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Fast Flux Test Facility Performance Monitoring Management Information December 1988

Prepared for the U.S. Department of Energy
Assistant Secretary for Nuclear Energy



Westinghouse

Hanford Company

Richland, Washington

Hanford Operations and Engineering Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

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J. D. Anaral 10/5/2016

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D. J. Newland

Date Published
January 1989

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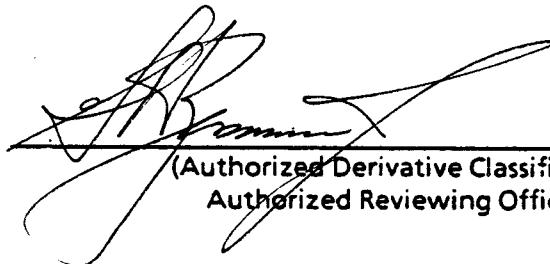
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FOREWARD

The purpose of this report is to provide management with performance data on key performance indicators selected from the FFTF Early Warning System performance indicators. This report contains the results for key performance indicators divided into two categories of "overall" and "other". The "overall" performance indicators, when considered in the aggregate, provide one means of monitoring overall plant performance. Overall performance indicators are listed in Table 1. The "other" performance indicators, listed in Table 2, are considered useful management tools for assessing the specific areas they address.

The data should be used in conjunction with the results of other management assessment activities to focus improvement efforts. Use of these key performance indicators as a group is stressed, since focusing on a single indicator or a narrow set of indicators can be counterproductive both to safety and to long-term performance improvement.

Any concerns regarding the accuracy or analysis of the specific indicator should be addressed to the responsible manager identified on the figure. This report must be reviewed with the understanding that both the design and the mission are different for FFTF compared to commercial power reactors.

FFTf PLANT MANAGER'S ASSESSMENT

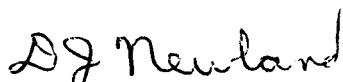
DECEMBER 1988

The plant operated at full power throughout the month of December, achieving a 98.9% Operational Efficiency Factor. The plant also set a new FFTf Annual Capacity Factor record of 78.5% during this past year. For the eleventh straight month there have been no unplanned automatic scrams or forced outages.

With no lost work day injuries occurring in December, none have occurred for eleven straight months, nearly achieving our 1988 Annual Lost Work Day Case Rate goal -- unattainable because of two incidents last January.

Overall performance indicators reflect very good FFTf operation. Concentrated effort is required to keep maintenance backlogs within parameters that compare favorably with the best commercial plants.

Please route your copy of this report to your staff and direct any questions or comments to J. E. Truax (376-0758).



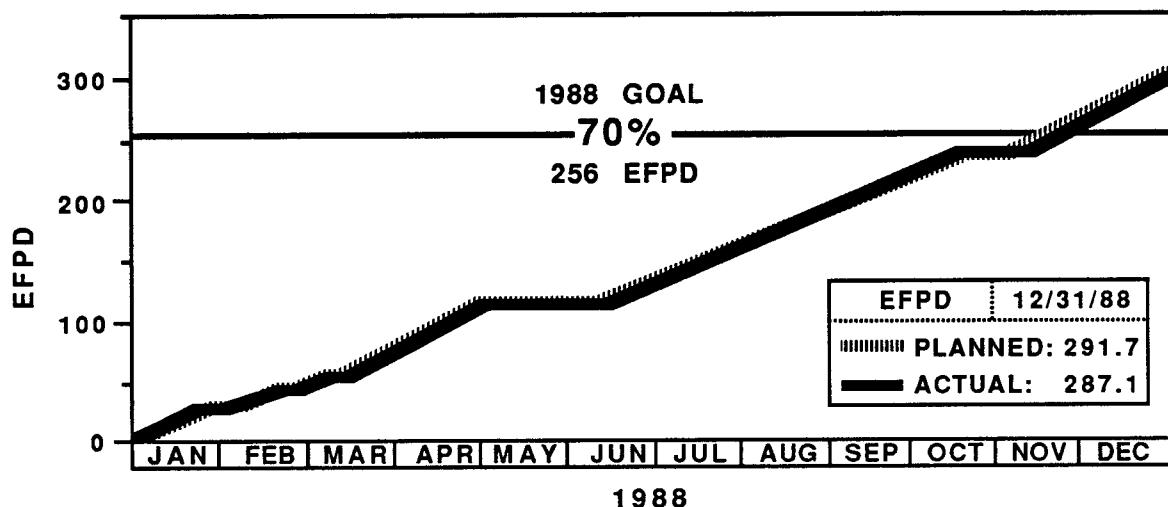
D. J. Newland
FFTf Plant Manager

TABLE 1
OVERALL PERFORMANCE INDICATORS

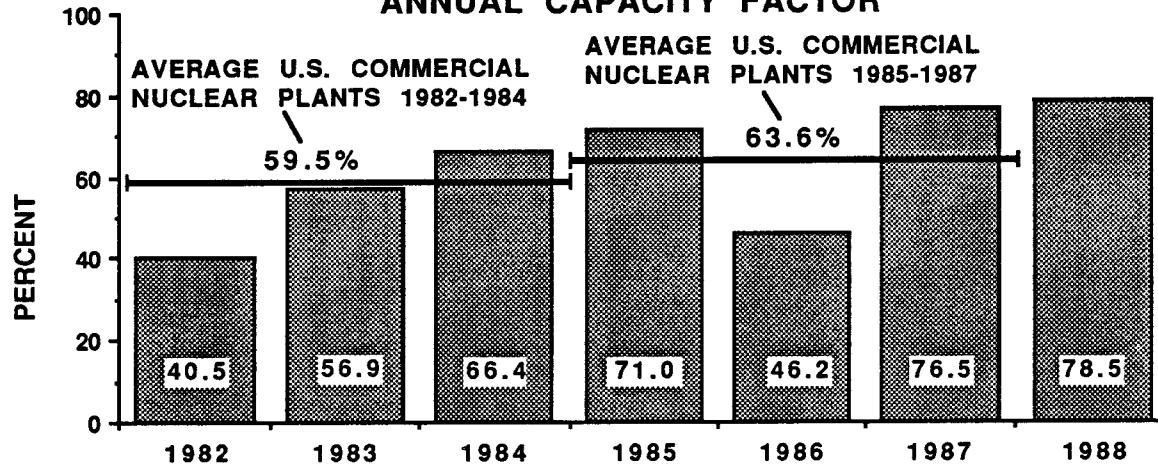
<u>FIGURE</u>	<u>PERFORMANCE INDICATOR</u>	<u>AREA</u>
1	Capacity Factor	OPS
2	Unplanned Automatic Scrams	OPS
3	Forced Outages	OPS
4	Unusual Occurrence Reports	OPS
5	Personnel Radiation Exposure	RADCON
6	Industrial Safety Statistics	INDSAF
7	Corrective Maintenance Workoff Rate	MAINT

CAPACITY FACTOR

TARGET 70% ANNUAL CAPACITY FACTOR



ANNUAL CAPACITY FACTOR



PURPOSE

TO MONITOR THE PLANT'S ABILITY TO PERFORM AT RATED POWER. CAPACITY FACTOR IS DEFINED AS THE ACTUAL EFPD DIVIDED BY THE PRODUCT OF THE CALENDAR DAYS IN THE REPORTING PERIOD TIMES THE MAXIMUM DEPENDABLE CAPACITY (MDC) FOR THE PERIOD. THE MDC FOR CDE CYCLES IS 1.0. FOR CYCLES PRIOR TO SEPTEMBER 1986, THE MDC WAS 0.973.

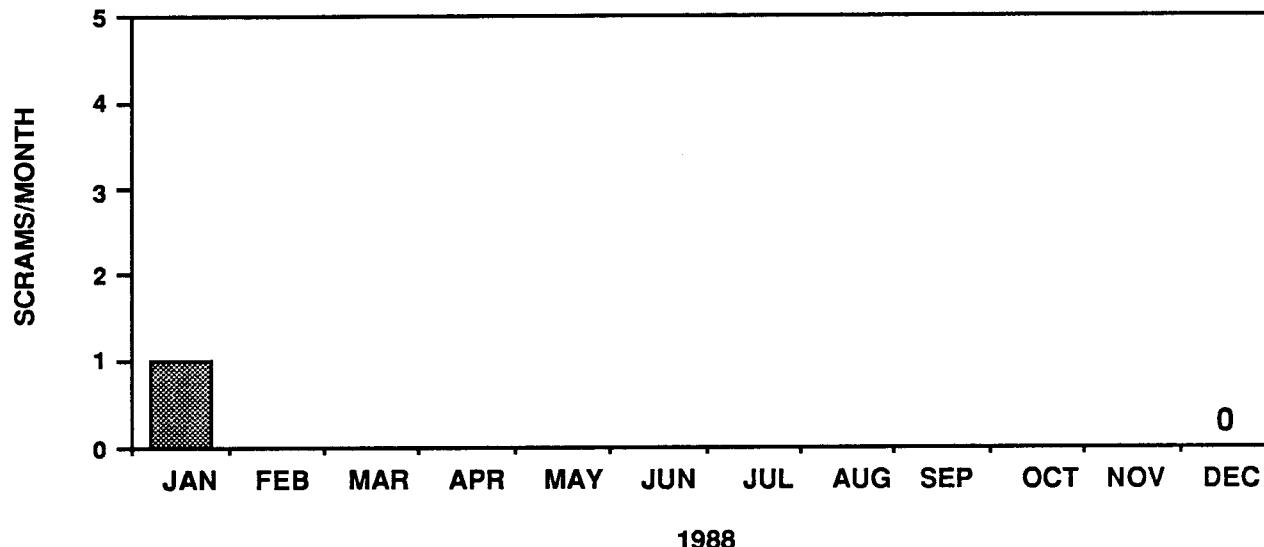
ASSESSMENT

THE CAPACITY FACTOR FOR THE MONTH OF DECEMBER WAS 99.7%.

THE 1988 ANNUAL CAPACITY FACTOR WAS 78.5%!!

