DOE/SSDP--0053

DE90 001657

SHIPPINGPORT STATION DECOMMISSIONING PROJECT

Removal Of Piping & Equipment

And

Removal Of Primary System Components

Topical Report

October 17, 1989

Prepared By:
Westinghouse Hanford Company
Shippingport Station Decommissioning Project Office
Shippingport, Pennsylvania
Under Contract DE-AC06-87RL10930

for the
U.S. Department of Energy
Shippingport Station Decommissioning Project Office

ABSTRACT

This report is a technical synopsis of the removal of contaminated and non-contaminated piping and equipment from the Shippingport Station Decommissioning Project (SSDP). The information is provided as a part of the Technology Transfer Program to document dismantling activities in support of reactor decommissioning.

ACKNOWLEDGMENTS

General Electric Company (GE) and Mk-Ferguson Company (MK) - as the Decommissioning Operations Contractor (DOC) developed the A/S 4 & 5 Specification, performed the procurement of the subcontract and managed the subcontractor's performance of work.

Westinghouse Hanford Company (WHC) - in the role of Technical support Contractor to the U.S. Department of Energy (DOE), reviewed the A/S 4 & 5 specification and consulted with the DOC in the development of the workscope and its technical content. WHC performed the photographic documentation of the work.

TLG/Cleveland Wrecking Company Inc. (TLG/CWC) - was the prime subcontractor for the pipe, equipment and primary components at SSDP. TLG Services, Inc. provided engineering support and Cleveland Wrecking Company managed the field operations.

DOC Force Account (F/A) - was the labor force employed by the DOC and managed by MK-Ferguson. The Force Account performed dismantling tasks and provided decommissioning support for other subcontractors.

NORALCO, Corp. - was the subcontractor for the demolition of non-contaminated structures (A/S 8B). During demolition activities in the RWP Yard Noralco removed contaminated drains from the building foundations and the yard areas.

CONTENTS

APPENDICES

FIGURES

TABLES

PHOTOGRAPHS

ACRONYMS

A/S	Activity Specification
AER	Auxiliary Equipment Room
ALARA	As Low As Reasonably Achievable
CER	Contaminated Equipment Room
CSCA	Controlled Surface Contamination Area
ConCom	Configuration and Communication Control
DAW	Dry Active Wastes
DOC	Decommissioning Operations Contractor
DOE	Department of Energy
F/A	Force Account
FHB	Fuel Handling Building
GE	General Electric Company
HDS	Heat Dissipation System
HEPA	High Efficiency Particulate Air (filter)
HVAC	Heating, Ventilating and Air Conditioning
LSA	Low Specific Activity
MER	Mechanical Equipment Room
NPT	National Pipe Thread
ORR	Operational Readiness Review
PCB	Polychlorinated Biphenyl
RCA	Radiologically Controlled Areas
RCT	Radiological Controls Technician
RPSB	Reactor Plant Service Building
RWP	Radioactive Waste Processing
SIS	Safety Injection System
SRPD	Self Reading Pocket Dosimeter
SSDP	Shippingport Station Decommissioning Project
SSDPO	Shippingport Station Decommissioning Project Office
TLG/CWC	TLG/Cleveland Wrecking Company

EXECUTIVE SUMMARY

The Shippingport Atomic Power Station was the first large-scale commercial nuclear power plant in the United States. The SSDP is also the first large-scale nuclear power decommissioning project. As a federally funded project managed by DOE, three performance objectives were mandated:

- Demonstrate the safe and cost-effective decommissioning of a large-scale commercial nuclear power plant, using existing state-of-the-art technology in removal of government-owned facilities and radioactive portions of the station to meet standards for unrestricted use of the site.
- Induce transfer of decommissioning technology in the U.S. nuclear industry by using subcontractors to perform discreet elements of the workscope.
- Document the experience gained at SSDP for technology transfer to the nuclear industry.

This Topical Report was developed in support of the SSDP Technology Transfer Program. The report covers initial management decisions, engineering requirements, operations, schedule performance, tools and equipment, waste handling and lessons learned. Selected photographs of the piping and equipment removal tasks are provided in the text where appropriate.

Highlights

The piping and equipment removal at SSDP was significant in that it resulted in the transition from an operating facility to an empty facility ready for final decontamination and demolition. Some of the highlights included:

- Piping and equipment removal was the largest subcontract activity at the SSDP.
- Large primary system components were removed in one piece and sealed as their own burial containers (refer to Section 2.1.1).
- Asbestos insulation was removed intact with steam and condensate piping from trenches in the radwaste yard. This approach eliminated duplication of effort for separate removal of asbestos and piping (refer to Section 2.1.4).
- Direct egress paths did not exist in all of the underground plant areas for the removal of segmented pipe and equipment. This was resolved by cutting large access holes in the underground steel chambers (the primary containment) (refer to Sections 5.2.5 and 5.2.6).
- Contamination control methods were employed which permitted thermal torch cutting of internally contaminated piping, without compromising the contamination control standards established in the project Radiological Control Manual (refer to Section 4.1).
- Embedded contaminated piping that would have been too costly to remove from concrete floors was decontaminated in-situ, filled with concrete and abandoned in-place (refer to Section 5.2.7.1).
- Segmentation of some slightly radioactive components was performed in open-air without exceeding the off-site airborne contamination limits (refer to Section 5.2.9, Reactor Chamber Dome).

Schedule Performance

The original workscope for the piping and equipment removal activities and the additional workscope items were completed on schedule. Refer to Section 3.1 for a discussion of schedule performance.

Activity Cost

The piping and equipment removed at SSDP was a fixed price, competitively bid subcontract awarded to TLG/Cleveland Wrecking Company Inc. The original contract price was $6,870,000 and because of additions to the workscope, completed for $7,576,087.

Portions of the A/S 4 & 5 workscope were also performed by the DOC Force Account for $403,000.

Contaminated piping that was not identified as a part of the A/S 4 workscope was discovered during demolition in the RWP Yard. This piping was subsequently removed by Noralco (the non-contaminated structures demolition subcontractor) for $134,746.

SHIPPINGPORT STATION DECOMMISSIONING PROJECT PIPING & COMPONENTS REMOVAL TOPICAL REPORT

1.0 INTRODUCTION

The Shippingport Atomic Power Station was the first large-scale commercial nuclear power plant in the United States, joining the Duquesne Light Company grid in December 1957. The station was located on the south bank of the Ohio River at Shippingport, Pennsylvania, on a seven-acre site. The reactor plant containment system consisted of four large interconnected steel chambers, housed in concrete enclosures, which were almost entirely underground. The Fuel Handling Building (FHB) was above the Reactor and Auxiliary Chambers. Support systems were contained in rooms that adjoined the FHB. Radwaste facilities were located in a separate building and in underground vaults and trenches. Figure 1 provides a plan view of the primary containment chambers and concrete enclosures. Figure 2 is a site plot plan that depicts the orientation of the primary containment chambers and the above-ground plant structures.

On September 6, 1984, the Shippingport Station Decommissioning Project Office (SSDPO) of the Department of Energy (DOE) assumed responsibility for the site. Like all power reactors, the Shippingport Station contained a large inventory of piping, heat exchangers, tanks, pumps, valves, fans, ductwork and miscellaneous equipment. The removal of piping and equipment is one of the most important activities in reactor plant decommissioning, due to:

1. Radiological Significance

- Removal of pipe and equipment results in the most significant reduction in plant area dose rates.
- The potential for radiation exposure to and contamination of dismantling workers, due to the repetitive cutting, handling and packaging of radioactively contaminated piping and components.

2. Waste Volume

- Radioactively contaminated pipe and equipment represent the largest volumetric and weight source of radioactive waste in the decommissioning of a light water reactor.

3. Cost Impact

- The removal of piping and equipment normally represents the highest direct cost decommissioning activity, as it was at SSDP.

The SSDP was initiated in November of 1979 with the start of the engineering and planning phase, which resulted in the development of a twelve-volume Decommissioning Plan (Reference 1). The technical baseline in the Decommissioning Plan specified the removal of piping and equipment in Activity Specification (A/S) 4 and the removal of primary system components in A/S 5.

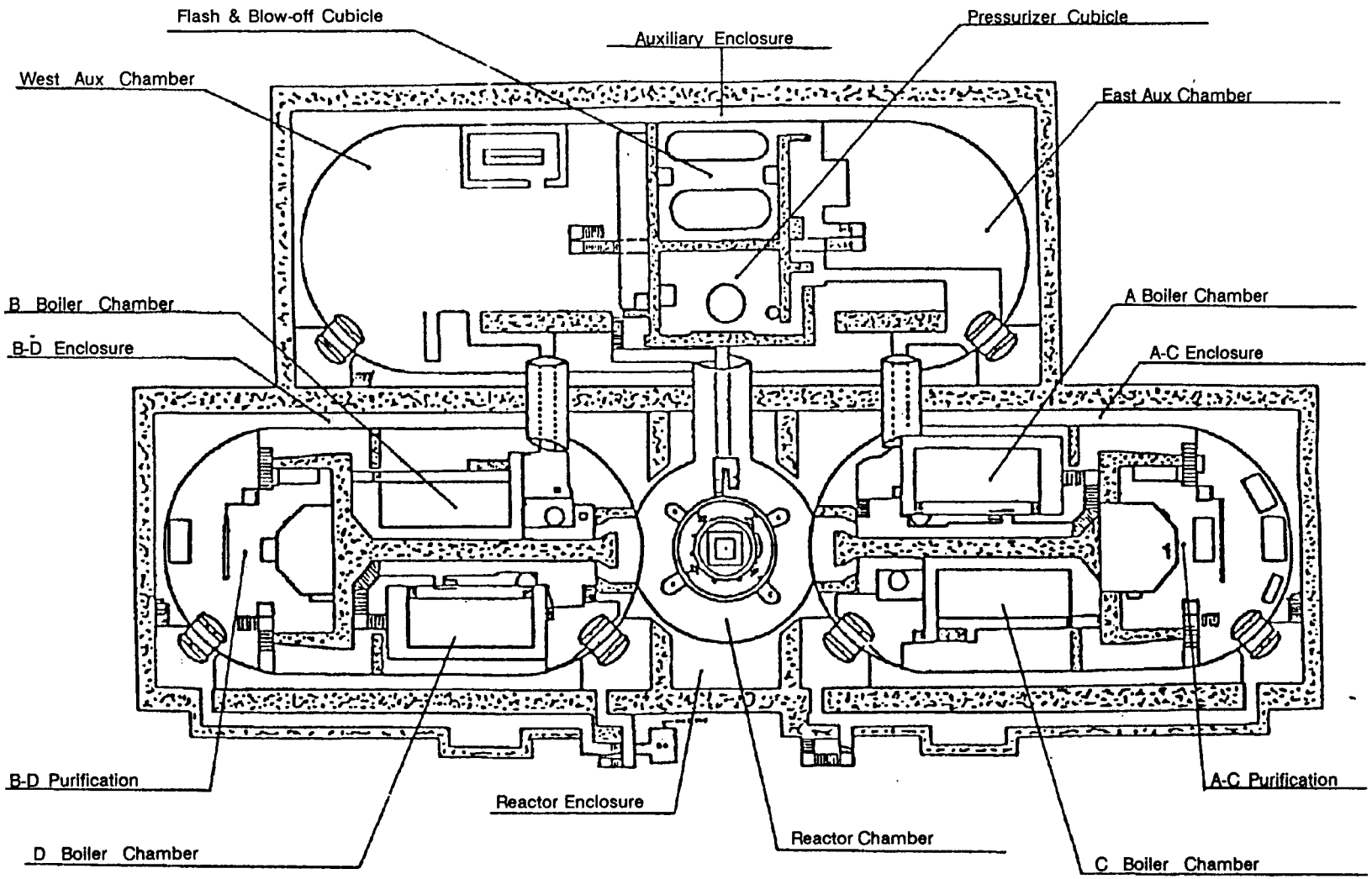


Figure 1
Plan View of Primary Containment Chambers and Concrete Enclosures

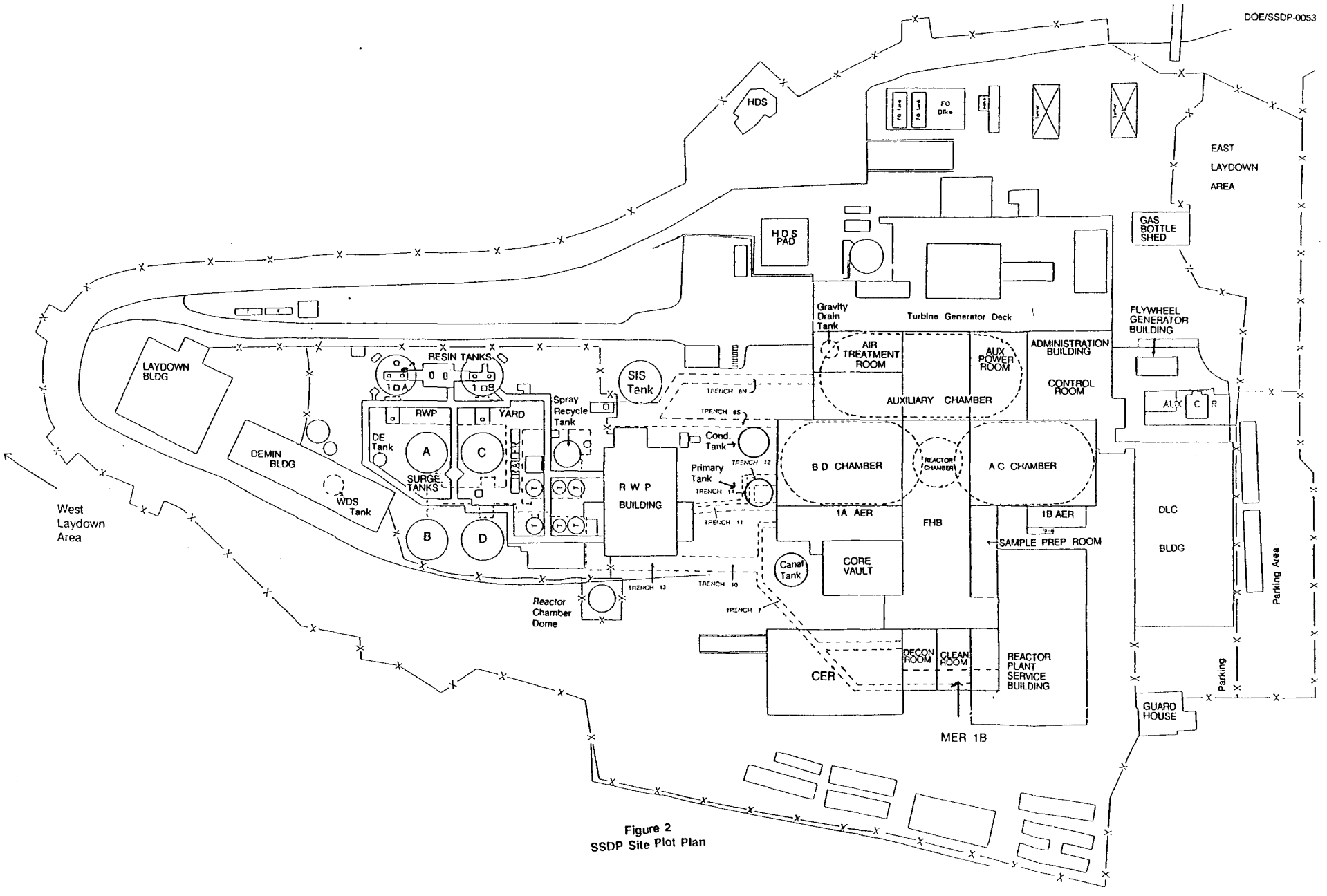


Figure 2
SSDP Site Plot Plan

The Decommissioning Operations Contractor (DOC) was responsible for overall decommissioning management. This work was performed by the prime contractor General Electric Company with their fully integrated subcontractor, MK-Ferguson Co. The DOC was required to optimize the awarding of dismantling work to other subcontractors. The contract for removal of piping and equipment and primary system components was therefore competitively bid and awarded to a joint venture between TLG Engineering and Cleveland Wrecking Company, Inc. (TLG/CWC). DOC management also utilized its own labor force, the DOC Force Account (F/A), for support tasks and a number of discrete A/S 4 & 5 dismantling tasks.

2.0 SPECIFICATION DEVELOPMENT

The technical specification for removal of piping and equipment and primary system components (Reference 2) was based on the Decommissioning Plan Activity Specifications of the same name. The workscope in the technical specifications differed from the Decommissioning Plan due to changes in the plant status that occurred during defueling, workscope realignments and technical revisions instituted by the DOC. The distribution of A/S 4 and 5 work activities, the performing organizations, and the reasons for these alignments are summarized in Tables 1 and 2 shown on the following pages. It should be noted that the majority of the activities initially designated to A/S 4 and 5 were performed by TLG/CWC (93% on the basis of cost). Therefore, this report focuses on those dismantling activities. Discussion of work performed by others is noted where appropriate.

2.1 TECHNICAL CONSIDERATIONS

The technical specification addressed the precautions and general procedures required for the safe, efficient dismantling of the plant systems. Features of the technical specification and their impact on removal of piping and equipment are discussed in the text following.

2.1.1 ALARA

ALARA considerations have the potential to influence the removal of piping and components at a nuclear installation, but SSDP was not significantly affected. Contact dose rates on piping and components were low, from 1 to 30 mR/hr. Most of the primary system piping and components were reading from 30 to 50 mR/hr, with only a few primary system components in the 500 mR/hr range.

The technical specification recommended one-piece removal for many of the radioactive components to reduce worker stay-time in radiation fields. One-piece removal is normally less labor intensive than segmentation, resulting in lower occupational exposures.

The specification was based on the segmentation of contaminated piping by mechanical cutting methods to control the spread of contamination. Since mechanical cutting methods are relatively slow, the subcontractor sought permission to use plasma torch to expedite pipe removal. After demonstrating that contaminated piping could be cut with plasma torch in a controlled environment, it was used throughout the site. The high cutting speed of the plasma torch reduced worker residence time near contaminated piping and components, contributing to a reduction in occupational exposures.

2.1.2 System Isolation

Several support systems continued in operation during the early phases of piping removal. Interfaces between support systems and non-support systems were isolated by specific valve closures to allow removal of the non-support plant systems. Valve isolations were made only by the DOC Plant Operations group until a system was turned over to the subcontractor for dismantling.

2.1.3 System Drainage

The specification indicated that all systems would be drained by the DOC prior to release for dismantling. However, the subcontractor was directed to verify the proper valve isolation and drainage status and to provide for collection of fluids from dead legs and traps.

Table 1
A/S 4 Workscope Distribution

Decommissioning Plan Activity	Approved SSDP Technical Specification	Performing Organization	Reasons for Revision
1) Miscellaneous contaminated tools and equipment present during defueling; A/S 4	N/A	Duquesne Light Co.	Disposal of these components was conveniently performed during defueling activities, prior to the start of decommissioning.
2) Irradiated Components, contaminated defueling tools and core vault contaminated equipment inventory; A/S 4	A/S 11 Technical Specification, Irradiated Components Transfer	NuPak/Alaron	Iradiated reactor internals were transferred into the RPV for one-piece shipment with the RPV. Contaminated tool & equipment removal from the refueling canal was deleted from A/S 4 and added to A/S 11 to consolidate all canal work into one specification.
3) Asbestos Removal Activities; A/S 4	N/A	IT Corporation	Asbestos removal was deleted from A/S 3A, 4 and 5 for consolidation into one specification.
4) Removal Of: - SIS Tank & Yard System - Heat Dissipation System - Condensate Storage Tank - Pressurizer, Flash & Blow-off Tank cubicle piping - Canal Water Storage Tank - FHB Extraction Crane - RWP Gas Surge & Gas Decay Tanks - Turbine Building piping; A/S 4	N/A	DOC Force Account	DOC Force Account (F/A) was created to provide a decommissioning work force to cover miscellaneous tasks not included in the subcontracted bid packages. These activities were deleted from the A/S 4 Technical Specification and assigned to the F/A to level the F/A manpower between miscellaneous support tasks.
5) Removal of temporary chambers ventilation equipment; A/S 4	N/A	N/A	This equipment was deleted from the A/S 4 workscope. The DOC extended the use of the reactor plant container air cooling system, obviating the need for the temporary system identified in the Decommissioning Plan.
6) Thin film evaporator support components; A/S 4.	N/A	N/A	These components were deleted from the scope of A/S 4. The DOC was able to process liquid wastes by filtration in lieu of the thin film evaporator. Consequently, the evaporator support equipment was not required.
7) A/S 4 baseline Subcontract Workscope	A/S 4 Technical Specification, Piping and Equipment Removal	TLG/CWC	
8) Removal buried piping & in-place grouting of embedded piping in RWP Yard (not specified in the Decommissioning Plan)	Additions to Technical Specification A/S 88-RWP -Removal of Structures at RWP Area.	Noralco	Drain piping in the Demineralizer Building was discovered to have low levels of contamination. These lines and others in the RWP Yard were removed. Releasable pipes in the RWP Yard were filled with grout and abandoned in-place.

Table 2
A/S 5 Workscope Distribution

	Decommissioning Plan Activity	Approved SSDP Technical Specification	Performing Organization	Reasons for Revision
1)	Removal of Pressurizer, Flash and Blow-off tank; A/S 5	N/A	DOC Force Account	Removal of these components was deleted from A/S 5 Technical Specification and added to the Force Account to facilitate an early start of physical decommissioning (approximately nine months prior to the start of pipe and equipment removal by TLG/CWC).
2)	Removal of the four steam generators; A/S 9.	A/S 5 Technical Specification, Primary System Components Removal	TLG/CWC	Removal of these components was deleted from A/S 9 Technical Specification (containment chambers removal) and added to the scope of A/S 5 Technical Specification, combining removal of the radioactive components into one contract.
3)	Asbestos Removal Activities; A/S 4	N/A	IT Corporation	Asbestos removal was deleted from A/S 3A, 4 and 5 for consolidation into one specification.
4)	A/S 5 baseline Subcontract Workscope	A/S 5 Technical Specification, Primary System Components Removal	TLG/CWC	

2.1.4 Asbestos

Removal of asbestos insulation in the RWP trenches was deleted from the scope of the asbestos removal specification (A/S 1D) and added to the scope of A/S 4 & 5 to eliminate duplication of preparatory efforts and reduce project costs. Removal of that insulation by the asbestos removal subcontractor would have required manned entry into the RWP trenches in containment tents with all the attendant radiological and asbestos controls in-place. That process would have been repeated for piping removal by the A/S 4 & 5 subcontractor, as the trenches contained varying levels of contamination. The A/S 4 & 5 technical specification combined both steps by requiring the simultaneous removal of piping and insulation by wrapping the pipe in plastic prior to segmentation.

Removal of asbestos from three tanks in the RWP Building was also included in the A/S 4&5 asbestos removal workscope. Additional information on asbestos removal activities at SSDP can be found in the Asbestos Removal Topical Report (Reference 4).

2.1.5 Closure of Pipes and Vessels

The specification required closure of contaminated piping with caps or sheet plastic and tape. One-piece components were sealed with socket weld end caps, steel plate plugs, blind flanges or threaded caps. The specification imposed Detailed Procedure 99Q, General Methods of Selection and Installation of Closures for Contaminated Pipes and Components (Reference 5).

2.1.6 Waste Egress Paths

Several areas of the plant (the east and west ends of the Auxiliary Chamber, boiler chamber enclosures, and the 1B Mechanical Equipment Room) lacked direct removal paths for pipe and equipment. The technical specification, therefore, suggested the creation of access holes to simplify ingress and egress of equipment and waste materials. The subcontractor developed and implemented the technical specification concept as discussed in Sections 5.2.5, 5.2.6 and 5.2.13.

2.2 SCOPE OF WORK

The A/S 4 and 5 activities performed by Noralco, the DOC F/A and others are listed in Table 1. The final scope of work performed by TLG/CWC in Technical Specification 4 and 5, including contract modifications, was comprised of the following:

2.2.1 A/S 4 - Removal of Piping and Equipment

Removal of contaminated piping and equipment included those specific plant systems located in the AC Boiler Chamber and Enclosure, BD Boiler Chamber and Enclosure, Auxiliary Chamber and Enclosure, Reactor Enclosure, Auxiliary and Mechanical Equipment Rooms, RWP Building, RWP Yard, Air Treatment Room, FHB and portions of the Reactor Plant Service Building (RPSB). Because of their level of contamination or location these systems were considered separately from the non-contaminated piping and equipment work.

Removal of non-contaminated piping and equipment included those specific plant systems located in the Auxiliary Power Room, as well as portions of the Reactor Plant Service Building and the Yard.

2.2.2 A/S 5 - Removal of Primary System Components

Removal of the major primary system components located in the AC Boiler Chamber and the BD Boiler Chamber included:

- 4 Steam Generators, including the associated steam drums, heat exchangers, risers, and downcomers.
- 2 Purification Loop Demineralizers
- 2 Resin Charging Tanks
- 4 Reactor Coolant Pumps
- 4 Eighteen inch Reactor Coolant System Loop Check Valves
- Reactor Coolant System piping
- Secondary Steam Supply piping
- Main Steam and Feedwater piping

3.0 PROJECT TASK MANAGEMENT

3.1 PERFORMANCE TRACKING

3.1.1 TLG/CWC Activities

The piping and equipment removed at SSDP was a fixed price, competitively bid subcontract awarded to TLG/Cleveland Wrecking Company Inc. The original contract price was $6,870,000 and because of additions to the workscope, completed for $7,576,087. During subcontractor mobilization, DOC and TLG/CWC negotiated a progress payment plan based on a series of progress data forms. The compilation of the completed forms is provided in Appendix A. The progress data forms identified 86 components and work areas to document the subcontractor's progress and determine the earned value of work performed. Other data on the progress data form included budgeted and actual manpower and materials costs. Appendix B provides the subcontractor's data collection forms for each work area. These forms identify labor hours by sub-task, crew mix, and the time card and radioactive work permit manhours (time spent in radiation work areas).

A progress schedule was developed for performance tracking of the areas and components identified in the progress data forms, as shown in Figure 3, pg. 12. The work performance closely followed the planned schedule, the variance never exceeding 3.6 percent of the plan during the 22 months of work performed.

3.1.2 DOC Force Account Activities

Portions of the A/S 4 & 5 workscope were also performed by the DOC Force Account for $403,000. Force Account dismantling activities were tracked by the DOC's internal cost account management system. Schedule performance and manpower and occupational exposure records for the Force Account are shown in Figure 4, pg. 13 for the 13,454 man-hours of work performed on these activities.

