300 FEET OF CORRODING SLURRY TRANSFER LINE.

7/84	SYSTEM						744		
8/84	SYSTEM						744		
9/84	SYSTEM						720		

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD RELATED OUTAGES WERE REPORTED DURING THE THIRD QUARTER OF 1984

10/84	SYSTEM						744		
11/84	SYSTEM						720		
12/84	SYSTEM						744		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS NOT AVAILABLE FOR THE FOURTH QUARTER OF 1984.

1/85	SYSTEM	744
2/85	SYSTEM	672
3/85	SYSTEM	744
4/85	SYSTEM	720
5/85	SYSTEM	744
6/85	SYSTEM	720
7/85	SYSTEM	744
8/85	SYSTEM	744
9/85	SYSTEM	720
10/85	SYSTEM	744
11/85	SYSTEM	720
12/85	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM	774
2/86	SYSTEM	672
3/86	SYSTEM	774
4/86	SYSTEM	720
5/86	SYSTEM	774
6/86	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF-LINE FROM JANUARY 5 TO JUNE 23, 1986 FOR BOILER TUBE REPLACEMENT WORK. APPROXIMATELY 10 OUT OF 40 SECTIONS HAD TO BE REPLACED. DURING THIS PERIOD, THE UTILITY INSTALLED THE NECESSARY EQUIPMENT TO TEST LIME REGENT ADDITION.

7/86	SYSTEM	774
8/86	SYSTEM	774
9/86	SYSTEM	720
10/86	SYSTEM	774
11/86	SYSTEM	720
12/86	SYSTEM	774

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTER 3 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART. HOURS	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY CONDUCTED LIME REAGENT TESTING DURING THE SECOND HALF OF 1986. THE UTILITY IS CONSIDERING CHANGING FROM LIMESTONE ADDITION TO LIME ADDITION DUE TO POOR LIMESTONE UTILIZATION AND POOR SO2 REMOVAL. THIS IS BELIEVED TO BE CAUSED BY ALUMINUM FLUORIDE BLINDING. NO MAJOR FGD-RELATED OUTAGES WERE REPORTED DURING THIS PERIOD. HOWEVER, THE UNIT WAS DOWN IN OCTOBER FOR A 3-WEEK SCHEDULED MAINTENANCE OUTAGE.

1/87	SYSTEM								744
2/87	SYSTEM								672
3/87	SYSTEM								744
4/87	SYSTEM								720
5/87	SYSTEM								744
6/87	SYSTEM								720
7/87	SYSTEM								744
8/87	SYSTEM								744
9/87	SYSTEM								720
10/87	SYSTEM								744
11/87	SYSTEM								720
12/87	SYSTEM								744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED UNIT OUTAGES WERE ENCOUNTERED DURING THE YEAR 1987. THE UTILITY CHANGED TO LIME SCRUBBING IN JANUARY AND OPERATED THE ENTIRE YEAR WITH THAT REAGENT.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	UTAH POWER & LIGHT	
PLANT NAME	HUNTINGTON	
UNIT NUMBER	1	
CITY	HUNTINGTON	
STATE	UTAH	
REGULATORY CLASSIFICATION	C	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	301.	(0.700 LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	810	
GROSS UNIT GENERATING CAPACITY - MW	426	
NET UNIT GENERATING CAPACITY W/FGD - MW	400	
NET UNIT GENERATING CAPACITY WO/FGD - MW	406	
EQUIVALENT SCRUBBED CAPACITY - MW	361	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	822.05	(1742000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	130.0	(266 F)
STACK HEIGHT - M	183.	(600 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	7.3	(24.0 FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	27098.	(11650 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		11100-12100
AVERAGE ASH CONTENT - %	12.02	
RANGE ASH CONTENT - %	7.27-28.15	
AVERAGE MOISTURE CONTENT - %	7.73	
RANGE MOISTURE CONTENT - %	2.13-14.99	
AVERAGE SULFUR CONTENT - %	0.43	
RANGE SULFUR CONTENT - %	0.29-0.83	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	
*** PARTICLE CONTROL		
** MECHANICAL COLLECTOR		
NUMBER	0	
TYPE	NONE	
** ESP		
NUMBER	1	
NUMBER OF SPARES	0	
TYPE	COLD SIDE	
SUPPLIER	BUELL DIVISION, ENVIROTECH	
INLET FLUE GAS CAPACITY - CU.M/S	822.0	(1742000 ACFM)
INLET FLUE GAS TEMPERATURE - C	127.8	(262 F)
PRESSURE DROP - KPA	0.4	(2. IN-H2O)
PARTICLE REMOVAL EFFICIENCY - %	99.5	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
*** FGD SYSTEM		

UTAH POWER & LIGHT: HUNTINGTON 1 (CONT.)

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIME
PROCESS ADDITIVES	NONE
SYSTEM SUPPLIER	GE ENVIRONMENTAL SERVICES
A-E FIRM	STEARNS-ROGER
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.50
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	80.00
ENERGY CONSUMPTION - %	1.4
CURRENT STATUS	1
COMMERCIAL START-UP	5/1978
INITIAL START-UP	5/1978
CONTRACT AWARDED	1/1975

** DESIGN AND OPERATING PARAMETERS

DESIGN COAL SULFUR CONTENT - %	0.55	
DESIGN COAL HEAT CONTENT - J/G	29075.0	(12500 BTU/LB)
DESIGN COAL ASH CONTENT - %	9.00	
DESIGN MOISTURE CONTENT - %	6.00	
DESIGN CHLORIDE CONTENT - %	*****	
OPER. & MAINT. REQUIREMENT - MANHR/DAY	136.0	

** QUENCHER/PRESATURATOR

NUMBER	0

** ABSORBER

NUMBER	4	
NUMBER OF SPARES	1	
GENERIC TYPE	SPRAY TOWER	
SPECIFIC TYPE	OPEN COUNTERCURRENT SPRAY	
TRADE NAME/COMMON TYPE	N/A	
SUPPLIER	GE ENVIRONMENTAL SERVICES	
DIMENSIONS - FT	27.5 DIAMETER X 96 HIGH	
SHELL GENERIC MATERIAL	CARBON STEEL	
SHELL SPECIFIC MATERIAL	AISI 1110	
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A	
LINER GENERIC MATERIAL	ORGANIC	
LINER SPECIFIC MATERIAL	GLASS FLAKE-FILLED POLYESTER	
LINER MATERIAL TRADE NAME/COMMON TYPE	FLAKELINE 103	
GAS CONTACTING DEVICE TYPE	NONE	
NUMBER OF CONTACTING ZONES	1	
LIQUID RECIRCULATION RATE - LITER/S	1178.	(18700 GPM)
L/G RATIO - L/CU.M	5.7	(42.9 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	0.6	(2.5 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/SEC	3.0	(10.0 FT/S)
INLET GAS FLOW - CU. M/S	205.51	(435500 ACFM)
INLET GAS TEMPERATURE - C	130.0	(266 F)
SO2 REMOVAL EFFICIENCY - %	80.0	

** MIST ELIMINATOR

PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR	
NUMBER PER SYSTEM	4	
NUMBER OF SPARES PER SYSTEM	0	
NUMBER PER MODULE	1	
GENERIC TYPE	IMPINGEMENT	
SPECIFIC TYPE	BAFFLE	
TRADE NAME/COMMON TYPE	CLOSED VANE	
CONFIGURATION	HORIZONTAL	
NUMBER OF STAGES	1	
NUMBER OF PASSES PER STAGE	4	
FREEBOARD DISTANCE - M	3.66	(12.0 FT)
DISTANCE BETWEEN VANES - CM	7.6	(3.00 IN)
PRESSURE DROP - KPA	0.2	(1.0 IN-H2O)
SUPERFICIAL GAS VELOCITY - M/S	3.0	(10.0 FT/S)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC	
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPROPYLENE	
WASH WATER SOURCE	FRESH & SUPERNATANT	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTINGTON 1 (CONT.)