UNPLANNED AUTOMATIC SCRAMS

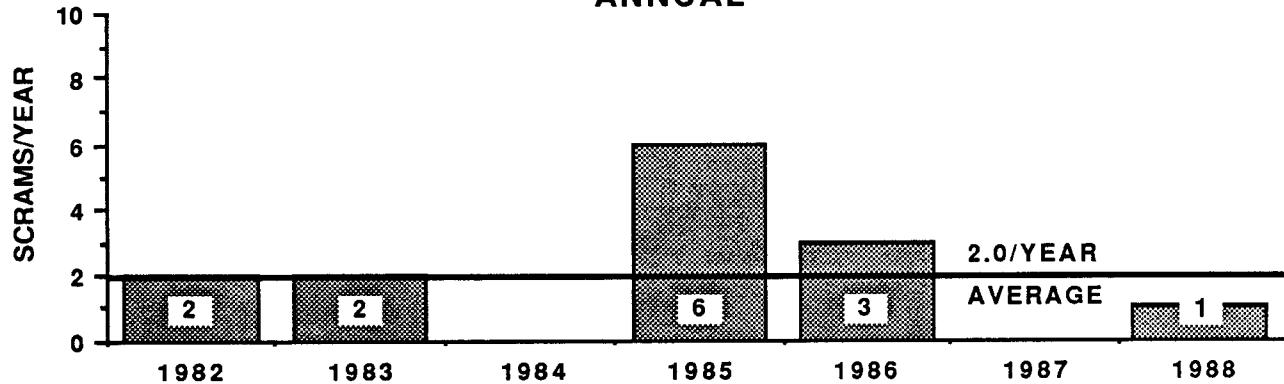
MONTHLY



1988

0

ANNUAL



PURPOSE

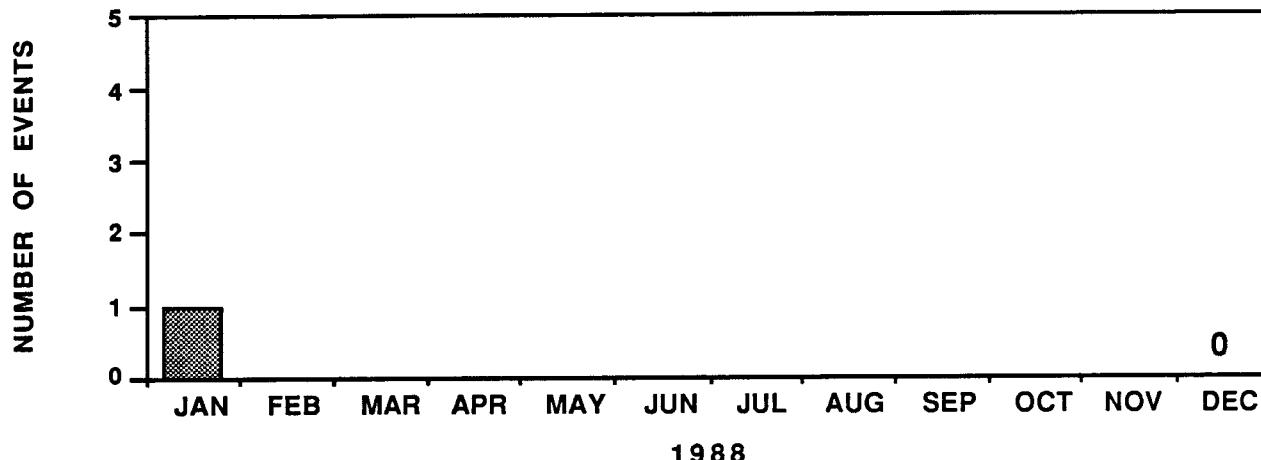
TO MONITOR THE NUMBER OF UNPLANNED AUTOMATIC SCRAMS THAT OCCUR WHILE THE REACTOR IS CRITICAL. UNPLANNED MEANS THAT THE SCRAM WAS NOT PART OF A PLANNED OPERATION OR TEST. UNPLANNED AUTOMATIC SCRAMS INCLUDE, FOR EXAMPLE, AUTOMATIC SCRAMS RESULTING FROM A TRANSIENT, AN EQUIPMENT FAILURE, A SPURIOUS SIGNAL, OR HUMAN ERROR.

ASSESSMENT

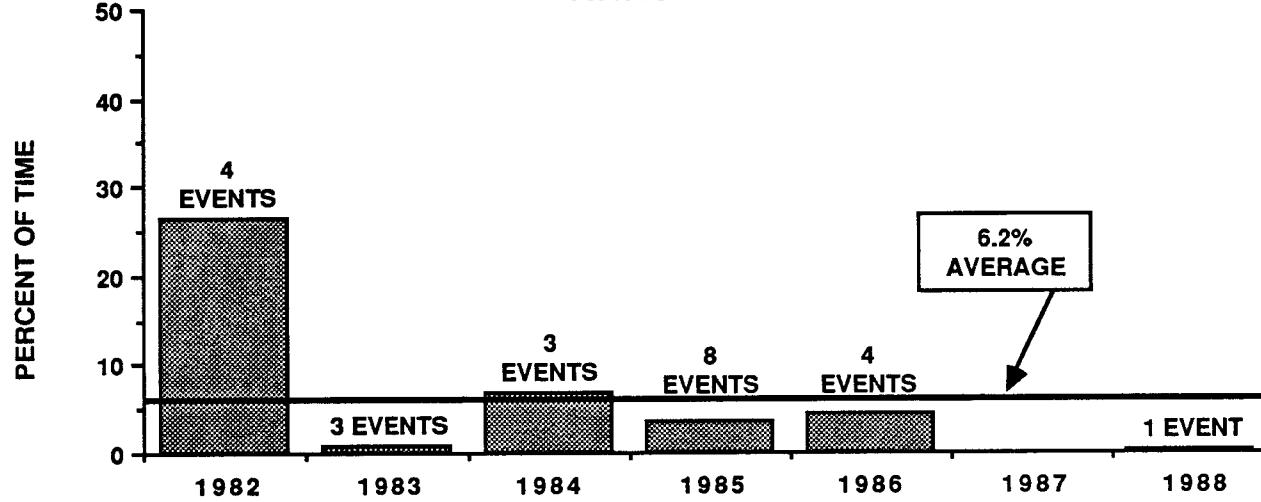
THERE WERE NO UNPLANNED AUTOMATIC SCRAMS DURING THE MONTH OF DECEMBER.

FORCED OUTAGES

MONTHLY



ANNUAL



PURPOSE

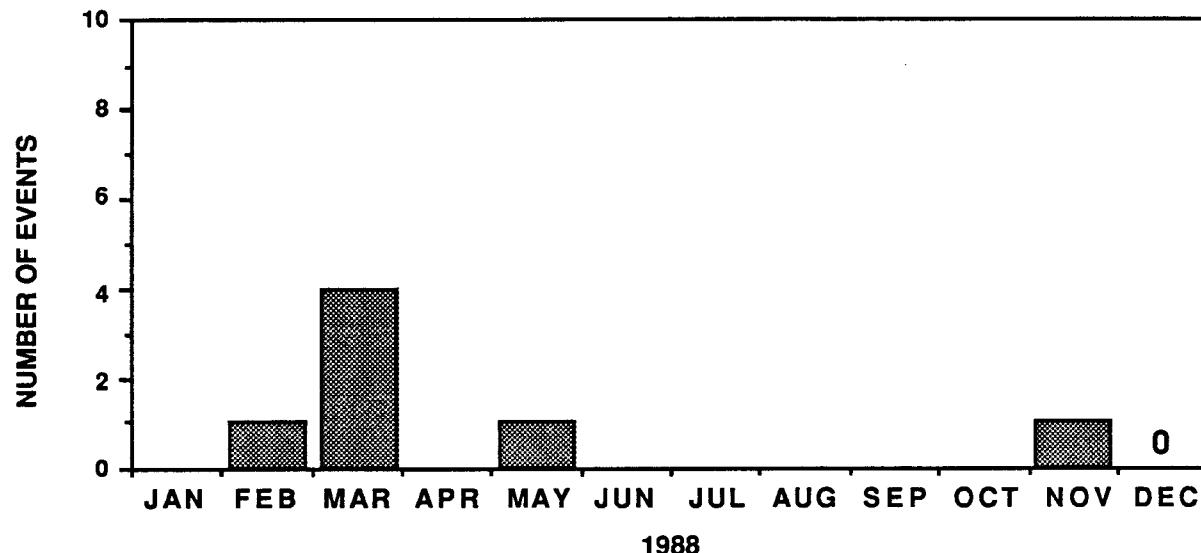
TO MONITOR THE PERCENTAGE OF TIME THAT THE REACTOR WAS NOT AVAILABLE FOR IRRADIATION TESTING DUE TO A FORCED SHUTDOWN. A FORCED SHUTDOWN IS ONE THAT WOULD NOT HAVE BEEN COMPLETED IN THE ABSENCE OF THE CONDITION FOR WHICH CORRECTIVE ACTION WAS TAKEN. TEST OUTAGES ARE NOT CONSIDERED FORCED SHUTDOWNS.

ASSESSMENT

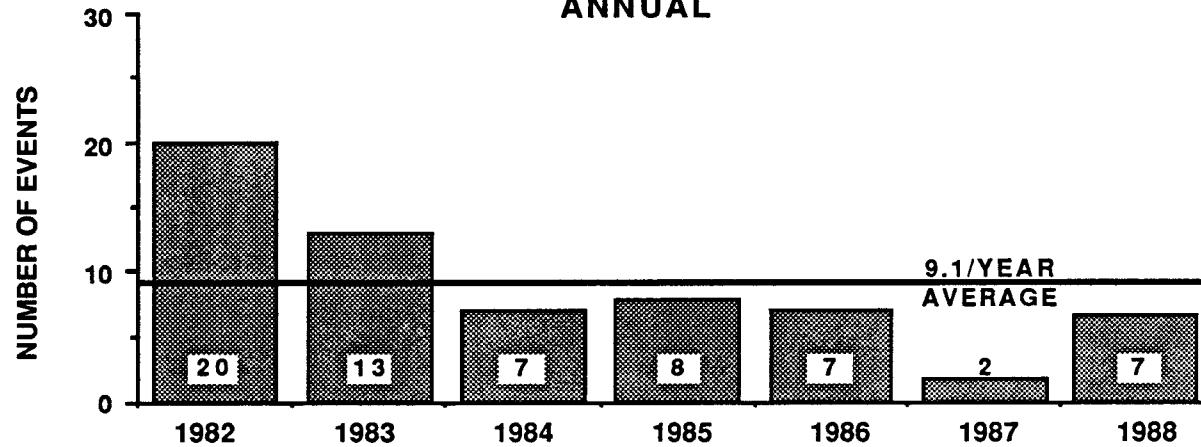
THERE WERE NO FORCED OUTAGES DURING THE MONTH OF DECEMBER.

UNUSUAL OCCURRENCE REPORTS

MONTHLY



ANNUAL



PURPOSE

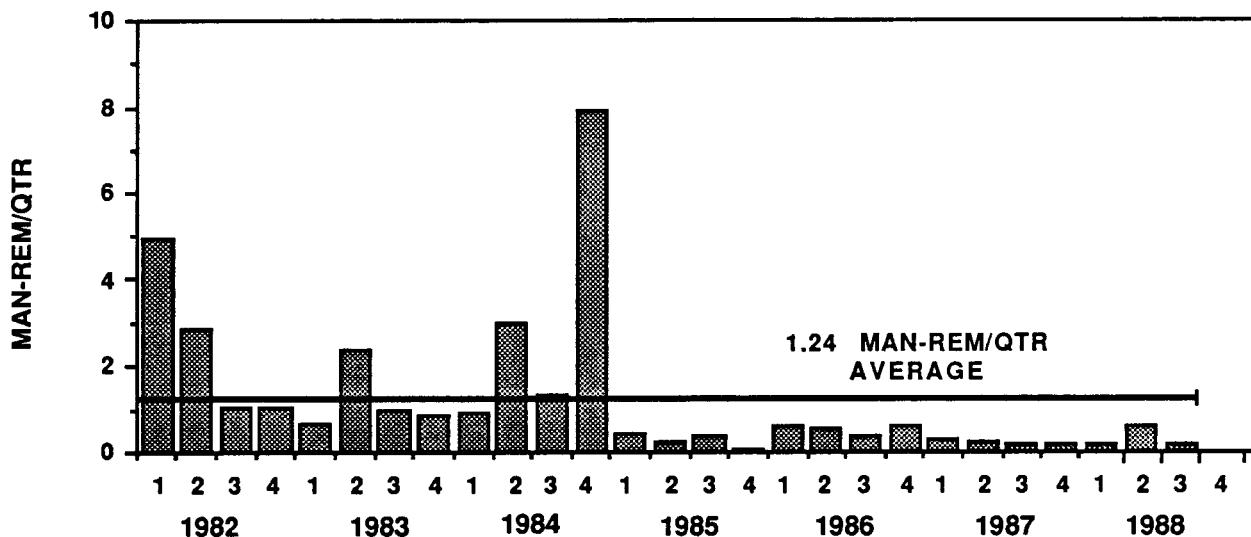
TO MONITOR THE NUMBER OF UNUSUAL OCCURRENCE REPORTS (UOR). A UOR IS AN EVENT OUTSIDE NORMAL OPERATIONS THAT CAUSES OR RISKS SERIOUS INJURY TO PERSONNEL, SERIOUS THREAT TO THE ENVIRONMENT, OR HAS SIGNIFICANT EFFECT UPON SAFETY, RELIABILITY OR COST OF FFTF OR FFTF PROGRAMS.