3.1.3 Noralco Activities

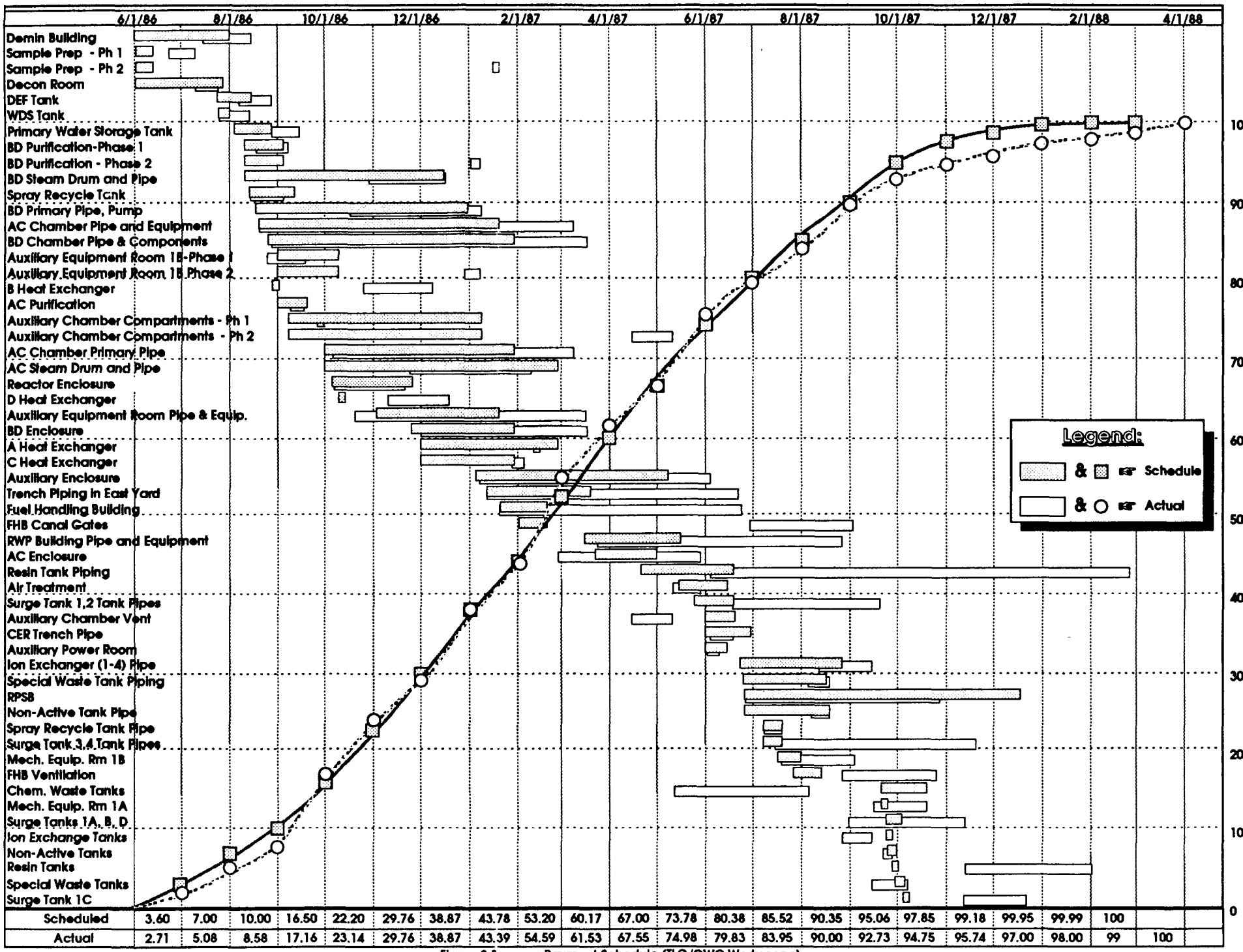
The contaminated piping removed by Noralco was an addition to their subcontract that was not significant from a scheduling or performance tracking standpoint and is not covered in this report. The cost of this contract addition was $134,746.

3.2 CONFIGURATION AND COMMUNICATION CONTROL

The DOC established a configuration and communication control (ConCom) system to control project activities and to ensure the safe and effective completion of dismantling activities. During the removal of pipe and equipment, the status of systems and coordination and control of work was critical due to the scheduling of parallel dismantling activities by multiple subcontractors. ConCom was responsible for work scheduling, issuance of and changes to work procedures, work authorization, control of ongoing work, task and system status, responsibilities of DOC personnel, and proper communications between DOC and subcontractors.

3.3 RADIOLOGICAL CONTROLS

Radiological controls were established by the DOC's radiological engineering group. Detailed procedures were generated by the subcontractor for the control of work activities. DOC Radcon reviewed the procedures to ensure proper work practices and ALARA considerations. Field observations by radiological engineering and radiological controls technicians (RCTs) ensured that procedures were followed. Post work reviews were used to track the accumulated exposures recorded on self-reading pocket dosimeters (SRPDs) and to seek improvements. The monthly occupational radiation exposures for the TLG/CWC workers are plotted in Figure 5, pg. 14. The values reported here are 60% of the pocket dosimeter readings to correct for drift and background. The 60% factor was developed from the historical comparison of thermoluminescent dosimeter readings to pocket dosimeter readings at SSDP. Figure 5 also depicts the monthly manpower expenditures.



Scheduled	3.60	7.00	10.00	16.50	22.20	29.76	38.87	43.78	53.20	60.17	67.00	73.78	80.38	85.52	90.35	95.06	97.85	99.18	99.95	99.99	100	
Actual	2.71	5.08	8.58	17.16	23.14	29.76	38.87	43.39	54.59	61.53	67.55	74.98	79.83	83.95	90.00	92.73	94.75	95.74	97.00	98.00	99	100

Figure 3 Progress Payment Schedule (TLG/CWC Workscope)

Figure 4
MK-F Force Account A/S - 4 & 5

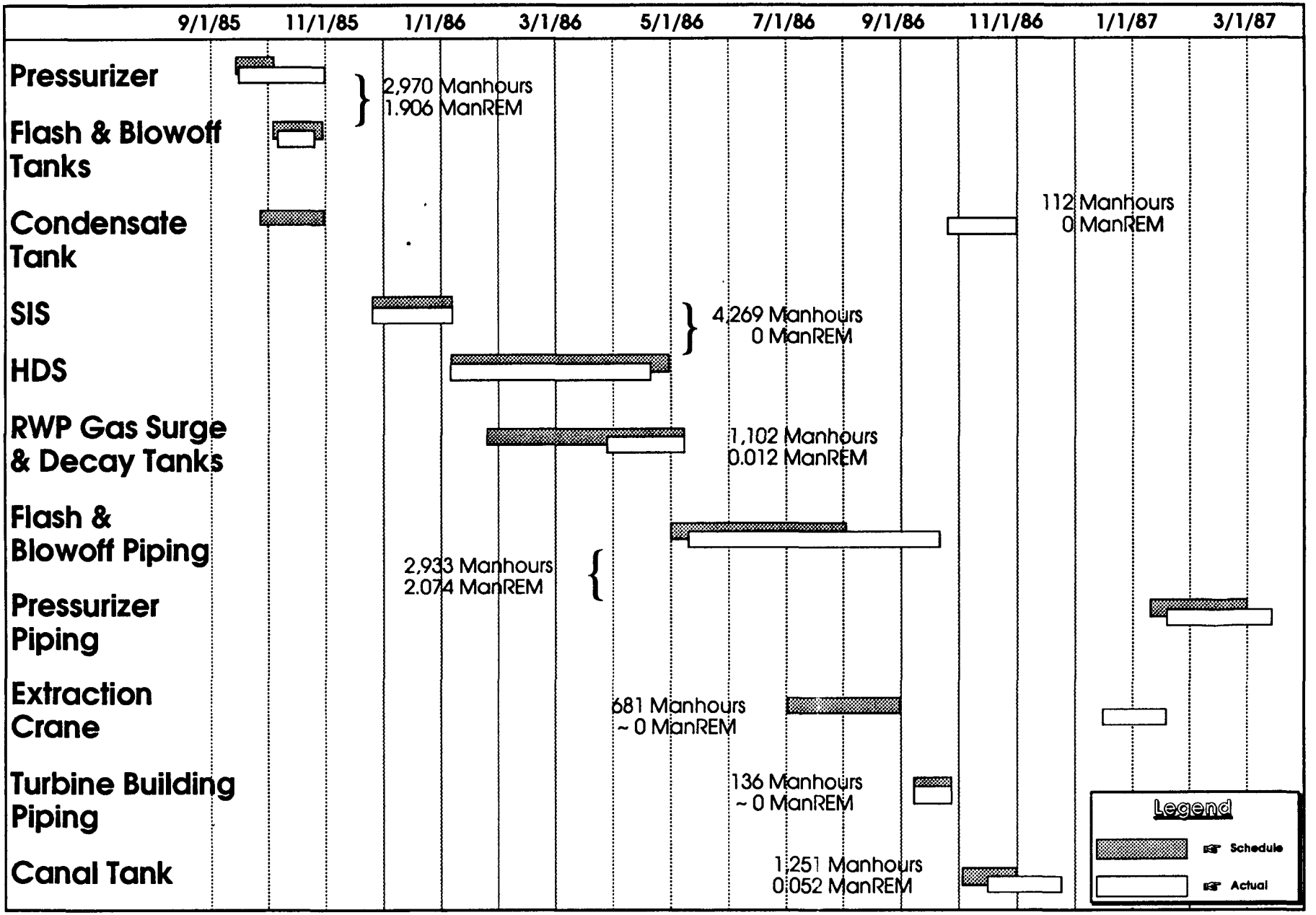
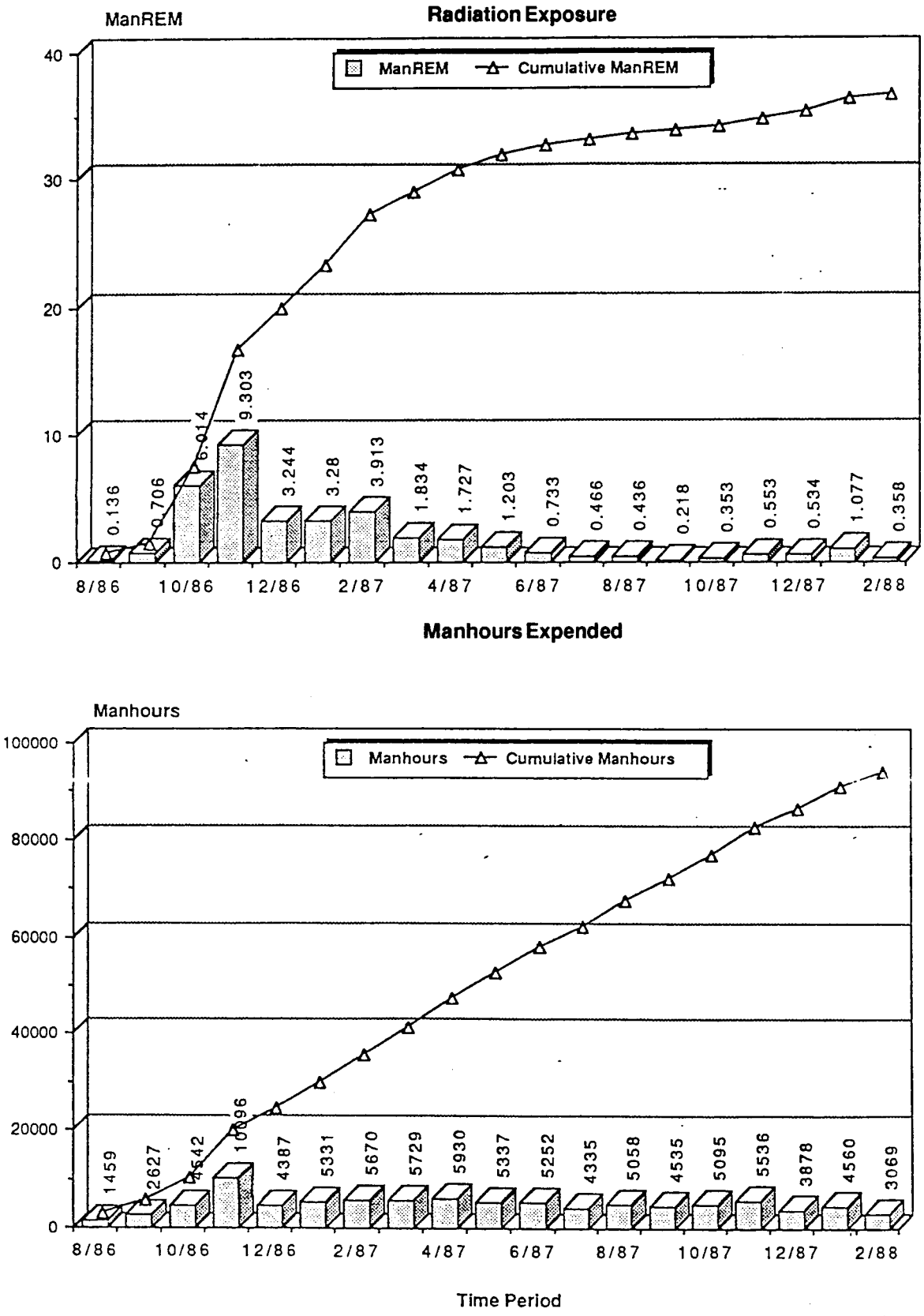


Figure 5
Occupational Radiation Exposures and Manpower Record for TLG/CWC



4.0 TOOLS & EQUIPMENT

4.1 SEGMENTATION TOOLS AND TECHNIQUES

Conventional cutting methods were employed for removal of both radioactively contaminated and non-contaminated pipe and equipment. Contamination controls were applied as necessary to support the radiological work. The technical specification identified mechanical cutting methods as the standard for segmentation of radioactively contaminated piping. The specification did not allow thermal segmentation methods for contaminated pipe cutting under normal circumstances, due to the potential for the dispersal of radioactive contamination with the smoke. The piping & equipment removal subcontractor initiated piping removal by mechanical methods but sought permission to use plasma torch to expedite segmentation operations. The DOC allowed the subcontractor to demonstrate plasma torch cutting of primary coolant pipe near a reactor coolant pump. A reinforced plastic containment tent was erected around the cutting area to contain smoke. HEPA filtered exhaust units were connected to the containment and to the pipe internals. Air samples taken inside the containment revealed that the airborne contamination levels did not approach the limit for personnel protection (10^{-9} mCi/ml of Co-60), as the HEPA filter that evacuated the piping effectively captured the smoke and off-gasses. This approach was so effective that the DOC allowed the subcontractor to expand the use of plasma torch for all pipe cutting without the use of containment tents while still monitoring for possible airborne contamination. A sketch of the HEPA-filtered pipe evacuation arrangement used during thermal cutting of contaminated piping is shown in Figure 6. Photo 1 shows plasma torch cutting of the reactor coolant piping in one of the boiler chambers. Average cutting time for this operation was approximately 30 minutes..

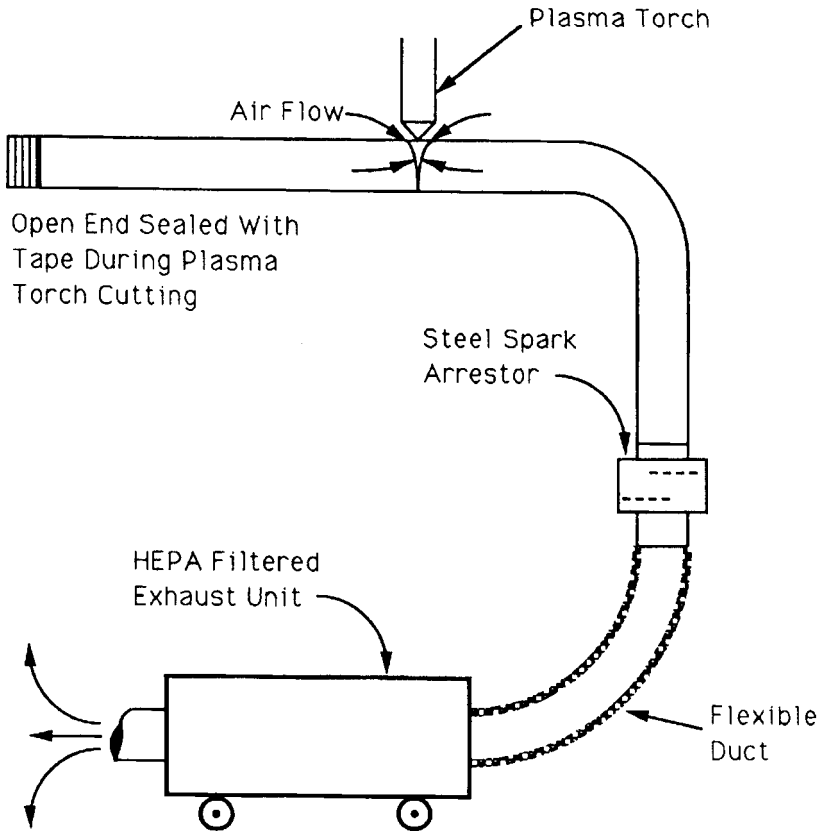


Figure 6
HEPA Filtered Ventilation for Thermal cutting of Piping

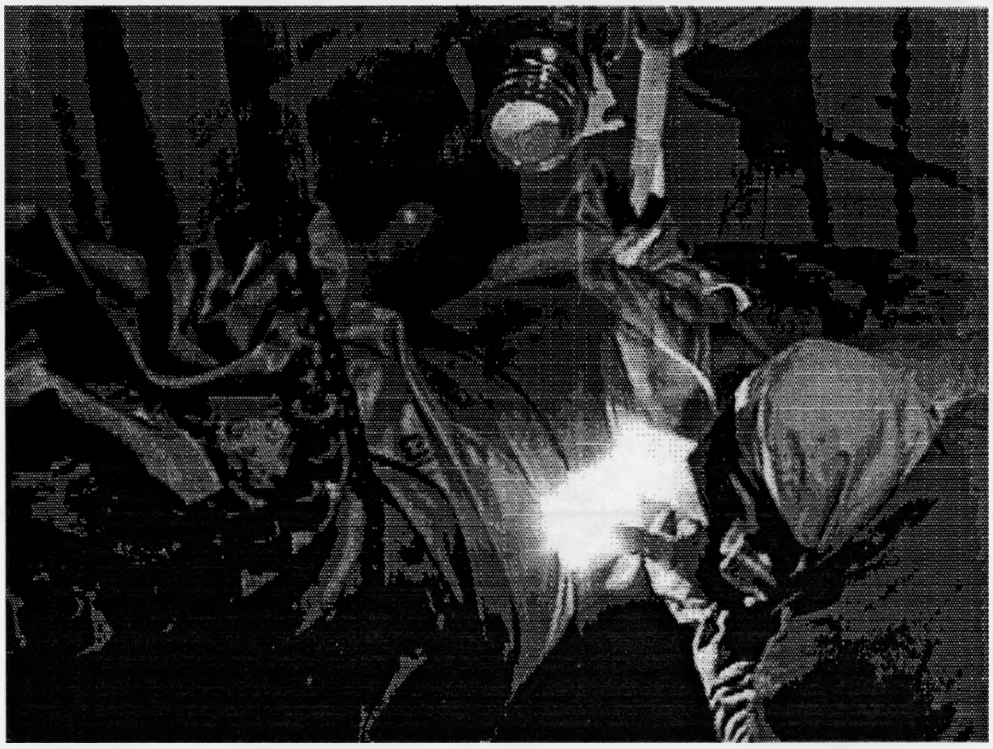


Photo 1. Plasma torch cutting of a reactor coolant pipe elbow (18-inch diameter, 1-1/2 inch wall thickness, stainless steel). Notice the portable air sampler positioned directly above the pipe. Average cutting time for this operation was about 30 minutes.

Mechanical pipe segmentation methods were also used extensively at SSDP. This included electric reciprocating saws, portable bandsaws and hydraulic shears. Bandsaws were used on carbon and stainless steel pipe up to four inches in diameter, and reciprocating power hacksaws were used for piping up to twelve inches in diameter. The mechanical cutters broke down on a frequent basis. Repairs of contaminated tools were performed at or near the jobsite by trained radiation workers. Photo 2 shows power hacksaw cutting of pipe in the Reactor Enclosure. Photo 3 shows a bandsaw cutting a two-inch diameter pipe.

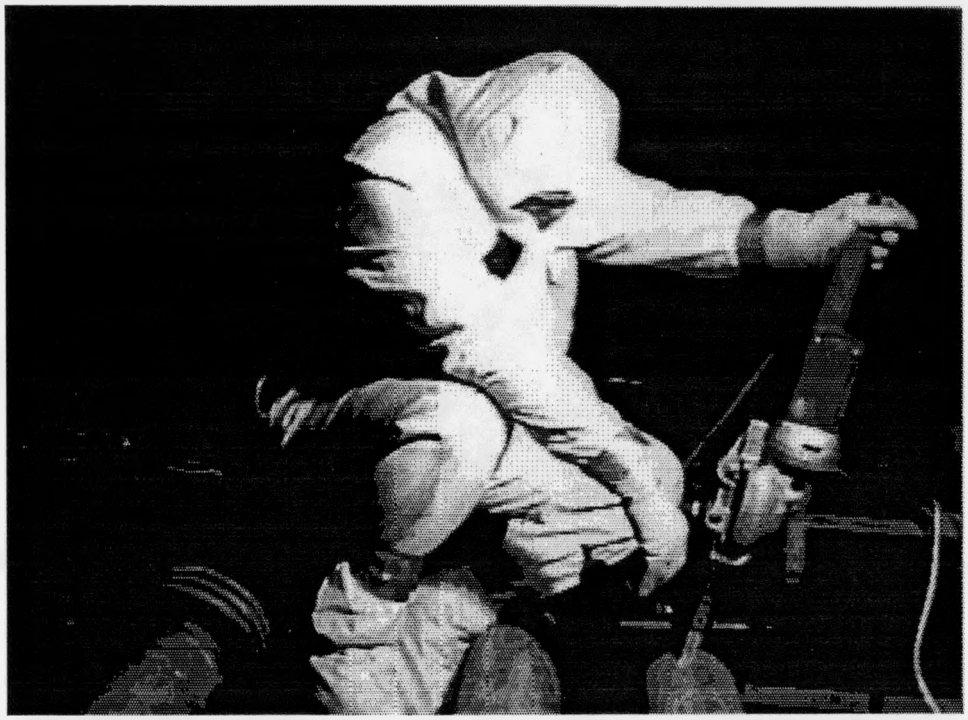


Photo 2. Power hacksaw cutting of a three-inch diameter pipe in the Reactor Enclosure.

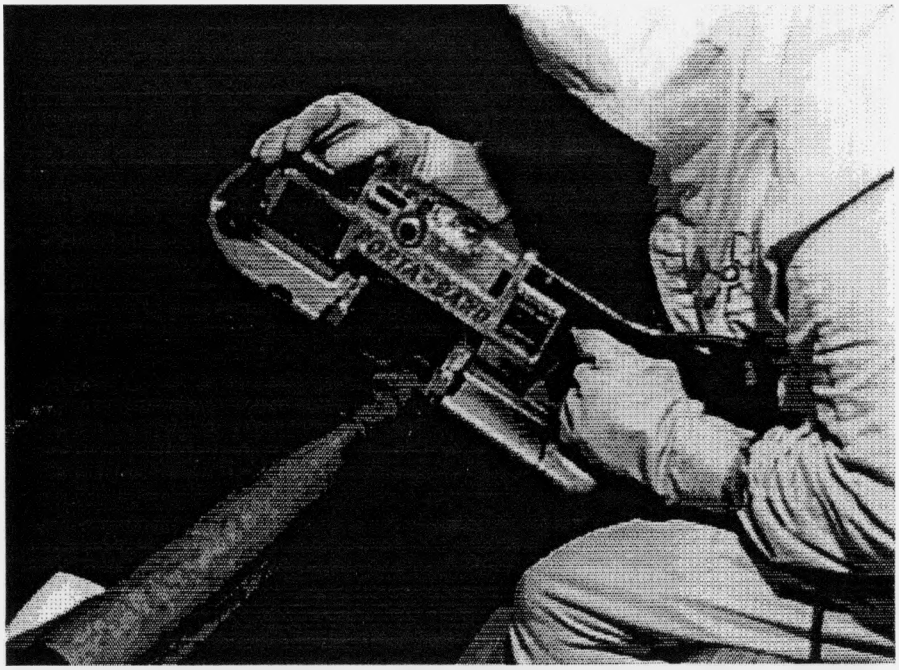


Photo 3. Bandsaw cutting of a two-inch diameter pipe.

The bandsaw was the best mechanical cutter for piping less than or equal to 2" in diameter. The "Fein" reciprocating saw was the most versatile tool for piping from 3" to 6" in diameter. The HSS (high strength steel) blade with 4 teeth per inch was found to be the best choice for stainless steel. Carbon steel pipe could be cut with blades up to 10 teeth per inch. For piping above 6" in diameter, the "Wachs" guillotine saw was chosen. It was a heavier unit than the "Fein" saw, requiring more set-up time, but cutting time was reduced.

The hydraulic shear was effective on small bore piping (up to two-inch, schedule 80). Cutting of two-inch, schedule 160 stainless steel pipe resulted in broken shear blades. Application of the shear was also limited by its weight and controls, requiring 3 to 4 men for positioning and operation. Photo 4 shows the cutting of small bore pipe in the Auxiliary Chamber with the hydraulic shear.

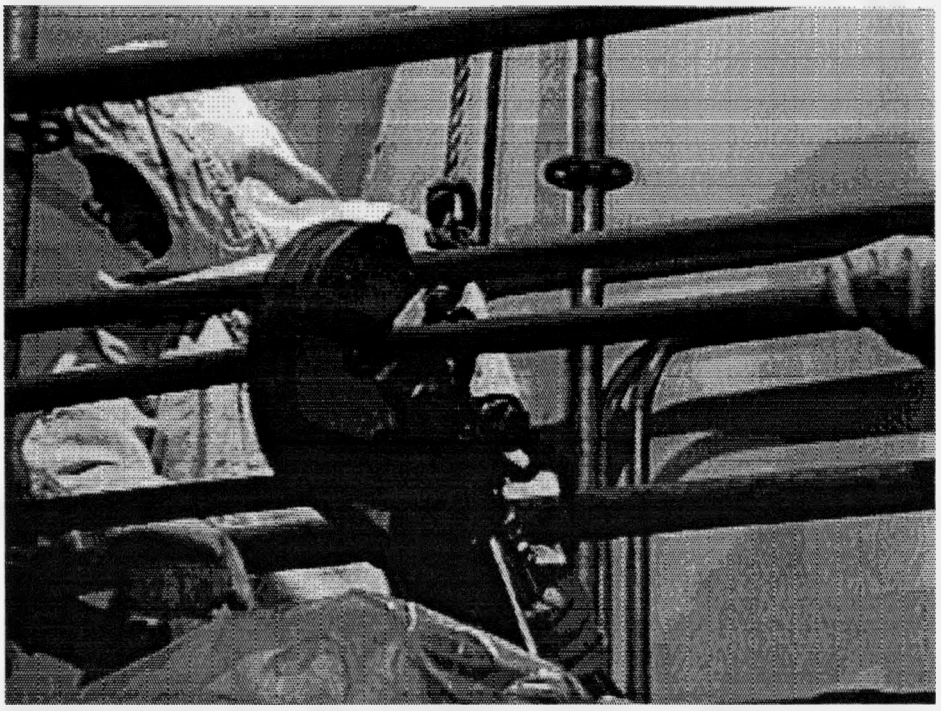


Photo 4. Cutting small bore pipe in the Auxiliary Chamber with the hydraulic shear.

The plasma torch was used initially on the large bore reactor coolant piping due to its high cutting speed, but was quickly applied universally for pipe and component removal. The plasma torch provided a speed advantage over the mechanical methods thereby reducing manpower requirements and occupational exposures. Operational considerations for the plasma torch included:

- Plasma torches need to be grounded to protect the operators from electrical shock when cutting pipe with residual water.

- The plasma torch generates substantial quantities of smoke during operation, necessitating the use of pre-filters on the HEPA filters to prevent premature filter clogging. It should be noted that even the pre-filters clogged quickly, and could result in excessive smoke in the work area. On those occasions, recovery consisted of shutting down the operations, changing the clogged filters and operating the HEPA unit until air quality was restored.