WASH FREQUENCY	CONTINUOUS/INTERMITTENT
WASH RATE - L/S	15.1 (240 GAL/MIN)
** REHEATER	
NUMBER	1
NUMBER OF SPARES	0
NUMBER PER MODULE	1
GENERIC TYPE	INDIRECT HOT AIR
SPECIFIC TYPE	EXTERNAL HEAT EXCHANGER
TRADE NAME/COMMON TYPE	STEAM TUBE BUNDLE
TEMPERATURE INCREASE - C	11.1 (20 F)
INLET FLUE GAS TEMPERATURE - C	46.1 (115 F)
OUTLET FLUE GAS TEMPERATURE - C	57.2 (135 F)
NUMBER OF HEAT EXCHANGER BANKS	1
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL 'HEADER!; STAINLESS STEEL 'TUBES!;
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110; AUSTENITIC; N/A
** FANS	
NUMBER	2
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
SUPPLIER	WESTINGHOUSE
FUNCTION	BOOSTER
APPLICATION	FORCED DRAFT
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	519.09 (1100000 ACFM)
FLUE GAS TEMPERATURE - C	144.4 (292 F)
PRESSURE DROP - KPA	2.8 (9.1 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** FANS	
NUMBER	2
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
SUPPLIER	NR
FUNCTION	UNIT
APPLICATION	FORCED DRAFT
SERVICE	DRY
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** FANS	
NUMBER	1
NUMBER OF SPARES	0
DESIGN	CENTRIFUGAL
SUPPLIER	WESTINGHOUSE
FUNCTION	REHEATER
APPLICATION	N/A
SERVICE	DRY
FLUE GAS FLOW RATE - CU.M/S	135.91 (288000 ACFM)
PRESSURE DROP - KPA	2.7 (9.0 IN-H2O)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
** DAMPERS	
NUMBER	4
FUNCTION	ISOLATION
GENERIC TYPE	GUILLOTINE
SPECIFIC TYPE	NR
SEAL AIR FLOW - CU. M/S	1.27 (2700 ACFM)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	HIGH STRENGTH LOW ALLOY 'HSLA!; AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	4
FUNCTION	ISOLATION & CONTROL
GENERIC TYPE	GUILLOTINE & LOUVER
SPECIFIC TYPE	NR; NR
SEAL AIR FLOW - CU. M/S	1.70 (3600 ACFM)
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL/STAINLESS STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	HIGH STRENGTH LOW ALLOY 'HSLA!; AUSTENITIC

UTAH POWER & LIGHT: HUNTINGTON 1 (CONT.)

LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	2
FUNCTION	CONTROL
GENERIC TYPE	BUTTERFLY
SPECIFIC TYPE	N/A
CONSTRUCTION MATERIAL GENERIC TYPE	STAINLESS STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AUSTENITIC
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	5
FUNCTION	CONTROL
GENERIC TYPE	BUTTERFLY
SPECIFIC TYPE	N/A
CONSTRUCTION MATERIAL GENERIC TYPE	STAINLESS STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AUSTENITIC
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	4
FUNCTION	CONTROL
GENERIC TYPE	BUTTERFLY
SPECIFIC TYPE	N/A
CONSTRUCTION MATERIAL GENERIC TYPE	CARBON STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	2
FUNCTION	ISOLATION
GENERIC TYPE	GUILLOTINE
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DAMPERS	
NUMBER	2
FUNCTION	ISOLATION
GENERIC TYPE	GUILLOTINE
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	FAN DISCHARGE
CONFIGURATION	RECTANGLE
DIMENSIONS	15 X 18 X 13
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	INLET MANIFOLD
CONFIGURATION	CIRCULAR
DIMENSIONS	18 D X 172.5
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTINGTON 1 (CONT.)

** DUCTWORK	
LOCATION	ABSORBER INLET
CONFIGURATION	RECTANGLE
DIMENSIONS	8 X 16 X 7
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	INORGANIC
LINER SPECIFIC MATERIAL TYPE	HYDRAULICALLY-BONDED MORTAR
** DUCTWORK	
LOCATION	ABSORBER OUTLET
CONFIGURATION	RECTANGLE
DIMENSIONS	8.5 X 13 X 12
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	INORGANIC
LINER SPECIFIC MATERIAL TYPE	HYDRAULICALLY-BONDED MORTAR
** DUCTWORK	
LOCATION	OUTLET MANIFOLD
CONFIGURATION	CIRCULAR
DIMENSIONS	16.75 D X 165
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	INORGANIC
LINER SPECIFIC MATERIAL TYPE	HYDRAULICALLY-BONDED MORTAR
** DUCTWORK	
LOCATION	BYPASS REHEAT
CONFIGURATION	CIRCULAR
DIMENSIONS	6 D X 60
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** DUCTWORK	
LOCATION	REHEAT
CONFIGURATION	RECTANGLE TO CIRCULAR
DIMENSIONS	9 X 7.5 TO 11.5 D X 83
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	SLAKER
DEVICE	SLAKER
MANUFACTURER	BIF
NUMBER	1
NUMBER OF SPARES	0
FULL LOAD DRY FEED CAPACITY - M.TONS/HR	2.7 (3 TPH)
** TANKS	
SERVICE	NUMBER
-----	-----
ABSORBER RECYCLE	4
LIME SLURRY	1
TRANSFER WATER	1
FLOCCULATION SYSTEM	****
THICKENER SUMP	****
PROCESS SUMP	****
** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER RECIRCULATION	16
THICKENER UNDERFLOW	2
SLURRY TRANSFER	2
THICKENER OVERFLOW	2

UTAH POWER & LIGHT: HUNTINGTON 1 (CONT.)

FILTRATE	****
ME WASH	****
THICKENER SUMP	2
PROCESS SUMP	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	VACUUM FILTER
NUMBER	2
NUMBER OF SPARES	0
CONFIGURATION	CYLINDER
DIMENSIONS - FT	6 DIA X 10 LONG
CAPACITY	19000 LB/HR
SHELL GENERIC MATERIAL TYPE	STAINLESS STEEL
SHELL SPECIFIC MATERIAL TYPE	AUSTENITIC
LINER GENERIC MATERIAL TYPE	NONE
LINER SPECIFIC MATERIAL TYPE	N/A
BELT GENERIC MATERIAL TYPE	ORGANIC
BELT SPECIFIC MATERIAL TYPE	POLYPROPYLENE
FEED STREAM SOURCE	THICKENER UNDERFLOW
FEED STREAM CHARACTERISTICS	100 GPM, 30% SOLIDS
OUTLET STREAM CHARACTERISTICS	50% SOLIDS
OUTLET STREAM DISPOSITION	LANDFILL
OVERFLOW STREAM DISPOSITION	TO THICKENER
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	1
NUMBER OF SPARES	0
CONFIGURATION	CYLINDRICAL
DIMENSIONS - FT	60 DIA X 12 HIGH
CAPACITY	250000
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	ASTM A-36
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
FEED STREAM SOURCE	ABSORBER BLEED
FEED STREAM CHARACTERISTICS	543 GPM, 5% SOLIDS
OUTLET STREAM CHARACTERISTICS	100 GPM, 30% SOLIDS
OVERFLOW STREAM CHARACTERISTICS	400 GPM, 150 PPM
OUTLET STREAM DISPOSITION	TO VACUUM FILTER
OVERFLOW STREAM DISPOSITION	RETURNED TO FGD SYSTEM
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	STABILIZATION
DEVICE	PUG MILL
PROPRIETARY PROCESS	N/A
** DISPOSAL	
NATURE	FINAL
TYPE	LANDFILL
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	TRUCK
SITE TREATMENT	NONE
** PROCESS CONTROL AND INSTRUMENTATION	
PROCESS STREAM	ABSORBER RECYCLE TO SPRAYS
CHEMICAL PARAMETERS	PH, CONTINUOUS
CONTROL LEVELS	5.8-6.2
MONITOR TYPE	UNILOC FLOW-THROUGH
PROCESS CONTROL MANNER	AUTOMATIC

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTINGTON 1 (CONT.)

** WATER BALANCE
 WATER LOOP TYPE CLOSED
 MAKEUP WATER ADDITION - LITERS/S 18.9 (300 GPM)

** CHEMICALS AND CONSUMPTION
 FUNCTION ABSORBENT
 NAME LIME
 PRINCIPAL CONSTITUENT 92% CAO, 6% MGO
 UTILIZATION - % 90.0
 POINT OF ADDITION SLAKER

** FGD SPARE CAPACITY INDICES
 ABSORBER - % 0.0

** FGD SPARE COMPONENT INDICES
 ABSORBER 0.0

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

0/78 SYSTEM

** PROBLEMS/SOLUTIONS/COMMENTS

THE FIGURES REPORTED BY UTAH POWER AND LIGHT ARE NOT CONSISTENT WITH THE FIGURES AS DEFINED BY PEDCO FOR THIS REPORT. IN THIS SURVEY "FGD SYSTEM HOURS" IS THE AVERAGE OF THE MODULAR HOURS ACCUMULATED BY EACH ABSORBER DURING A GIVEN MONTH. UP&L DEFINES "FGD SYSTEM HOURS" AS ACCUMULATED HOUR WHEN ANY OR ALL OF THE ABSORBERS IS IN OPERATION DURING A GIVEN MONTH. TH OPERABILITY AND UTILIZATION FIGURES REPORTED ARE BASED UPON "FGD SYSTEM HOURS" AS DEFINED BY UP&L AND THEREFORE MAY YIELD DEPENDABILITY FACTORS THAT ARE NOT COMPARABLE WITH OTHER DEPENDABILITY FACTORS INCLUDED IN THIS SURVEY.