ASSESSMENT

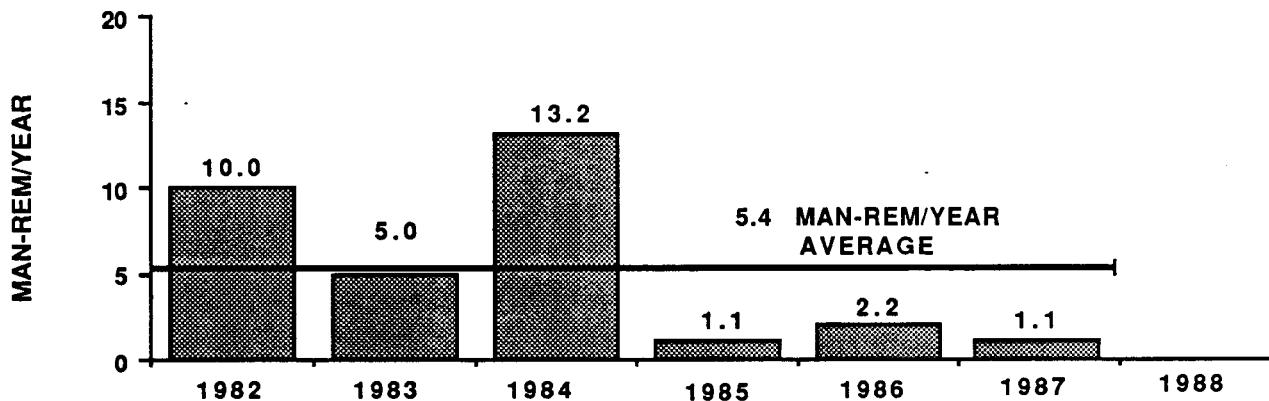
THERE WERE NO UNUSUAL OCCURRENCE REPORTS DURING THE MONTH OF DECEMBER.

PERSONNEL RADIATION EXPOSURE

QUARTERLY MAN-REM EXPOSURE



ANNUAL MAN-REM EXPOSURE



PURPOSE

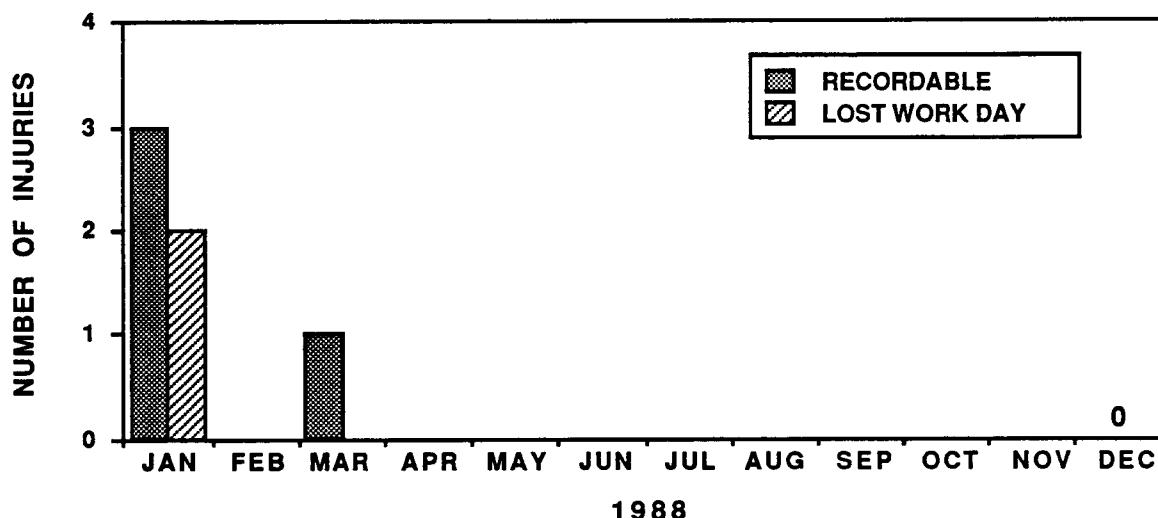
TO MONITOR THE QUARTERLY RADIATION EXPOSURE TO THE FFTF RADIATION WORKERS. DUE TO THE VERY LOW EXPOSURES, DATA IS COLLECTED AND REPORTED QUARTERLY.

ASSESSMENT

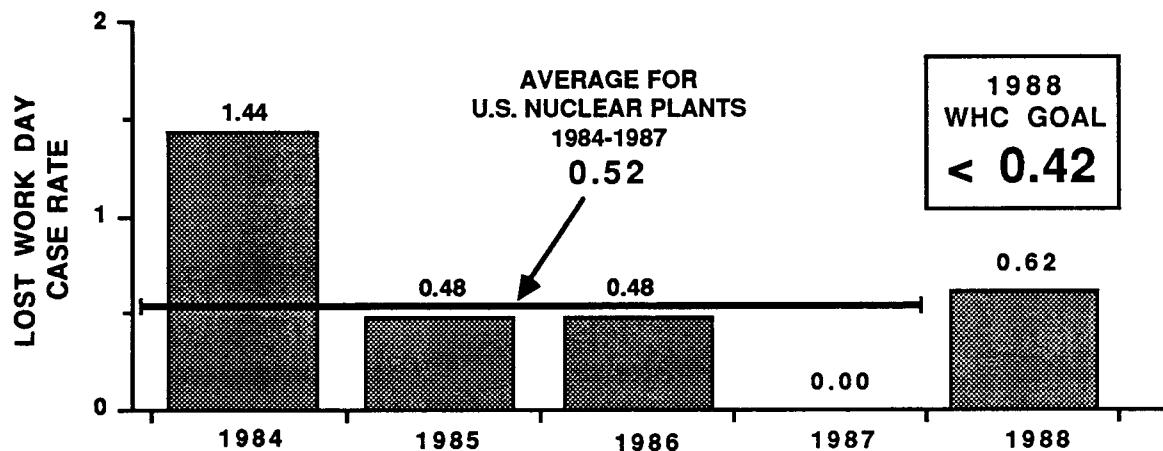
PLANT PERSONNEL RADIATION EXPOSURE DURING THE THIRD QUARTER OF 1988 REMAINED LOW. THE HIGHEST INDIVIDUAL EXPOSURE WAS 40 MREM. WITH 201 RADIATION WORKERS AT FFTF THE AVERAGE EXPOSURE WAS LESS THAN 4 MREMS PER WORKER PER QUARTER.

INDUSTRIAL SAFETY STATISTICS

MONTHLY INJURIES



ANNUAL LOST WORK DAY CASE RATE



PURPOSE

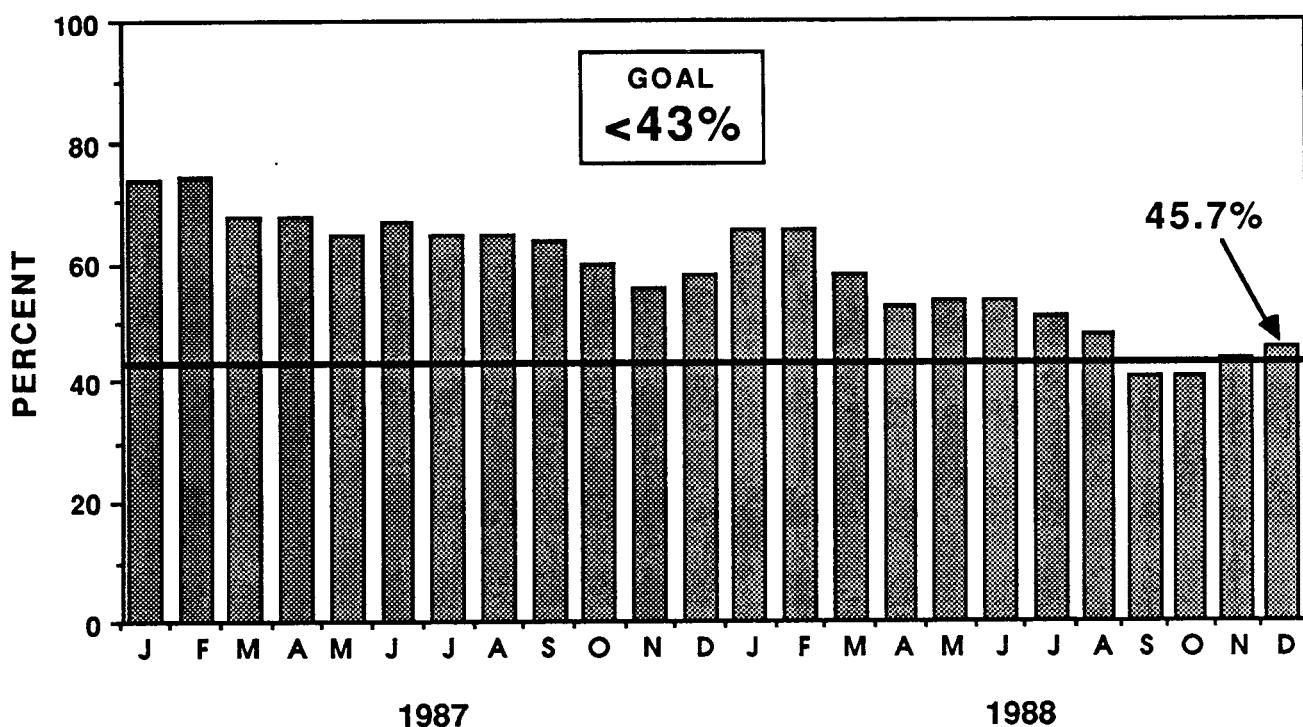
TO MONITOR THE NUMBER OF RECORDABLE AND LOST WORK DAY INJURIES. THE LOST WORK DAY INJURY INCIDENT RATE (THE NUMBER OF LOST TIME INJURIES PER 200,000 EMPLOYEE-HOURS) IS ALSO MONITORED FOR PERMANENT SITE PERSONNEL.

ASSESSMENT

THERE WERE NO OSHA RECORDABLE INJURIES AT FFTF DURING THE MONTH OF DECEMBER.

CORRECTIVE MAINTENANCE WORKOFF RATE

CORRECTIVE MAINTENANCE BACKLOG GREATER THAN THREE MONTHS OLD



PURPOSE

TO MONITOR THE RATE OF COMPLETION OF CORRECTIVE MAINTENANCE ITEMS. THIS CHART INDICATES THE EFFICIENCY OF THE FFTF WORK CONTROL PROCESS AND THE STAFF'S ABILITY TO FOLLOW THROUGH ON THE DISPOSITION, SCHEDULING, FIELD WORK, AND CLOSE OUT OF CORRECTIVE MAINTENANCE.

ASSESSMENT

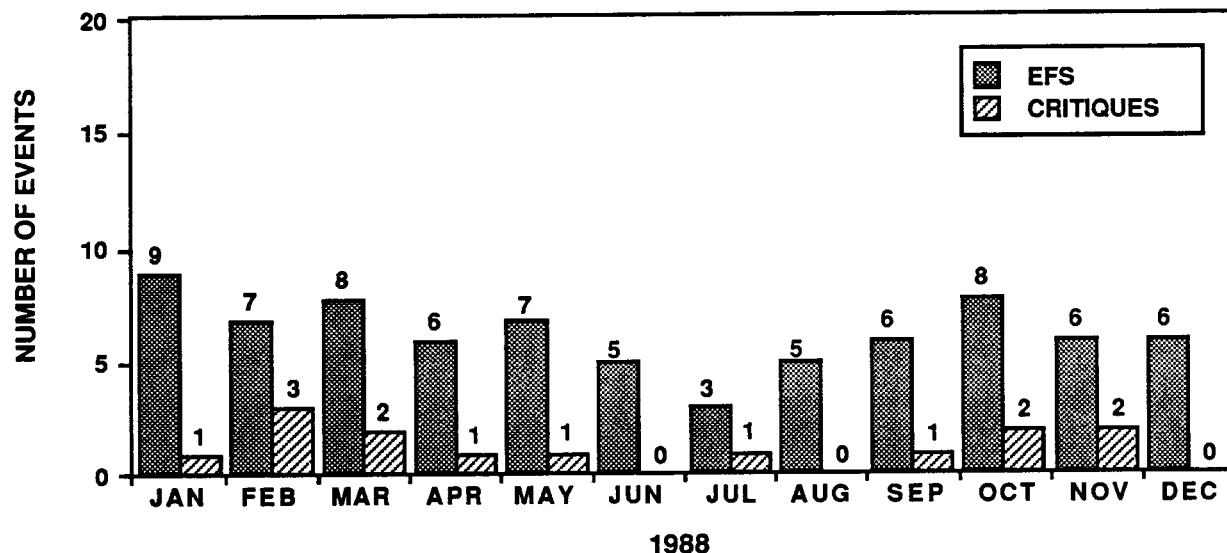
THE BACKLOG GREATER THAN THREE MONTHS MADE A SIGNIFICANT INCREASE TO 45.7% DURING THE MONTH OF DECEMBER. FOCUSING ON OTHER GOALS (MASF UPGRADES, FUSION MOTA, ETC.) HAVE DIVERTED SOME ATTENTION FROM THIS GOAL. INCREASED FOCUS ON THE PLANNING AND SCHEDULING OF OLDER CORRECTIVE MAINTENANCE ITEMS IS NEEDED TO REDUCE THIS PARAMETER.