4.2 SUPPORT EQUIPMENT

General support equipment consisted of conventional slings, come-alongs, shackles, wire and fiber ropes, pulleys, chainfalls, dollies and hand tools. Radiological controls for segmentation of contaminated piping consisted of protective clothing, catch trays, saddle tap valves and collection bottles for pipe drainage, HEPA filtered vacuum cleaners for surface cleaning and small bore pipe evacuation, and HEPA filtered exhaust units for area ventilation control and large bore pipe evacuation. The subcontractor's data collection forms in Appendix B identify the specific equipment, consumables and radiation controls and the quantities utilized in each work area.

Saddle tap valves were used extensively throughout the plant to drain piping prior to segmentation. A member of the DOC's integrated subcontractor (MK-Ferguson) developed a modification to the saddle tap valves that were used for pipe drainage. The result was increased productivity and man-rem savings as the installation effort was reduced from 14 man-minutes to one man-minute. Photo 5 shows a display of the components of the saddle tap valve. Photo 6 shows the saddle tap valve in use. The nylon tubing compression fitting is an essential part in the assembly, providing a seal between the pipe nipple and the drill bit. The compression fitting used was 1/4" NPT x 1/4" tube compression. A block of neoprene rubber was glued to the center of the angle bracket to provide a seal between the pipe and the angle bracket.

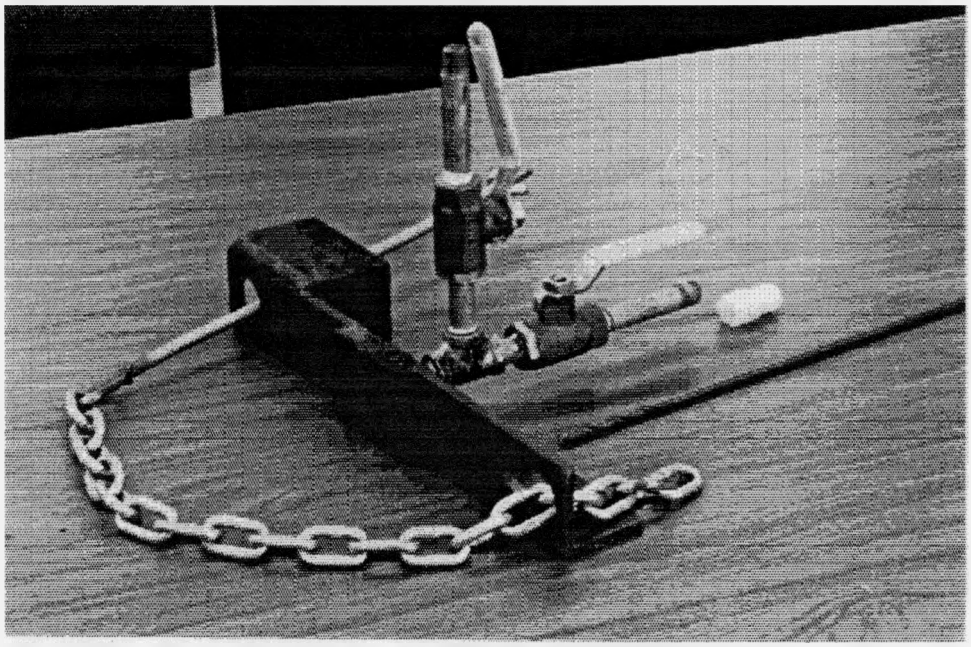


Photo 5. Saddle tap valve components (185/04).

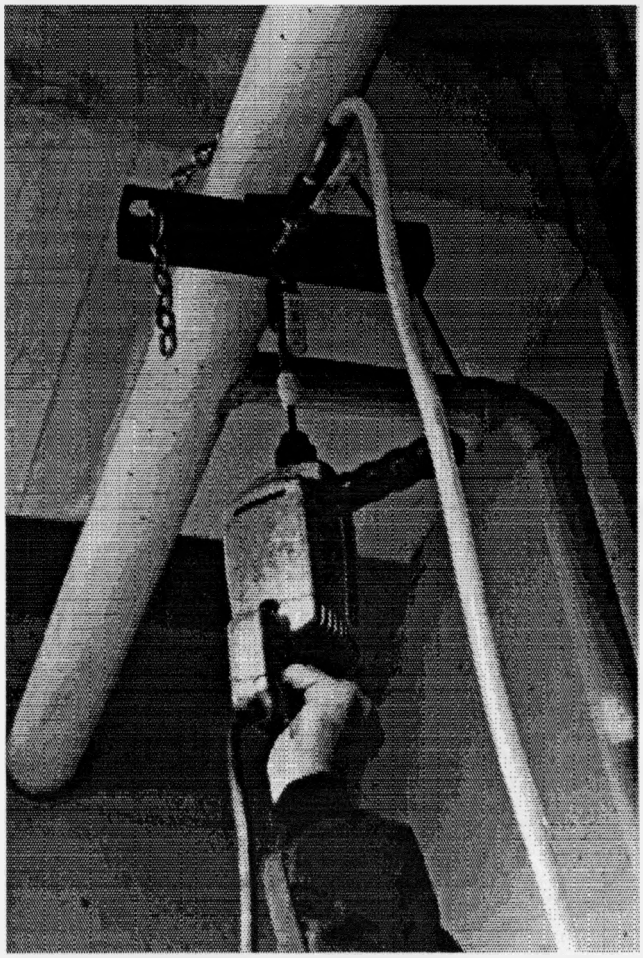


Photo 6. Installation of a saddle tap valve for drainage of an overhead horizontal pipe (185/20).

5.0 DISMANTLING OPERATIONS

5.1 PIPE AND EQUIPMENT REMOVAL PRECAUTIONS

The segmentation, handling and packaging of radioactively contaminated pipe and equipment had the potential to expose the plant and decommissioning personnel to radioactive liquid spills, airborne contamination and hazardous materials (such as asbestos). Protection measures established by the DOC included personnel training, medical screening and physical contamination barriers.

5.1.1 Personnel Training and Medical Exams

Prior to performing any dismantling work onsite workers were required to complete the following:

- A two-day Radiation Worker Training course, conducted by the DOC, which culminated in a written test
- A one-day Respiratory Protection Training course and Respirator Fit-Test, conducted by the subcontractor
- Detailed Work Procedure (DWP) training prior to implementation of that DWP
- Medical examinations were required for workers prior to their employment at SSDP and at termination, if the last job-related physical was over a year old
- Whole body counting was performed for all workers prior to start and after completion of employment at SSDP

5.1.2 Personnel Protection

Personnel protection requirements varied according to the type of work and area contamination levels. Activities with potential for exposure to airborne or loose surface contamination were performed in anti-C's and respirators. Segmentation of the RWP Surge Tanks was performed inside the tanks and included supplied air respirators. Asbestos work was performed in disposable clothing with respirators, boots and gloves that were all taped closed. However, many tasks were performed in clean areas with non-contaminated components using normal work clothes and gloves. Radiation/Contamination surveys and air monitoring results determined the level of protection required.

5.1.3 Plant Protection

During many segmentation operations, reinforced plastic was taped to the floor or deck plates to prevent the spread of contamination. When contamination levels and dismantling operations warranted, contamination envelopes, HEPA filtered evacuation, barrier ropes, and step-off pads were employed. When contamination envelopes were not applied, the room, chamber or enclosure formed the primary containment barrier.

5.2 DISMANTLING OPERATIONS

Dismantling activities are presented by major plant work area, with particular attention given to unique work practices. Work areas of little technology transfer significance have been omitted. These included the Sample Preparation Room, Decontamination Room, MER 1B, and the Auxiliary Power Room.

5.2.1 Demineralizer Building

The Demineralizer Building housed remnants of the decontamination system used in 1964 for the primary coolant system. The most significant component was the stainless steel Waste Decontamination Solution tank, located behind a concrete shield wall. The subcontractor erected scaffolds to support an I-beam above the tank. After rigging the tank with a chainfall, the legs were removed from the tank and it was incrementally lowered into position for segmentation by plasma torch. Cut segments were loaded into a Low Specific Activity (LSA) container at the work area. Figure 7 shows a sketch of this arrangement.

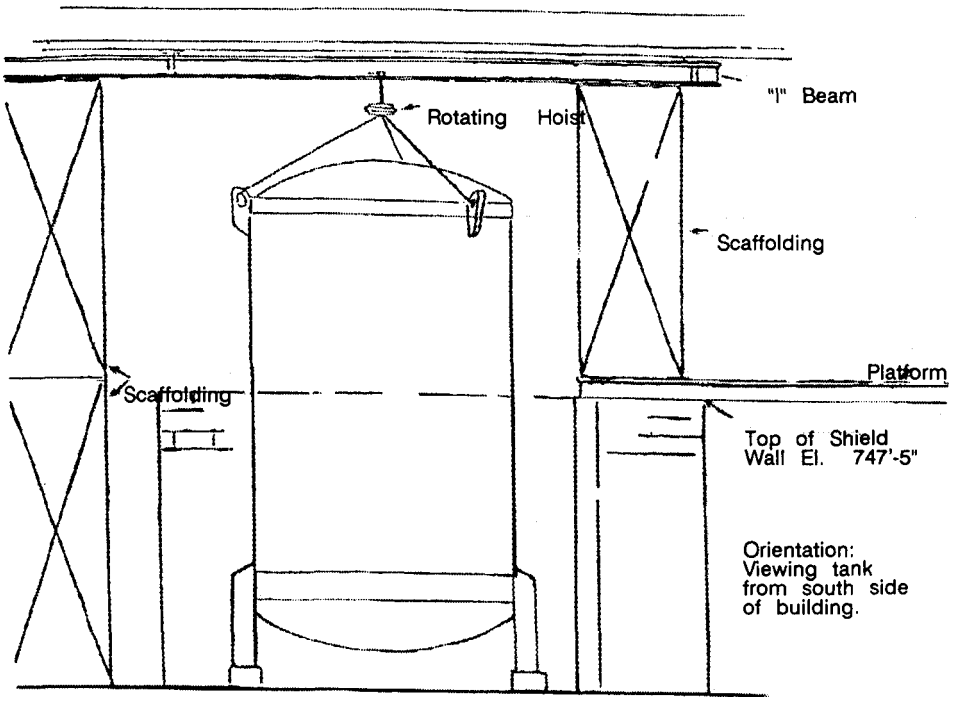


Figure 7
Waste Decontamination Solution Tank Segmentation

During removal of other contaminated components in the Demineralizer Building, several problems were encountered:

1. Some of the specified valve alignments were not made prior to pipe segmentation. To provide prompt resolution, the DOC granted TLG/CWC permission to position the valves.

2. A vent line unexpectedly contained approximately 20-30 gallons of water. This was drained by TLG/CWC workers.

3. One pipe was discovered that was not identified in the technical specification. The DOC decided to remove this line at a later date.

5.2.2 Auxiliary Equipment Room 1A (AER 1A)

The AER 1A contained support systems and components that were used for: valve operation, canal water, coolant charging, component cooling water, safety injection, control air and service air systems. A rolling steel door at the west wall of the AER 1A provided access for ingress/egress of LSA containers and tools and equipment.

The two canal water demineralizer tanks were disconnected from the piping systems and sealed with blind flanges prior to one-piece removal by fork-truck. The heavy walled stainless steel piping of the valve operating system was segmented by plasma torch with HEPA filter trunkline. Other systems were cut thermally or mechanically according to need and availability of equipment. As the pipe removal progressed, the use of plasma torch became increasingly common. Its high cutting speed made it the first choice for most pipe removal operations.

Two workscope additions were made in this area; removal of asbestos and removal of contaminated structural steel:

1. The asbestos insulation was observed in pipe chases in the north wall of the AER 1A. A reinforced plastic containment tent was established around the pipe penetrations and the asbestos was removed and double-bagged. Asbestos was also discovered in the pipe fittings of a fiberglass insulated four-inch pipe. It was removed by stripping the fiberglass insulation up to the fitting locations, and wrapping the asbestos in plastic and taping the plastic to the pipe. As the pipe was segmented, the wrapped fittings were disposed of as LSA waste and the rest of the pipe was discarded as clean scrap.

2. The platform steel that had surrounded the canal water demineralizers and embedded anchors in the concrete floor were found to be contaminated. The platforms were removed, and the top of the embedded anchors were taped to fix the loose contamination prior to removal by jack hammer.

5.2.3 Auxiliary Equipment Room 1B (AER 1B)

The AER 1B contained the piping and components for cooling of the refueling canal water and component cooling water.

The canal water cooler and component cooling water cooler were long double-tiered heat exchangers that were unbolted from the piping systems and capped with blind flanges and gaskets for one-piece shipment. Due to their configurations, these heat exchangers had to be tipped on end and rotated to enable complete drainage prior to closure. Piping in this room was removed by mechanical cutting, plasma torch cutting, and unbolting of pipe flanges. The component cooling water expansion tank was removed in one piece and delivered to the RWP Yard for segmentation in a HEPA filtered containment tent.

After removal of all equipment and minor decontamination, the subcontractor was permitted to demolish the AER 1B to provide access for the heavy lifting equipment that was necessary for removal of the AC steam generators. This concrete block building was manually demolished with sledge hammers.

5.2.4 Boiler Chambers

The boiler chambers housed the steam generators, reactor coolant piping and associated support systems and components.

The Decommissioning Plan presented a one-piece removal approach for the heat exchangers which was adopted by the subcontractor. Due to the size of the heat exchangers, other equipment in the chambers had to be removed to accommodate heat exchanger removal operations.

Main steam and feedwater piping systems were the first removed, as they were located in the upper region of the chamber with good access to the equipment hatch. These systems were non-contaminated.

Reactor coolant pumps were prepared for removal due to their position near the equipment hatches. These canned motor pumps were separated from the piping system by plasma torch cutting within containment tents and openings were sealed prior to removal from chamber. Lifting was performed by the enclosure roof monorail cranes and supplementary chainfalls in the chambers. After lifting and translation, they were loaded on flatbed trailers and delivered to the east laydown yard for storage. Photo 7 shows the 1B Reactor Coolant Pump as it emerged from the equipment hatch.

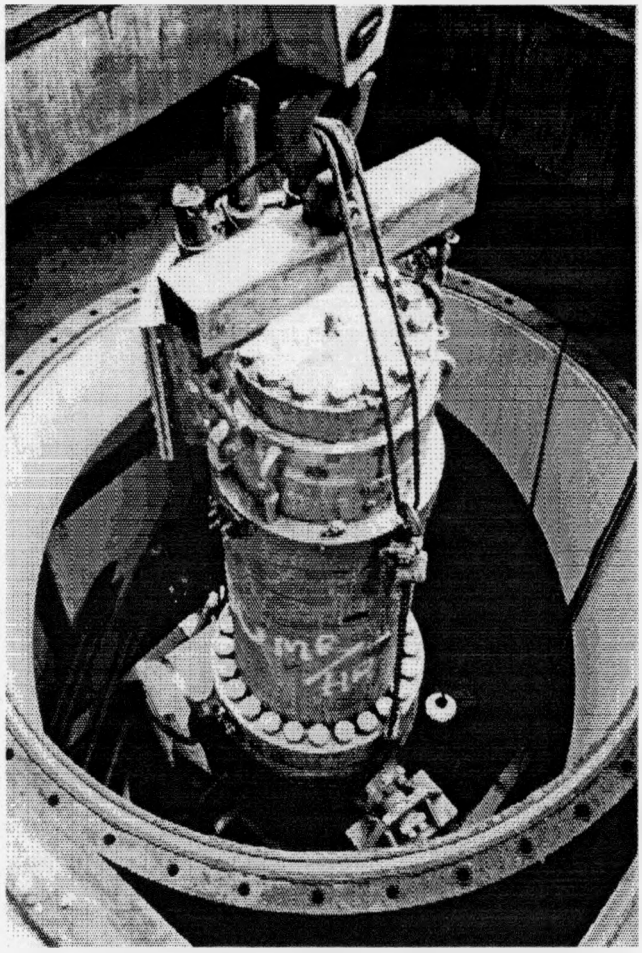


Photo 7. Removal of 1B reactor coolant pump from chamber hatch (98/09).

Following removal of the pumps, small bore piping and instrumentation was removed to provide a clear removal path for primary coolant piping. Primary piping was segmented by plasma torch, with a 1000 cfm HEPA filter maintaining a negative pressure in the piping and a 2300 cfm HEPA providing additional direct air evacuation near the cut via a flexible trunk line.

Steam generators were next readied for extraction. As Figure 8 shows, the steam generators consisted of an upper steam drum, a lower heat exchanger and interconnecting riser and downcomer piping. Preparation included removal of minor electrical components and structural steel members to provide a clear removal path. The steam drums and heat exchangers of each steam generator were individually rigged to structural members in the chamber to provide stability, and then separated by removal of the interconnecting piping.

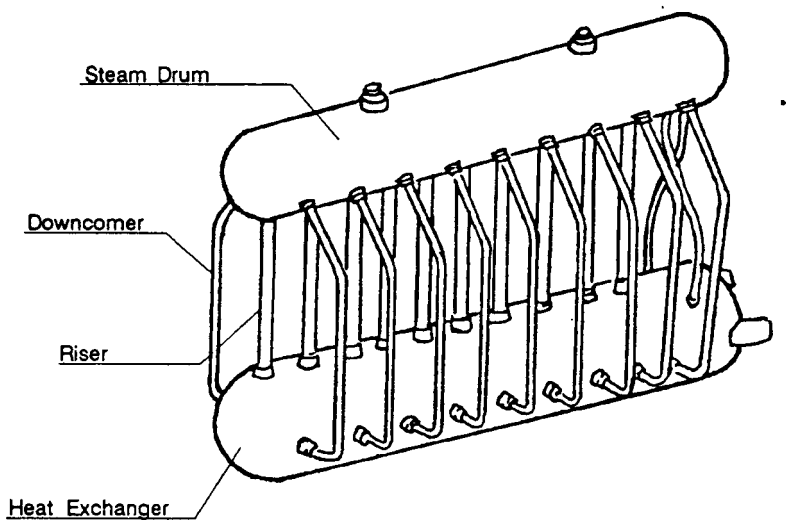


Figure 8
Steam Generator Configuration (Typical)

During preparation of the steam generators, a unique approach was used to remove the riser and downcomer pipes. Since there was no intermediate deck between the steam drums and heat exchangers, the removal crew erected a "clothes line" in the form of a horizontal cable with a small trolley just below the steam drum. Prior to removal of a pipe it was rigged to the trolley with a fabric sling. After the pipe was cut free, workers pulled the pipe segment to the landing under the equipment hatch for later removal by the monorail crane.

During the one-piece removal operations, steam drums and heat exchangers were positioned under the equipment hatch by chainfalls in the boiler chambers. The chainfall support was provided by the boiler chamber external structural members which were accessed through holes in the chamber shell. Wire rope slings were wrapped around the girders, providing a strong support line for the chainfalls. Figure 9 is an illustration of the rigging for a typical steam drum or heat exchanger during one-piece removal.

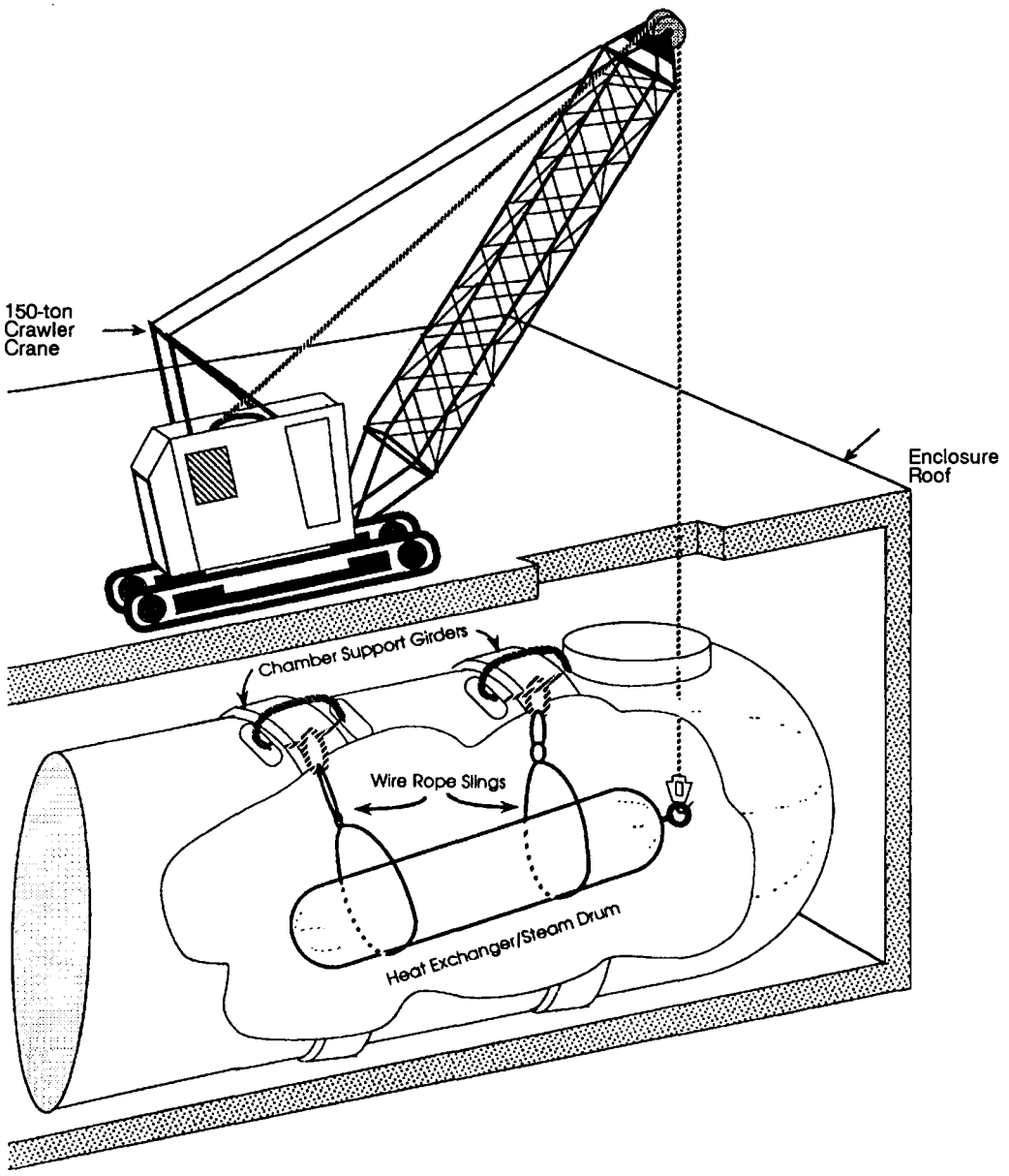


Figure 9
Rigging of a Typical Steam Drum or Heat Exchanger From the Chamber

By manually working the chainfalls, the components were translated and positioned under the equipment hatch where the load was transferred to a large crawler crane on the roof of the boiler enclosure. The crawler crane subsequently moved the load to the end of the enclosure roof for placement onto a lowboy trailer and delivery to the west laydown yard. Photo 8 shows the 1A heat exchanger during removal from the equipment hatch.

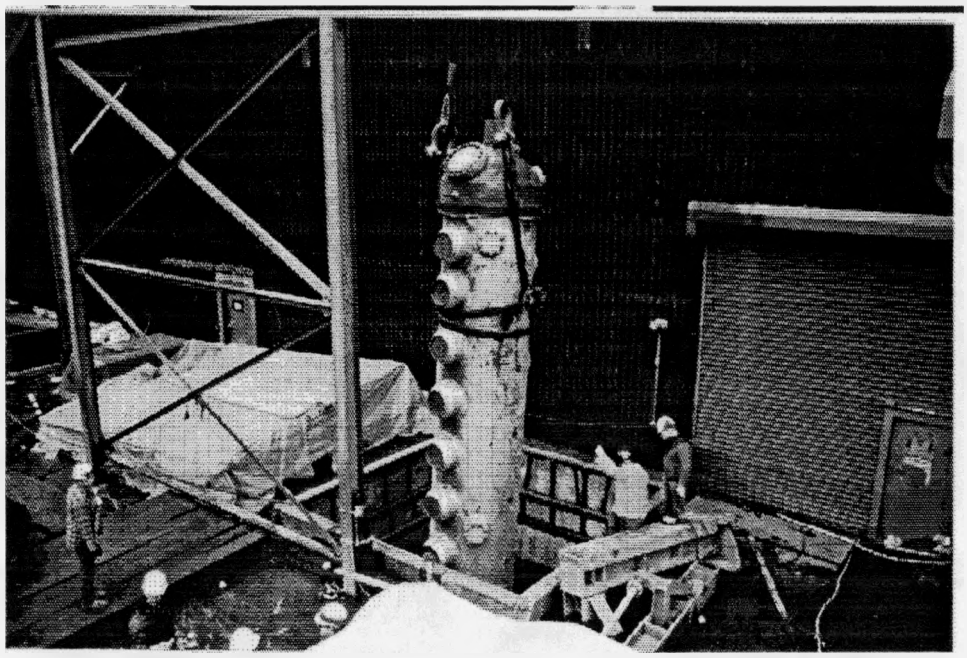


Photo 8. Removal of the 1A heat exchanger from the equipment hatch (109/29).

Follow-on work in the boiler chambers consisted of the removal of internal structural steel used on the loops and miscellaneous cleanup.

The purification demineralizers were located in concrete shield cubicles at the outermost ends of the boiler chambers. They were removed in one piece and placed in containers for shipment. Access to the demineralizers was accomplished by removal of a concrete hatch plug. During removal of the BD purification concrete plug, an unexpected and significant spill of hidden contaminated resins occurred (refer to Section 8.1). To prevent the possibility of a recurrence at the AC purification hatch, extensive contamination controls were employed. The contamination levels observed during removal of the AC purification hatch plug did not approach those in the BD purification side.

5.2.5 Boiler Enclosures

The concrete enclosures that housed the boiler chambers contained only small quantities of piping. Piping removal in the enclosures was consistent with other pipe removal work onsite except for the vertical pipe runs. The work crew tied off the long vertical pipes and cut them free at top and bottom. Cutting was performed at the floor level as the hanging pipe was lowered into position. Since the pipe was cut by plasma torch, a HEPA filter duct was attached at the top of the pipe to create a negative internal pressure.

Egress of the piping from boiler enclosures required the cutting of access holes in lower portions of the boiler chambers. Piping was packaged in LSA containers in the enclosure and moved into positions under the chamber equipment hatch for lifting through the access hole as shown in Figure 10. The hole under the purification cubicle was added for the removal of structural steel through its hatch. Boxes were filled in the boiler chamber/enclosures and closed, but the lids were not locked with the lid-clips. Instead, the lids were taped closed to provide a containment barrier during on-site relocation. Boxes were hoisted to the boiler enclosure roofs by the monorail crane and delivered to the FHB for inspection, surveying, labeling and lid closure prior to delivery to the laydown yard.