5/78 SYSTEM

744

** PROBLEMS/SOLUTIONS/COMMENTS

INITIAL OPERATIONS BEGAN ON MAY 10, 1978. COMMERCIAL FGD SYSTEM OPERATION ARE EXPECTED TO BEGIN IN JUNE.

6/78 SYSTEM 65.3 65.3 720 720 470

7/78 SYSTEM 97.7 95.9 744 731 714

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT BECAUSE 10-20% OF THE FLUE GAS BYPASSED THE FGD SYSTEM AS DAMPERS ARE VARRIED BY THE OPERATOR, IT IS DIFFICULT TO DETERMIN OVERALL SO2 REMOVAL EFFICIENCY.

8/78 SYSTEM 100.0 73.1 744 544 544

9/78 SYSTEM 100.0 68.9 720 496 496

** PROBLEMS/SOLUTIONS/COMMENTS

AN EXPLOSION CAUSED A THREE WEEK BOILER OUTAGE DURING THE AUGUST-SEPTEMBER PERIOD.

THE UTILITY REPORTED THAT THERE WERE NO FORCED FGD OUTAGES DURING AUGUST AND SEPTEMBER.

10/78 SYSTEM 100.0 100.0 744 744 744

11/78 SYSTEM 62.4 62.4 720 720 449

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTINGTON 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE THICKENER HAD SOLIDS BUILDUP THE LAST OF NOVEMBER AND THE FIRST PART OF DECEMBER RENDERING THE RAKE INOPERATIVE. THE FGD SYSTEM WAS TAKEN OUT OF SERVICE TO ALLOW MANUAL REMOVAL OF THE SOLIDS.

TO PREVENT FUTURE SOLIDS BUILDUP IN THE THICKENER THE UTILITY IS CONSIDERING LOWERING THE PH AND POSSIBLY ADDING A FORCED OXIDATION SYSTEM. FOR NO THE UTILITY IS ATTEMPTING TO BE MORE CONSCIENTIOUS IN MAINTAINING PROPER SOLIDS CONTENT IN THE THICKENERS.

12/78	SYSTEM	34.0	32.7	744	715	243
1/79	SYSTEM	76.2	65.7	744	642	489

** PROBLEMS/SOLUTIONS/COMMENTS

FREEZE-UP PROBLEMS CAUSED OUTAGES TOTALLING A FEW WEEKS DURATION DURING DECEMBER AND JANUARY.

2/79	SYSTEM	90.1	58.2	672	434	391
3/79	SYSTEM	100.0	86.6	744	644	644
4/79	SYSTEM	100.0	76.8	720	553	553

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE PROBLEMS ENCOUNTERED DURING FEBRUARY-APRIL INCLUDED LINING FAILURES (BOTH DESIGN-RELATED AND APPLICATION-RELATED), PUMP PROBLEMS AND DAMPER PROBLEMS.

PROBLEMS HAVE BEEN EXPERIENCED WITH DAMPER MECHANISMS CLOGGING. THE CLOGGING CAN RESULT IN DAMPER LEAKING AS MUCH AS 50%.

THE UTILITY HAS BEEN OPERATING THE FGD SYSTEM AT A PH OF 5 RATHER THAN THE DESIGN 6.5 TO YIELD A BETTER QUALITY SLUDGE PRODUCT.

5/79	SYSTEM	100.0	92.6	744	689	689
6/79	SYSTEM	62.5	54.9	720	632	395
7/79	SYSTEM	79.7	79.5	744	742	591
8/79	SYSTEM	30.1	27.0	744	669	201
9/79	SYSTEM	54.9	54.2	720	712	391

** PROBLEMS/SOLUTIONS/COMMENTS

THE PROBLEMS ENCOUNTERED DURING THE THIRD QUARTER 1979 INCLUDED FAILURE OF CONTROL VALVES AND SOME AGITATOR PROBLEMS.

10/79	SYSTEM			744	497	

** PROBLEMS/SOLUTIONS/COMMENTS

ON OCTOBER 15 FGD OPERATIONS WITH LIMESTONE WERE INITIATED FOR TESTING PURPOSES. IF THE FGD SYSTEM OPERATIONS ARE ADEQUATE WITH LIMESTONE THE UTILITY WILL STUDY THE ECONOMIC TRADEOFFS OF LIME VS LIMESTONE SUCH AS PUMP WEAR ETC. IF THE RESULTS FAVOR LIMESTONE THE HUNTINGTON 1 FGD SYSTEM PROCESS MAY BE SHIFTED FROM LIME TO LIMESTONE.

11/79	SYSTEM			720	28	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTINGTON 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
12/79	SYSTEM						744	642		
1/80	SYSTEM						744	668		
** PROBLEMS/SOLUTIONS/COMMENTS										
DUE TO A LACK OF RECORDS, DATA CONCERNING THE FGD SYSTEM OPERATIONS WAS UNAVAILABLE FOR THE MONTHS OF OCTOBER 1979 THROUGH JANUARY 1980. IN NOVEMBER THE BOILER WAS DOWN MOST OF THE MONTH FOR A SCHEDULED UNIT OVERHAUL.										
2/80	SYSTEM	100.0			86.9		696	605	605	
3/80	SYSTEM	100.0			89.2		744	664	664	
4/80	SYSTEM	98.1			92.1		720	676	663	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE FGD SYSTEM OPERATED ALONG WITH THE BOILER DURING FEBRUARY AND MARCH WITH NO MAJOR PROBLEMS.										
5/80	SYSTEM	100.0			99.7		744	742	742	
6/80	SYSTEM	100.0			99.2		720	714	714	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE FGD SYSTEM OPERATED ALONG WITH THE BOILER DURING THE APRIL THROUGH JUNE PERIOD EXCEPT FOR A FEW HOURS IN APRIL. THE UTILITY REPORTED THAT NO MAJOR PROBLEMS OCCURRED DURING THIS TIME.										
7/80	SYSTEM	100.0			87.2		744	649	649	
** PROBLEMS/SOLUTIONS/COMMENTS										
NO MAJOR FGD-RELATED PROBLEMS WERE REPORTED DURING JULY.										
8/80	SYSTEM	100.0					744	695		
** PROBLEMS/SOLUTIONS/COMMENTS										
NO MAJOR OPERATIONAL PROBLEMS WERE REPORTED IN AUGUST.										
9/80	SYSTEM	0.0			0.0		720	0	0	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE FGD SYSTEM AND BOILER WERE DOWN THROUGHOUT SEPTEMBER FOR A SCHEDULED MAINTENANCE OVERHAUL.										
10/80	SYSTEM	100.0			97.5		744	726	726	
11/80	SYSTEM	100.0			100.0		720	720	720	
12/80	SYSTEM	100.0			99.5		744	741	741	
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER 1980.										
1/81	SYSTEM	100.0			96.4		744	717	717	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTINGTON 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD HOURS	CAP. FACTOR

2/81	SYSTEM		100.0		100.0			672	672	672
3/81	SYSTEM		100.0		93.5			744	696	696
** PROBLEMS/SOLUTIONS/COMMENTS										
DURING THE FIRST QUARTER 1981, THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE EXPERIENCED.										
4/81	SYSTEM		100.0		34.8			720	251	251
5/81	SYSTEM		100.0		4.2			744	31	31
6/81	SYSTEM		100.0		77.5			720	558	558
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE SECOND QUARTER 1981. LOW BOILERS HOURS DURING THE MONTH OF MAY WERE DUE TO COAL STRIKE AND SCHEDULED UNIT OUTAGE.										
7/81	SYSTEM							744		
8/81	SYSTEM							744		
9/81	SYSTEM							720		
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE THIRD QUARTER 1981.										
10/81	SYSTEM							744		
11/81	SYSTEM							720		
12/81	SYSTEM							744		
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE FOURTH QUARTER 1981.										
1/82	SYSTEM							744		
2/82	SYSTEM							672		
3/82	SYSTEM							744		
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT NO-FGD RELATED PROBLEMS WERE ENCOUNTERED DURING THE FIRST QUARTER OF 1982. THE UNIT WENT OFF-LINE ON APRIL 26 FOR A SCHEDULED OVERHAUL.										
4/82	SYSTEM							720		
5/82	SYSTEM							744		
6/82	SYSTEM							720		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTINGTON 1 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE UNIT WAS OFF-LINE FOR A SCHEDULED BOILER/FGD OUTAGE PERIOD FROM APRIL 26 TO MAY 14. THE UNIT WAS ALSO TRIPPED VOLUNTARILY FOR ONE DAY IN JUNE TO REPLACE A BOILER VALVE. NO OTHER BOILER/FGD RELATED PROBLEMS WERE REPORTED FOR THE SECOND QUARTER 1982.