TABLE 2
OTHER PERFORMANCE INDICATORS

<u>FIGURE</u>	<u>PERFORMANCE INDICATOR</u>	<u>AREA</u>
8	(TBD)	
9	(TBD)	
10	(TBD)	
11	Reportable Events	OPS
12	Outage Planning Performance (In Review)	MAINT
13	Corrective Maintenance Backlog	MAINT
14	Protective Maintenance Performance	MAINT
15	Modification Status (In Review)	ENG
16	Temporary Modification Status	ENG
17	Essential Drawing Status	ENG
18	(TBD)	
19	Staffing Status	PERS
20	(TBD)	
21	Solid Radioactive Waste	RADCON
22	Liquid Radioactive Waste	RADCON
23	Skin Contaminations	RADCON
24	Safety/Quality Commitments	QA
25	FFT Operating Histogram	OPS
26	Annual Operational Performance	OPS

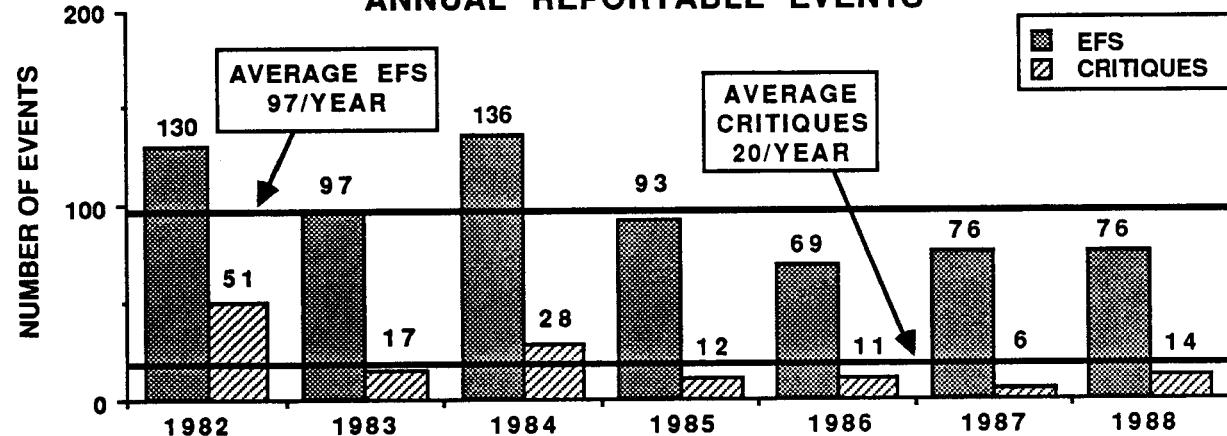
REPORTABLE EVENTS

MONTHLY REPORTABLE EVENTS



1988

ANNUAL REPORTABLE EVENTS



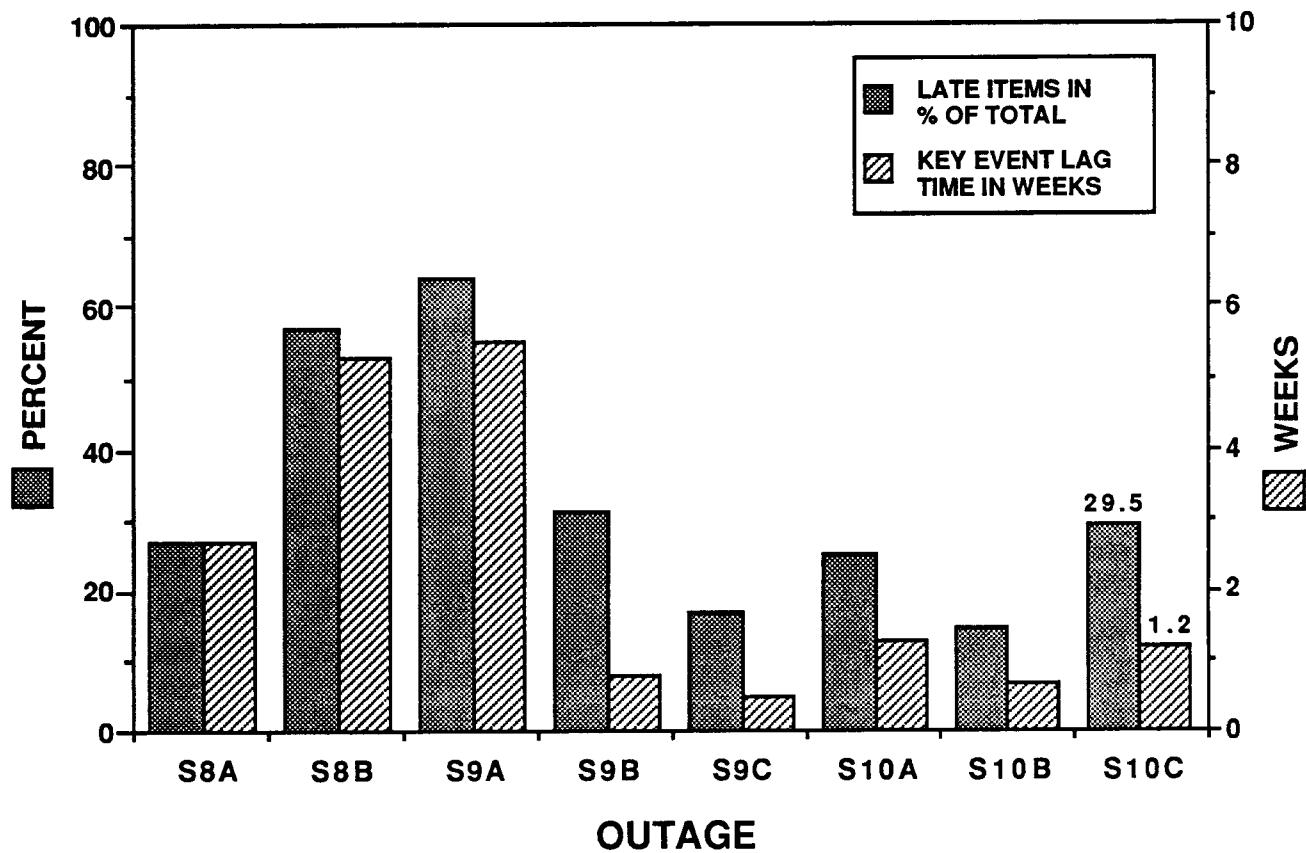
PURPOSE

TO MONITOR THE NUMBER OF EVENT FACT SHEETS (EFS) AND CRITIQUES. AN EVENT FACT SHEET RECORDS ANY SIGNIFICANT DEVIATION THAT MAY OR MAY NOT BE REPORTABLE AS A CRITIQUE OR UNUSUAL OCCURRENCE REPORT (UOR). A CRITIQUE IS AN EVALUATION OF THOSE EVENTS THAT DO NOT MEET THE CRITERIA FOR A UOR, BUT REQUIRE INVESTIGATION BEYOND THAT IDENTIFIED IN AN EFS.

ASSESSMENT

THERE WERE SIX EVENT FACT SHEETS AND NO CRITIQUES WRITTEN THIS MONTH.

OUTAGE PLANNING PERFORMANCE



PURPOSE

TO MONITOR THE PLANT STAFF'S ABILITY TO MEET OUTAGE PLANNING ACTION ITEM DUE DATES. BOTH PERCENTAGE OF ITEMS THAT ARE LATE AND KEY EVENT LAG TIME ARE PLOTTED. THESE PARAMETERS HAVE A DIRECT IMPACT ON MINIMIZING THE LENGTH OF PLANNED OUTAGES.

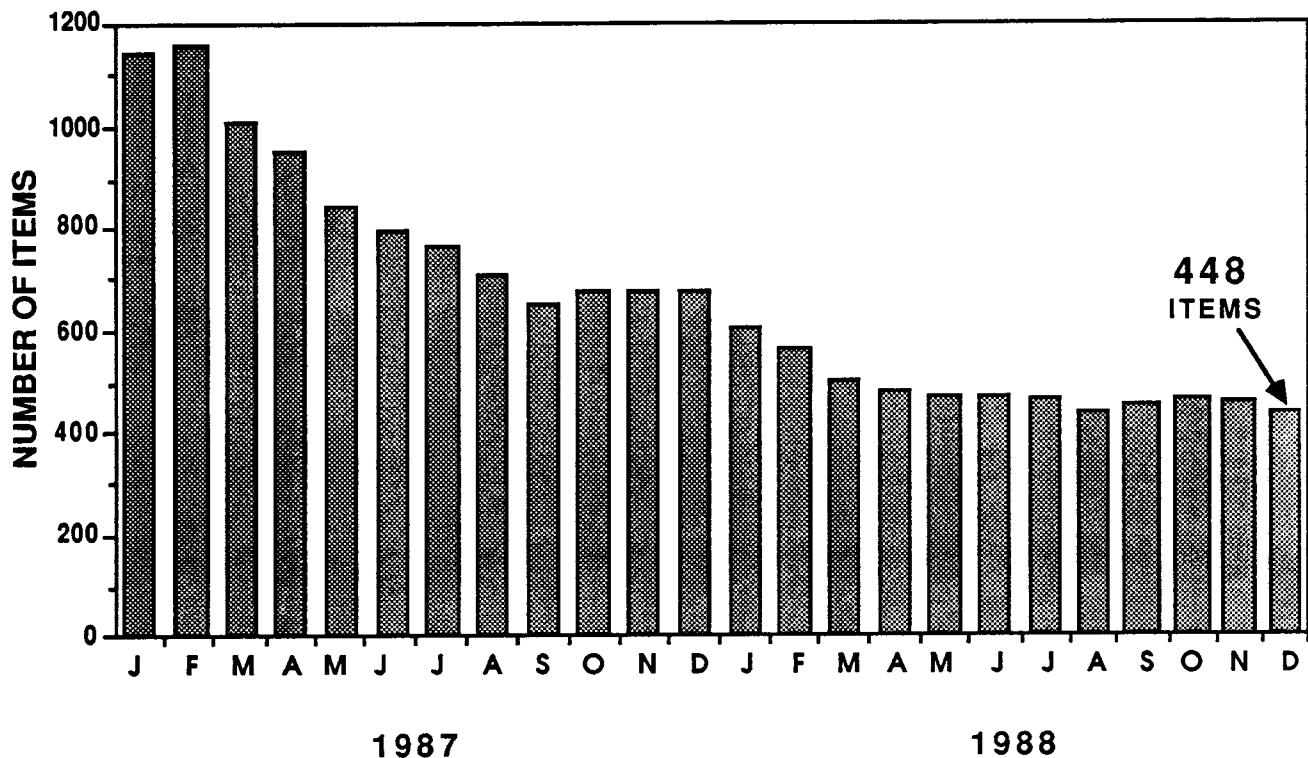
ASSESSMENT

PLANNING FOR THE S10C OUTAGE WAS IN PAR WITH PAST OUTAGES. PLANNING EFFORTS WERE AIDED BY THE THIRTY-DAY EXTENSION TO P10B OPERATION.

THIS INDICATOR IS UNDER REVIEW FOR REVISION.