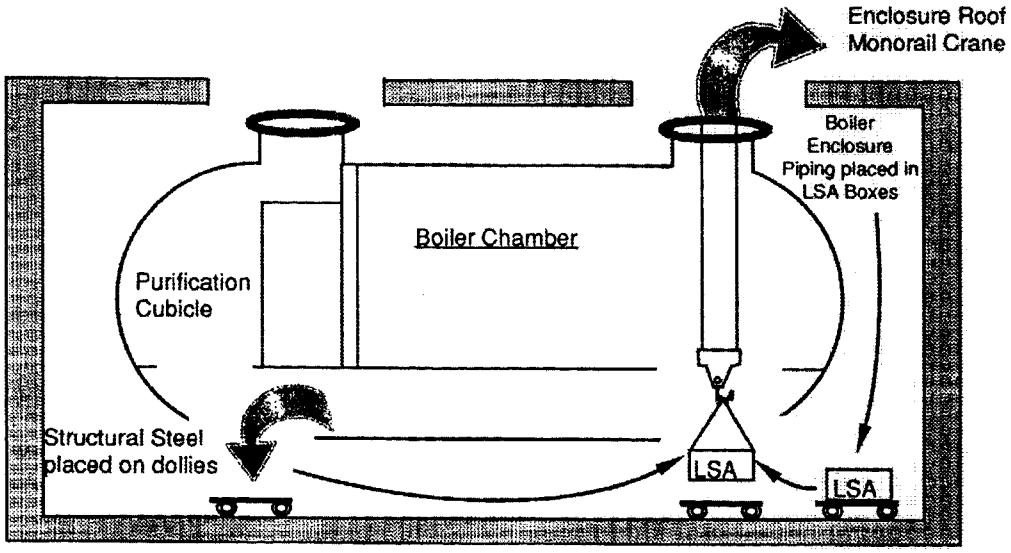


Figure 10
Boiler Chamber and Enclosure
Ingress/Egress Paths for Equipment and Waste Materials

5.2.6 Auxiliary Chamber

The Auxiliary Chamber was the largest of the primary containment chambers at the Shippingport Station. As shown in Figure 1 (pg. 2), the chamber was divided into four cubicles by internal concrete shield walls that isolated the pressurizer and the flash and blow-off tanks (primary system components). The DOC Force Account removed all piping and components from these two center cubicles, and TLG/CWC removed all equipment from the east and west ends of the Auxiliary Chamber.

The Pressurizer, Flash and Blow-off tanks were removed by DOC F/A. Initial activities consisted of piping removal to separate the tanks from the piping systems and to provide a clear path for one-piece removal of the tanks. Open nozzles on the tanks were closed with welded covers, and the areas were then turned over to the asbestos removal subcontractor. After asbestos removal, each tank was rigged and lifted from its respective cubicle by the FHB main crane. After placement on a lowboy trailer, they were delivered to the east laydown yard for onsite storage.

Piping removal in the Auxiliary Chamber utilized every cutting technique employed by TLG/CWC. Plasma and oxyacetylene torches were used for the large bore steam and feedwater piping. Mechanical cutting tools were used in the other systems. The complex arrays of some of the piping systems made access for cutting tools difficult. The hydraulic shears proved to be very effective in these cases, however, the valve operating system contained some 2-in., schedule 160 stainless steel pipe. Use of the hydraulic shear on the heavy wall pipe only resulted in broken shear blades. The subcontractor sought to use the plasma torch on these small bore piping systems since it had worked well on the large bore reactor coolant system. The small bore pipe had complex valve manifolds, and internal HEPA evacuation was not considered to be practical. The DOC allowed testing with a 1000 cfm HEPA trunk line held directly over the cut area with workers wearing full-face respirators. Air sampling revealed that contamination levels were maintained within the strict SSDP airborne limit (10^{-9} microCi/ml). As a result of the successful application of plasma torch and HEPA trunk filtration, this approach was used repeatedly when similar plant conditions existed.

Pipe penetrations through the chamber shell that contained radioactive contamination were removed by cutting the penetrations from the chamber steel by oxyacetylene torch. In some cases individual penetrations were removed, and in other cases penetrations that contained groups of piping were removed intact.

The container air cooling system (ductwork and air cooler units) was the last system removed from the auxiliary chamber, as the ventilation was necessary to support dismantling work in the chambers. The ductwork was segmented into large sections and lowered to the deckplate for further segmentation. The air coolers were likewise segmented and packaged in LSA containers.

The east and west ends of the Auxiliary chamber had no equipment hatches or other suitable access for removal of waste material. However, the flash & blow-off cubicle in the Auxiliary Chamber was equipped with an equipment hatch at the top providing direct access to the FHB main crane. This cubicle had been previously cleared of all pipe and equipment by the DOC Force Account and was available for use. It was decided that a hole would be cut in the Auxiliary chamber shell at the bottom of the flash & blow-off cubicle (refer to Figure 11). Additional holes were required in two intermediate platform floors to provide a direct removal path from the Auxiliary Enclosure floor to the FHB operating floor. The Auxiliary Chamber shell was also cut at the bottom of the east and west ends next to the access under the flash & blow-off cubicle. Empty LSA containers were lowered to the Auxiliary Enclosure floor from the FHB and set on dollies. The containers were rolled from the flash & blow-off access to the east and west access ports for loading with LSA waste. After loading, the containers were rolled back under the flash & blow-off port and lifted into the FHB. This approach was effective and it allowed the contaminated pipe and equipment to be packaged and sent to the FHB without leaving radiologically controlled areas.

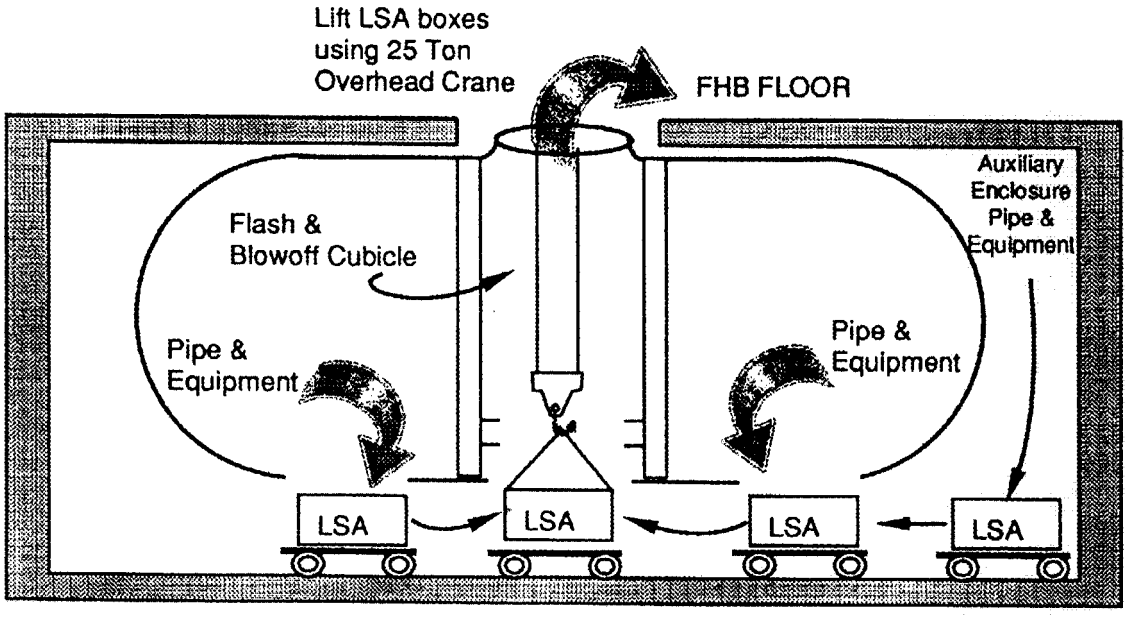


Figure 11
Ingress/Egress Paths to the Auxiliary Chamber

5.2.7 Auxiliary Enclosure

The Auxiliary Enclosure contained piping for support systems and a sump at the west end of the enclosure contained the gravity drain system. Much of the piping was secured to the enclosure walls at the upper elevations, which required extensive use of scaffolds. Pipe removal methods followed normal practices, except as noted.

The northeast corner of the enclosure floor contained a shower facility, with both clean and contaminated drains on the enclosure floor. Workers removed the clean drains by breaking the belled end of the cast iron fittings with a sledgehammer. The contaminated drains were removed in similar fashion, except that reinforced plastic was first sealed around the pipe. After the bell fitting was broken, the plastic was gathered and taped over the broken ends of the pipe. The embedded lines were subsequently decontaminated and grouted in place.

The main steam and feedwater piping in the enclosure (between the steel chamber and the north wall of the concrete enclosure) was insulated with asbestos. Four separate containment tents were erected on scaffolds approximately 30 feet above the floor elevation. The wall penetrations were sealed on the turbine building side of the auxiliary enclosure wall with sheet plastic. The asbestos was removed from the outside of the pipe and from inside the wall penetration. After the insulation and the containment tents were removed, the piping was segmented and lowered to the Auxiliary Enclosure floor.

The reactor plant Gravity Drain System in the sump exhibited radiation levels similar to the primary coolant system, with contact readings in the 30 mr/hr range. A large containment tent was erected in the sump area, with a HEPA filter creating a negative pressure environment. HEPA filter suction was applied to the gravity drain tank, establishing a negative pressure in the system while the piping was mechanically segmented. Piping and tanks in the sump were cut by plasma torch to improve productivity and reduce worker stay-time in this area. Workers were provided with supplied air respirators during these operations. The raw sewage receiver in the sump contained radioactively contaminated water with active bacteria. The DOC shocked the contents with liquid chlorine, killing the bacteria. After the tank was drained to the RWP system, it was turned over to the subcontractor for segmentation. Plasma torch was used to segment the tank after it was verified that no sewer gas remained.

5.2.7.1 Embedded Gravity Drain Line

The technical specification called for the removal of approximately 150 ft. of a gravity drain line that was embedded five feet below the surface of the Auxiliary Enclosure floor. The subcontractor proposed decontaminating the line and leaving it in place in lieu of excavation. The DOC concluded that decontamination could be an acceptable alternative to excavation and removal if the piping internal dose rate could be reduced to less than 5 mr/hr throughout.

A significant collection of dirt, debris and rust was found throughout the interior of the carbon steel embedded gravity drain pipe. Therefore, the pipe had to be cleaned of debris to allow accurate dose mapping. Containment tents were established at each open end of the pipe. A fine string was attached to a balloon and the balloon was pulled through the pipe by the negative pressure created with a HEPA filter unit. A heavier line was then attached and pulled through. A twelve-inch diameter wire brush was pulled through the pipe to loosen debris and scale. A scoop made of a section of 8-inch diameter pipe (with a knife sharp leading edge) was then pulled through the drain line to collect the loose scale. As the quantity of scale decreased, it was decided that the pipe was ready for radiological survey. A device was fabricated to hold a detection probe in the center of the twelve-inch drain line during travel through the pipe. The dose rates were reduced as a result of the scale removal, but the 5 mr/hr criterion was not satisfied.

The subcontractor obtained a special tool to mechanically cut the interior of the pipe. The tool was similar to a boiler tube cleaner, with four rotating cutting heads that were driven by an air motor (refer to Figure 12). The cutting tool was winched through the pipe, as it and the steel reinforced air hose

weighed approximately 800 lbs. A negative pressure was maintained inside the pipe via a 4000 cfm HEPA unit attached to the pipe. Open branch ends were sealed with 1/8" thick rubber that was clamped to the pipe. The cutting tool traversed the main branch of the pipe six times and twice through the reactor enclosure branch. The debris was scooped out and rags were pulled through for final wipedown. Except for some readily accessible areas, all of the dose rates were below the 5 mr/hr criterion during the subsequent survey. After manual decontamination of the offending hot spots, the pipe was filled with concrete and abandoned in-place as it was to be further buried under 50 feet of backfill in the enclosure.

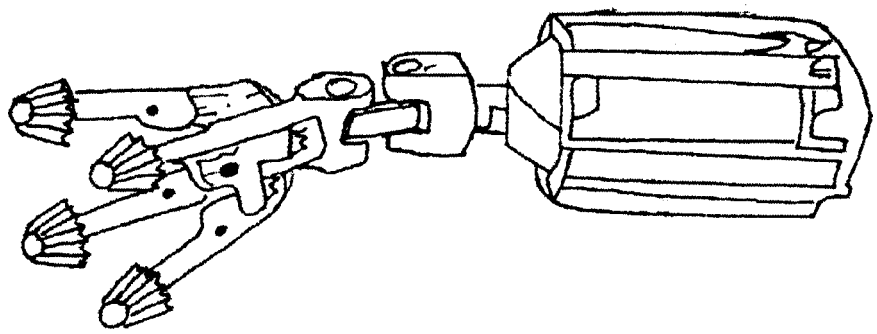


Figure 12
Cutting Tool for Gravity Drain Line Internal Decontamination

5.2.8 Fuel Handling Building

The FHB housed the refueling canal and piping associated with the canal water system, FHB ventilation equipment, contaminated reactor components and defueling equipment in cask storage pits, and miscellaneous piping systems. Figure 13 depicts a plan view of the FHB.

Removal of the canal water system was significant due to localized airborne contamination incidents that took place during removal of the canal water pumps. The pump motors were located at the operating floor elevation. The pump shafts and impellers extended into individual sumps, as much as fifty feet below the operating floor. Photo 9 shows the four canal water pumps and sumps.

The four concrete sumps exhibited high levels of loose surface contamination, with certain locations exceeding 100,000 pCi/100 cm^2. Localized airborne contamination problems were experienced as the pump shafts were lifted from the sumps and segmented for packaging. Increased attention to contamina- tion controls and procedures resolved the airborne contamination incidents. The placement of a cover over the sumps and installation of a HEPA trunkline into the sump pits were key elements of the enhanced contamination controls. The canal water system also included contaminated aluminum piping and valves. HEPA filtered evacuation of the pipe was maintained during segmentation by power hacksaw.

Duct work in the FHB ventilation system was attached to the ceiling of the FHB, approximately 53 feet above the operating floor. Due to the height above the floor and the periodic use of the FHB main crane, scaffolding was impractical for access to the duct. The DOC subsequently arranged for part-time availability of the FHB main crane for use as a work platform and the duct was removed by workers atop the crane.

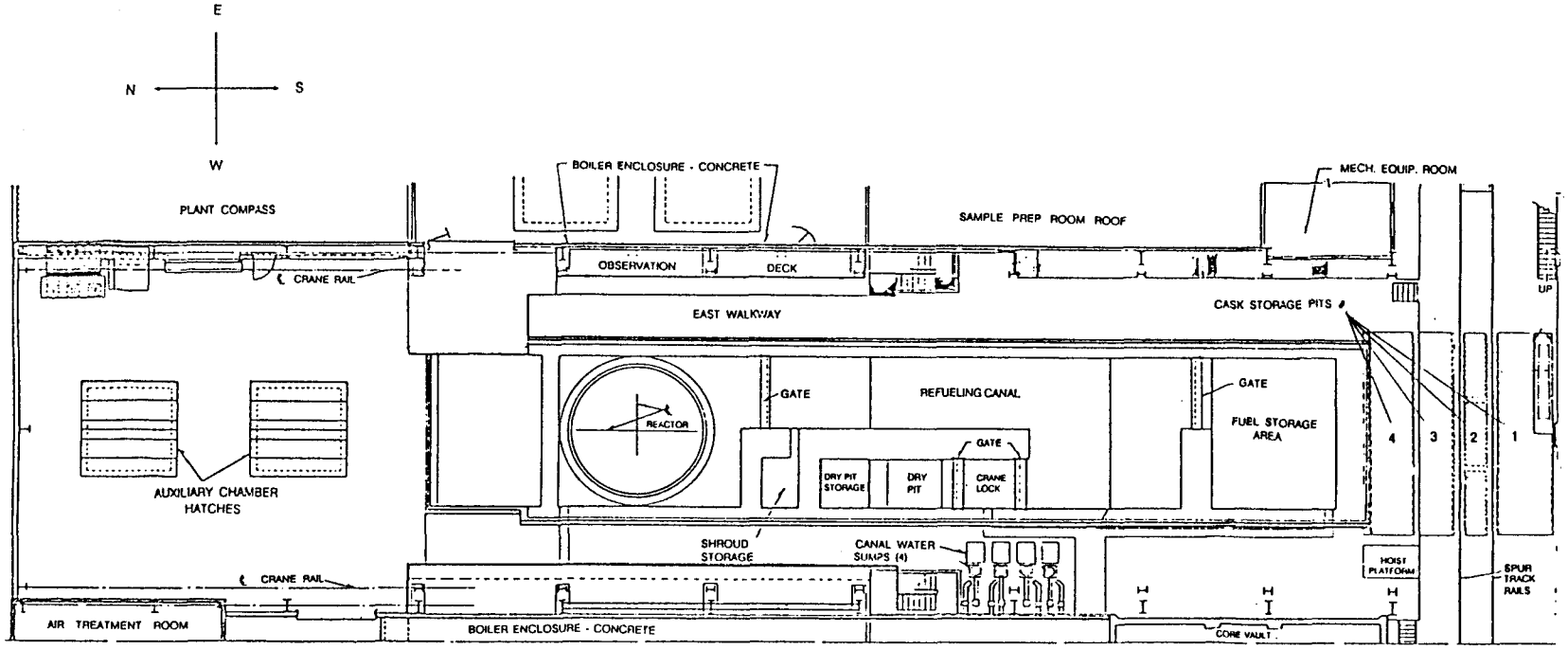


Figure 13
Plan View of the Fuel Handling Building

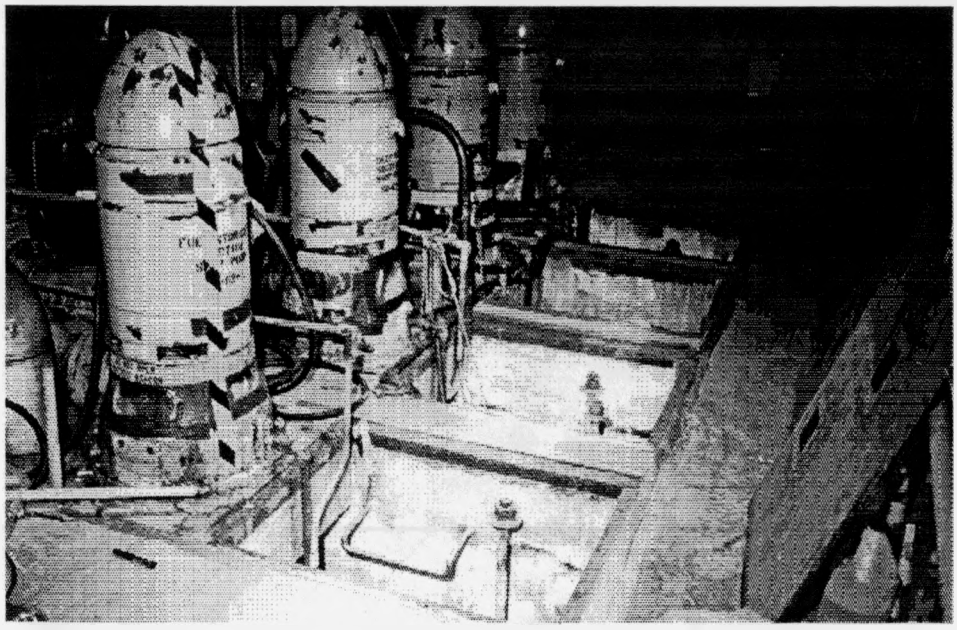


Photo 9. View of the four canal water system pumps. Note the uncovered sumps adjacent to the pumps (75/04).

The inventory of contaminated reactor components and defueling equipment in the four cask storage pits was removed and packaged as LSA waste. Four retired reactor coolant pumps were removed from cask storage pit #1 for one-piece shipment. After all equipment was removed, cask pit #1 was prepared as a contamination control envelope for the thermal cutting of components stored in the other cask pits. Reinforced plastic was draped over the pit walls and floor, and a roof was fabricated and attached with velcro. Two 2" x 12" scaffold planks supported the plastic cover when closed. A 2300 cfm HEPA filter provided a negative pressure environment during thermal segmentation. This arrangement was so effective that contaminated components from other locations onsite were delivered to cask pit #1 for segmentation.

The four canal gates were removed from the refueling canal and transported to cask storage pit #1 for segmentation. Due to the size of these gates, they did not fit entirely within the confines of the contamination control envelope, which necessitated manual decontamination prior to thermal segmentation. The manual decontamination effort was the slowest part of the gate segmentation process.

Miscellaneous support piping systems were located throughout the FHB. These systems included low pressure steam and condensate, treated water and control and service air piping. These lines were generally cut by bandsaw.

An addition to the FHB workscope was the removal of sludge from the canal water system suction pipe in the deep pit. With containment provisions at both ends of the pipe, a twelve-inch diameter chimney sweep brush and a scoop were pulled through the pipe. Approximately one gallon of sludge was removed with a dose rate of 1 R/hr. The sludge was turned over to the DOC for solidification and packaging.

5.2.9 RWP Yard

The RWP Yard contained components used for processing and storage of radioactively contaminated water and spent resins. The RWP Yard contained seven above-ground tanks, four below-ground liquid surge tanks, two below-ground spent resin storage tanks, four below-ground Ion exchange vessels, upper and lower trench piping, and miscellaneous support equipment and piping. After completion of the pipe and equipment removal by TLG/CWC, contamination was discovered in drains, in building foundations, as well as in sections of pipe that were buried directly in the soil. These were removed by the non-contaminated structures demolition (A/S 8B) subcontractor via workscope additions. This work is discussed at the end of this section.

The six underground tanks were enclosed in concrete vaults with access through hatches in the roof. Prior to segmentation of the surge tanks, the subcontractor erected a containment tent over each tank vault. The interior of the tank was evacuated through a HEPA filter unit and flexible duct. The blower exhausted to outside the tent, providing a negative pressure in the tank. The interior surfaces of the tanks were painted with latex paint to fix contamination prior to segmentation. A rolling scaffold platform was erected inside the tank for access to tank surfaces. During the plasma torch segmentation, workers were equipped with supplied air respirators for protection against the dense smoke that was generated in the confined work spaces. Tank segments were hoisted up to the containment tent operating floor and packaged in LSA containers. The approach taken for the spent resin storage tanks was virtually identical, except that the wood and plastic containments erected over the tank vaults by the resin removal subcontractor were left in place for use during segmentation.

The above-ground tanks were segmented within a single containment tent. The tent was erected around the largest of the six tanks. After the first tank was dismantled, the others were lifted from their foundations by a mobile crane and lowered into the containment. As the tanks were cut, the segments were loaded directly into LSA containers inside the tent. Two of the above-ground tanks were rubber lined and were cut by a gasoline powered saw with abrasive wheels. The other tanks were segmented by plasma torch.

The reactor chamber dome was the top, removable portion of the reactor chamber. Due to its proximity to the reactor during operation, the chamber dome experienced slight neutron activation, which necessitated its disposal as LSA waste. It was segmented in the open air by plasma torch. Since there was very little activation in the base metal, and the plasma torch creates a very narrow kerf, the smoke samples taken during segmentation were within the project airborne contamination limits for off-site release (8×10^{-11} microCi/ml for Co-60). Photo 10 shows the initial cutting activities on the reactor chamber dome.

Four ion exchangers were located in separate vaults in the RWP Yard near the RWP Building. The general removal sequence included isolation of the ion exchange vessels from system piping, erection of containment tents, removal of concrete vault covers, and removal of the vessels. These vessels were planned to be disposed of as one-piece shipping containers, but the DOC approved the subcontractor's request for segmentation and packaging, as an alternative to the labor-intensive closure of the vessel nozzles.

The RWP yard contained a two-tier system of pipe trenches that connected the underground Surge tanks and Resin tanks. The upper trenches contained steam and condensate piping that was insulated with asbestos. The lower trenches contained contaminated transfer piping for waste water and spent resin that was not insulated a it was well below the frost line.

Portable containment tents were installed over the upper trenches during pipe removal. As the work in a trench was completed, the tent was lifted and moved progressively to the next trench location. As discussed in Section 2.1.4, the pipe and insulation were removed intact.

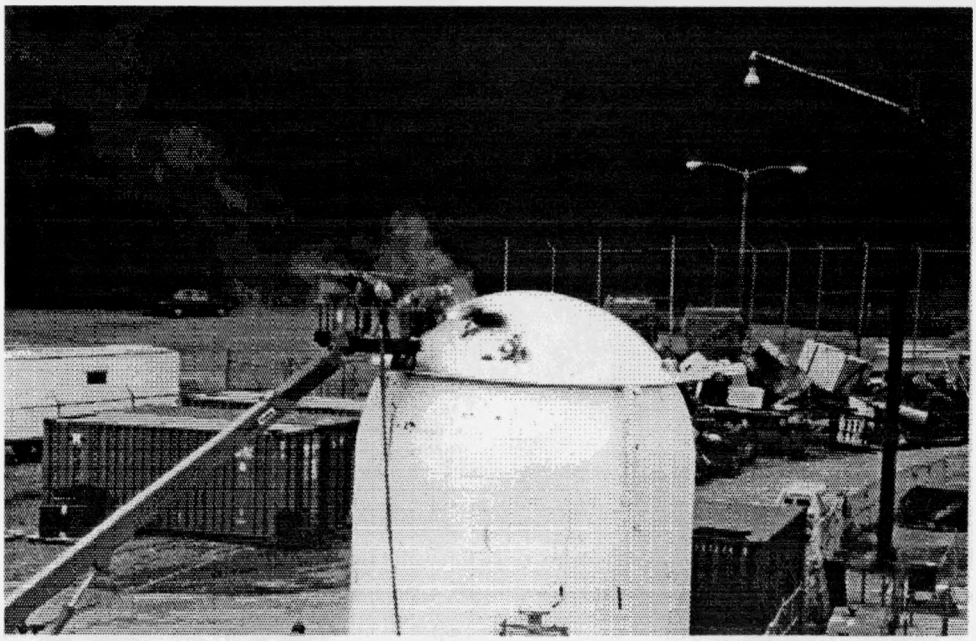


Photo 10. Initial segmentation of the reactor chamber dome (158/33).

Removal of the piping from the lower trenches was accomplished by cutting the pipe in the trenches at access points with oxyacetylene torch or bandsaws. After cutting, the pipe was withdrawn to the manway for further segmentation. This approach was possible since the pipes only rested on the supports and the trenches were large enough for worker access. This enabled the subcontractor to avoid the significant excavation effort and additional radiological controls required to open the trench covers.

During demolition of non-contaminated structures in the RWP Yard (which followed the piping and equipment removal), contaminated drain piping was discovered in the foundations of the Auxiliary Equipment room 1A, the Demineralizer and RWP Buildings and in the RWP Yard. Removal of these contaminated lines was assigned to the A/S 8B subcontractor who was responsible for non-contaminated structures removal. Drains in the concrete foundation that were located within the top three feet of the grade elevation were removed prior to using the small ram-hoe to demolish the foundation. Drains deeper than three feet below grade were excavated from the soil with a back-hoe after foundation demolition. The soil around pipes was hand-shoveled and surveyed by RCT's. Drains were wrapped in reinforced plastic and broken with sledgehammer. The plastic was gathered around the ends and the pipes were packaged as LSA waste. Portions of the pipe runs were filled with grout and abandoned in-place when radiological conditions and locations permitted.

5.2.10 RWP Building

The RWP Building contained piping and equipment for the processing of solid, liquid and gaseous radwastes. Portions of the building contained complex arrays of small bore pipe that required special removal precautions to ensure the complete drainage of all process chemicals. The subcontractor's engineering group installed perforated identification tags on all systems to be removed. Each tag was numbered in accordance with the detailed procedures used in the field. As the piping was drained, the corresponding tags were separated at the perforation line and returned to engineering. When all tags were removed from a given area, it was released for dismantling. Other removal activities included salvage of the thin film evaporator, chemical waste tanks segmentation, and removal of miscellaneous asbestos.