7/82	SYSTEM	744
8/82	SYSTEM	744
9/82	SYSTEM	720
10/82	SYSTEM	720
11/82	SYSTEM	720
12/82	SYSTEM	744
1/83	SYSTEM	744
2/83	SYSTEM	672
3/83	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE PERIOD OF JULY 1982 THROUGH MARCH 1983

4/83	SYSTEM	720
5/83	SYSTEM	744
6/83	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UNIT WAS OFF-LINE FOR 5 WEEKS IN MAY FOR A SCHEDULED SPRING OUTAGE. DURING THIS PERIOD, THE ABSORBER OUTLET GUILLOTINE DAMPERS WERE CONVERTED FROM BOTTOM-ENTRY TO TOP-ENTRY. THE UTILITY REPORTED THAT WATER CARRYOVER FROM THE MIST ELIMINATORS WAS DRAINING INTO THE BOTTOM-ENTRY DAMPERS. IN WINTER MONTHS, THE WATER WOULD FREEZE AND THE UTILITY WAS OFTEN UNABLE TO CLOSE THE DAMPERS TO ISOLATE THE ABSORBER TOWERS FOR REPAIRS.

STARTING IN OCTOBER OF LAST YEAR AND ENDING IN MAY, THE UTILITY INSTALLED NEW AGITATORS IN THE BOTTOM OF THE ABSORBER TOWERS TO IMPROVE SLURRY MIXING. THE INSTALLATION WAS COMPLETED DURING OUTAGE PERIODS ON A MODULE-BY-MODULE BASIS.

THE UTILITY REPORTED THAT ONCE OR TWICE A YEAR THE MIST ELIMINATORS ARE REMOVED FOR MANUAL CLEANING DUE TO SCALE BUILDUP. THE CLEANING IS NORMALLY DONE EACH YEAR DURING THE SCHEDULED SPRING OUTAGE. THE PROCESS IS VERY COSTLY AND IS NECESSARY NOT ONLY AT THE HUNTINGTON STATION BUT ALSO AT THE HUNTER UNITS. THE UTILITY IS PRESENTLY INSTALLING AT HUNTINGTON A MIST ELIMINATOR WASH ADDITIVE FEED SYSTEM TO SOLVE THE SCALING PROBLEM. IT IS HOPED THAT THE ADDITIVE WILL BOTH INHIBIT AND DISSOLVE SCALE BUILDUP ON THE MIST ELIMINATORS.

7/83	SYSTEM	744
8/83	SYSTEM	744
9/83	SYSTEM	720

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTINGTON 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. HOURS FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR OUTAGES OCCURRED DURING THE THIRD QUARTER 1983.

THE UTILITY IS PRESENTLY INSTALLING A NEW PH MONITORING SYSTEM. THE PH PROBES WILL BE POSITIONED IN THE RECYCLE PUMP LINES LOCATED IN-HOUSE OUT OF THE WEATHER. THE UTILITY BELIEVES THIS WILL ENCOURAGE MAINTENANCE WORKERS TO CLEAN THEM VERSUS THE PRESENT PROBES WHICH ARE POSITIONED AT THE BOTTOM OF THE ABSORBER VESSELS LOCATED OUTSIDE IN THE WEATHER.

THE UTILITY ALSO PLANS TO INSTALL ULTRASONIC MONITORS ON ALL FOUR ABSORBER VESSELS TO MONITOR LIQUID LEVEL. IN ADDITION TO THE PH MONITORING SYSTEM, THE UTILITY BELIEVES THIS WILL ENABLE THEM TO BETTER CONTROL SYSTEM CHEMISTRY.

10/83	SYSTEM							744	
11/83	SYSTEM							720	
12/83	SYSTEM							744	

** PROBLEMS/SOLUTIONS/COMMENTS

NO MAJOR FGD-RELATED OUTAGES WERE REPORTED IN THE THIRD QUARTER. THE FGD SYSTEM WAS OFF-LINE OCTOBER 31 THROUGH NOVEMBER 2 TO WASH OUT THE THICKENER. THE UTILITY BELIEVES THE THICKENER PLUGGED DUE TO EXCESSIVE ADDITION OF FLOCCULANT. THE UTILITY IS PRESENTLY TESTING A NEW POLYMER FLOCCULANT.

BEGINNING IN OCTOBER, THE UTILITY BEGAN TESTING A SCALE INHIBITOR IN MODUL 4. IN JANUARY, THE MODULE IS TO BE TAKEN OFF-LINE AND COMPARED TO OTHER MODULES WHICH ARE NOT USING THE SCALE INHIBITOR. THE CHEMICAL BEING TESTED IS AN ORGANIC PHOSPHATE.

THE UNIT WAS DOWN FOR A COUPLE OF DAYS DURING THE FOURTH QUARTER FOR CONDENSER TUBE AND BOILER RECIRCULATION PUMP REPAIRS.

1/84	SYSTEM							744	
2/84	SYSTEM							696	
3/84	SYSTEM							744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD RELATED PROBLEMS WERE ENCOUNTERED DURING THE FIRST QUARTER OF 1984.

4/84	SYSTEM							720	
5/84	SYSTEM							744	
6/84	SYSTEM							720	
7/84	SYSTEM							744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT A SCHEDULED OVERHAUL TOOK PLACE FROM APRIL THROUGH JULY 1984.

8/84	SYSTEM							744	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTINGTON 1 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR
9/84	SYSTEM						720			
** PROBLEMS/SOLUTIONS/COMMENTS										
THE UTILITY REPORTED THAT NO MAJOR FGD RELATED PROBLEMS WERE ENCOUNTERED DURING AUGUST AND SEPTEMBER 1984.										
10/84	SYSTEM						744			
11/84	SYSTEM						720			
12/84	SYSTEM						744			
** PROBLEMS/SOLUTIONS/COMMENTS										
UTILITY REPORTED THAT ONE OF THE FGD BOOSTER FANS HAD TO BE REMOVED FROM SERVICE FOR TWO MONTHS TO REWIND THE MOTOR. THE UNIT WAS FORCED TO REDUCE LOAD TO HALF CAPACITY WHILE REPAIRS WERE MADE.										
1/85	SYSTEM						744			
2/85	SYSTEM						672			
3/85	SYSTEM						744			
4/85	SYSTEM						720			
5/85	SYSTEM						744			
6/85	SYSTEM						720			
7/85	SYSTEM						744			
8/85	SYSTEM						744			
9/85	SYSTEM						720			
10/85	SYSTEM						744			
11/85	SYSTEM						720			
12/85	SYSTEM						744			
** PROBLEMS/SOLUTIONS/COMMENTS										
INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.										
1/86	SYSTEM						774			
2/86	SYSTEM						672			
3/86	SYSTEM						774			
4/86	SYSTEM						720			
5/86	SYSTEM						774			
6/86	SYSTEM						720			
7/86	SYSTEM						774			
8/86	SYSTEM						774			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: HUNTINGTON 1 (CONT.)

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR

9/86	SYSTEM							720		
10/86	SYSTEM							774		
11/86	SYSTEM							720		
12/86	SYSTEM							744		

** PROBLEMS/SOLUTIONS/COMMENTS

FOR THE YEAR 1986, UNIT AVAILABILITY WAS 88.4 PERCENT, CAPACITY FACTOR WAS 64.5 PERCENT, BOILER OPERATING HOURS 7,746.2, SCRUBBER OPERATING HOURS 7,719.7 AND SYSTEM OPERABILITY 99.6 PERCENT.

1/87	SYSTEM							744		
2/87	SYSTEM							672		
3/87	SYSTEM							744		
4/87	SYSTEM							720		
5/87	SYSTEM							744		
6/87	SYSTEM							720		
7/87	SYSTEM							744		
8/87	SYSTEM							744		
9/87	SYSTEM							720		

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR UNIT OR FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE PERIOD JANUARY THROUGH SEPTEMBER 1987.

10/87	SYSTEM							744		
11/87	SYSTEM							720		
12/87	SYSTEM							744		

** PROBLEMS/SOLUTIONS/COMMENTS

FOR THE YEAR 1987, UNIT AVAILABILITY WAS 77.2 PERCENT, CAPACITY FACTOR 70.3 PERCENT, BOILER OPERATING HOURS 6742.3, AND FGD SYSTEM OPERATING HOURS 16729.1

THE UTILITY REPORTED THAT THE UNIT WAS OFF-LINE 11 WEEKS DURING THE MONTHS OF OCTOBER THROUGH DECEMBER FOR SCHEDULED TURBINE/BOILER REPAIRS. DURING THIS OUTAGE, THE ABSORBER OUTLET DUCTWORK AND STACK INLET WERE RELINED WITH HASTELTOY C-22. THE ORIGINAL MATERIAL WAS PRE-KRETE AND HAD LASTED APPROXIMATELY 10 YEARS.