CORRECTIVE MAINTENANCE BACKLOG

TOTAL CORRECTIVE MAINTENANCE BACKLOG



448
ITEMS

1987

1988

PURPOSE

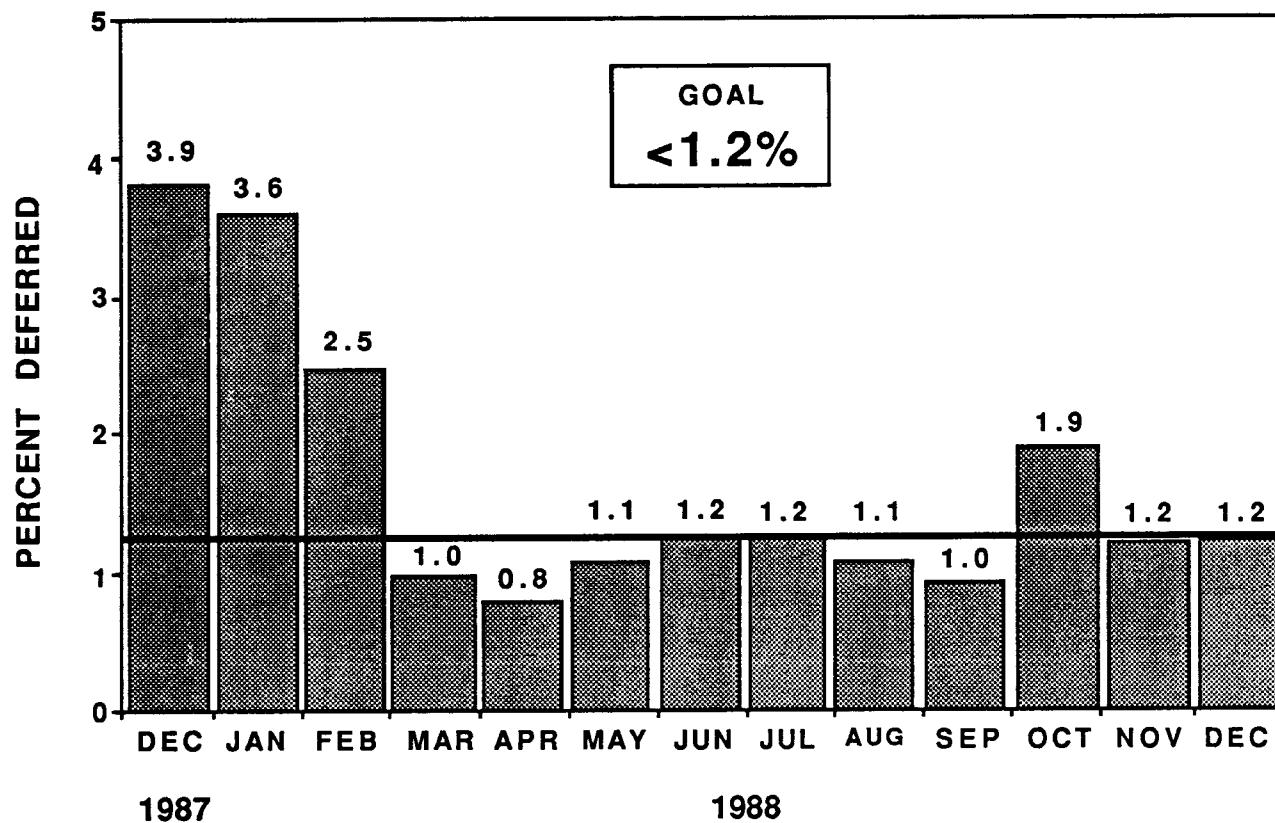
TO MONITOR THE OVERALL MATERIAL CONDITION OF THE FFTF. CORRECTIVE MAINTENANCE IS DEFINED AS ACTIVITY THAT REPAIRS, RESTORES, OR MODIFIES PLANT EQUIPMENT TO RESTORE IT TO THE INTENDED DESIGN CONDITION OR FUNCTION.

ASSESSMENT

THE TOTAL CORRECTIVE MAINTENANCE BACKLOG DECREASED SLIGHTLY TO 448 ITEMS DURING THE MONTH OF DECEMBER. THE CHANGE IS NOT SIGNIFICANT ENOUGH TO DETERMINE IF A TREND IS IN PROGRESS. HOWEVER, IT IS LARGE ENOUGH TO HAVE CAUSED A TWO PERCENT INCREASE IN THE PERCENTAGE OF ITEMS GREATER THAN THREE MONTHS OLD.

PROTECTIVE MAINTENANCE PERFORMANCE

PROTECTIVE MAINTENANCE ITEMS DEFERRED



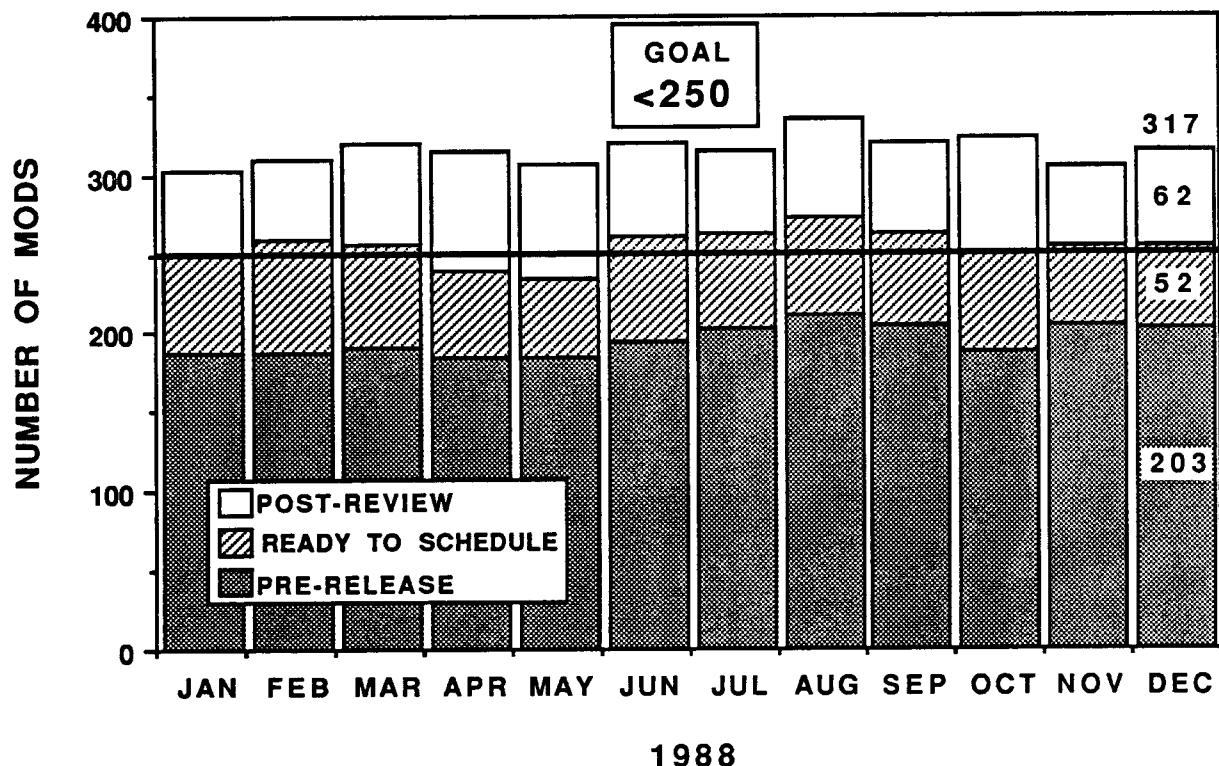
PURPOSE

TO MONITOR THE NUMBER OF PROTECTIVE MAINTENANCE (PMP AND ICR) ITEMS THAT HAVE BEEN DEFERRED. IT ILLUSTRATES THE ORGANIZATION'S ABILITY TO SCHEDULE AND COMPLETE ROUTINE MAINTENANCE.

ASSESSMENT

THE PROTECTIVE MAINTENANCE BACKLOG IS CURRENTLY AT 1.18%. MAINTENANCE OF THIS PARAMETER AT $<1.2\%$ IS CONTINGENT UPON BALANCING PROTECTIVE MAINTENANCE ACTIVITIES WITH CORRECTIVE MAINTENANCE WORK AND UTILIZING RESOURCES EFFECTIVELY THROUGH THE S10C-2 AND S11A OUTAGES.

MODIFICATION STATUS



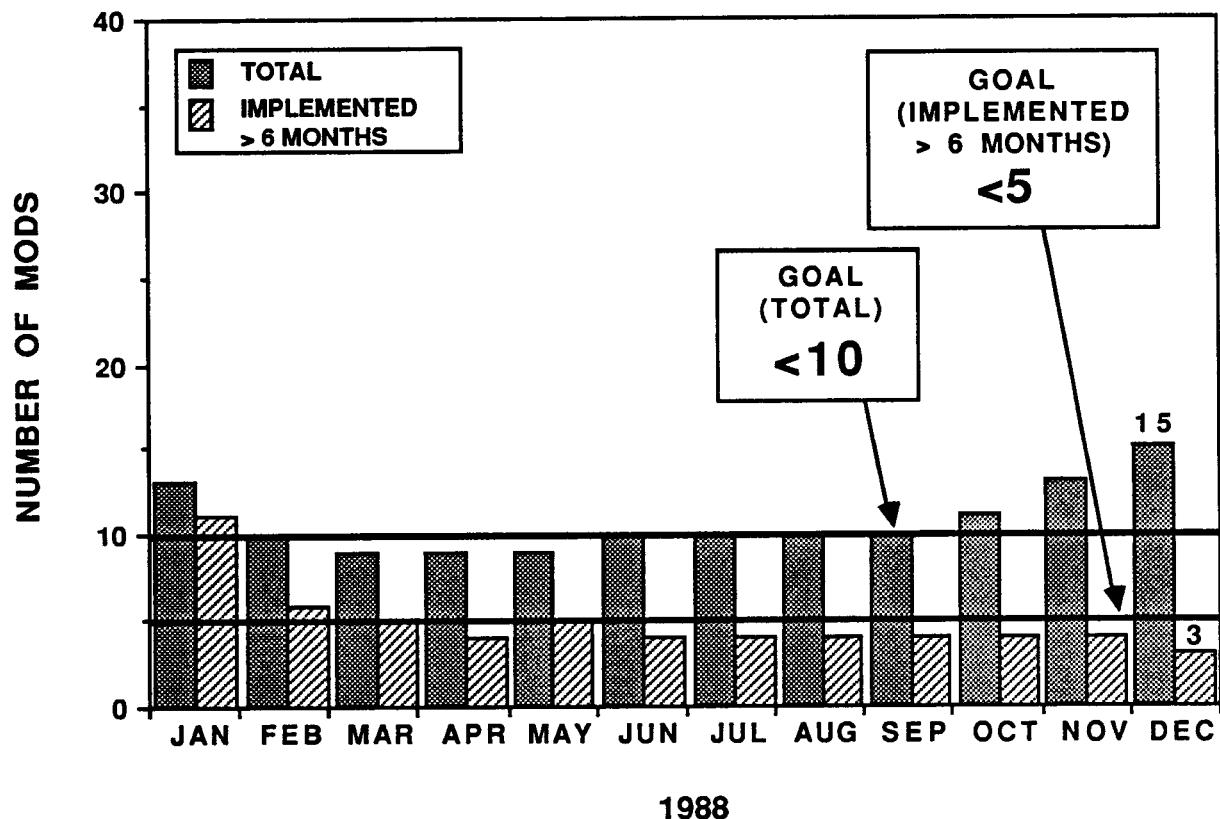
PURPOSE

TO MONITOR THE NUMBER OF PLANT MODIFICATIONS THAT ARE ACTIVE IN THE PLANT TRACKING SYSTEM (PTS). IT ILLUSTRATES THE ORGANIZATION'S ABILITY TO DESIGN, IMPLEMENT AND CLOSEOUT CHANGES IN THE PLANT.

ASSESSMENT

THE TOTAL NUMBER OF OUTSTANDING MODIFICATIONS INCREASED DURING DECEMBER. A NEW GOAL HAS BEEN SET AT <250 MODIFICATION PACKAGES OUTSTANDING. THIS AREA NEEDS ATTENTION IN ORDER TO ACCOMPLISH THIS GOAL.