The thin film evaporator was salvaged intact by removing interconnecting piping and sealing the nozzle ends. It was removed on its support frame and delivered to an area near the east laydown yard for packaging, shipment and use at another government facility.

The chemical waste tanks in the RWP basement were segmented by plasma torch after removal of the outer insulation. Although the tanks were not insulated with asbestos, the mud insulation used at the interface between the tank insulation and pipe insulation was found to contain asbestos. Other pockets of fugitive asbestos were removed by use of glove bags, or the asbestos insulated components were bagged, removed and packaged with insulation intact as LSA waste.

5.2.11 East Yard Area

The East Yard area was a narrow corridor between the FHB and the RWP Yard. The East Yard contained the Safety Injection System (SIS) tank, condensate tank, reactor plant water storage tank, canal water tank, decontamination heat exchangers, and trench piping. The Heat Dissipation System (HDS) was located north of the East Yard. The DOC Force Account dismantled the SIS tank and associated systems, the condensate tank, canal water tank and the HDS facility.

The HDS and SIS were non-contaminated systems. Dismantling was conducted principally with oxyacetylene torch and conventional rigging equipment. There were two abnormal events that occurred during dismantling of the HDS (see Section 8.2). The SIS tank was segmented by workers in a man-basket. Photo 11 shows some of the initial dismantling progress with the SIS tank.

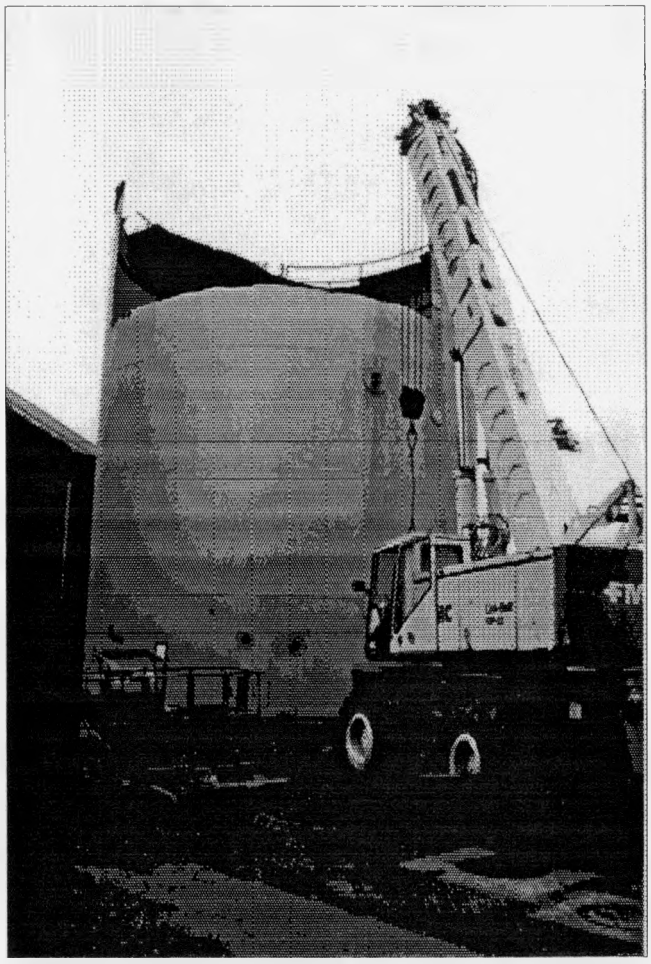


Photo 11. Initial stages of segmenting the SIS Tank (20/10).

The Canal Water Tank was segmented by oxyacetylene torch from an aerial manlift. Segments were cut to size for the LSA containers, then lowered with a small crane. A radiological concern over the potential for contaminated metal flakes to drift outside the controlled area resulted in a revision to the segmentation cutting pattern. Long vertical sections were cut and placed in the tank base for further segmentation. This approach created a problem when a vertical segment was removed, leaving another tall vertical segment with insufficient lateral support. The weight of the unsupported segment caused it to fold over into the tank. No injuries were sustained.

The Condensate tank was non-contaminated, and was dismantled in the most expeditious manner possible. The bottom of the tank was cut into pie segments that were allowed to hang down by residual tabs. Work then proceeded from the top down, and segments were dropped into the tank, falling to the ground. Finally, the bottom and legs were cut. A scrap dealer loaded the tank segments and transported them offsite.

The Reactor Plant Water Storage Tank was elevated on four support legs. After survey by the DOC, it was released as non-contaminated. The tank was initially supported by a mobile crane, to allow the removal of the four legs. The tank was then lowered to the ground for worker access. Plasma torch was used to segment the stainless steel tank for disposal as scrap.

The trenches in the East Yard were handled differently than these in the RWP Yard. Since no access points existed, the trenches were excavated, exposing their concrete covers. Photo 12 shows the excavation of a trench west of the 1A Auxiliary Equipment Room.

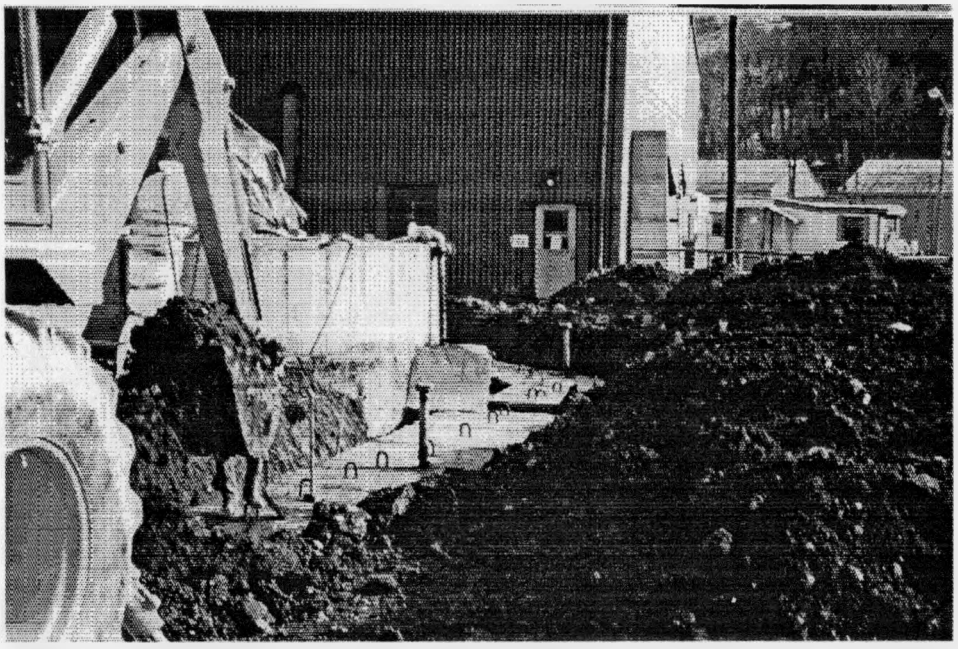


Photo 12. Excavation of a pipe trench in the East Yard area (106/31).

Trench covers were lifted within containment tents while contamination levels were verified. If contamination levels were less than 10,000 pCi/100 cm^2, the containment tents and covers were removed. The trenches were re-surveyed and plywood covers were placed on top and sealed against rain. Pipes were cut within a containment tent by pulling lengths of pipe into the tent for segmentation. Photo 13 shows a portable containment tent over a pipe trench in the East Yard.

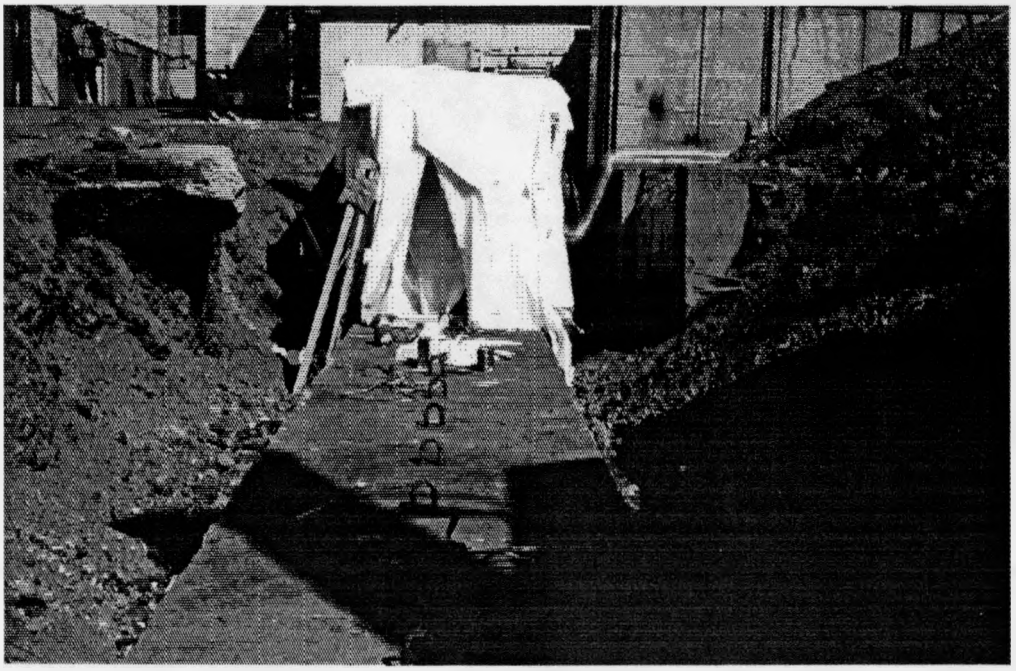


Photo 13. A portable containment tent in-place over a pipe trench in the East Yard (110/29).

5.2.12 Reactor Plant Service Building (RPSB)

The RPSB housed chemical laboratories, offices, the radiological counting room, laundry, locker room, and lunch room. Since this building continued to serve support functions, the DOC sequenced release of the work areas to the subcontractor. The first area released was the Monitored Waste Room, which was in the basement. Two holding tanks and associated piping were removed by mechanical methods. The tanks were segmented by reciprocating saws as they were lined with rubber. The large bore cast iron pipe was unbolted at flange connections, the small bore pipe was segmented with power hacksaws and bandsaws.

The balance of the RPSB was divided into seven work areas. The general order of work was removal of the above ground non-contaminated pipe followed by the contaminated piping in the shallow trenches. The traps and drains in the laboratories were a concern due to the potential for residual caustics and acids, however, no problems existed.

Fugitive asbestos was discovered throughout the RPSB, in the counting room ceiling, Men's room pipe chase, laundry room pipe chase, shower room ceiling, and the Cold Lab shallow trench. Asbestos was known to exist behind a concrete block wall in the Hot Chemistry Laboratory. Asbestos was removed from the pipe at cut points via glove bags. Pipe segments were double-wrapped in plastic with the insulation intact and loaded in LSA boxes for disposal.

5.2.13 Mechanical Equipment Room 1B

The MER 1B adjoined the south end of the FHB. It contained HVAC equipment for the FHB, Clean Room and Decontamination Room. Components that were removed included electrostatic air cleaners, adhesive pumps, heating coils, filters, dampers, ductwork, fans, and steam and condensate piping.

Although all equipment was anticipated to be non-contaminated, the DOC required the detailed procedures to reflect removal of contaminated components. This approach was prudent, as the duct and fan unit for the Decontamination room was found to be contaminated. The non-contaminated components were released as clean scrap after they were surveyed.

Asbestos insulation was discovered on the FHB supply fan housing. A HEPA ventilated containment was erected over the blower unit and the insulation was removed and loaded into plastic waste bags for disposal at Hanford.

The third floor location of the MER 1B did not provide a direct removal path for waste. The subcontractor removed the inner and outer steel siding panels of the south wall to allow direct access. When waste materials were accumulated, a skip-box was lifted to the opening by a cherry picker crane and loaded with scrap. Photo 14 shows the opening in the side of the MER 1B directly above the Clean Room.

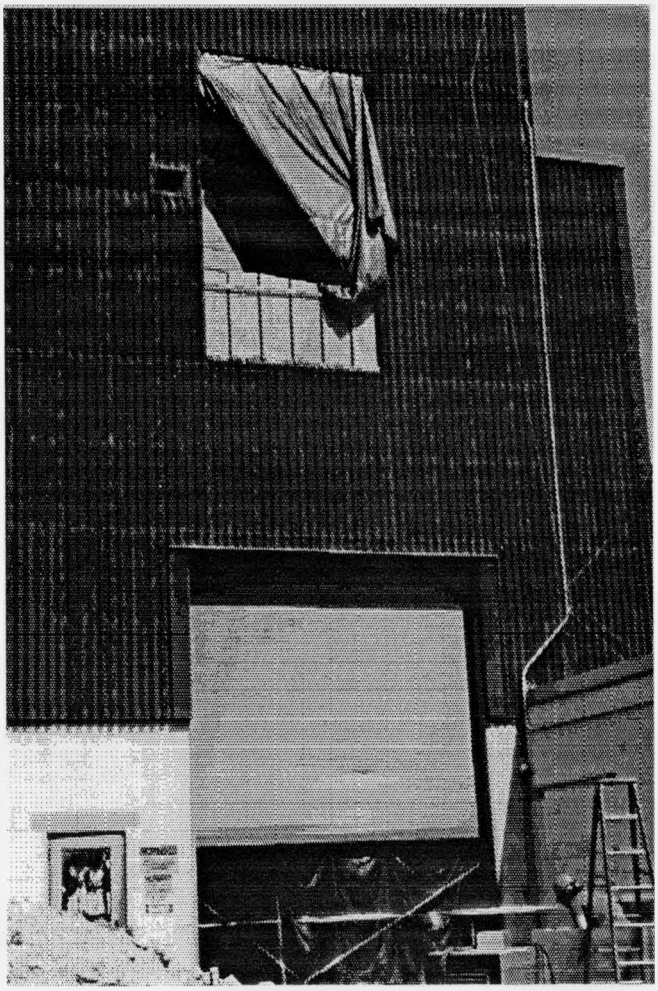


Photo 14. Waste egress path created in the side wall of the MER 1B (top center of photo) (162/07).

6.0 SOLID WASTE MANAGEMENT

6.1 DETERMINATION OF WASTE TYPES AT SSDP

Prior to removal of pipe and equipment, the DOC's Health Physics organization initiated a sampling and analysis program to characterize the waste stream at SSDP. The piping waste stream was determined to be dominated by Co-60 and Fe-55 from the analysis of a section of reactor coolant pipe. Based on the low concentrations of these radionuclides, the DOC concluded that essentially all waste at SSDP would qualify as LSA material (in accordance with 49CFR173.403). The only exceptions encountered were the Pressurizer and Flash Tank which required internal decontamination prior to shipment.

6.2 WASTE PACKAGING

The technical specification for A/S 4&5 required the subcontractor to package radioactive wastes in the field. When access permitted, LSA containers were placed in the work area and the waste was promptly packaged. Photo 15 shows an LSA container that was loaded with piping in the 1A AER. In other cases, waste storage areas were established and pipe and equipment were accumulated until transported to a packaging area. Photo 16 shows contaminated piping that was temporarily stored for further segmentation prior to waste packaging at another location. Open ends of radioactively contaminated piping were taped shut with sheet plastic and duct tape prior to placement in LSA boxes. Small pumps, receivers, tanks, heat exchangers and all valves were treated as piping. Loaded LSA containers were delivered to the FHB or the Contaminated Equipment Room (CER) for rad survey, labeling, inventory documentation and closure. Large pumps and heat exchangers were removed in one piece for shipping as their own containers after sealing open nozzles with welded or bolted closures. Large tanks were segmented by plasma or oxyacetylene torch.

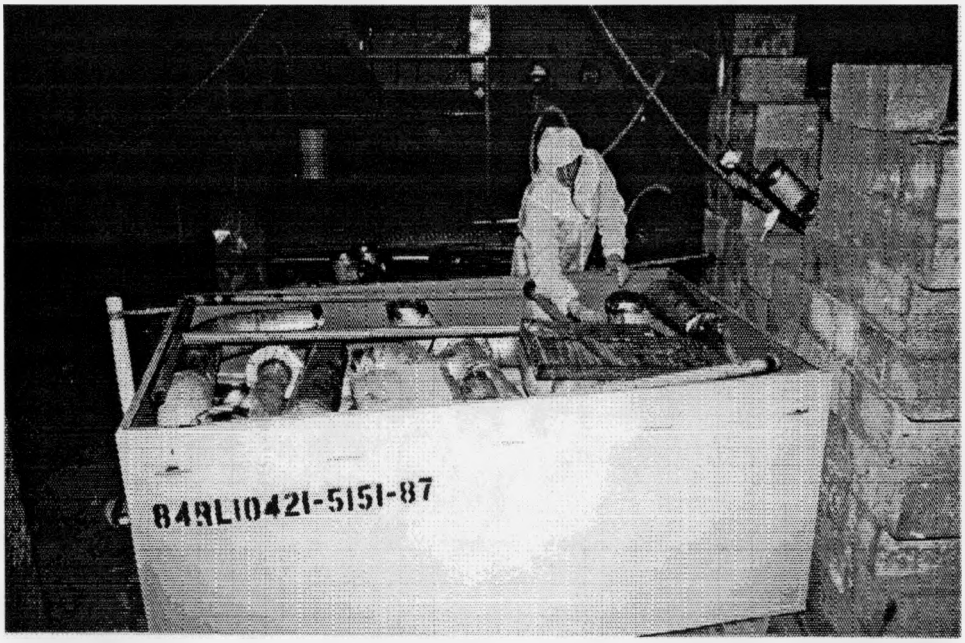


Photo 15. LSA container loaded with canal water system piping in the Auxiliary Equipment Room 1A (104/08).

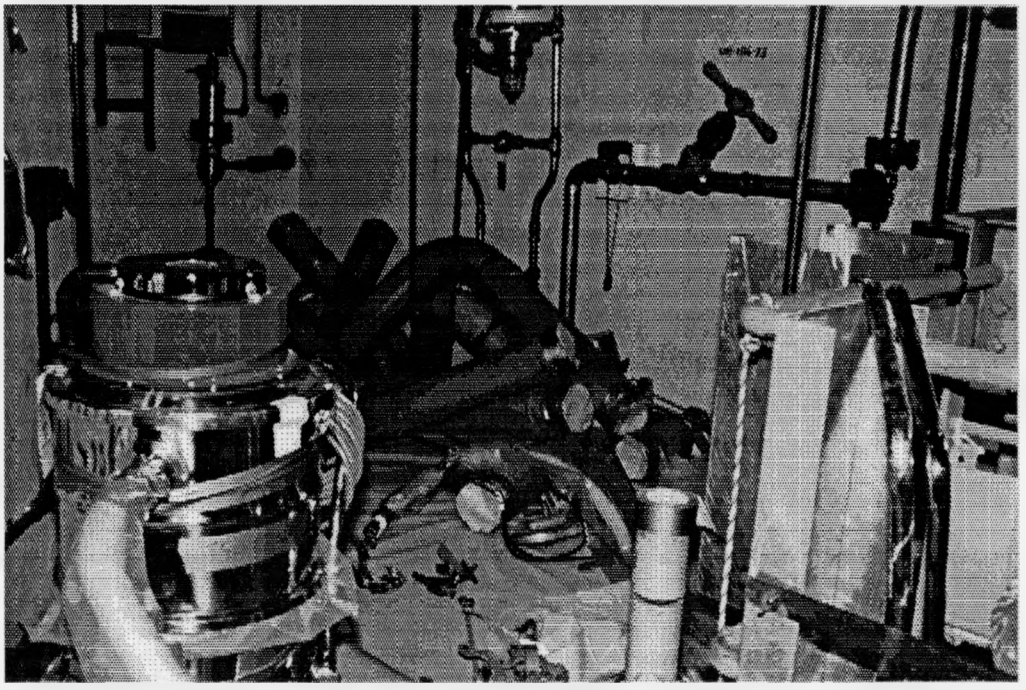


Photo 16. Contaminated piping in a storage location awaiting further segmentation for packaging (97/30).

6.3 HANDLING AND STORAGE OF SOLID WASTES

Handling of waste containers within the radiologically controlled areas (RCA's) was generally performed with unsealed boxes. Prior to removal from an RCA, all boxes were sealed, wiped down and surveyed. Waste containers were transported by dolly, forklift, or the building cranes. Asbestos waste was stored in the Demineralizer Building prior to shipment to the Hanford burial ground. LSA waste containers and one-piece containers were stored in the east or west laydown areas until shipped. The subcontractor was responsible for waste containers until they were delivered to the designated storage and laydown areas. Waste manifests, shipping papers, laydown yard handling/storage and waste shipments were DOC responsibilities.

6.4 WASTE CONTAINERS AND WASTE VOLUME SUMMARY

The waste containers used at SSDP included the following:

- CPC-S-96 - these steel boxes provided a net volume of 96 $ft.^3$ and had a burial volume of 131 ft^3. These were the standard LSA containers used on the site until replaced by the lower cost 86 $ft.^3$ (net) LSA containers.

- FMI S-112 - these steel boxes had a net volume of 86 $ft.^3$, a burial volume of 112 $ft.^3$, and a load capacity of 7000 lbs. They were used for all forms of LSA waste, including piping, valves, pumps, wire, conduit, tank segments, etc. Dry active waste (DAW) such as booties, gloves, plastic, rags, and miscellaneous wastes were used to fill voids in the containers prior to lid closure. This practice eliminated the use of 55-gallon drums for DAW.

- CPC B-12V - these small steel LSA containers were used to package segments of the canal water tank. Due to their high weight capacity (100 lbs/ft.^{3}), they accepted segments of the tank shell without overloading.

- ASP-101 - these plywood boxes were used as an overpack container for the double-bagged asbestos wastes to ensure the safety of the public and material handlers at the burial site.

- 17-H steel drums - were used exclusively for the wastes generated during decontamination of the embedded gravity drain line in the Auxiliary Enclosure.

- CI TMB-V - two steel special sized Type A containers were used for the reactor coolant sample trains.

- CPC-S-282 - this Type A steel container was used for the reactor coolant purification demineralizers.

- One-piece containers - Due to their configurations, 25 components were shipped from SSDP as their own containers. This approach was adopted as a time, cost, and ALARA benefit in lieu of segmentation. Components shipped in one piece included reactor coolant pumps, heat exchangers, demineralizers, and one steam drum.

The total waste volume generated during the performance of A/S 4 & 5 was 87,963 ft^3. A tabulation of the containers used and the corresponding waste volumes is identified for each of the performing organizations in Tables 3 and 4.

Table 3

TLG/CWC
Waste Containers and Burial Volumes
for Contaminated Piping and Equipment

Container Type	Rated Burial Volume	# of Containers	Total Burial Volume
CPC-S-96	131 ft.^{3}	48	6,288 ft.^{3}
FMI S-112	112 ft.^{3}	487	54,554 ft.^{3}
ASP-101	130 ft.^{3}	47	6,110 ft.^{3}
17-H drums	7.4 ft.^{3}	3	22 ft.^{3}
CI TMB-V	379 ft.^{3}	2	758 ft.^{3}
CPC-S-282	282 ft.^{3}	1	282 ft.^{3}
One-piece containers	Varied	22	9,140 ft.^{3}
Total		610	77,154 ft.^{3}

Table 4

DOC Force Account
Waste Containers and Burial Volumes
for Contaminated Piping and Equipment

Container Type	Rated Burial Volume	# of Containers	Total Burial Volume
CPC-S-96	131 $ft.^3$	15	1965 $ft.^3$
FMI S-112	112 $ft.^3$	46	5152 $ft.^3$
CPC B-12V	56 $ft.^3$	20	1120 $ft.^3$
ASP-101	130 $ft.^3$	1	130 $ft.^3$
17-H drums	7.4 $ft.^3$	3	22 $ft.^3$
One-piece containers	Varied	3	2420 $ft.^3$
Subtotal		88	10,809 $ft.^3$

Note: The volume of piping that was packaged by Noralco (A/S 8B-RWP) from contaminated drains in the RWP Yard was insignificant in comparison with the volume of other contaminated wastes that were packaged by TLG/CWC and DOC. Noralco wastes are reported in the A/S 8B Topical Report.

7.0 PROJECT OBSERVATIONS

Lessons Learned during removal of piping and equipment covered management, engineering and operations, and they are grouped below accordingly.

7.1 MANAGEMENT/ENGINEERING LESSONS LEARNED

1. The division of work responsibilities in the boiler chambers created cleanup problems for the DOC. Pipe, equipment and certain structural members were removed by the A/S 4&5 subcontractor. Some of the reactor coolant pipe was removed by the A/S 3A (Reactor Vessel Preparation) subcontractor, and electrical conduit was removed by DOC F/A. Due to the distribution of work among the three organizations and the work sequencing, the final cleanup activities could not be properly assigned, and the DOC had to assume responsibility for the area cleanup. The use of one subcontractor for all removal work in a given area would have simplified the scheduling of work and precluded the problems associated with cleanup jurisdiction.

2. Review and approval of subcontractor procedures was expedited by inviting the subcontractor to the DOC review meetings. This reduced the comment and response cycles.

3. Sign-off for procedures and activity change notices was initially required by the DOC section managers. Delegation of signature authority was given to middle-level managers to expedite the approval process.

4. Asbestos insulation was discovered during piping removal at pipe elbows, in hidden areas behind shield walls, and in piping penetrations. Some of the asbestos removal was added to the A/S 4 & 5 subcontract, and some was assigned to a DOC F/A asbestos removal team that was established to remove pockets of fugitive asbestos insulation.

5. Formal documentation of accidents, spills, and recovery actions that occurred during plant operation should be provided at turnover for decommissioning. This information should be included in the dismantling plan and factored into decommissioning detailed procedures. The resin spill in the BD purification cubicle (refer to Section 8.1) may have been avoided if written notification had been incorporated into plans and procedures.

6. The Decommissioning Plan included the establishment of a central waste packaging area in the CER. This concept was based on the utilization of a dedicated work area and personnel for efficient waste packaging. The DOC chose not to follow this approach as the low burial charges applied to the SSDP were not part of the DOC contract. Packaging responsibility was given to the subcontractor and performed in the field.

   The Decommissioning of a commercial facility with a substantial volume of radwaste would benefit greatly by a well-planned volume reduction and/or decontamination program due to the higher commercial burial fees.

7.2 OPERATIONS LESSONS LEARNED

1. Electrical power in the field was provided by temporary power cables to local power boards at the various work areas. Due to the extensive use of the plasma torch and HEPA filter ventilation units (which required 480-volt, three-phase power), the initial power supply was inadequate. The DOC made two additional 150-amp power sources available in the Turbine Building to meet the subcontractor's needs. Initially, the temporary power system provided two 50-amp, 3-phase circuits

and six 50-amp, 1-phase circuits. It should have provided at least fifteen 50-amp, 3-phase circuits to support the level of effort at SSDP.

2. Dismantling of large above-ground contaminated tanks was initially performed within a tent containment to control airborne contamination. During segmentation of the spray-recycle tank, the DOC determined that painting the tank interior surfaces would enhance contamination control. Air samples taken during segmentation indicated that airborne contamination was maintained within allowable levels with the painted walls. Continued monitoring showed that exterior tent containments were not required for many of the subsequent tank segmentation operations.

3. Piping systems were drained by DOC Plant Operations personnel prior to turnover to the subcontractor. Long horizontal runs of piping and horizontally-mounted heat exchangers were prone to collect water that could not be effectively drained until segmentation. Therefore, despite the precautions, water was frequently collected from piping and components during removal. The subcontractor used drip pans and self-tapping saddle valves and tipped the components to drain water pockets when necessary. Two unusual events related to residual water are reported in Sections 8.4 and 8.5.