DO NOT RECRUIT
TRY 2003

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	UTAH POWER & LIGHT	
PLANT NAME	NAUGHTON	
UNIT NUMBER	3	
CITY	KEMMERER	
STATE	WYOMING	
REGULATORY CLASSIFICATION	A	
PARTICULATE EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	86.	(0.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	*****	
GROSS UNIT GENERATING CAPACITY - MW	346	
NET UNIT GENERATING CAPACITY W/FGD - MW	330	
NET UNIT GENERATING CAPACITY WO/FGD - MW	335	
EQUIVALENT SCRUBBED CAPACITY - MW	346	

** UNIT DATA - BOILER AND STACK

BOILER SUPPLIER	COMBUSTION ENGINEERING	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	707.85	(1500000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	148.9	(300 F)
STACK HEIGHT - M	145.	(475 FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	*****	(***** FT)

** FUEL DATA

FUEL TYPE	COAL	
FUEL GRADE	SUBBITUMINOUS	
AVERAGE HEAT CONTENT - J/G	22097.	(9500 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		*****
AVERAGE ASH CONTENT - %	6.00	
RANGE ASH CONTENT - %	*****	
AVERAGE MOISTURE CONTENT - %	*****	
RANGE MOISTURE CONTENT - %	*****	
AVERAGE SULFUR CONTENT - %	0.55	
RANGE SULFUR CONTENT - %	*****	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	*****	

*** PARTICLE CONTROL

** ESP

NUMBER	1
TYPE	HOT SIDE

** PARTICLE SCRUBBER

NUMBER	0
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON NAME	N/A
SHELL GENERIC MATERIAL	N/A
SHELL SPECIFIC MATERIAL	N/A
LINER GENERIC MATERIAL	N/A
LINER SPECIFIC MATERIAL	N/A
GAS CONTACTING DEVICE TYPE	N/A

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	SODIUM CARBONATE
SYSTEM SUPPLIER	AIR CORRECTION DIVISION, UOP
A-E FIRM	BECHTEL
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	RETROFIT
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	98.00
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	70.00
ENERGY CONSUMPTION - %	1.4

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: NAUGHTON 3 (CONT.)

CURRENT STATUS	1
COMMERCIAL START-UP	12/1981
INITIAL START-UP	9/1981
CONTRACT AWARDED	0/1977
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
** QUENCHER/PRESATURATOR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** ABSORBER	
GENERIC TYPE	NR
SPECIFIC TYPE	NR
TRADE NAME/COMMON TYPE	NR
SHELL GENERIC MATERIAL	NR
SHELL SPECIFIC MATERIAL	NR
SHELL MATERIAL TRADE NAME/COMMON TYPE	NR
LINER GENERIC MATERIAL	NR
LINER SPECIFIC MATERIAL	NR
LINER MATERIAL TRADE NAME/COMMON TYPE	NR
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
TRADE NAME/COMMON TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** REHEATER	
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON TYPE	N/A
CONSTRUCTION MATERIAL GENERIC TYPE	N/A
CONSTRUCTION MATERIAL SPECIFIC TYPE	N/A
** FANS	
DESIGN	NR
FUNCTION	NR
APPLICATION	NR
SERVICE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** DUCTWORK	
SHELL GENERIC MATERIAL TYPE	NR
SHELL SPECIFIC MATERIAL TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	MIX TANK
DEVICE	N/A
DEVICE TYPE	AGITATED TANK
** PUMPS	
SERVICE	NUMBER
-----	-----
NR	****

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: NAUGHTON 3 (CONT.)

** SOLIDS CONCENTRATING/DEWATERING
DEVICE NR

*** SALEABLE BYPRODUCTS
NATURE NONE
DISPOSITION N/A

*** SLUDGE

** TREATMENT
METHOD UNSTABILIZED
DEVICE NR
PROPRIETARY PROCESS NR

** DISPOSAL
NATURE FINAL
TYPE POND
SITE TREATMENT NR

-----PERFORMANCE DATA-----
PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
SO2 PART. HOURS HOURS HOURS FACTOR

9/81 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

OPERATION OF THE FGD SYSTEM INSTALLED ON NAUGHTON 3 BEGAN IN SEPTEMBER 1981. THE SYSTEM IS CURRENTLY IN THE START-UP PHASE OF OPERATION AND IS NOT REQUIRED TO BE IN FULL SERVICE UNTIL THE END OF THE YEAR. SOME INITIAL DAMPER PROBLEMS WERE REPORTED.

10/81 SYSTEM 744

11/81 SYSTEM 720

12/81 SYSTEM 744

1/82 SYSTEM 744

2/82 SYSTEM 672

3/82 SYSTEM 744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT FOR THE FIRST QUARTER 1982 THE FGD AVAILABILITY AVERAGED GREATER THAN 90%.

4/82 SYSTEM 720

5/82 SYSTEM 744

6/82 SYSTEM 720

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT FOR THE SECOND QUARTER THE FGD AVAILABILITY AVERAGED GREATER THAN 90%.

7/82 SYSTEM 744

8/82 SYSTEM 744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: NAUGHTON 3 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD CAP. HOURS FACTOR
9/82	SYSTEM							720	
10/82	SYSTEM							744	
11/82	SYSTEM							720	
12/82	SYSTEM							744	
1/83	SYSTEM							744	
2/83	SYSTEM							672	
3/83	SYSTEM							744	
** PROBLEMS/SOLUTIONS/COMMENTS									
INFORMATION WAS UNAVAILABLE FOR THE PERIOD OF JULY 1982 THROUGH MARCH 1983									
4/83	SYSTEM							720	
5/83	SYSTEM							744	
6/83	SYSTEM							720	
** PROBLEMS/SOLUTIONS/COMMENTS									
INFORMATION WAS UNAVAILABLE FOR THE PERIOD OF JULY 1982 TO JUNE 1983.									
7/83	SYSTEM							744	
8/83	SYSTEM							744	
9/83	SYSTEM							720	
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT NO FGD-RELATED OUTAGES WERE ENCOUNTERED DURING THE THIRD QUARTER OF 1983.									
THE UTILITY REPORTED PLUGGING PROBLEMS IN THE PRESATURATOR HEADERS AND NOZZLES. THIS IS BELIEVED TO BE DUE TO INSUFFICIENT FLOW AND PIPE CONFIGURATION (TOO MANY ELBOWS). THE UTILITY IS GOING TO EXPERIMENT BY RUNNING THE FGD SYSTEM WITHOUT THE PRESATURATOR. UNIT WAS AVAILABLE APPROXIMATELY 70% OF THE PERIOD. THE UTILITY REPORTED THAT LOW UNIT AVAILABILITY ACCOUNTS FOR A MAJORITY OF FGD PROBLEMS DUE TO RESTART COMPLICATIONS.									
10/83	SYSTEM							744	
** PROBLEMS/SOLUTIONS/COMMENTS									
THE FGD SYSTEM WAS DOWN DURING THE FIRST TWO WEEKS OF OCTOBER DUE TO A RUPTURED EFFLUENT LINE TO THE EVAPORATION POND.									
11/83	SYSTEM							720	
12/83	SYSTEM							744	
** PROBLEMS/SOLUTIONS/COMMENTS									
THE UTILITY REPORTED THAT THE FGD SYSTEM HAS ONLY OPERATED APPROXIMATELY 30 DAYS DURING THE FOURTH QUARTER DUE TO TURBINE PROBLEMS ON THE UNIT.									
THE UTILITY EXPERIENCED RECYCLE PUMP PROBLEMS DURING THE FOURTH QUARTER.									

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: NAUGHTON 3 (CONT.)

-----PERFORMANCE DATA-----
 PERIOD MODULE AVAILABILITY OPERABILITY RELIABILITY UTILIZATION % REMOVAL PER BOILER FGD CAP.
 SO2 PART. HOURS HOURS HOURS FACTOR

SPECIFICALLY, WORN SLEEVES AND VIBRATION PROBLEMS.

1/84	SYSTEM	744
2/84	SYSTEM	696
3/84	SYSTEM	744
4/84	SYSTEM	720
5/84	SYSTEM	744
6/84	SYSTEM	720
7/84	SYSTEM	744
8/84	SYSTEM	744
9/84	SYSTEM	720

** PROBLEMS/SOLUTIONS/COMMENTS

THE RECYCLE PUMP WAS REPLACED WITH A LARGER UNIT AT NAUGHTON 3 TO REDUCE VIBRATION.