TEMPORARY MODIFICATION STATUS



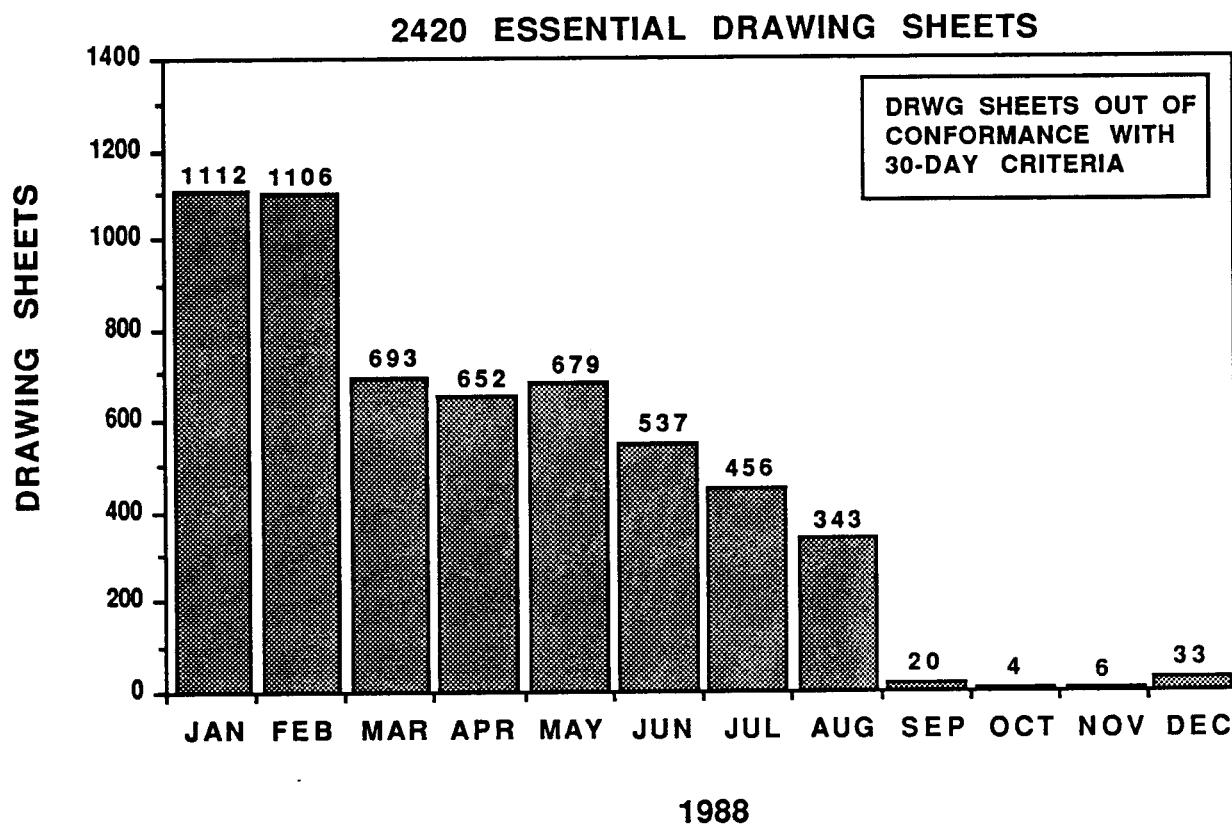
PURPOSE

TO MONITOR THE NUMBER OF MODIFICATIONS THAT ARE NOT PERMANENT. IT ALSO MONITORS THE ORGANIZATION'S ABILITY TO COMPLETE THE DOCUMENTATION AND PROVIDE PERMANENT CHANGES TO THE FFTF.

ASSESSMENT

THE TOTAL NUMBER OF TEMPORARY MODIFICATIONS HAS CONTINUED TO CLIMB. THE INCREASE IS DUE TO SIX TEMPORARY MODIFICATIONS BEING READIED FOR ILRT IN S11A.

ESSENTIAL DRAWING STATUS



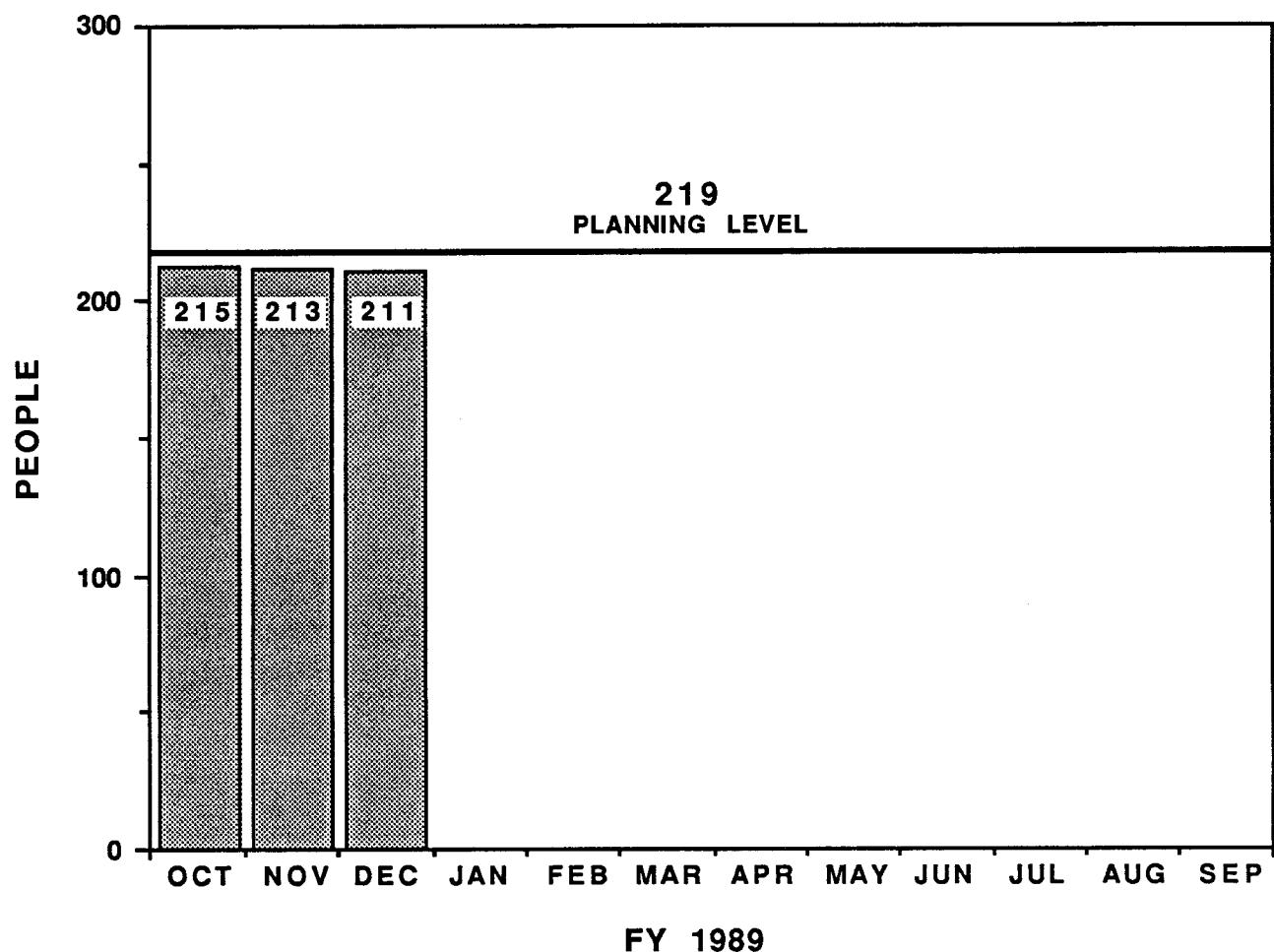
PURPOSE

TO MONITOR THE NUMBER OF ESSENTIAL DRAWING SHEETS ON WHICH CHANGES HAVE NOT BEEN INCORPORATED WITHIN THIRTY WORKING DAYS AFTER COMPLETION OF THE FIELD WORK PACKAGE.

ASSESSMENT

EXCELLENT PROGRESS IS BEING MADE TOWARD THE YEAR END GOAL OF ELIMINATING THE BACKLOG OF ESSENTIAL DRAWINGS THAT NEED TO BE UPDATED. IT APPEARS THAT A WORKING LEVEL OF 5 SHEETS IS A NORMAL BACKLOG. A TARGET TO MAINTAIN THE MONTH TO MONTH LEVEL LESS THAN 10 SHEETS IS REASONABLE.

DIRECT STAFFING



PURPOSE

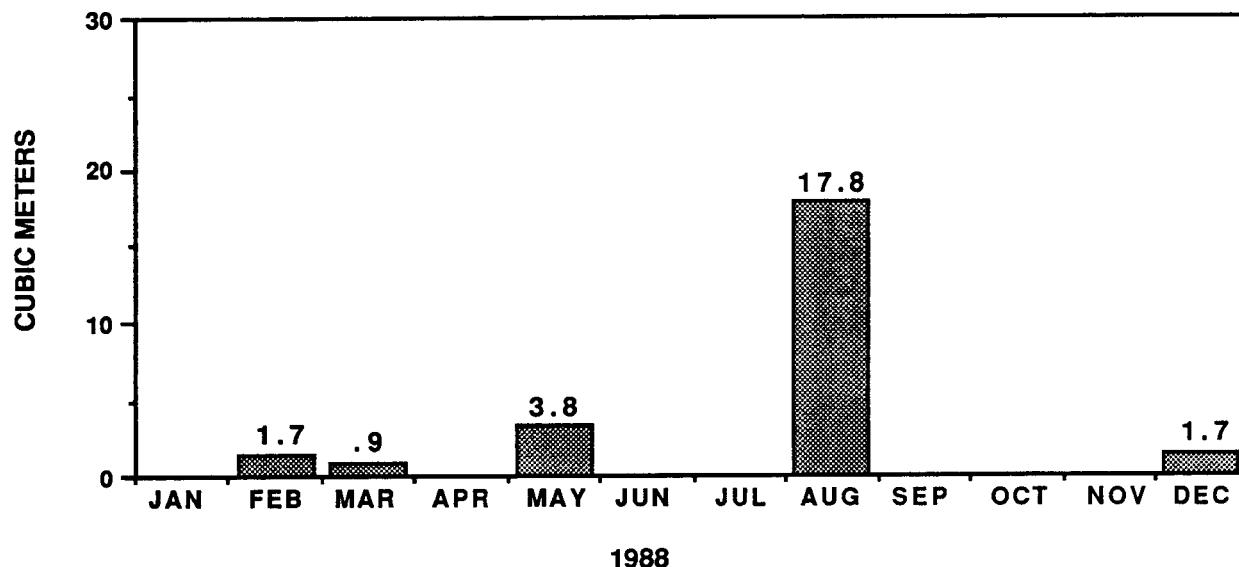
TO MONITOR THE NUMBER OF DIRECT STAFF. THE NUMBER OF DIRECT STAFF IS OBTAINED FROM MONTHLY MANPOWER REPORTS.

ASSESSMENT

THE NUMBER OF FFTF DIRECT STAFF REMAINED ESSENTIALLY THE SAME THROUGH DECEMBER, SLIGHTLY BELOW THE PLANNING LEVEL.