4. All unnecessary electrical circuits in work areas were de-energized to preclude accidental contact with live wires. Active circuits and temporary power lines were marked with red and white tape bands for ready identification. Despite the precautions, there were several incidents involving electrical circuits:

   a. A reactor coolant pump swung into a light fixture during removal, shorting out the circuit.

   b. A worker cut a conduit that was obstructing access to his work underneath a cat-walk in a boiler chamber. The conduit had been painted blue to indicate that it was de- energized, but it was not. Further examination revealed that the circuit had been de-energized properly, but it was cross-connected to another live circuit without indication in the electrical diagrams.

5. There were several iterations in the review and approval of the procedures for segmentation of the Chemical Waste Tanks, due to trace quantities of PCBs and chromates that were detected in the tank sludge. The final procedure required PCB contaminated piping to be segregated from piping without PCB's. Thermal cutting of the Chemical Waste Tanks was permitted. During tank segmentation, an oily film on the internal surfaces created smoke that clogged the HEPA filters. The surfaces were subsequently wiped down prior to thermal cutting and workers were provided with supplied air.

8.0 REPORTABLE INCIDENTS

There were two reportable incidents during the piping and equipment removal that qualified as Unusual Occurrences as defined by DOE 5000.2. There were also several incidents of lesser significance which were not considered as reportable. The text that follows reports on the unusual occurrences, as well as those abnormal events that have potential technology transfer value. The incidents were experienced by TLG/CWC, the DOC RadCon group and DOC F/A and are so noted.

8.1 UOR GE/MK 86-06, APRIL 7, 1987, RESIN SPILL DURING REMOVAL OF DEMINERALIZER CUBICLE HATCH

On December 18, 1986, radioactively contaminated resin beads and dust were released from the sides of the concrete shield plug as it was lifted from its position in the demineralizer cubicle (over the demineralizer) in the B/D chamber. The resin beads fell onto the top of the cubicle and down into the open cavity. Workers attempted to control the dust by misting with water at the suggestion of the RCT, but swipe measurements showed that the contamination was spreading rapidly. The RCT cleared the work area and called his supervisor. Sampling revealed a radioactive airborne concentration of 4.5 x 10^{-8} microCi/ml and loose contamination on the deck around the demineralizer cubicle. The control room was notified and the entire chamber was evacuated. During the evacuation, some of the workers in the adjacent boiler cubicles exited through the contaminated demineralizer area, as it was the normal mode of personnel egress. This resulted in additional contamination of personnel and the access walkway.

Investigation Results

1. One skin decontamination was required, and eight shoe contaminations were observed. Nasal smears were taken for all personnel within the BD enclosure. Nasal flushes were performed for personnel with positive smear results, followed by chest and face surveys. Three workers received less than 1%, and one received 1.5% of the maximum permissible lung exposure. The resultant dose commitments to the lung were 74 mRem and 113 mRem, respectively.

2. The incident was caused by a lack of communication regarding the contaminated resin beads trapped between the concrete plug and plug frame. Verbal information from previous operators had been given concerning a spill, but no written information had been provided. The verbal information was not incorporated into the concrete plug removal procedure.

3. As soon as the unexpected conditions were observed, the work should have stopped. Instead, the personnel involved did not immediately recognize the significance of the problem and the Emergency Plan was not activated. Consequently, the proper egress paths were not defined in the evacuation announcement, resulting in unnecessary spread of contamination and exposure of personnel.

4. A higher level of protection is required for operations that have a potential for internal exposure. This was controlled through the radiological engineering review of procedures. Personnel with previous operating experience at Shippingport were incorporated in the procedure reviews when appropriate.

8.2 LESSONS LEARNED #4, MAY 15, 1986, SMOKE FROM CUTTING OPERATIONS TRAVELING THROUGH CONDUITS AND CUTTING OF ENERGIZED LINE

1. Smoke Traveling Through Conduits:

An electrical junction box was reported to be smoking. The stand-by alarm sounded and the circuits were traced to locate the source.

Investion Results

a. During flame cutting of electrical conduit in the yard, smoke traveled through the conduit to other plant areas giving a false indication of electrical malfunction.

b. Conduit should be mechanically cut at or near junction boxes and sealed prior to flame cutting to prevent travel of smoke beyond the work area.

2. Cutting of Energized Line

An energized heat trace line which was not shown on the electrical diagrams was cut during segmentation of the HDS piping. No injury occurred. The control room was notified and the circuit was located and de-energized.

Investigation Results

a. A new Project Instruction, Electrical Decommissioning (PI #34), was developed as a result of this incident.

b. Personnel were trained on their responsibility to check the status of electrical lines and conduits prior to dismantling.

8.3 LESSONS LEARNED #19, SEPTEMBER 19, 1986, VACUUM CLEANER SPILL

Two decommissioning workers were moving a HEPA vacuum cleaner on September 9, 1986. As the vacuum was lifted over a ladder into the Auxiliary Chamber at the "A" chamber interconnect, the latch released on the side of the unit. The vacuum came apart, spilling the contents onto the deck and on another worker. An RCT escorted the worker to a control point frisking station and notified the control room. Personnel in the chamber were evacuated and the Level 1 alarm was sounded. The individual's shirt was contaminated (200 cpm) as well as a small patch of chest skin (80 cpm). The shirt was disposed of, and the skin surface decontaminated.

Investigations Results

1. The weight of the filled vacuum cleaner may have been excessive.

2. The center latch on the vacuum cleaner body was not lock-wired. The subcontractor was required to lock-wire all vacuum cleaners, and the subcontractor procedures and DOC RadCon Manual were revised accordingly.

8.4 ON-SITE INVESTIGATION 34, JANUARY 7, 1987, CONTAMINATED WATER RELEASED FROM "B" REACTOR COOLANT PUMP

During removal of the "B" reactor coolant pump on October 17, 1986, the pump was down-ended in preparation for re-rigging and placement on a truck. Residual water drained out of the pump volute during the down-ending. The spill was soaked up with absorbent material and decontaminated by the DOC.

Investigation Results

1. Prior to pump removal, the suction and discharge piping was cut off and the volute drained. Steel cover plates were tack-welded to the volute nozzles until transferred to a temporary storage area for better welding access.

2. Residual water in the pump internal cooling system did not drain until the pump was tipped during down-ending.

3. Procedures were revised to require installation of a containment bag with a drain tube and collection bottle on the volute suction nozzle.

8.5 ON-SITE INVESTIGATION 38, OCTOBER 27, 1986, NON-RADIOACTIVE WATER SPILL FROM COMPONENT COOLING WATER LINE

A HEPA vacuum was connected to a flexible line in the four-inch component cooling water piping. The vacuum pulled water from an unknown location, saturating the vacuum and spilling approximately seven gallons of non-radioactive chromated water at the vacuum, plus a small amount from a taped drain hole in the line.

Investigation Results

1. The probable cause of the spill was the siphoning effect of the HEPA vacuum on water in two segments of a line, which were about 1" lower than the vacuum connection.

2. This incident caused the DOC to re-evaluate plant drainage practices. The conclusion was that the Plant Operations organization had achieved a well-balanced approach to drainage. While this spill was being investigated, another spill occurred. A long, horizontal pipe that was cut at both ends was moved, discharging water from the lower end. The DOC concluded that it would not be cost-effective to attempt to eliminate all residual water in piping prior to segmentation. Therefore, provisions for drainage should be made prior to and during pipe segmentation.

3. The leakage from the drain hole was caused by insufficient tape coverage. The subcontractor committed to wrap the tape completely around the pipe, covering the 1/4" drain holes.

4. After this spill, the subcontractor reported the removal of an additional 50 gallons of water from the same line. The DOC concluded that this quantity of water could only have come from siphoning the water a height of four feet from beyond two open vents in the line. Since a vacuum can have such a profound effect on residual water in piping systems, precautions are necessary to avoid spills. Such precautions should include drainage of possible siphon loops, use of vent holes, isolation valving and installation of water traps between the HEPA vacuum and piping.

8.6 ON-SITE INVESTIGATION #47, FEBRUARY 3, 1987, SPILL FROM "D" HEAT EXCHANGERS

On December 5, 1986, a work crew was cutting risers and downcomers from the "D" loop heat exchangers. A plastic drain sleeve had been run from the heat exchanger drain lines to the chamber sump. As the risers and downcomers were removed, the heat exchanger weight shifted, causing a surge of water through the drain. The plastic sleeve split open with the surge, releasing approximately 40 gallons into the bilge area of the chamber. The Emergency Plan was activated, and the area was evacuated. One laborer got wet, but was not contaminated.

Investigation Results

1. The plastic sleeve was not strong enough to withstand the water surge. It was replaced with an air hose and clamps prior to resuming work in the area.

2. The AC Chamber heat exchangers were drained with fire hoses.

8.7 LESSONS LEARNED #22, DECEMBER 12, 1986, CUTTING OF AN ENERGIZED CONDUIT

DOC F/A personnel were removing blue painted conduit in the AER 1A that had previously been de-energized in accordance with Project Instruction 34. During the cutting of conduit, the saw blade contacted the conductors and sparking occurred. No injuries occurred, but the F/A Work Group Supervisor was informed and work was stopped.

Investigation Results

1. When the Force Account de-energized the circuits to be removed, the Neutron Shield Tank level instrumentation was also de-energized. On October 27, 1986, the Control Room Shift Supervisor noticed that the pilot light on the Neutron Shield Tank Level Instrument was not illuminated. After determining how the level instrument was de-energized, the Shift Supervisor prepared a maintenance work request and re-energized the Neutron Shield Tank Level Instrument from an alternate power source. By re-energizing this instrument, the Shift Supervisor inadvertently re-energized a conduit which was previously decommissioned. This work was not deemed safety related by the Shift Supervisor and hence, it did not receive further review or attention.

2. A recheck of all electrical work previously performed by the Shift Supervisor was conducted to locate any other re-energized circuits.

3. An increased sensitivity to documentation review was required. Procedures were required to ensure that electrical work is coordinated with other groups that are performing electrical work. Documentation of re-energizing previously de-energized circuits is critical.

8.8 LESSONS LEARNED #26, MARCH 17, 1987, AIRBORNE CONTAMINATION AT THE CANAL WATER PUMP AREA

On March 16, 1987, a work crew was removing piping from the south canal water pump pit. The workers, who were dressed in Anti-C's but not respirators, were spraying the pipe with a cleaning agent, then wiping it down with dry rags as the line was raised above the floor level. A HEPA vacuum was used to suction the pipe/deck opening. The line had been raised approximately 6 feet when the nearby air monitor indicated airborne contamination. The alarm was sounded and the area evacuated. The contamination level was finally established at 2.6×10^{-9} microCi/ml.

Investigation Results

1. The individuals exiting the FHB were body scanned. There was no personnel contamination, including those working in the Canal Water Pump area.

2. The air in the immediate area was re-sampled after cessation of work activities. No further evidence of airborne contamination was found.

3. The area outside the CSCA was surveyed for loose surface contamination, and none was found.

4. While surveys of the sump wall surfaces had been made, no surveys existed for the pipe surfaces.

5. The crew wiping down the pipe were using dry rags, rather than wet, which tended to promote the spread of airborne activity.

6. A HEPA vacuum at the pipe/floor deck joint provided inadequate ventilation. A HEPA filter hose was required to draw air into the sump.

9.0 REFERENCES

1. Burns and Roe Insustrial Services Corp./Nuclear Energy Services, Inc. Shippingport Station Decommissioning Plan, Vol. 1-12 (RL/SFM-83-4), September 1983.

2. Technical Specification 4884-4, Removal of Piping and Equipment for the SSDP; and Technical Specification 4884-5, Removal of Primary Systems Components for the SSDP, Decommissioning Implementation Document, General Electric Company; Shippingport Station Decommissioning Project, Shippingport, Pennsylvania, October 30, 1985.

3. Technical Specification 4884-11, Irradiated Components Transfer; Decommissioning Implementation Document, General Electric Company, Shippingport Station Decommissioning Project, Shippingport, Pennsylvania, June 1985.

4. Westinghouse Hanford Company, Shippingport Station Decommissioning Project Asbestos Removal Topical Report, (DOE/SSDP-0033), July 6, 1988.

5. Detailed Procedures, Division 99, Decommissioning Implementation Document, General Electric Company; Shippingport Station Decommissioning Project, Shippingport, Pennsylvania, June 16, 1988.

APPENDIX A
SUBCONTRACTOR PROGRESS DATA FORMS
FOR
TLG/CWC

Appendix A
Page 1
Progress Data Status

JOB TITLE: Shippingport Station Decommissioning Project
SUBCONTRACT: TLG/Cleveland

DATE OF PREPARATION: 02-20-88
SUBCONTRACT: 86N-599235X

				TOTAL DOLLARS		DIRECT FIELD LABOR HOURS		MATERIAL DOLLARS	
	PERCENT LINE	PERCENT COMPLETE		LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS
DESCRIPTION	ITEM WEIGHT	THIS PERIOD	TO DATE	TOTAL	TO DATE	JOB TOTAL	TO DATE	TOTAL	TO DATE
DOCUMENTATION REQUIREMENTS									
MOBILIZATION FACILITIES									
DEMOBILIZATION									
MOBILIZATION									
A. PRELIM ENGR., PLAN DOC. REVIEW	0.527	0.0	100.0	36200	36200				
B. DOCUMENTATION, PR.PL., SCHEDULES	0.367	0.0	100.0	25200	25200				
C. INTI. MOBIL., INS.,EQT. TRAINING	1.908	0.0	100.0	131106	131106				
D. CHAMBER EQUIPMENT COLL.	1.740	0.0	100.0	119519	119519				
				312025	312025				

Appendix A
Page 2
Progress Data Status

JOB TITLE: Shippingport Station Decommissioning Project
SUBCONTRACT: TLG/Cleveland

DATE OF PREPARATION: 02-20-88
SUBCONTRACT: 86N-599235X

				TOTAL DOLLARS		DIRECT FIELD LABOR HOURS		MATERIAL DOLLARS	
	PERCENT LINE ITEM WEIGHT	PERCENT COMPLETE		LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS
		THIS PERIOD	TO DATE	TOTAL	TO DATE	JOB TOTAL	TO DATE	TOTAL	TO DATE
1. SAMPLE PREP ROOM	0.974	0.0	100.0	66909	66909	1057	486	13382	15869
2. DECONTAMINATION ROOM	0.252	0.0	100.0	17318	17318	257	428	3464	11032
3. DEMINERALIZER BUILDING	1.603	0.0	100.0	110101	110101	1663	806	22020	25552
4. WASTE DECON. SOLUTION TANK	0.303	0.0	100.0	20787	20787	290	178	4157	4610
5. DECONTAMINATION EFFLUENT TANK	0.303	0.0	100.0	20787	20787	290	626	4157	16589
6. YARD PRIMARY WATER TANK	0.771	0.0	100.0	52940	52940	894	210	10589	8363
7. RWP SPRAY RECYCLE TANK	0.437	0.0	100.0	29998	29998	457	658	6000	17457
8. AUX EQUIP. RM-18 PIPE & VALVES	1.646	2.0	100.0	113069	113069	1639	500	22614	1370
9. AUX EQUIP RM-18 COMPONENTS	0.734	2.0	100.0	50392	50392	696	364	10078	8404
10. BD CHAMBER-PRIMARY PIPE, PUMP	1.358	2.0	100.0	93286	93286	1380	1318	18657	10979
11. BD CHAMBER-PRIMARY HEAT "B"	1.836	2.0	100.0	126163	126163	1988	1200	25233	12406
12. BD CHAMBER-PRIMARY HEAT "D"	1.836	2.0	100.0	126163	126163	1988	1300	25233	14667
13. BD CHAMBER-2ND DRUM & PIPING	1.893	0.0	100.0	130,051	130,051	2118	1005	26,010	16,657
14. BD CHAMBER-PURIFICATION	1.044	0.0	100.0	71,696	71,696	350	262	14,339	6204
15. AUX. CHAMBER COMPONENTS	0.601	2.0	100.0	41,291	41,291	501	515	8258	4433
16. AUX CHAMBER WEST END SOUTH WALL	1.836	2.0	100.0	126,153	126,153	1877	1116	25,230	11,841
				1,197,104	1,197,104	17,445	10,972	239,421	186,433

Appendix A
Page 3
Progress Data Status

JOB TITLE: Shippingport Station Decommissioning Project
SUBCONTRACT: TLG/Cleveland

DATE OF PREPARATION: 02-20-88
SUBCONTRACT: 86N-599235X

				TOTAL DOLLARS		DIRECT FIELD LABOR HOURS		MATERIAL DOLLARS	
	PERCENT LINE ITEM WEIGHT	PERCENT COMPLETE		LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS
DESCRIPTION		THIS PERIOD	TO DATE	TOTAL	TO DATE	JOB TOTAL	TO DATE	TOTAL	TO DATE
17. AUX CHAMBER WEST END EAST WALL	2.142	2.0	100.0	147,179	147,179	2190	1889	29,436	15,741
18. AUX CHAMBER EAST END WEST WALL	1.989	2.0	100.0	136,666	136,666	2034	434	27,333	3497
19. AUX CHAMBER EAST PIPING	1.683	2.0	100.0	115,640	115,640	1721	1179	23,128	12,229
20. REACTOR ENCLOSURE	0.641	0.0	100.0	44,048	44,048	672	822	8810	11,149
21. AUX EQUIP ROOM 1A COMP.	0.394	2.0	100.0	27,050	27,050	500	289	5410	2039
22. AUX EQUIP. ROOM 1A C.S. CONT	0.232	2.0	100.0	15,950	15,950	242	67	3190	566
23. AUX EQUIP. ROOM 1A C.S. NON	0.476	2.0	100.0	32,674	32,674	560	167	6535	1380
24. AUX EQUIP. ROOM 1A S/S CONT.	2.154	2.0	100.0	147,994	147,994	2223	609	29,599	5127
25. AUX EQUIP ROOM-1A S.S. NON	0.053	2.0	100.0	3614	3614	61	17	723	143
26. AUX EQUIP ROOM-1A ALUMINUM CONT	0.658	22.0	100.0	45,234	45,234	668	312	9047	1310
27. AC CHAMBER PRIMARY PIPE/PUMP	1.358	2.0	100.0	93,286	93,286	1380	1186	18,657	11,936
28. AC CHAMBER PRIMARY HEAT "A"	1.836	2.0	100.0	126,163	126,163	1988	1846	25,233	14,557
29. AC CHAMBER PRIMARY HEAT "C"	1.836	2.0	100.0	126,163	126,163	1988	1154	25,233	10,140
30. AC CHAMBER - 2ND DRUM & PIPE	1.893	2.0	100.0	130,051	130,051	2118	967	26,010	17,201
31. AC CHAMBER - PURIFICATION	1.044	2.0	100.0	71,696	71,696	350	239	14,339	5581
				1,263,408	1,263,408	18,695	11,177	252,683	112,596

Appendix A
Page 4
Progress Data Status

JOB TITLE: Shippingport Station Decommissioning Project
SUBCONTRACT: TLG/Cleveland

DATE OF PREPARATION: 02-20-88
SUBCONTRACT: 86N-599235X

				TOTAL DOLLARS		DIRECT FIELD LABOR HOURS		MATERIAL DOLLARS	
	PERCENT LINE ITEM WEIGHT	PERCENT COMPLETE		LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS
DESCRIPTION		THIS PERIOD	TO DATE	TOTAL	TO DATE	JOB TOTAL	TO DATE	TOTAL	TO DATE
32. BD CHAMBER COMPONENTS	0.936	0.0	100.0	64,317	64,317	897	1297	12,863	8245
33. BD CHAMBER CONT. PIPING	1.832	0.0	100.0	125,851	125,851	1875	1634	25,170	24,066
34. BD CHAMBER NON-CONT. PIPE	0.321	0.0	100.0	22,019	22,019	375	333	4403	5030
35. BD ENCLOSURE	0.998	2.0	100.0	68,586	68,586	1043	1067	13,717	6021
36. FUEL HANDLING BUILDING	1.531	2.0	100.0	105,194	105,194	1665	1611	21,039	9145
37. RWP YARD - E-1 RESIN	1.542	3.0	95.0	105,917	100,621	1561	732	21,183	4867
38. RWP YARD - E1-2, RESIN STORAGE	1.223	20.0	95.0	84,003	79,803	1238	770	16,801	11,215
39. RWP YARD - EW-1 & 2	1.887	0.0	98.0	129,657	127,064	1910	957	25,931	828
40. RWP YARD - E2-3 & 4	0.744	0.0	98.0	51,132	50,109	753	523	10,226	4256
41. RWP YARD - E9-1	0.598	0.0	98.0	41,088	40,266	605	210	8218	1758
42. RWP YARD - E12-1	1.316	0.0	98.0	90,408	88,600	1332	330	18,082	1035
43. RWP YARD - EW0-1	0.687	0.0	98.0	47,224	46,280	696	101	9445	811
44. RWP YARD - E21-1	1.389	0.0	98.0	95,398	93,490	1406	389	19,080	1448
45. RWP YARD - E12-2	0.832	0.0	98.0	57,129	55,986	842	308	11,425	1565
46. RWP YARD - E10-2	0.683	0.0	98.0	46,932	45,993	692	341	9386	2672
				1,134,855	1,134,855	16,890	10,60 3	226,969	82,962

JOB TITLE: Shippingport Station Decommissioning Project
SUBCONTRACT: TLG/Cleveland

DATE OF PREPARATION: 02-20-88
SUBCONTRACT: 86N-599235X

				TOTAL DOLLARS		DIRECT FIELD LABOR HRS		MATERIAL DOLLARS	
	PERCENT LINE ITEM WEIGHT	PERCENT COMPLETE		LINE BUDGET	LINE ACTLS	LINE BUDGET	LINE ACTLS	LINE BUDGET	LINE ACTLS
DESCRIPTION		THIS PERIOD	TO DATE	TOTAL	TO DATE	JOB TOTAL	TO DATE	TOTAL	TO DATE
47. RWP YARD - 321-2	1.316	0.0	98.0	90,394	88,586	1332	405	18,079	1175
48. RWP YARD - E6-1	1.372	0.0	98.0	94,229	92,344	1388	611	18,846	828
49. RWP YARD - CANAL WATER STORAGE	1.834	0.0	98.0	126,004	123,484	1857	697	25,201	3979
50. RWP YARD - AUX CHAMBER	2.225	20.0	98.0	152,838	149,781	2252	925	30,568	5054
51. RWP YARD - BD CHAMBER AUX	1.517	0.0	98.0	104,191	102,107	1535	903	20,834	5741
52. RWP YARD - AUX YARD PIPING AREA	1,887	0.0	98.0	129,657	127,064	1910	585	25,932	3984
53. RWP YARD - AUX YARD PIPING BLDG	1.249	0.0	98.0	85,829	84,112	1265	338	17,166	2841
54. RWP YARD - AUX EQUIP ROOM BLDG	0.824	0.0	98.0	56,611	55,479	834	501	11,322	3138
55. RWP YARD - AUX EQUIP ROOM CH	0.202	0.0	98.0	13,879	13,601	204	94	2776	515
56. RWP YARD - AUX PIPING SOUTH	0.930	0.0	98.0	63,915	62,637	942	460	12,783	1999
57. RWP YARD - DECONTAM PIPING	2.313	0.0	98.0	158,875	155,698	2341	1085	31,775	7708
58. YARD - CHEMICAL SHUTDOWN	0.162	0.0	98.0	11,153	10,930	188	147	2231	869
59. FUEL HANDLING BUILDING GATE	0.684	0.0	98.0	46,990	46,050	797	1161	9398	828
60. RWP YARD - SURGE TANKS (3)	0.893	2.0	97.0	61,346	59,506	1113	1672	12,269	12,755
61. AC CHAMBER COMPONENTS	0.944	2.0	100.0	64,819	64,819	926	593	12,964	968
62. AC CHAMBER CONTAMINATED PIPING	1.227	2.0	100.0	87,720	87,720	1289	1273	17,544	16,525
63. AC CHAMBER NON-CONT. PIPING	0.172	2.0	100.0	11,813	11,813	202	206	2363	2646
				1,360,263	1,335,731	20,375	11,656	272,051	71,553

JOB TITLE: Shippingport Station Decommissioning Project
SUBCONTRACT: TLG/Cleveland

DATE OF PREPARATION: 02-20-88
SUBCONTRACT: 86N-599235X

				TOTAL DOLLARS		DIRECT FIELD LABOR HOURS		MATERIAL DOLLARS	
	PERCENT LINE	PERCENT COMPLETE		LINE BUDGET	LINE ACTLS	LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS
DESCRIPTION	ITEM WEIGHT	THIS PERIOD	TO DATE	TOTAL	TO DATE	JOB TOTAL	TO DATE	TOTAL	TO DATE
64. AC ENCLOSURE	1.824	2.0	100.0	125,331	125,331	1927	1135	25,066	5187
65. AUX ENCLOSURE COMPONENTS	0.708	0.0	98.0	48,624	47,652	773	781	9725	5142
66. AUX ENCLOSURE NORTH WALL PIPING	2.341	0.0	98.0	160,826	157,609	2363	1131	32,165	6506
67. AUX ENCLOSURE SOUTH WALL PIPING	2.211	0.0	98.0	151,891	148,853	2232	1236	30,378	7583
68. AUX ENCLOSURE EAST & WAST WALL	1.951	2.0	98.0	134,021	131,341	1970	852	26,804	6562
69. RWP YARD - SPECIAL WASTE TANKS	0.147	0.0	98.0	10,077	9875	183	322	2015	2666
70. RWP YARD-NON ACTIVE WASTE TANKS	0.179	0.0	98.0	12,306	12,060	223	322	2461	2666
71. RWP YARD - ION EXCHANGE TANKS	0.054	0.0	98.0	3683	3609	50	80	737	828
72. RWP YARD - CHEMICAL WASTE TANKS	0.117	2.0	100.0	8051	8051	146	878	1610	6565
73. SPENT RESIN TANKS 1A & 1B	0.26	40.0	98.0	17,650	17,297	320	430	3530	7722
74. RWP YARD - SURGE TANK (1)IPING	0.30	0.0	98.0	20,448	20,039	371	703	4090	5343
75. RWP BULDING COMP.	1.48	2.0	100.0	101,702	101,702	1635	928	20,340	311
76. RWP BLDG CONT C.S.	2.59	2.0	100.0	177,795	177,795	2612	1156	35,559	8690
77. RWP BUILDING CONT.	2.59	2.0	100.0	177,795	177,795	2612	1362	35,559	5963
78. RWP NON-CONT. C.S.H WALL PIPING	0.37	2.0	100.0	25,219	25,219	428	278	5043	1837
79. FUEL HANDLING BUILDING VENT	1.02	2.0	98.0	70,362	68,955	950	1101	14,072	8495
80. REACTOR PLANT SERVICE BUILDING	2.10	2.0	100.0	144,187	144,187	2255	931	28,837	4496
				1,389,968	1,377,370	21,050	13,626	277,991	86,562

Appendix A
Page 7
Progress Data Status

JOB TITLE: Shippingport Station Decommissioning Project
SUBCONTRACT: TLG/Cleveland