ESP CONTROLS WERE INOPERATIVE FOR APPROXIMATELY ONE WEEK DURING THE FIRST THREE QUARTERS OF 1984 FORCING THE FGD SYSTEM OUT OF SERVICE.

DAMPER PROBLEMS WERE REPORTED DURING THE FIRST THREE QUARTERS OF 1984. BENT SHAFTS AND LIMIT TORQUES WERE PREVENTING THE INLET LOUVERS FROM CLOSING PROPERLY.

OVERALL FGD SYSTEM AVAILABILITY DURING THE FIRST THREE QUARTERS OF 1984 WAS ESTIMATED AT 90 TO 95%.

SLURRY TANK HEATERS BURNING OUT CONTRIBUTED TO FGD SYSTEM OUTAGE TIME DURING THE FIRST THREE QUARTERS OF 1984. THE RESULTING LOWERED TEMPERATURE OF THE SODA LIQUOR CAUSED CRYSTALLIZATION OF THE SLURRY.

THE UTILITY REPORTED PROBLEMS WITH PLUGGED PRESATURATOR SPRAY NOZZLES DUE TO POOR CLARIFIER OPERATION.

10/84	SYSTEM	744
11/84	SYSTEM	720
12/84	SYSTEM	744

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT THE FGD WAS DOWN ONE DAY IN NOVEMBER DUE TO LEAKS IN THE 4 INCH WASTE EFFLUENT PIPELINE TO THE POND. PIPE JOINTS HAD COME APART DUE TO POOR INSTALLATION. THE FGD AVAILABILITY WAS REPORTED TO BE APPROXIMATELY 95 PERCENT FOR THE FOURTH QUARTER 1984.

1/85	SYSTEM	744
2/85	SYSTEM	672
3/85	SYSTEM	744
4/85	SYSTEM	720
5/85	SYSTEM	744

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: NAUGHTON 3 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER BOILER HOURS	FGD CAP. HOURS FACTOR
6/85	SYSTEM							720	
7/85	SYSTEM							744	
8/85	SYSTEM							744	
9/85	SYSTEM							720	
10/85	SYSTEM							744	
11/85	SYSTEM							720	
12/85	SYSTEM							744	

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM							774	
2/86	SYSTEM							672	
3/86	SYSTEM							774	
4/86	SYSTEM							720	
5/86	SYSTEM							774	
6/86	SYSTEM							720	
7/86	SYSTEM							774	
8/86	SYSTEM							774	
9/86	SYSTEM							720	
10/86	SYSTEM							774	
11/86	SYSTEM							720	
12/86	SYSTEM							774	

** PROBLEMS/SOLUTIONS/COMMENTS

FGD SYSTEM AVAILABILITY FOR THE YEAR 1986 WAS APPROXIMATELY 92-95%. THE UNIT CAPACITY FACTOR WAS IN THE RANGE OF 50-60%. FGD PROBLEMS ENCOUNTERED DURING THE YEAR INCLUDED FAULTY RECYCLE PUMP SEALS, LEAKS AROUND GUILLOTINE ISOLATION DAMPERS, FAILED BOOSTER FAN ROTORS, AND WEARING OF THE ABSORBER RUBBER LINER AT THE INLET. THE UTILITY IS CURRENTLY NOT USING ANY ADDITIVES BUT IS LOOKING INTO THE POSSIBILITY OF PRODUCING A SALEABLE SODIUM SULFATE (NASO4) PRODUCT. THE SODIUM SULFATE WOULD BE PURCHASED BY PAPER COMPANIES.

1/87	SYSTEM							744	
2/87	SYSTEM							672	
3/87	SYSTEM							744	
4/87	SYSTEM							720	
5/87	SYSTEM							744	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

UTAH POWER & LIGHT: NAUGHTON 3 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD CAP. HOURS FACTOR
6/87	SYSTEM							720	
7/87	SYSTEM							744	
8/87	SYSTEM							744	
9/87	SYSTEM							720	
10/87	SYSTEM							744	
11/87	SYSTEM							720	
12/87	SYSTEM							744	999.9

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED
IN THE YEAR 1987. SYSTEM AVAILABILITY WAS REPORTED TO BE 95+%.

DO NOT REPRODUCE
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	WEST PENN POWER	
PLANT NAME	MITCHELL	
UNIT NUMBER	3	
CITY	COURTNEY	
STATE	PENNSYLVANIA	
REGULATORY CLASSIFICATION	A	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	193.	(0.450 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	*****	
GROSS UNIT GENERATING CAPACITY - MW	296	
NET UNIT GENERATING CAPACITY W/FGD - MW	284	
NET UNIT GENERATING CAPACITY WO/FGD - MW	287	
EQUIVALENT SCRUBBED CAPACITY - MW	296	
** UNIT DATA - BOILER AND STACK		
BOILER SUPPLIER	****	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	613.47	(1300000 ACFM)
BOILER FLUE GAS TEMPERATURE - C	148.9	(300 F)
STACK HEIGHT - M	*****	(**** FT)
STACK SHELL	CONCRETE	
STACK TOP DIAMETER - M	*****	(***** FT)
** FUEL DATA		
FUEL TYPE	COAL	
FUEL GRADE	BITUMINOUS	
AVERAGE HEAT CONTENT - J/G	29122.	(12520 BTU/LB)
RANGE HEAT CONTENT - BTU/LB		10770-13310
AVERAGE ASH CONTENT - %	12.50	
RANGE ASH CONTENT - %	6.3-15.2	
AVERAGE MOISTURE CONTENT - %	5.50	
RANGE MOISTURE CONTENT - %	4.0-8.9	
AVERAGE SULFUR CONTENT - %	2.80	
RANGE SULFUR CONTENT - %	1.8-3.2	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	0.00-0.10	
*** PARTICLE CONTROL		
** ESP		
NUMBER	1	
INLET FLUE GAS CAPACITY - CU.M/S	613.5	(1300000 ACFM)
INLET FLUE GAS TEMPERATURE - C	153.3	(308 F)
PARTICLE REMOVAL EFFICIENCY - %	99.5	
** PARTICLE SCRUBBER		
NUMBER	0	
GENERIC TYPE	NONE	
SPECIFIC TYPE	N/A	
TRADE NAME/COMMON NAME	N/A	
SHELL GENERIC MATERIAL	N/A	
SHELL SPECIFIC MATERIAL	N/A	
LINER GENERIC MATERIAL	N/A	
LINER SPECIFIC MATERIAL	N/A	
GAS CONTACTING DEVICE TYPE	N/A	
*** FGD SYSTEM		
** GENERAL DATA		
SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT	
SO2 REMOVAL MODE	WET SCRUBBING	
PROCESS TYPE	LIME	
SYSTEM SUPPLIER	GE ENVIRONMENTAL SERVICES	
A-E FIRM	GIBBS & HILL	
DEVELOPMENT LEVEL	FULL SCALE	
NEW/RETROFIT	RETROFIT	
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	95.00	

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

WEST PENN POWER: MITCHELL 3 (CONT.)

ENERGY CONSUMPTION - %	1.0
CURRENT STATUS	1
COMMERCIAL START-UP	9/1982
INITIAL START-UP	8/1982
CONTRACT AWARDED	9/1979
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
** QUENCHER/PRESATURATOR	
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
** ABSORBER	
NUMBER	3
NUMBER OF SPARES	1
GENERIC TYPE	SPRAY TOWER
SPECIFIC TYPE	OPEN COUNTERCURRENT SPRAY
TRADE NAME/COMMON TYPE	N/A
SUPPLIER	GE ENVIRONMENTAL SERVICES
DIMENSIONS - FT	33.5 DIA X 97.5
SHELL GENERIC MATERIAL	CARBON STEEL
SHELL SPECIFIC MATERIAL	AISI 1110
SHELL MATERIAL TRADE NAME/COMMON TYPE	N/A
LINER GENERIC MATERIAL	ORGANIC
LINER SPECIFIC MATERIAL	GLASS FLAKE-FILLED POLYESTER
LINER MATERIAL TRADE NAME/COMMON TYPE	FLAKELINE 103
GAS CONTACTING DEVICE TYPE	NONE
NUMBER OF CONTACTING ZONES	6
LIQUID RECIRCULATION RATE - LITER/S	28. (452 GPM)
L/G RATIO - L/CU.M	12.0 (90.0 GAL/1000 ACF)
GAS-SIDE PRESSURE DROP - KPA	0.6 (2.5 IN-H2O)
SUPERFICAL GAS VELOCITY - M/SEC	3.0 (10.0 FT/S)
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	PRIMARY COLLECTOR
GENERIC TYPE	IMPINGEMENT
SPECIFIC TYPE	BAFFLE
TRADE NAME/COMMON TYPE	CLOSED VANE
CONFIGURATION	HORIZONTAL
NUMBER OF PASSES PER STAGE	4
PRESSURE DROP - KPA	0.1 (0.4 IN-H2O)
SUPERFICAL GAS VELOCITY - M/S	3.0 (10.0 FT/S)
CONSTRUCTION MATERIAL GENERIC TYPE	ORGANIC; STAINLESS STEEL
CONSTRUCTION MATERIAL SPECIFIC TYPE	POLYPROPYLENE; AUSTENITIC
WASH WATER SOURCE	FRESH
WASH RATE - L/S	6.1 (97 GAL/MIN)
** REHEATER	
GENERIC TYPE	NONE
SPECIFIC TYPE	N/A
TRADE NAME/COMMON TYPE	N/A
CONSTRUCTION MATERIAL GENERIC TYPE	N/A
CONSTRUCTION MATERIAL SPECIFIC TYPE	N/A
** FANS	
DESIGN	CENTRIFUGAL
FUNCTION	BOOSTER
APPLICATION	NR
SERVICE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
** DAMPERS	
FUNCTION	NR
GENERIC TYPE	NR
SPECIFIC TYPE	NR
CONSTRUCTION MATERIAL GENERIC TYPE	NR
CONSTRUCTION MATERIAL SPECIFIC TYPE	NR
LINER GENERIC MATERIAL TYPE	NR
LINER SPECIFIC MATERIAL TYPE	NR