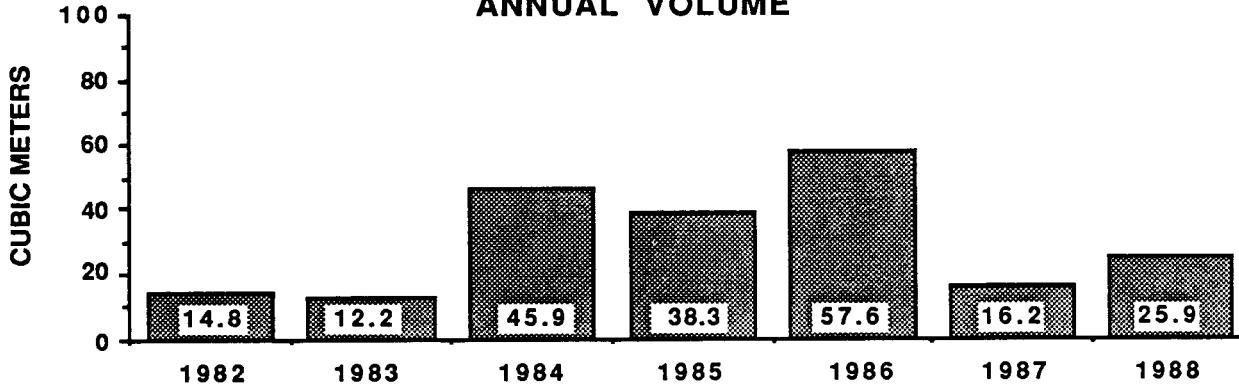
SOLID RADIOACTIVE WASTE

MONTHLY VOLUME



1988

ANNUAL VOLUME



PURPOSE

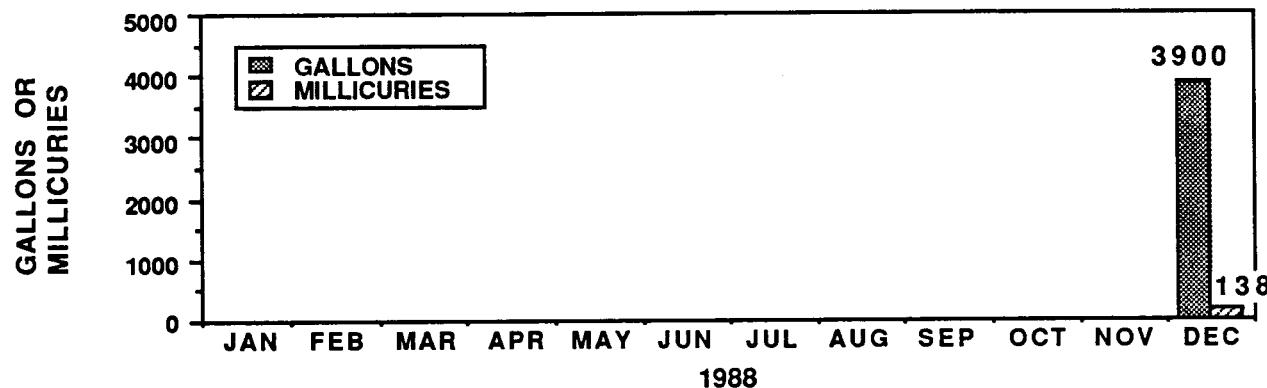
TO MONITOR THE VOLUME OF SOLID RADIOACTIVE WASTE THAT IS SHIPPED OFF THE FFTF SITE. SOLID RADIOACTIVE WASTE GENERATED FROM THE FFTF, IEM CELL, AND MASF ARE INCLUDED IN THE TOTALS.

ASSESSMENT

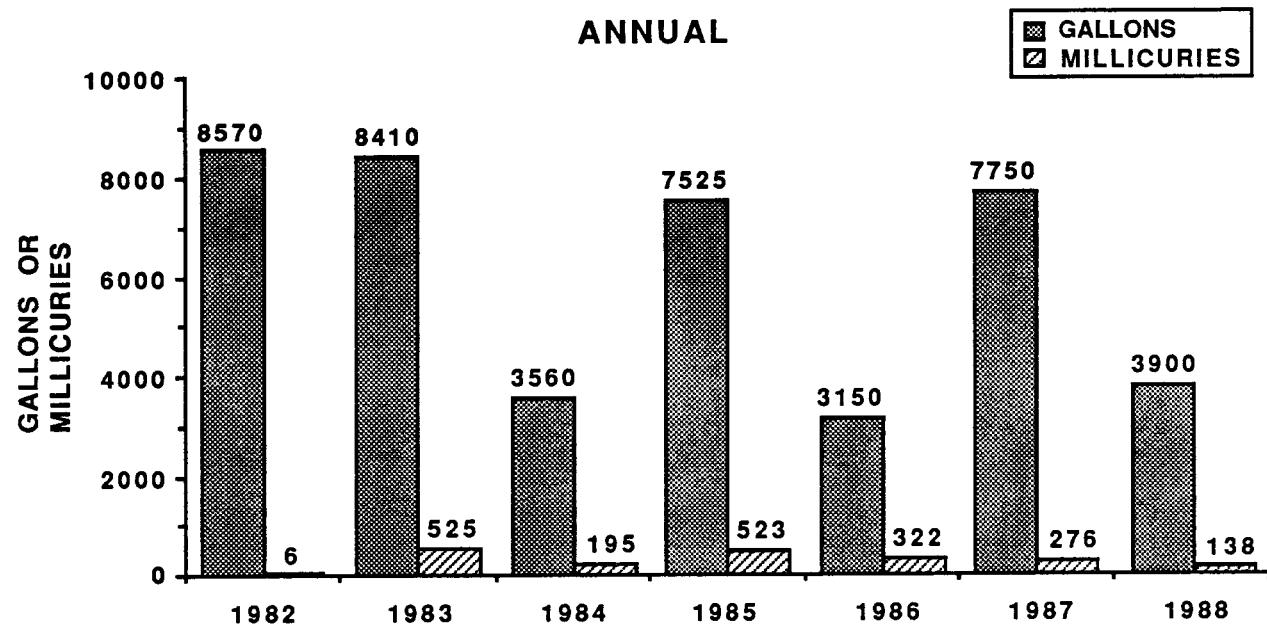
THERE WAS ONE SHIPMENT OF SOLID RADIOACTIVE WASTE DURING THE MONTH OF DECEMBER. THE SHIPMENT CONSISTED OF EIGHT COMPACTED DRUMS.

LIQUID RADIOACTIVE WASTE

MONTHLY



ANNUAL



PURPOSE

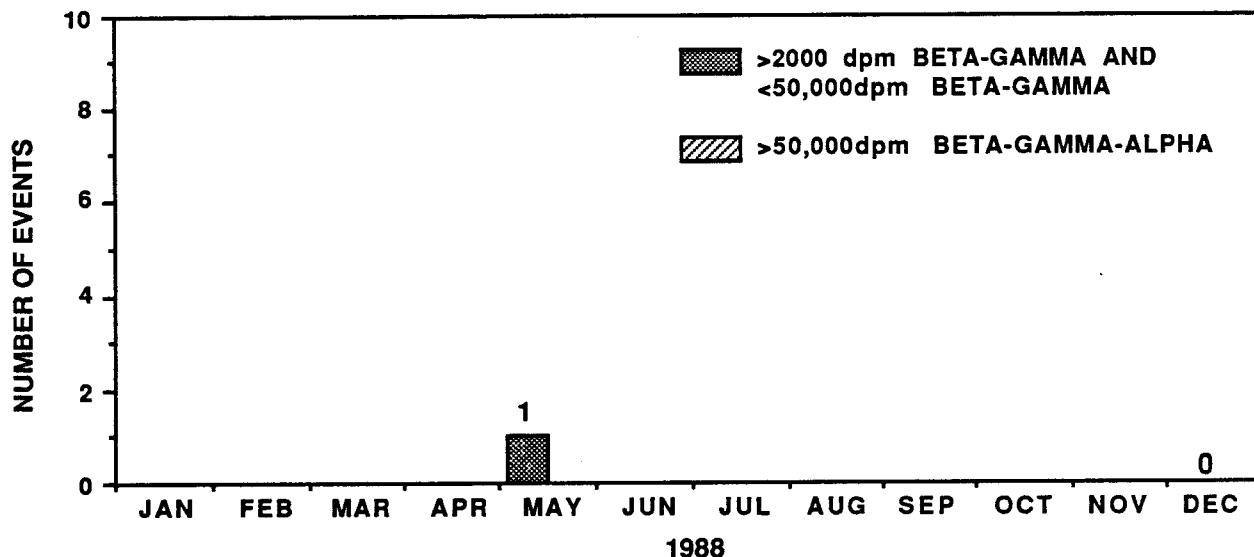
TO MONITOR THE VOLUME OF LIQUID RADIOACTIVE WASTE SHIPPED FROM STORAGE TANK T-103 TO THE RAILROAD TANK CAR FOR SHIPMENT OFF THE FFTF SITE.

ASSESSMENT

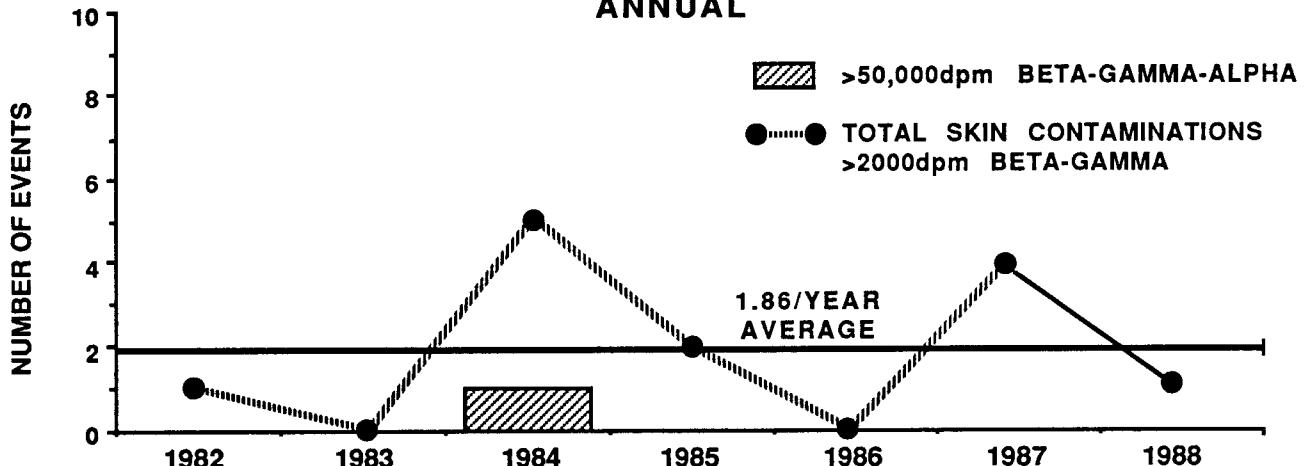
THERE WAS ONE SHIPMENT OF LIQUID RADIOACTIVE WASTE DURING THE MONTH OF DECEMBER, CONSISTING OF 3900 GALLONS AND 138 MILLCURIES.

SKIN CONTAMINATIONS

MONTHLY



ANNUAL



PURPOSE

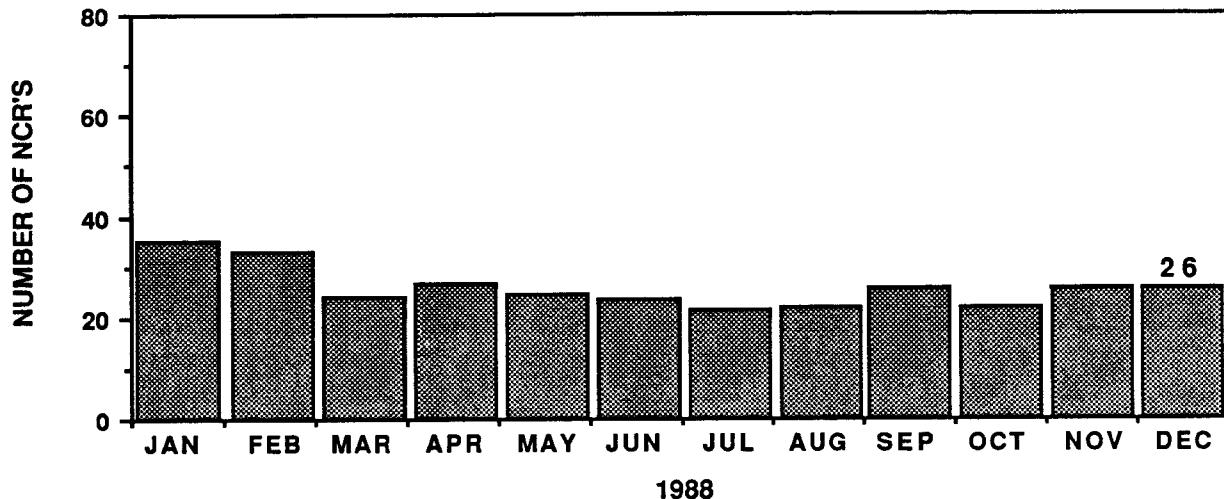
TO MONITOR THE NUMBER OF RECORDABLE AND SIGNIFICANT (REPORTABLE) SKIN CONTAMINATION EVENTS. A RECORDABLE SKIN CONTAMINATION EVENT IS ANY EVENT WITH DETECTABLE CONTAMINATION LEVELS ABOVE 2000 dpm/PROBE AREA BETA-GAMMA AND/OR 500 dpm/PROBE AREA ALPHA (NOT TO INCLUDE RADON/THORON ISOTOPES). A SIGNIFICANT (REPORTABLE) SKIN CONTAMINATION EVENT IS ANY EVENT WITH DETECTABLE CONTAMINATION LEVELS ABOVE 50,000 dpm/PROBE AREA BETA-GAMMA-ALPHA.