DATE OF PREPARATION: 02-20-88
SUBCONTRACT: 86N-599235X

				TOTAL DOLLARS		DIRECT FIELD LABOR HOURS		MATERIAL DOLLARS	
	PERCENT LINE ITEM WEIGHT	PERCENT COMPLETE		LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS
DESCRIPTION		THIS PERIOD	TO DATE	TOTAL	TO DATE	JOB TOTAL	TO DATE	TOTAL	TO DATE
81. MECHANICAL EQUIPMENT ROOM 1A	0.26	0.0	98.0	17,782	17,426	303	484	3556	4049
82. MECHANICAL EQUIPMENT ROOM 1B	0.17	2.0	100.0	11,845	11,845	204	491	2369	1035
83. AUXILIARY POWER ROOM	0.06	0.0	100.0	4078	4078	66	26	816	216
84. CER TRENCH PIPING EQUIPMENT	0.45	2.0	100.0	31,051	31,051	471	484	6210	3645
85. AUXILIARY CHAMBER VENT SYSTEM	0.915	2	98.0	62,835	62,835	860	945	12,567	207
86. AIR TREATMENT ROOM	1.234	0	98.0	84,786	83,090	1356	2176	16,957	1101
				212,377	210,325	3260	4606	42,475	10,253

Appendix A
Page 8
Progress Data Status

JOB TITLE: Shippingport Station Decommissioning Project
SUBCONTRACT: TLG/Cleveland

DATE OF PREPARATION: 02-20-88
SUBCONTRACT: 86N-599235X

				TOTAL DOLLARS		DIRECT FIELD LABOR HOURS		MATERIAL DOLLARS	
	PERCENT LINE	PERCENT COMPLETE		LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS
DESCRIPTION	ITEM WEIGHT	THIS PERIOD	TO DATE	TOTAL	TO DATE	JOB TOTAL	TO DATE	TOTAL	TO DATE
CONTRACT MODIFICATIONS:									
I. ASBESTOS REMOVAL-THREE AREAS	N/A	0	100.0	46,870	46,870	888	724	9466	2352
II. TECH TRANSFER FORM CHANGE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
III. AGING STUDY, SPECIAL HANDLING	N/A	0	90.0	2200	1980	56	56	58	0
IV. AUX EQUIPMENT ROOM 1B REMOVAL	N/A	0	100.0	6200	6200	220	308	2870	2146
V. SMALLER LSA CONTAINERS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VI. NUC HAZARDS INDEMNITY, AR.78	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VII. AC&BD-30 ROOF PLUGS-5 FHB PLG	N/A	0	100.0	1500	1500	25	30	250	19
VIII. RWP YARD EAST - WINTER WORK	N/A	0	100.0	25,000	25,000	420	420	4000	0
IX. ASBESTOS, SEVEN AREAS	N/A	0	100.0	53,548	53,548	890	902	7500	4056
X. ASBESTOS, THREE AREAS	N/A	0	100.0	15,562	15,562	260	160	2550	1500
XI. MISC SMALL TUBING (4 ITEMS)	N/A	0	100.0	3179	3179	67.5	68	557	557
XII. RESIN SPILL, RET. STM DRUM	N/A	0	100.0	46,158	46,158	696	696	10,975	10,975
XIII. TRENCH WORK SPECIAL HANDLING	N/A	0	100.0	14,851	14,851	280	225	2977	3941
XIV. SAFETY HEAT EXCHANGERS	N/A	0	100.0	10,283	10,283	168	184	1600	1527
XV. B/D PURIFICATION	N/A	0	100.0	65,500	65,500	1508	985	5917	6107
XVI. PRIMARY PUMP AND STEAM DRUM	N/A	0	100.0	13,815	13,815	208	176	4262	4419
				304,666	304,446	5687	4934	52,982	37,599

JOB TITLE: Shippingport Station Decommissioning Project
SUBCONTRACT: TLG/Cleveland

DATE OF PREPARATION: 02-20-88
SUBCONTRACT: 86N-599235X

				TOTAL DOLLARS		DIRECT FIELD LABOR HOURS		MATERIAL DOLLARS	
	PERCENT LINE ITEM WEIGHT	PERCENT COMPLETE		LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS
DESCRIPTION		THIS PERIOD	TO DATE	TOTAL	TO DATE	JOB TOTAL	TO DATE	TOTAL	TO DATE
CONTRACT MODIFICATIONS CONTINUED:									
XVII. 3" LINE, 8N ASBESTOS AND ACE	N/A	0	100.0	27,017	27,017	568	394	2316	2376
XVIII. ELA TO WLA & RWP CLEANUP	N/A	0	100.0	5726	5726	80	50	2060	2370
XIX. EXC & BACKFIL 3 RWPY E.TREN	N/A	20	100.0	36,918	36,918	606	450	11,369	14,114
XX. ASBESTOS, 3 AREAS, B/O & RWP B.	N/A	0	100.0	20,688	20,688	514	607	2773	5200
XXI. AREIB, FIRE PROT., AC&BD DRAIN	N/A	0	100.0	23,748	23,748	655	720	1201	5976
XXII. COMPACTOR/PUMP, FHB & HE WATR	N/A	0	100.0	12,497	12,497	228	200	2746	1660
XXIII. AER1B & BD LEAD DOOR	N/A	0	100.0	15,248	15,248	306	296	3350	2960
XXIV. BD PLUGS, AC PURIFICATION	N/A	0	100.0	97,656	97,656	1670	1393	16,331	16,300
XXV. 3 PIPES, TFE & SHIELD WALL	N/A	0	100.0	4702	4702	83	94	1059	940
XXVI. DAMS, FENCE, BACKFILL #7 TRCH	N/A	0	100.0	7452	7452	136	124	1348	1300
XXVII. HOIST & ORNS-FHB, TANKS, MWR	N/A	10	100.0	9610	9610	264	235	1366	2054
XXVIII. MUD, ASBESTOS, MER1B DUCT	N/A	0	100.0	19,939	19,939	408	400	3028	3400
XXIX.	N/A	0	100.0	9775	9775	176	176	0	0
XXX.	N/A	0	100.0	25,973	25,973	688	720	8553	6800
				316,949	316,949	6382	5859	57,500	65,450

JOB TITLE: Shippingport Station Decommissioning Project
SUBCONTRACT: TLG/Cleveland

DATE OF PREPARATION: 02-20-88
SUBCONTRACT: 86N-599235X

				TOTAL DOLLARS		DIRECT FIELD LABOR HOURS		MATERIAL DOLLARS	
	PERCENT LINE	PERCENT COMPLETE		LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS
DESCRIPTION	ITEM WEIGHT	THIS PERIOD	TO DATE	TOTAL	TO DATE	JOB TOTAL	TO DATE	TOTAL	TO DATE
CONTRACT MODIFICATIONS CONTINUED:									
XXXI. RWPY SP WASTE TANK & RSB DUCT	N/A	0	100.0	16,350	16,350	496	448	2512	2490
XXXII. AG STUDY, 5H20 SEALS & HEPA	N/A	0	100.0	8212	8212	212	160	1000	1790
XXXIII. AER1B & CER TRENCHES	N/A	10	100.0	13,276	13,276	240	224	3410	2184
XXXIV. RSB ASBESTOS	N/A	0	100.0	13,070	13,070	290	320	2200	2204
XXXV. MWR AND FHB ROLL-UP DOOR	N/A	0	100.0	6088	6088	120	110	710	912
XXXVI. RESIN TNK B/RADCON/DAMS	N/A	100	100.0	5199	5199	80	80	375	426
XXXVII. CREDIT & MISC. MODS	N/A	100	100.0	(19,534)	(19,534)	N/A	N/A	N/A	N/A
XXXVIII. SETTLEMENT MOD.	N/A	100	100.0	41,000	41,000	N/A	N/A	N/A	N/A
				83,661	83,661	1438	1342	10,207	10,006

Appendix A
Page 11
Progress Data Status

JOB TITLE: Shippingport Station Decommissioning Project
SUBCONTRACT: TLG/Cleveland

DATE OF PREPARATION: 02-20-88
SUBCONTRACT: 86N-599235X

				TOTAL DOLLARS		DIRECT FIELD LABOR HOURS		MATERIAL DOLLARS	
	PERCENT LINE ITEM WEIGHT	PERCENT COMPLETE		LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS	LINE BUDGET	LINE ACTUALS
DESCRIPTION		THIS PERIOD	TO DATE	TOTAL	TO DATE	JOB TOTAL	TO DATE	TOTAL	TO DATE
MATERIAL DOLLARS ARE:									
1. COST OF EXPANDABLES & CONSUMABLS									
2. COST OF MATLS INCORP INTO WORK									
3. COST OF EQUIP COMMITED TO WORK									

APPENDIX B
SUBCONTRACTOR'S A/S 4 & 5
DATA COLLECTION FORMS
FOR
TLG/CWC

DATA COLLECTION FORMS
LEGEND

EQUIPMENT

BAND SAW	E1
CHAIN FALL	E2
ELECTRIC DRILL	E3
FORK LIFT	E4
COM-ALONG	E5
PAC-10 TORCH	E6
PAC-44 TORCH	E7
	E8
RECIPROCATING SAW	E9
HYDRAULIC SHEAR	E10
ELECTRICJACKHAMMER	E11
FORKLIFT	E12

CONSUMABLES

DRILL BITS	C1
DUCT TAPE (ROLL)	C2
FILTERS	C3
FLEX HOSE (12")	C4
PLASTIC BAGS	C5
PIPE SLEEVING (FOOT)	C6
RAGS (25#)	C7
SAW BLADES	C8
SHEET PLASTIC	C9
SILTEMP CLOTH	C10
VACUUM HOSE (FOOT)	C11
GAS (BOTTLES)	C12

SCAFFOLDING

12 FOOT TOWER	S1
16 FOOT TOWER 20K	S2
32 FOOT TOWER 20K	S3

RADIATION CONTROLS

PIPE DRAINAGE (SADDLE TAP)	R1
CATCH TRAY	R2
ANTI CONTAMINATION CLOTHING	R3
CONTAINMENT (TENT)	R4
AIR PURIFYING RESPIRATORS	R5
SHIELDING	R6
HEPA VAC PIPE EVACUATION	R7
FIXED CONTAMINATION	R8
DECONTAMINATION	R9
TYPE "C" SUPPLIED AIR RESPIRATORS	R10
HEPA VAC EXHAUST VENTILATION	R11
GLOVE BAGS	R12
WORKER TASK ROTATION	R13
MOCK-UP PRACTICE	R14

CREW

FOREMAN	F
LABORER	L
OPERATOR	0

A/S 4 DATA COLLECTION FORM
MECHANICAL EQUIP. RM 1A - AREA 3

File: TTAS4_03

ACTIVITY #81
M07-DWP-003-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFOLDING & PREP. WORK	0	XXXXXXXXXXX	F-1, L-2	21	24	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1 R2 R5 R9	F-2 L-6 O-1			E1 E2 E3 E5 E9 & OXYACETYLENE	C1-12 C2-24 C5-100				
1. 50-F1-6 Storage Tank	1 ea.			45	XXXXXXXX	TORCH	C7-4 C8-60	XXXX	XXXX	XXXX	
2. 50-F1-5 Tank	1 ea.			17	XXXXXXXX		C9-1 ROLL C10-30 FEET	XXXX	XXXX	XXXX	
3. 50-E5-3 Compression Tk.	1 ea.			17	XXXXXXXX		C12-23	XXXX	XXXX	XXXX	
4. 50-G2-1,-2 Circ. Pumps	2 ea.			22	XXXXXXXX			XXXX	XXXX	XXXX	
5. 50-F1-33 Heater	1 ea.			15	XXXXXXXX			XXXX	XXXX	XXXX	
6. 50-F1-25,-31, 50-G6-14 Thru -17 Fans	6 ea.			41	XXXXXXXX XXXXXXXX			XXXX	XXXX	XXXX	
7. Heating & Cooling Coils	9 ea.			52.5	XXXXXXXX			XXXX	XXXX	XXXX	
8. Air Conditioning Unit	1 ea.			28	XXXXXXXX			XXXX	XXXX	XXXX	
9. 50-G5-1 Compressor	1 ea.			23	XXXXXXXX			XXXX	XXXX	XXXX	
10.Heat Exchanger				20	XXXXXXXX			XXXX	XXXX	XXXX	
11.50-F1-32 Evap.Condensor	1 ea.			22	XXXXXXXX			XXXX	XXXX	XXXX	
Sub Total - All piping & Equip Removal.	XXX			XXXXXXXX	516			1	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	16	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	28	32	XXXXXXXX	XXXXXXXX	0	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	564	XXXXXXXX	XXXXXXXX	1	0	0	

A/S 4 DATA COLLECTION FORM
MECHANICAL EQUIP. RM 18 - AREA 4

File: TTAS4_04

ACTIVITY #82
M07-DWP-004-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used: LSA	Drums	1-Piece	Remarks and Comments
A. SCAFOLDING & PREP. WORK	S1-2	XXXXXXXXXX	F-1,L-2	93	115	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R2, R3, R5 R7, R8, R9 R11, R12	F-1 F-3 O-1			E1-1, E2-2 E3-1, E4-1 E6-1, E9-1	C1-6, C2-10 C3-100 C4-50,				
* 1. 50-G6-2/3/4/5 Fans	4 ea.			124	XXXXXXXX		C5-100 C7-4, C8-24	XXXX	XXXX	XXXX	
2. 50-F1-9 Fans	1 ea.			4	XXXXXXXX		C11-100 C12-10	XXXX	XXXX	XXXX	
3. 50-G3-8 Pump	1 ea.			4	XXXXXXXX			XXXX	XXXX	XXXX	
4. 50-H9-2 thru 12 Dampers	11 ea.			30	XXXXXXXX			XXXX	XXXX	XXXX	
5. 50-E5-1 Water Storage	1 ea.			5	XXXXXXXX			XXXX	XXXX	XXXX	
6. 50-E5-6 Flash Tank	1 ea.			3	XXXXXXXX			XXXX	XXXX	XXXX	
7. Duct 24" x 12"	16 LF				XXXXXXXX				XXXX	XXXX	
4" Dia.	30 LF				XXXXXXXX				XXXX	XXXX	
12" Dia.	25 LF				XXXXXXXX				XXXX	XXXX	
24" Dia.	40 LF			308	XXXXXXXX			1	XXXX	XXXX	
Sub Total - All piping & Equip Removal.	XXX			XXXXXXXX	668			1	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	16	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-2	110	125	XXXXXXXX	XXXXXXXX	1	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	809	XXXXXXXX	XXXXXXXX	2	0	0	

* Does not include asbestos removal

A/S 4 DATA COLLECTION FORM
AUXILIARY EQUIPMENT ROOM 1A - AREA 5

File: TTAS4_05

ACTIVITY #'S 21, 22, 23, 24, 25, & 26
M07-DWP-005-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFOLDING & PREP. WORK*	S1-2	XXXXXXXXXX	F-1, L-3	204	242	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1,R2,R3,R7 R8,R9,R11 R14	F-1 L-3 O-1			E1-2,E2-2 E3-2,E5-4 E6-1,E9-2	C1-20,C2-40 C3-6,C4-100 C5-300,C6-100				
1. 15-E1 Water Flask	1 ea.			80	XXXXXXXX	E11-1,E12-1	C7-75lbs,C8-40 C9-2 ROLLS	XXXX	XXXX	XXXX	
2. 15-E2-1,2,3,4 Air Botls	4 ea.			24	XXXXXXXX		C10-1/2 ROLL	XXXX	XXXX	XXXX	
3. 15-G4-1,2 Air Comprs.	2 ea.			49	XXXXXXXX		C12-25',C13-10 S1-1	XXXX	XXXX	XXXX	
4. 56-E6-1,2 Demineralzs.	2 ea.			118	XXXXXXXX			XXXX	XXXX	2	
5. Carbon Steel Piping											
<2 in. Diam.	492			64	XXXXXXXX			XXXX	XXXX	XXXX	
2-6 in. Diam.	462			62	XXXXXXXX			XXXX	XXXX	XXXX	
6. Service Air Compressor				XXXXXXXX	XXXXXXXX			XXXX	XXXX	XXXX	
7. G2-1 Centrifugal Fill Pump	1 ea.	SEE NEXT	SEE NEXT	33	XXXXXXXX	SEE NEXT	SEE NEXT	XXXX	XXXX	XXXX	
8. G3-1 Hydro Test Pump	1 ea.	PAGE	PAGE	53	XXXXXXXX	PAGE	PAGE	XXXX	XXXX	XXXX	

* Includes Asbestos Removal

A/S 4 DATA COLLECTION FORM
AUXILIARY EQUIPMENT ROOM 1A - AREA 5

File: TTAS4_05

ACTIVITY #'S 21, 22, 23, 24, 25, & 26
M07-DWP-005-A

9. Carbon Steel Piping (Overhead)		SEE	SEE			SEE	SEE				
<2 in. Diam.	45	PREVIOUS	PREVIOUS	12	XXXXXXXX	PREVIOUS	PREVIOUS	XXXX	XXXX	XXXX	
2-6 in. Diam.	587	PAGE	PAGE	148	XXXXXXXX	PAGE	PAGE	XXXX	XXXX	XXXX	
>6 in. Diam.	166			53	XXXXXXXX			XXXX	XXXX	XXXX	
10.Stainless Steel Piping (Overhead)											
<2 in. Diam.	542			49	XXXXXXXX			XXXX	XXXX	XXXX	
2-6 in. Diam.	1350			137	XXXXXXXX			XXXX	XXXX	XXXX	
>6 in. Diam.	90			40	XXXXXXXX			XXXX	XXXX	XXXX	
11.Aluminum Piping 6 in. Diam.	731			123	XXXXXXXX			XXXX	XXXX	XXXX	
Sub Total - All piping & Equip Removal.	4465			1045	1325			12	0	2	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	32	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-2	254	317	XXXXXXXX	XXXXXXXX	2	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1916	XXXXXXXX	XXXXXXXX	14	0	2	

A/S 4 DATA COLLECTION FORM
AUXILIARY EQUIP. RM 1B - AREA 6

File: TTAS4_06

ACTIVITY NO. 8 & 9
M07-DWP-006A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFOLDING & PREP. WORK	S1-1	R3	F-1, L-2	84	96	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1, R2, R3 R4, R5, R7 R9, R11	F-1 L-3 O-1			E1-2 E2-3 E3-2	C1-12 C2-24 C3-2				
1. 17-E6-1 Expansion Tanks	1 ea.			84	XXXXXXXX	E4-1 E5-3	C4-100 C5-250	XXXX	XXXX	0	
2. 17 F1-1 Water Cooler	1 ea.			60	XXXXXXXX	E6-1 E9-1	C6-100 C7-4	XXXX	XXXX	1	
3. 17-G2-1, 2 Water Pumps	2 ea.			12	XXXXXXXX		C8-48 C9-2 ROLLS	XXXX	XXXX	0	
4. 50-G2-12 Sump Pump	1 ea.			18	XXXXXXXX		C10-1 ROLL C11-150	XXXX	XXXX	0	
5. 56-F1-1 Heat Exchanger	1 ea.			60	XXXXXXXX		C12-15	XXXX	XXXX	1	
6. Carbon Steel Piping											
<2 in. Diam.	219			35	XXXXXXXX				XXXX		
2-6 in. Diam.	237			71	XXXXXXXX				XXXX		
>6 in. Diam.	228			67	XXXXXXXX			2	XXXX	0	
7. Aluminum Piping											
<2 in. Diam.	475			30	XXXXXXXX				XXXX		
2-6 in. Diam.	537			40	XXXXXXXX				XXXX		
>6 in. Diam.	107			37	XXXXXXXX			2	XXXX	0	
Sub Total - All piping	1803			514	586			4	0	2	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	235	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	R3	F-1, L-2	61	70	XXXXXXXX	XXXXXXXX	1	0	0	
EXTRA		R3	F-1				XXXXXXXX	XXXX	XXXX	XXXX	
AER 1B DEMOLITION	1 ea.	R9	L-5, O-1	203	232	E11-2	XXXXXXXX	XXXX	XXXX	XXXX	
TOTALS	1803	XXXXXXXX	XXXXXXXX	XXXXXXXX	1219	XXXXXXXX	XXXXXXXX	5	0	2	

A/S 4 DATA COLLECTION FORM
AIR TREATMENT ROOM - AREA 7

File: TTAS4_07

ACTIVITY 86
M07-DWP-007-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used: LSA	Drums	1-Piece	Remarks, and Comments
A. SCAFOLDING & PREP. WORK	S1-4	R-3	F-1, L-3	126	144	XXXXXXXX	XXXXXXXX				
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R-1 R-2 R-3 R-5 R-9 R-11 R-12	F-1 L-3 O-1			E1-2 E2-2 E3-1 E4-1	C1-72 C2-48 C3-4 C4-150				
1. 19-G3-1,2 Hydraulic Pumps (5 HP)	2 ea	R-4 ASBESTOS		32	XXXXXXXX	E5-4	C5-500	XXXX	XXXX	2	
2. 19-H1-(1-4) Valves	4 ea			96	XXXXXXXX	E9-1 & OXYACETYLENE	C7-100 C8-24 C9-5 ROLLS	XXXX	XXXX	4	
3. 19-G3-3 Pump	1 ea			24	XXXXXXXX		C10-1 ROLL C11-100	XXXX	XXXX	1	
4. 19-G6-1,2,3,4 Fans	4 ea			96	XXXXXXXX		C12-12	XXXX	XXXX	4	
5. 19-H9-1 thru 14 Damper	14 ea			84	XXXXXXXX			XXXX	XXXX	14	
6. 19-H9-17,18 Dampers	2 ea			32	XXXXXXXX			XXXX	XXXX	2	
7. 19-H9-15,16 Dampers	2 ea			32	XXXXXXXX			XXXX	XXXX	2	
8. Duct 28" x 36"	136 LF			TOTAL	XXXXXXXX				XXXX	XXXX	
30" x 48"	21 LF			COMBINED	XXXXXXXX				XXXX	XXXX	
36" x 48"	46 LF			DUCT	XXXXXXXX				XXXX	XXXX	
40" x 48"	35 LF			REMOVAL	XXXXXXXX				XXXX	XXXX	
48" diam.	80 LF			= 284	XXXXXXXX			2	XXXX	XXXX	
9. 50-G6-1 Fan	1 ea			32	XXXXXXXX			XXXX	XXXX	XXXX	
10. Piping				TOTAL PIPING	XXXXXXXX				XXXX	XXXX	
under 2"	375			REMOVAL					XXXX	XXXX	
2" to 6"	734			= 160				1	XXXX	XXXX	
Sub Total - All piping & Equip Removal.	XXX			872	996			3	0	29	

A/S 4 DATA COLLECTION FORM
AIR TREATMENT ROOM - AREA 7

File: TTAS4_07

ACTIVITY 86
M07-DWP-007-A

C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	34	34	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
D. CLEAN-UP WORK *	XXX	R-3	F-1, L-2	235	268.5	XXXXXXXX	XXXXXXXX	1	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1424.5	XXXXXXXX	XXXXXXXX	4	0	29	

* INCLUDES ASBESTOS REMOVAL

A/S 4 DATA COLLECTION FORM

RADIOACTIVE WASTE PROCESSING BUILDING - AREA 8 - COMPONENTS LESS CHEMICAL WASTE TANKS

File: TTAS4_08

ACTIVITY #75
M07-DWP-008-A

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFOLDING & PREP. WORK	S1-3	XXXXXXXXXX	F-1, L-2	54	67	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1, R2, R3 R4, R5, R7 R8, R9, R10	F-2 L-8 O-1			E1-6 E2-2 E3-3 E5-4 E6-1 E9-2	C1-50 C2-40 C3-20 C4-250 C5-300 C6-150 C7-10 C8-120 C9-6 ROLLS C10-2 ROLLS C11-200 C12-20	9	0	XXXX	
1. 43-F3-1 Wst. Liq.Cooler	1 ea.	R11, R12		16	XXXXXXXX			XXXX	XXXX	XXXX	
2. 43-F2-1 Compressor Seal Water Cooler	1 ea.			3	XXXXXXXX			XXXX	XXXX	XXXX	
3. Thin Film Evaporator	1 ea.			84	XXXXXXXX			XXXX	XXXX	1	SALVAGE
4. 43-E10-1 Gas Stripper	1 ea.			145	XXXXXXXX			XXXX	XXXX	XXXX	
5. 43-F5-1 Feed Bottoms Heat Exchanger	1 ea.			29	XXXXXXXX			XXXX	XXXX	XXXX	
6. 43-F4-1 Strip. Condnsr.	1 ea.			35	XXXXXXXX			XXXX	XXXX	XXXX	
7. 43-G6-1,2 Stripper Pumps (1 HP)	2 ea.			43	XXXXXXXX			XXXX	XXXX	XXXX	
8. 43-E49-1 Bed Filter	1 ea.			14	XXXXXXXX			XXXX	XXXX	XXXX	
9. Spare Bed Sand Filter				17	XXXXXXXX			XXXX	XXXX	XXXX	
10.43-E38-1,2,3,4 Bed Filters	4 ea.			68	XXXXXXXX			XXXX	XXXX	XXXX	

A/S 4 DATA COLLECTION FORM

RADIOACTIVE WASTE PROCESSING BUILDING - AREA 8 - COMPONENTS LESS CHEMICAL WASTE TANKS

File: TTAS4_08

ACTIVITY #75
M07-DWP-008-A

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
11.43-G2-1,2,3 Vent Gas Compressors (20 HP)	3 ea.			36	XXXXXXXX			XXXX	XXXX	XXXX	
12.43-E49-3 Filter	1 ea.			24	XXXXXXXX			XXXX	XXXX	XXXX	
13.43-G27-1,2 Aux. Booster Pumps	2 ea.			7	XXXXXXXX			XXXX	XXXX	XXXX	
14.43-G4-1,2 Spray Recycle Pumps (30 HP)	2 ea.			35	XXXXXXXX			XXXX	XXXX	XXXX	
15.43-G8-1 Effluent Transfer Pump (<1 HP)	1 ea.			27	XXXXXXXX			XXXX	XXXX	XXXX	
16.43-G7-1 Backflush Pump (7.5 HP)	1 ea.			16	XXXXXXXX			XXXX	XXXX	XXXX	
17.43-G14-1 Special Montr. Effluent Pump (1.5 HP)	1 ea.			18	XXXXXXXX			XXXX	XXXX	XXXX	
18.43-G15-1,2 Chem. Wst. Effluent Pumps (2 HP)	2 ea.			32	XXXXXXXX			XXXX	XXXX	XXXX	
19.Ch-Pu-1 Charging Pumps (50 HP)	3 ea.			3	XXXXXXXX			XXXX	XXXX	XXXX	
20.43-G22-1 Evap.Feed Pump	1 ea.			13	XXXXXXXX			XXXX	XXXX	XXXX	

A/S 4 DATA COLLECTION FORM

RADIOACTIVE WASTE PROCESSING BUILDING - AREA 8 - COMPONENTS LESS CHEMICAL WASTE TANKS

ACTIVITY #75

File: TTAS4_08

M07-DWP-008-A

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
21.43-G24-1 Evap. Distillate Pump	1 ea.			3	XXXXXXXX			XXXX	XXXX	XXXX	
22.43-G25-1 Evap. Concentrate Pump	1 ea.			28	XXXXXXXX			XXXX	XXXX	XXXX	
Filter	1 ea.			3	XXXXXXXX			XXXX	XXXX	XXXX	
27.43-G21-1 Basement Sump Pump	1 ea.			15	XXXXXXXX			XXXX	XXXX	XXXX	
28.43-E8-1,2 Final Filters	2 ea.			38	XXXXXXXX			XXXX	XXXX	XXXX	
29.Drum Roller & Scale	1 ea.			26	XXXXXXXX			XXXX	XXXX	XXXX	
Sub Total - All piping & Equip Removal.	XXX			XXXXXXXX	1304			9	0	1	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	32	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	116	130	XXXXXXXX	XXXXXXXX	1	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1533	XXXXXXXX	XXXXXXXX	10	0	1	