WEST PENN POWER: MITCHELL 3 (CONT.)

** DUCTWORK	
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
SHELL SPECIFIC MATERIAL TYPE	AISI 1110
LINER GENERIC MATERIAL TYPE	ORGANIC
LINER SPECIFIC MATERIAL TYPE	GLASS FLAKE-FILLED POLYESTER
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	SLAKER
DEVICE	NR
DEVICE TYPE	NR
MANUFACTURER	WALLACE & TIERNAN
NUMBER	3
PRODUCT QUALITY - % SOLIDS	15.0
** TANKS	
SERVICE	NUMBER
-----	-----
THICKENER UNDERFLOW	1
VACUUM FILTER FILTRATE	1
FIXATION ADDITIVE	2
FLYASH	1
WASTE SLURRY BLEED	1
REAGENT PREP PRODUCT	1
ABSORBER RECYCLE	3
THICKENER OVERFLOW	1
** PUMPS	
SERVICE	NUMBER
-----	-----
ABSORBER RECIRCULATION	18
ABSORBER BLEED	6
FIXATION ADDITIVE	2
ALKALI PREPARATION AREA SUMP	2
ABSORBER AREA SUMP	2
THICKENER AREA SUMP	2
VACUUM FILTRATE	-2
VACUUM FILTER FEED	****
VACUUM	****
LIME SLURRY	2
THICKENER UNDERFLOW	2
THICKENER OVERFLOW	2
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	VACUUM FILTER
NUMBER	2
NUMBER OF SPARES	1
CAPACITY	888 TON/DAY
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
OUTLET STREAM CHARACTERISTICS	50% SOLIDS
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	THICKENER
NUMBER	1
DIMENSIONS - FT	139.0 DIA X 12.0
SHELL GENERIC MATERIAL TYPE	CARBON STEEL
FEED STREAM CHARACTERISTICS	10% SOLIDS
OUTLET STREAM CHARACTERISTICS	20% SOLIDS
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	

WEST PENN POWER: MITCHELL 3 (CONT.)

** WATER BALANCE
MAKEUP WATER ADDITION - LITERS/S 28.4 (450 GPM)

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING FEBRUARY OR MARCH.

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

WEST PENN POWER: MITCHELL 3 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2 PART.	PER BOILER HOURS	FGD HOURS	CAP. FACTOR
4/83	F-101	100.0	100.0	100.0	100.0				
	F-201	75.6	100.0	100.0	75.6				
	F-301	24.4	100.0	100.0	24.4				
	SYSTEM	100.0	100.0	100.0	100.0		720	93	720 79.1
5/83	F-101	100.0	100.0	100.0	100.0				
	F-201	0.0	0.0		0.0				
	F-301	100.0	100.0	100.0	100.0				
	SYSTEM	100.0	100.0	100.0	100.0		744	617	744 62.2
6/83	F-101	26.7	26.7	100.0	26.7				
	F-201	73.3	73.3	100.0	73.3				
	F-301	100.0	100.0	100.0	100.0				
	SYSTEM	100.0	100.0	100.0	100.0		720	720	720 82.8

** PROBLEMS/SOLUTIONS/COMMENTS

THE UTILITY REPORTED THAT NO MAJOR FGD-RELATED PROBLEMS WERE ENCOUNTERED DURING THE PERIOD OF APRIL THROUGH JUNE 1983.

7/83	SYSTEM						744		
8/83	SYSTEM						744		
9/83	SYSTEM						720		

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE THIRD QUARTER OF 1983.

10/83	SYSTEM						744		
11/83	SYSTEM						720		
12/83	SYSTEM						744		

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE FOURTH QUARTER OF 1983.

1/84	SYSTEM						744		
2/84	SYSTEM						696		
3/84	SYSTEM						744		
4/84	SYSTEM						720		
5/84	SYSTEM						744		
6/84	SYSTEM						720		
7/84	SYSTEM						744		
8/84	SYSTEM						744		
9/84	SYSTEM						720		

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE FIRST THREE QUARTERS OF 1984.

10/84	SYSTEM						744		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

WEST PENN POWER: MITCHELL 3 (CONT.)

-----PERFORMANCE DATA-----											
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART.	PER HOURS	BOILER HOURS	FGD HOURS	CAP. FACTOR

11/84	SYSTEM							720			

12/84	SYSTEM							744			

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE FOURTH QUARTER OF 1984.

1/85	SYSTEM							744			

2/85	SYSTEM							672			

3/85	SYSTEM							744			

4/85	SYSTEM							720			

5/85	SYSTEM							744			

6/85	SYSTEM							720			

7/85	SYSTEM							744			

8/85	SYSTEM							744			

9/85	SYSTEM							720			

10/85	SYSTEM							744			

11/85	SYSTEM							720			

12/85	SYSTEM							744			

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY THROUGH DECEMBER 1985.

1/86	SYSTEM							774			

2/86	SYSTEM							672			

3/86	SYSTEM							774			

4/86	SYSTEM							720			

5/86	SYSTEM							774			

6/86	SYSTEM							720			

7/86	SYSTEM							774			

8/86	SYSTEM							774			

9/86	SYSTEM							720			

10/86	SYSTEM							774			

11/86	SYSTEM							720			

12/86	SYSTEM							774			

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

WEST PENN POWER: MITCHELL 3 (CONT.)

-----PERFORMANCE DATA-----										
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR

** PROBLEMS/SOLUTIONS/COMMENTS

NO INFORMATION WAS REPORTED BY THE UTILITY FOR THE MONTHS OF JANUARY
THROUGH DECEMBER 1986.

1/87	SYSTEM								744	
2/87	SYSTEM								672	
3/87	SYSTEM								744	
4/87	SYSTEM								720	
5/87	SYSTEM								744	
6/87	SYSTEM								720	
7/87	SYSTEM								744	
8/87	SYSTEM								744	
9/87	SYSTEM								720	
10/87	SYSTEM								744	
11/87	SYSTEM								720	
12/87	SYSTEM								744	

** PROBLEMS/SOLUTIONS/COMMENTS

INFORMATION WAS UNAVAILABLE FOR THE MONTHS OF JANUARY
TO DECEMBER 1987.