ASSESSMENT

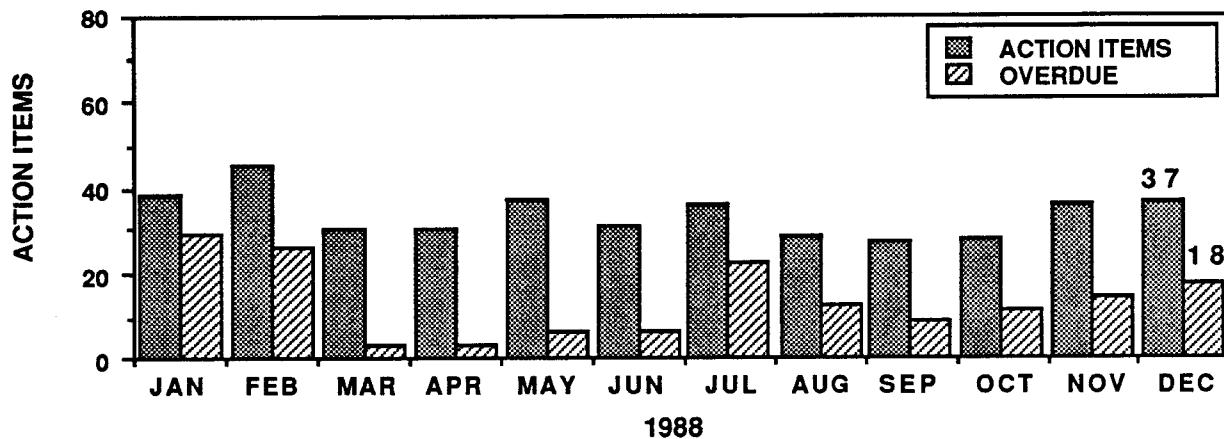
THERE WERE NO SKIN CONTAMINATION EVENTS IN THE 400 AREA DURING THE MONTH OF DECEMBER.

SAFETY/QUALITY COMMITMENTS

NON CONFORMANCE REPORTS



ACTION ITEMS



PURPOSE

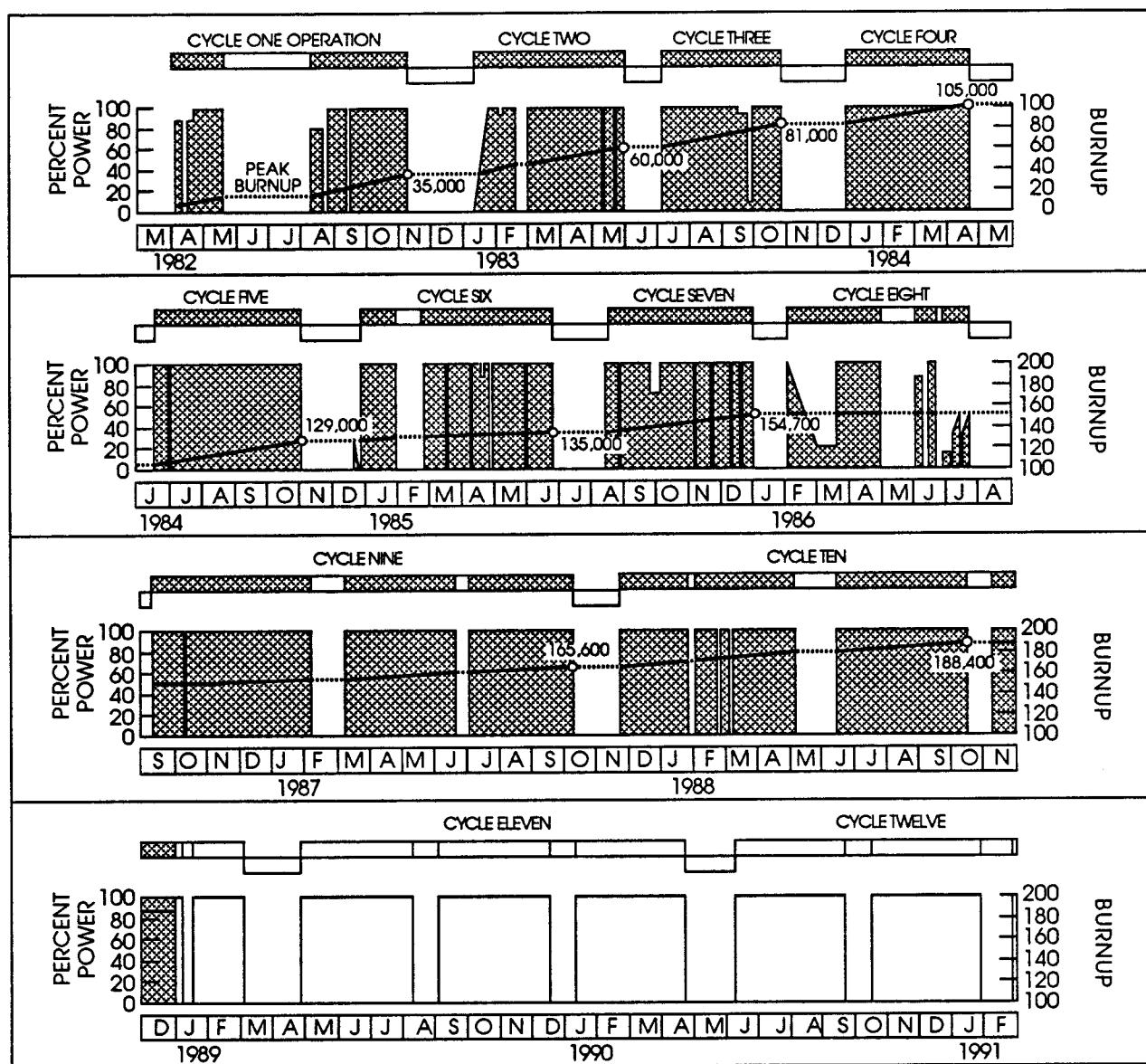
TO MONITOR THE NUMBER OF NONCONFORMANCE REPORTS (NCR) AND ACTION ITEMS RESULTING FROM REPORTABLE EVENTS, CRITIQUES, AND UOR'S. THE NUMBER OF OVERDUE ACTION ITEMS IS ALSO MONITORED TO MEASURE RESPONSIVENESS TO COMPLETING IDENTIFIED ACTION ITEMS.

ASSESSMENT

THE NUMBER OF OPEN NCR'S REMAINS AT 26.

THE NUMBER OF ACTION ITEMS WHICH ARE OVERDUE ONCE AGAIN INCREASED IN DECEMBER. EFFORTS HAVE BEEN INITIATED TO DRIVE THIS NUMBER TOWARDS THE DESIRED GOAL OF ZERO.

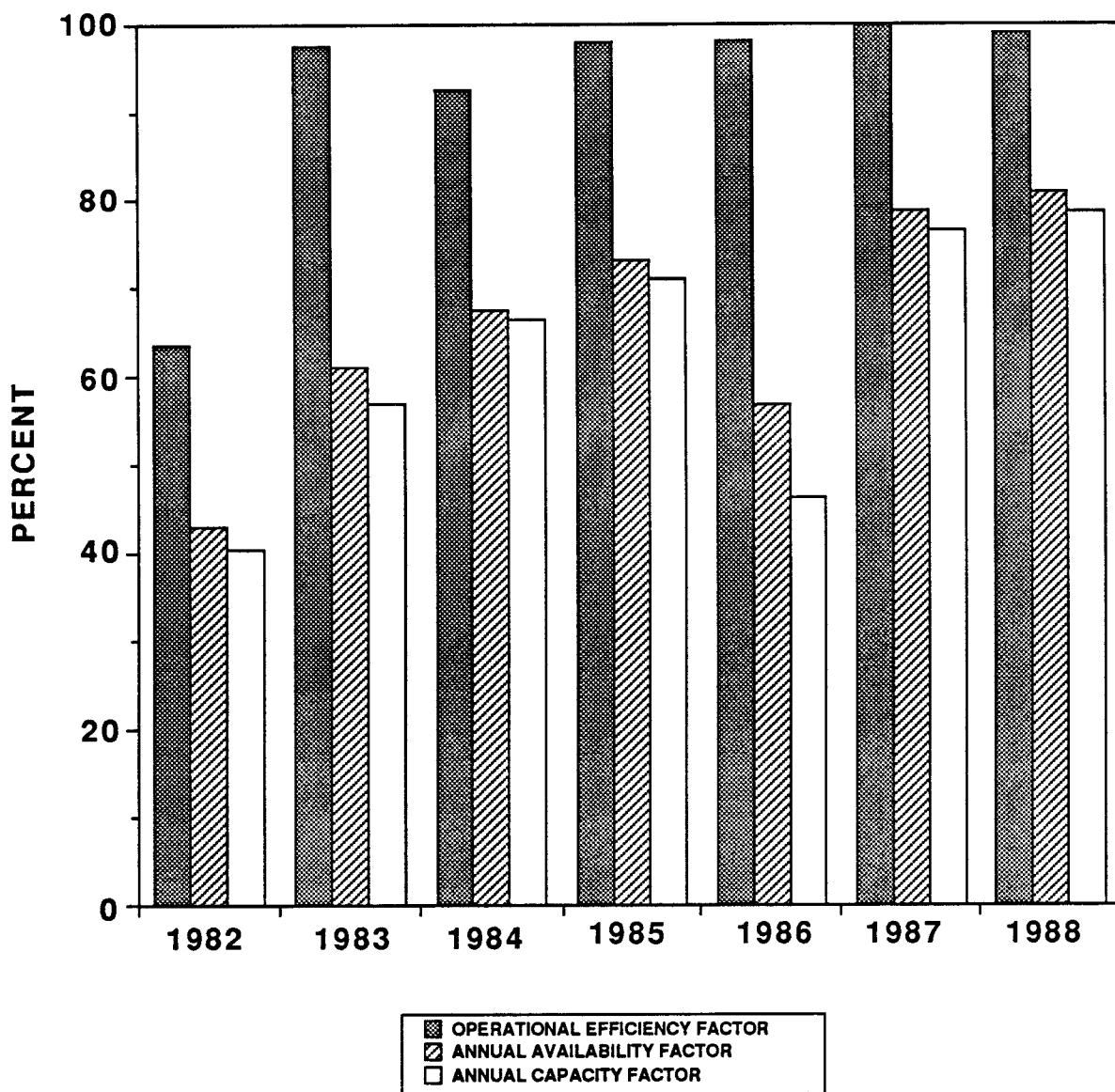
FFTF OPERATING HISTOGRAM



OPERATING STATISTICS

	CYCLE 1	CYCLE 2	CYCLE 3	CYCLE 4	CYCLE 5	CYCLE 6	CYCLE 7	CYCLE 8	CYCLE 9	CYCLE 10 (12/31/88)
EFPD FOR CYCLE:	101.5	100.5	101.5	109.5	122.7	134.0	122.8	63.0	341.8	328.1
TOTAL PLANT EFPD AT END OF CYCLE:	134.3	234.8	336.3	445.8	568.5	702.5	825.3	888.3	1230.1	1558.2
CYCLE CAPACITY FACTOR (%):	50.3	83.1	93.5	99.5	93.5	74.9	90.3	38.9	86.6	80.2
AVAILABILITY FACTOR (%):	53.0	90.6	99.0	100.0	94.6	78.5	94.6	57.9	89.6	83.2
NUMBER OF EXPERIMENTS:	61	64	57	51	51	41	31	19	44	38
MAXIMUM FUEL BURNUP AT END OF CYCLE (MWd/MT):	35,000	60,000	81,000	105,000	129,000	135,000	154,700	154,700	165,600	188,400

ANNUAL OPERATIONAL PERFORMANCE



	1982*	1983	1984	1985	1986	1987	1988
CAPACITY FACTOR (%):	40.5	56.9	66.4	71.0	46.2	76.5	78.5
AVAILABILITY FACTOR (%):	42.8	61.1	67.6	73.0	56.8	78.7	81.2
OPERATIONAL EFFICIENCY FACTOR (%):	63.5	97.6	92.6	98.0	98.1	100.0	98.9

* Reporting began at start of Cycle 1 on April 16, 1982

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January 1989