DO NOT MICROFILM
THIS PAGE

SECTION 13
DESIGN AND PERFORMANCE DATA FOR OPERATIONAL DOMESTIC FGD SYSTEMS

COMPANY NAME	WEST TEXAS UTILITIES	
PLANT NAME	OKLAUNION	
UNIT NUMBER	1	
CITY	OKLAUNION	
STATE	TEXAS	
REGULATORY CLASSIFICATION	B	
PARTICULATE EMISSION LIMITATION - NG/J	43.	(0.100 LB/MMBTU)
SO2 EMISSION LIMITATION - NG/J	516.	(1.200 LB/MMBTU)
NOX EMISSION LIMITATION - NG/J	*****	(***** LB/MMBTU)
NET PLANT GENERATING CAPACITY - MW	1440	
GROSS UNIT GENERATING CAPACITY - MW	720	
NET UNIT GENERATING CAPACITY W/FGD - MW	640	
NET UNIT GENERATING CAPACITY WO/FGD - MW	642	
EQUIVALENT SCRUBBED CAPACITY - MW	504	

** UNIT DATA - BOILER AND STACK

BOILER SUPPLIER	FOSTER WHEELER	
BOILER TYPE	PULVERIZED COAL	
BOILER SERVICE LOAD	BASE	
DESIGN BOILER FLUE GAS FLOW - CU.M/S	1124.39	(2382679 ACFM)
BOILER FLUE GAS TEMPERATURE - C	143.3	(290 F)
STACK HEIGHT - M	138:	(453 FT)
STACK SHELL	NA	
STACK TOP DIAMETER - M	7.0	(23.0 FT)

** FUEL DATA

FUEL TYPE	COAL	
FUEL GRADE	SUBBITUMINOUS	
AVERAGE HEAT CONTENT - J/G	19136.	(8227 BTU/LB)
RANGE HEAT CONTENT - BTU/LB	****	
AVERAGE ASH CONTENT - %	5.18	
RANGE ASH CONTENT - %	****	
AVERAGE MOISTURE CONTENT - %	30.50	
RANGE MOISTURE CONTENT - %	****	
AVERAGE SULFUR CONTENT - %	0.34	
RANGE SULFUR CONTENT - %	****	
AVERAGE CHLORIDE CONTENT - %	*****	
RANGE CHLORIDE CONTENT - %	****	

*** PARTICLE CONTROL

** ESP

NUMBER	1
TYPE	COLD SIDE
SUPPLIER	LODGE-COTTRELL
PARTICLE REMOVAL EFFICIENCY - %	99.6

** PARTICLE SCRUBBER

NUMBER	0
GENERIC TYPE	NA
SPECIFIC TYPE	NA
TRADE NAME/COMMON NAME	NA
SHELL GENERIC MATERIAL	NA
SHELL SPECIFIC MATERIAL	NA
LINER GENERIC MATERIAL	NA
LINER SPECIFIC MATERIAL	NA

*** FGD SYSTEM

** GENERAL DATA

SALEABLE PRODUCT/THROWAWAY PRODUCT	THROWAWAY PRODUCT
SO2 REMOVAL MODE	WET SCRUBBING
PROCESS TYPE	LIMESTONE
SYSTEM SUPPLIER	GE ENVIRONMENTAL SERVICES
A-E FIRM	GE ENVIRONMENTAL SERVICES
DEVELOPMENT LEVEL	FULL SCALE
NEW/RETROFIT	NEW
UNIT DESIGN PARTICLE REMOVAL EFFICIENCY - %	99.67
UNIT DESIGN SO2 REMOVAL EFFICIENCY - %	70.00

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

WEST TEXAS UTILITIES: OKLAUNION 1 (CONT.)

ENERGY CONSUMPTION - %	0.3
CURRENT STATUS	1
COMMERCIAL START-UP	12/1986
INITIAL START-UP	11/1986
CONTRACT AWARDED	8/1981
** DESIGN AND OPERATING PARAMETERS	
DESIGN CHLORIDE CONTENT - %	*****
** QUENCHER/PRESATURATOR	
CONSTRUCTION MATERIAL GENERIC TYPE	NA
CONSTRUCTION MATERIAL SPECIFIC TYPE	NA
** ABSORBER	
NUMBER	3
NUMBER OF SPARES	1
GENERIC TYPE	SPRAY TOWER
SPECIFIC TYPE	OPEN COUNTERCURRENT SPRAY
TRADE NAME/COMMON TYPE	NA
SUPPLIER	GE ENVIRONMENTAL SERVICES
SHELL GENERIC MATERIAL	NA
SHELL SPECIFIC MATERIAL	NA
SHELL MATERIAL TRADE NAME/COMMON TYPE	NA
LINER GENERIC MATERIAL	NA
LINER SPECIFIC MATERIAL	NA
LINER MATERIAL TRADE NAME/COMMON TYPE	NA
** MIST ELIMINATOR	
PRE-MIST ELIMINATOR/MIST ELIMINATOR	NA
GENERIC TYPE	NA
SPECIFIC TYPE	NA
TRADE NAME/COMMON TYPE	NA
CONSTRUCTION MATERIAL GENERIC TYPE	NA
CONSTRUCTION MATERIAL SPECIFIC TYPE	NA
** REHEATER	
GENERIC TYPE	BYPASS
SPECIFIC TYPE	NA
TRADE NAME/COMMON TYPE	NA
CONSTRUCTION MATERIAL GENERIC TYPE	NA
CONSTRUCTION MATERIAL SPECIFIC TYPE	NA
** FANS	
DESIGN	NR
FUNCTION	NA
APPLICATION	NR
SERVICE	NA
CONSTRUCTION MATERIAL GENERIC TYPE	NA
** DAMPERS	
FUNCTION	NA
GENERIC TYPE	NA
SPECIFIC TYPE	NA
CONSTRUCTION MATERIAL GENERIC TYPE	NA
CONSTRUCTION MATERIAL SPECIFIC TYPE	NA
LINER GENERIC MATERIAL TYPE	NA
LINER SPECIFIC MATERIAL TYPE	NA
** DUCTWORK	
SHELL GENERIC MATERIAL TYPE	NA
SHELL SPECIFIC MATERIAL TYPE	NA
LINER GENERIC MATERIAL TYPE	NA
LINER SPECIFIC MATERIAL TYPE	NA
** REAGENT PREPARATION EQUIPMENT	
FUNCTION	NA
DEVICE	NA
DEVICE TYPE	NA

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

WEST TEXAS UTILITIES: OKLAUNION 1 (CONT.)

** PUMPS	
SERVICE	NUMBER
-----	-----
NA	****
** SOLIDS CONCENTRATING/DEWATERING	
DEVICE	NONE
*** SALEABLE BYPRODUCTS	
NATURE	NONE
DISPOSITION	N/A
*** SLUDGE	
** TREATMENT	
METHOD	UNSTABILIZED
DEVICE	NA
PROPRIETARY PROCESS	NA
** DISPOSAL	
NATURE	FINAL
TYPE	POND
LOCATION	ON-SITE
SITE TRANSPORTATION METHOD	PIPE LINE
SITE TREATMENT	NA
** WATER BALANCE	
WATER LOOP TYPE	CLOSED
SOURCE OF MAKEUP WATER	COOLING TOWER

-----PERFORMANCE DATA-----

PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PER PART.	BOILER HOURS	FGD HOURS	CAP. FACTOR

11/86	SYSTEM							720		
12/86	SYSTEM							774		

** PROBLEMS/SOLUTIONS/COMMENTS

INITIAL START-UP AND DEBUGGING OPERATIONS OF THE OKLAUNION 1 FGD
SYSTEM COMMENCED IN NOVEMBER 1986. THE UNIT WAS DECLARED COMMERCIAL THE
FOLLOWING MONTH ON DECEMBER 24, 1986.

1/87	SYSTEM							744		
2/87	SYSTEM							672		
3/87	SYSTEM							744		
4/87	SYSTEM							720		
5/87	SYSTEM							744		
6/87	SYSTEM							720		
7/87	SYSTEM							744		
8/87	SYSTEM							744		
9/87	SYSTEM							720		
10/87	SYSTEM							744		

UTILITY FGD SURVEY: JANUARY - DECEMBER 1987

WEST TEXAS UTILITIES: OKLAUNION 1 (CONT.)

-----PERFORMANCE DATA-----									
PERIOD	MODULE	AVAILABILITY	OPERABILITY	RELIABILITY	UTILIZATION	% REMOVAL SO2	PART. HOURS	PER BOILER HOURS	FGD CAP. HOURS FACTOR
11/87	SYSTEM							720	
12/87	SYSTEM							744	

** PROBLEMS/SOLUTIONS/COMMENTS

THE NEXT SCHEDULED UNIT OUTAGE WILL BE A 1-MONTH TURBINE WARRANTY INSPECTION IN MARCH 1988. THE LAST OUTAGE PERIOD OCCURRED IN NOVEMBER AND LASTED ONLY 2 WEEKS.

THE UTILITY REPORTED DESIGN-RELATED PROBLEMS WITH THE FGD SYSTEM. HIGHER THAN DESIGNED FLUE GAS VELOCITIES THROUGH THE ABSORBERS AND POOR GAS DISTRIBUTION HAS RESULTED IN SLURRY CARRYOVER PAST THE MIST ELIMINATORS AND INTO DOWNSTREAM DUCTWORK AND STACK. THE UTILITY REPORTED HAVING HARD SCALE DEPOSITS IN BOTH THE DUCTWORK AND STACK AS THICK AS 5 FEET IN SOME AREAS. THE UTILITY IS CURRENTLY WORKING WITH THE SYSTEM SUPPLIER TO RECTIFY THIS PROBLEM.