A/S 4 DATA COLLECTION FORM

RADIOACTIVE WASTE PROCESSING BUILDING - AREA 8 - PIPING

File: TTAS4_08

ACTIVITY #'S 76, 77 & 78

M07-DWP-008-B

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-3	XXXXXXXXXX	F-1, L-3	182	205	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING	XXX	R1 R2 R3 R4 R5 R7 R8 R9 R10 R11	F-2 L-6 O-1	XXXXXXXX	XXXXXXXX	E1-6 E2-2 E3-3 E5-4 E6-1 E9-2	C1-50 C2-40 C3-20 C4-250 C5-300	5	0	0	
1. Carbon Steel Piping (Overhead Only)					XXXXXXXX		C6-150	XXXX	XXXX	XXXX	
					XXXXXXXX		C7-10 C8-120	XXXX	XXXX	XXXX	
<2 in. Diam.	6597			416	XXXXXXXX		C9-6 ROLLS	XXXX	XXXX	XXXX	
2 - 6 in. Diam.	9916			511	XXXXXXXX		C10-2 ROLLS	XXXX	XXXX	XXXX	
>6 in. Diam.	180			13	XXXXXXXX		C11-200	XXXX	XXXX	XXXX	
							C12-20				
					XXXXXXXX			XXXX	XXXX	XXXX	
2. Stainless Steel Piping (Overhead Only)					XXXXXXXX			XXXX	XXXX	XXXX	
					XXXXXXXX			XXXX	XXXX	XXXX	
<2 in. Diam.	2722			347	XXXXXXXX			XXXX	XXXX	XXXX	
2 - 6 in. Diam.	3856			410	XXXXXXXX			XXXX	XXXX	XXXX	
<6 in. Diam.					XXXXXXXX			XXXX	XXXX	XXXX	
Sub Total - All piping & Equip Removal.	XXX			XXXXXXXX	2280			5	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	40	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1 L-3	90	111	XXXXXXXX	XXXXXXXX	0	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	2431	XXXXXXXX	XXXXXXXX	5	0	0	

A/S 4 DATA COLLECTION FORM

RADIOACTIVE WASTE PROCESSING BUILDING - AREA 8 - CHEMICAL WASTE TANKS (E22-1 & 2)

File: TTAS4_08

ACTIVITY #72

M07-DWP-008-C

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-6	XXXXXXXXXX	F-1, L-2	195	217	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R3 R4 R5 R9 R10 R11	F-2 L-4 O-1	XXXXXXXX	XXXXXXXX	E2-3 E3-1 E5-2 E6-1	C2-20 C3-150 C4-100 C7-10 C9-6 ROLLS C10-2 ROLLS C12-20	5	0	0	
1. 43-E22-1,2 Chemical Waste Tanks	2 ea.			932	XXXXXXXX			XXXX	XXXX	XXXX	
Sub Total - All piping & Equip Removal.	XXX			XXXXXXXX	1340			5	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	35	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	140	161	XXXXXXXX	XXXXXXXX	1	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1536	XXXXXXXX	XXXXXXXX	6	0	0	

A/S 4 DATA COLLECTION FORM
SAMPLE PREP ROOM - AREA 10

File: TTAS4_10

ACTIVITY #1
M07-DWP-010-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	0	XXXXXXXX	F-1, L-3	17	28	XXXXXXXX	XXXXXXXX	---	---	---	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1-2 R2-6 R4 R5 R6 R7 R8 R10 R11 R12 R13 R14	F-1, L-3			E1-2 E2-1 E3-2 E4-1 E5-1 E9-1 E10-1	C1-21 C2-24 C3-1 C4-25 C5-100 C8-24 C6-200 C7-50 C9-1 ROLL C11-100				
1. 12-N9-1, 2, 3 Framing & Enclosure	3 ea.			16	XXXXXXXX		C12-4	XXXX	XXXX	XXXX	
2. 50-G2-11 Pump	1 ea.	XXXXXXXX	XXXXXXXX	12	XXXXXXXX	XXXXXXXX		XXXX	XXXX	XXXX	
3. Floor Storage Tube Buckets (13)	13 ea.	XXXXXXXX	XXXXXXXX	32	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
4. 50-H9-2 thru 12 Dampers	11 ea.	XXXXXXXX	XXXXXXXX	56	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
5. Duct 16" x 20"	42 LF	XXXXXXXX	XXXXXXXX	42	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
20" x 10"	16 LF	XXXXXXXX	XXXXXXXX	62	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
6. Carbon Steel Piping		XXXXXXXX	XXXXXXXX			XXXXXXXX					
<2 in. Diam.	1017	XXXXXXXX	XXXXXXXX	148	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
2 - 6 in. Diam.	234	XXXXXXXX	XXXXXXXX	26	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
7. Stainless Steel Piping		XXXXXXXX	XXXXXXXX			XXXXXXXX					
<2 in. Diam.	214	XXXXXXXX	XXXXXXXX	51	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
Sub Total - All piping & Equip Removal.	1265	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	4	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	16	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	8	13	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
T O T A L S	1265	XXXXXXXX	XXXXXXXX	XXXXXXXX	566	XXXXXXXX	XXXXXXXX	4	0	0	

A/S 4 DATA COLLECTION FORM

FUEL HANDLING BUILDING - AREA 11 - PIPE & SUPPORTS

File: TTAS4_11

ACTIVITY #36

M07-DWP-011-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-4	R3	F-1, L-2	105	136	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1 R2 R3 R4 R5 R7 R8 R9 R10	F-2 L-5 O-2			E1-2 E2-3 E3-2	C1-72 C2-60 C3-9				
1. 56-G2-1 thru 4 Pumps	4 ea.	R11 R12		494	XXXXXXXX	E4-1 E5-2	C4-500 FT C5-400	XXXX	XXXX	XXXX	
2. Carbon Steel Piping						E6-1	C6-400 FT				
<2 in. Diam.	1390				XXXXXXXX	E9-1	C7-8	XXXX	XXXX	XXXX	
2-6 in. Diam.	923				XXXXXXXX		C8-130	XXXX	XXXX	XXXX	INCLUDES M130
>6 in. Diam.	0			670	XXXXXXXX		C9-5 ROLLS C10-100 FT C11-200 FT	XXXX	XXXX	XXXX	SUPPORT PIPING
3. Aluminum Piping 6 in. Diam.	80			203	XXXXXXXX		C12-12	XXXX	XXXX	XXXX	
4. Stainless Steel Piping	350			112	XXXXXXXX			XXXX	XXXX	XXXX	
Sub Total - All Piping & Equip Removal.	XXX			XXXXXXXX	1634			6	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	52	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	2743	R3	F-1, L-2	189	216	XXXXXXXX	XXXXXXXX	2	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	2038	XXXXXXXX	XXXXXXXX	8	0	0	

A/S 4 DATA COLLECTION FORM

FUEL HANDLING BUILDING - AREA 11 - VENT SYSTEM

File: TTAS4_11

ACTIVITY #79

M07-DWP-011-C

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-2	R3	F-1, L-4	63	72	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R2 R3 R5	F-1 L-4 O-2			E2-1 E4-1 E5-4	C2-48 C3-11 C4-300 FT				
1. Duct 6" x 10"	12 LF	R9		XXXXXXXX	XXXXXXXX	E9-2	C5-200	XXXX	XXXX	XXXX	
10" x 16"	21 LF	R11		XXXXXXXX	XXXXXXXX	OXYACETYLENE	C7-4	XXXX	XXXX	XXXX	
12" x 14"	19 LF			XXXXXXXX	XXXXXXXX	TORCH	C8-48	XXXX	XXXX	XXXX	
12" x 42"	70 LF			XXXXXXXX	XXXXXXXX		C9-1 ROLL	XXXX	XXXX	XXXX	
16" x 6"	12 LF			XXXXXXXX	XXXXXXXX		C10-1 ROLL	XXXX	XXXX	XXXX	
26" x 10"	63 LF			XXXXXXXX	XXXXXXXX		C12-16	XXXX	XXXX	XXXX	
26" x 18"	417 LF			XXXXXXXX	XXXXXXXX			XXXX	XXXX	XXXX	
46" x 18"	39 LF			XXXXXXXX	XXXXXXXX			XXXX	XXXX	XXXX	
46" x 46'	341 LF			XXXXXXXX	XXXXXXXX			XXXX	XXXX	XXXX	
Sub Total - Duct Removal.	XXX			XXXXXXXX	824			2	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	35	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	R3	F-1, L-2	210	240			1	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1171	XXXXXXXX	XXXXXXXX	3	0	0	

M07-DWP-013-A-C
M07-DWP-013-A-J

A/S 4 DATA COLLECTION FORM
YARD - AREA 13A - ABOVE GROUND PIPING

ACTIVITY NOS. 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58

File: TTAS4_13

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used: LSA	Drums	1-Piece	Remarks and Comments
A. SCAFFOLDING & PREP. WORK	S1-12	N/A	F-1, L-3	248	284	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1 R3 R4	F-2 L-6 O-2			E1-2 E3-2 E4-1	C1-5 C2-25 C3-2				
1. Carbon Steel Piping		R5				E6-1	C4-75				
<2 in. Diam.	2877	R11		994	XXXXXXXX		C5-350				
2 - 6 in. Diam.	3098			1070	XXXXXXXX		C6-420				
>6 in. Diam.	200			75	XXXXXXXX		C7-5				
							C8-50				
							C11-125				
2. Stainless Steel Piping							C12-2				
<2 in. Diam.	120			42	XXXXXXXX			6	0	0	
3. Reactor Dome	1 ea.			201	XXXXXXXX	HIGH REACH		16	0	0	
Sub Total - All piping & Equip Removal	6295			XXXXXXXX XXXXXXXX	2686			22	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	40	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK *	XXX	R3	F-1, L-3	690	789			4	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	3799	XXXXXXXX	XXXXXXXX	26	0	0	

* Includes asbestos removal

M07-DWP-013-A-C
M07-DWP-013-A-J

A/S 4 DATA COLLECTION FORM
YARD - AREA 13A - UNDERGROUND PIPING

File: TTAS4_13

ACTIVITY NOS. 37 38 39 40 41 42 43 44 45 46 47
48 49 50 51 52 53 54 55 56 57 58

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK *	N/A	N/A	F-1, L-3	990	1132	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1 R3 R4 R5	F-2 L-8 O-2			E1-4 E3-2 E4-1 E6-1	C1-8 C2-47 C3-4 C4-75				
1. Carbon Steel Piping		R10					C5-650	XXXX	XXXX	XXXX	
<2 in. Diam.	7220	R11		764	XXXXXXXX		C6-780	XXXX	XXXX	XXXX	
2 - 6 in. Diam.	16003			1693	XXXXXXXX		C7-7				
2. Stainless Steel Piping							C8-88				
<2 in. Diam.	1015			107	XXXXXXXX		C9-225	XXXX	XXXX	XXXX	
2 - 6 in. Diam.	2294			243	XXXXXXXX		C11-50	XXXX	XXXX	XXXX	
>6 in. Diam.	88			11	XXXXXXXX		C12-2	XXXX	XXXX	XXXX	
Sub Total - All piping & Equip Removal.	26620			XXXXXXXX	3219			30	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	65	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK **	XXX	R3	F-1, L-3	446	510	XXXXXXXX	XXXXXXXX	4	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	4926	XXXXXXXX	XXXXXXXX	34	0	0	

*Includes fabrication of plywood trench covers as well as soil excavation
**Includes asbestos removal

A/S 4 DATA COLLECTION FORM

YARD - AREA 13A - NON-ACTIVE WASTE TANKS (E20-1 & 2)

File: TTAS4_13

ACTIVITY #70

M07-DWP-013A-C

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	0	N/A	N/A	0	0	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R3 R4 R5	F-1 L-3 O-1			E2-1 E4-1 E6-1	C2-24 C9-225 C3-2 C10-100 C4-75 C5-50				
1. 43-E20-1,2 Non-Active Tanks	2 ea.			98	112		C7-1 C12-2	2	0	0	
Sub Total - All piping & Equip Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	112	XXXXXXXX	XXXXXXXX	2	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	2	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	R3	F-1, L-2	XXXXXXXX	8	XXXXXXXX	XXXXXXXX	1	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	122	XXXXXXXX	XXXXXXXX	3	0	0	

A/S 4 DATA COLLECTION FORM

YARD - AREA 13A - SPECIAL WASTE TANKS (E21-1 & 2)

File: TTAS4_13

ACTIVITY #69

M07-DWP-013A-C

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-8	N/A	F-1, L-3	105	120	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R2 R3 R9	F-1 L-3 O-1			E2-1 GAS POWERED CUT-OFF SAW					
1. 43-E21-1,2 Special Waste Tanks	2 ea.			266	305		ABRASIVE WHEELS 18	2	0	0	
Sub Total - All piping & Equip Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	305	XXXXXXXX	XXXXXXXX	2	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	6	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	N/A	F-1, L-2	XXXXXXXX	80	XXXXXXXX	XXXXXXXX	1	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	511	XXXXXXXX	XXXXXXXX	3	0	0	

A/S 4 DATA COLLECTION FORM

YARD - AREA 13A - ION EXCHANGE TANKS (E6-1, 2, 3 & 4)

File: TTAS4_13

ACTIVITY #71

M07-DWP-013A-C

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-4	N/A	F-1, L-2	77	88	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1 R3 R4	F-1 L-3 O-1			E1-1 E3-1 E5-1	C2-10 C3-1 C4-25				
1. 43 E-6-1,2,3,4 Ion Exchangers	4 ea.	R5 R11		224	XXXXXXXX	E6-1	C5-50 C8-5 C9-75	4	0	0	
Sub Total - All piping & Equip Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	256			4	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	4	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	R3	F-1, L-2	XXXXXXXX	80	XXXXXXXX		1	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	428	XXXXXXXX	XXXXXXXX	5	0	0	

A/S 4 DATA COLLECTION FORM

YARD - AREA 13A - SURGE TANK (E2-1, 2, 3, & 4)

File: TTAS4_13

ACTIVITY #60 & #74

M07-DWP-013A-C

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-12	N/A	F-1, L-3	315	360	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1 R2 R3	F-1 L-4 O-2			E1-2 E2-2 E3-2	C1-4 C2-168 C3-250				
1. 43-E2-4 Surge Tank	4 ea.	R4		2723	3112	E4-1 E6-2	C4-400 C5-700	32	0	0	
2. Surge Tank Desludge	4 ea.	R7 R8		574	656		C6-200 C7-14	XXXX	XXXX	XXXX	
3. Surge Tank Painting	4 ea.	R9 R10 R11		175	200		C9-600 C11-75 C12-40	XXXX	XXXX	XXXX	
Sub Total - All piping & Equip Removal	XXX			XXXXXXXX	4328			32	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	62	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	R3	F-1, L-3	217	248	XXXXXXXX	XXXXXXXX	4	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	4638	XXXXXXXX	XXXXXXXX	36	0	0	

A/S 4 DATA COLLECTION FORM

YARD - AREA 13A - SPENT RESIN TANKS 1A & 1B (E1-1 & 2)

File: TTAS4_13

ACTIVITY #73

M07-DWP-013A-C

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK		R3	F-1, L-4	161	184	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R3, R4, R8 R9, R10, R11 R13	F-1 L-4 O-2			E1-2 E2-1 E3-2 E4-1 E6-1	C1-5 C11-50 C2-50 C12-48 C3-60 C8-12 C4-100 C5-200 C7-6				
1. 43-E1-1,2 Resin Tanks	2 ea.			1185	XXXXXXXX			8		0	
Sub Total - All piping & Equip Removal.	XXX				1354		C9-150	8	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	16	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	R3	F-1, L-3	98	112	E4-1	XXXXXXXX	2	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1666	XXXXXXXX	XXXXXXXX	10	0	0	

A/S 4 DATA COLLECTION FORM
DECONTAMINATION ROOM - AREA 14

File: TTAS4_14

ACTIVITY #2
M07-DWP-014-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-1	XXXXXXXX	F-1, L-2	82	97	XXXXXXXX	XXXXXXXX	---	XXXX	XXXX	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1-3 R2-9 R3 R7-1 R11-1 R13	F-1, L-2			E1-2 E4-1 E10-2					
1. 50-G2-9 Pump	1 ea.	R14	XXXXXXXX	6	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
2. Sump Tank	1 ea.	XXXXXXXX	XXXXXXXX	16	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
3. 50-G6-23 Fan	1 ea.	XXXXXXXX	XXXXXXXX	4	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
4. Duct 16" x 10"	25 LF	XXXXXXXX	XXXXXXXX	46	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
16" x 14"	18 LF	XXXXXXXX	XXXXXXXX	17	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
22" x 12"	20 LF	XXXXXXXX	XXXXXXXX	18	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
5. Carbon Steel Piping											
<2 in. Diam.	883	XXXXXXXX	XXXXXXXX	89	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
2 - 6 in. Diam.	114	XXXXXXXX	XXXXXXXX	36	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
6. Stainless Steel Piping											
2-6 in. Diam.	117	XXXXXXXX	XXXXXXXX	23	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
Sub Total - All piping & Equip Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	291	XXXXXXXX	C1-10 C2-15 C3-2 C5-100 C7-25 C8-35	3	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	18	XXXXXXXX	XXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-2	14	16	XXXXXXXX	XXXX	XXXX	XXXX	XXXX	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	325	XXXXXXXX	XXXXXXXX	3	0	0	

A/S 4 DATA COLLECTION FORM

"AC" BOILER CHAMBER - AREA 16 - COMPONENTS, CONTAMINATED & NON-CONTAMINATED PIPING

ACTIVITY #'S 61, 62 & 63

File: TTAS4_16

M07-DWP-016-F

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-2	XXXXXXXX	F-1, L-3	104	121	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1 R2 R3 R4 R5 R6 R7 R8 R9 R11 R12	F-2 L-6 O-1			E1-6, E2-2 E3-3, E4-1 E5-2, E6-1	C1-40 C2-50 C3-11 C4-150 C5-300				
1. 07-F1-1 Heat Exchanger	1 ea.	R13		73	XXXXXXXX	E9-2	C6-200 C7-100	XXXX	XXXX	1	
2. 07-F2-1 Heat Exchanger	1 ea.	XXXXXXXX	XXXXXXXX	67	XXXXXXXX	XXXXXXXX	C8-150 C9-10 ROLLS	XXXX	XXXX	1	
3. 45-G2-1 Pump	1 ea.	XXXXXXXX	XXXXXXXX	36	XXXXXXXX	XXXXXXXX	C10-1 ROLL C11-125	XXXX	XXXX	0	
4. 82-9-F-1,3 Cooling Unit	2 ea.	XXXXXXXX	XXXXXXXX	90	XXXXXXXX	XXXXXXXX	C12-12	XXXX	XXXX	0	
5. Duct 6" x 10"	90 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
6" x 18"	9 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
9" x 18"	9 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
10" x 16"	15 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
12" x 18"	24 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
15" x 18"	22 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
16" x 7"	12 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
25" x 30"	166 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
30" x 25"	3 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
25" x 30"	7 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
3" diam.	5 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
8" daim.	172 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
12" diam.	38 LF	XXXXXXXX	XXXXXXXX	428	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	0	

SHEET 1 OF 2

A/S 4 DATA COLLECTION FORM

"AC" BOILER CHAMBER - AREA 16 - COMPONENTS, CONTAMINATED & NON-CONTAMINATED PIPING

File: TTAS4_16

ACTIVITY #'S 61, 62 & 63

M07-DWP-016-F

6. Carbon Steel Piping											
<2 in. Diam.	1711	XXXXXXXX	XXXXXXXX	275	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
2-6 in. Diam.	1215	XXXXXXXX	XXXXXXXX	212	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
>6 in. Diam.	190	XXXXXXXX	XXXXXXXX	36	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	0	
7. Stainless Steel Piping											
<2 in. Diam.	1266	XXXXXXXX	XXXXXXXX	244	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX		
2-6 in. Diam.	1237	XXXXXXXX	XXXXXXXX	255	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	0	
Sub Total - All piping & Equip Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	2724	XXXXXXXX	XXXXXXXX	12	0	2	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	92	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	292	311	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	3127	XXXXXXXX	XXXXXXXX	12	0	2	

SHEET 2 OF 2

A/S 5 DATA COLLECTION FORM

"A" BOILER CHAMBER - AREA 16.28 - STEAM AND FEED WATER PIPING

Activity #s 30 & 16

M07-DWP-016-C

File: TIAS5_28

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-1	XXXXXXXX	F-1, L-3	52	59	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING	XXX	R1 R2 R7 R9 R11	F-1 L-5 O-1	XXXXXXXX	XXXXXXXX	E1-1 E2-1 E3-2 E4-1 E5-4 E6-1	C1-10 C2-20 C3-4 C5-100 C7-2 C9-1 ROLL C10-1 ROLL C11-150 C12-10	XXXX	XXXX	XXXX	
1. Main Steam Piping on Steam Generator	155	XXXXXXXX	XXXXXXXX	136	XXXXXXXX	XXXXXXXX		XXXX	XXXX	XXXX	
2. Boiler Feedwater Piping, in all form	136	XXXXXXXX	XXXXXXXX	52	XXXXXXXX	XXXXXXXX		XXXX	XXXX	XXXX	
Sub Total - All piping & Equip. Removal.	291	XXXXXXXX	XXXXXXXX	XXXXXXXX	295	XXXXXXXX	XXXXXXXX	0	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	30	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	15	21	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
T O T A L S	291	XXXXXXXX	XXXXXXXX	XXXXXXXX	346	XXXXXXXX	XXXXXXXX	0	0	0	

A/S 5 DATA COLLECTION FORM

"A" BOILER CHAMBER - AREA 16.28 - PRIMARY PIPING AND PUMP

File: TTAS5_28

Activity 27

M07-DWP-016-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-2	XXXXXXXX	F-1, L-3	64	71	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXXXX	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING	XXX	R1 R2 R3 R4 R5 R6 R7 R9 R10 R11 R13 R14	F-1 L-4 O-2	XXXXXXXX	XXXXXXXX	E2-4, E3-1 E4-1, E5-3 E7-1	C1-12 C2-35 C3-10 C4-150 C5-100 C7-2 C8-20 C9-6 ROLLS C10-2 ROLLS C11-150 C12-20	XXXX XXXX XXXX XXXX XXXX XXXX XXXX	XXXX XXXX XXXX XXXX XXXX XXXX XXXX		
1. Reactor Coolant Pump No. 205-G1-1	1		XXXXXXXX	120	XXXXXXXX	XXXXXXXX				1	
2. Reactor Coolant Loop Check Valve 05-H7	1	XXXXXXXX	XXXXXXXX	44	XXXXXXXX	XXXXXXXX		1	XXXX	0	
3. Reactor Coolant Piping	55	XXXXXXXX	XXXXXXXX	448	XXXXXXXX	XXXXXXXX	XXXXXXXX	7	XXXX	0	
Sub Total - All piping & Equip. Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	841	XXXXXXXX	XXXXXXXX	8	0	1	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	30	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	57	67	XXXXXXXX	XXXXXXXX	0	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	938	XXXXXXXX	XXXXXXXX	8	0	1	

A/S 5 DATA COLLECTION FORM

"A" BOILER CHAMBER - AREA 16.28 - STEAM DRUM & PRIMARY HEAT EXCHANGER

Activity #s 28, 29 & 30

M07-DWP-016-B

File: TTAS5_28

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-1	XXXXXXXX	F-1, L-3	558	669	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1 R2 R3 R5 R6 R7 R8 R9 R11	F-2 L-8 O-3			E2-8, E4-1 E5-6 E7-1	C2-25 C3-12 C4-100 C5-200 C7-4 C8-200 C9-4 ROLLS C10-1 ROLL C11-100 C12-40	XXXX XXXX XXXX XXXX XXXX XXXX XXXX XXXX	XXXX XXXX XXXX XXXX XXXX XXXX XXXX XXXX		
1. Straight Tube Steam Generator No. 205-F1-1	1	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX					
- Steam Drum		XXXXXXXX	XXXXXXXX	116	XXXXXXXX	XXXXXXXX					
- Heat Exchanger Drum		XXXXXXXX	XXXXXXXX	220	XXXXXXXX	XXXXXXXX				1	20 WOODEN OVERPACK
- Risers & Downcomers		XXXXXXXX	XXXXXXXX	185	XXXXXXXX	XXXXXXXX				1	BOXES REQUIRED FOR INSULATION
Sub Total - All piping & Equip. Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1391	XXXXXXXX	XXXXXXXX	0	0	2	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	35	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	230	276	XXXXXXXX	XXXXXXXX	0	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1702	XXXXXXXX	XXXXXXXX	0	0	2	

A/S 5 DATA COLLECTION FORM

"C" BOILER CHAMBER - AREA 16.29 - STEAM AND FEED WATER PIPING

File: TTAS5629

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-1	XXXXXXXX	F-1, L-3	36	42	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING	XXX	R1 R2 R7 R9	F-1 L-5 O-1	XXXXXXXX	XXXXXXXX	E1-1 E2-1 E3-2 E4-1 E5-4 E6-1	C1-10 C2-20 C3-4 C5-100 C7-2	XXXX	XXXX	XXXX	
1. Main Steam Piping on Steam Generator	75	XXXXXXXX		60	XXXXXXXX		C9-1 ROLL C10-1 ROLL C11-150 C12-10	XXXX	XXXX	XXXX	
2. Boiler Feedwater Piping, in all form	25	XXXXXXXX	XXXXXXXX	7	XXXXXXXX	XXXXXXXX		XXXX	XXXX	XXXX	
Sub Total - All piping & Equip. Removal.	100	XXXXXXXX	XXXXXXXX	XXXXXXXX	134	XXXXXXXX	XXXXXXXX	0	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	30	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	17	23	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
T O T A L S	100	XXXXXXXX	XXXXXXXX	XXXXXXXX	187	XXXXXXXX	XXXXXXXX	0	0	0	

A/S 5 DATA COLLECTION FORM

"C" BOILER CHAMBER - AREA 16.29 - PRIMARY PIPING AND PUMP

File: TTAS5629

Activity 27

M07-DWP-016-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-2	XXXXXXXX	F-1, L-3	57	64	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXXXX	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING	XXX	R1 R2 R3 R4 R5 R6 R7 R9 R10 R11 R13	F-1 L-4 O-2	XXXXXXXX XXXXXXXX XXXXXXXX	XXXXXXXX XXXXXXXX XXXXXXXX	E2-4, E3-1 E4-1, E5-3 E7-1	C1-12 C2-35 C3-10 C4-150 C5-11 C7-2 C8-20 C9-6 ROLLS C10-2 ROLLS C11-150 C12-20	XXXX XXXX XXXX	XXXX XXXX XXXX	XXXX XXXX XXXX	
1. Reactor Coolant Pump No. 205-G1-3	1	XXXXXXXX	XXXXXXXX	80	XXXXXXXX	XXXXXXXX		XXXX	XXXX	1	
2. Reactor Coolant Loop Check Valve 05-H7-3	1	XXXXXXXX	XXXXXXXX	36	XXXXXXXX	XXXXXXXX		1	XXXX	0	
3. Reactor Coolant Piping	18	XXXXXXXX	XXXXXXXX	139	XXXXXXXX	XXXXXXXX	XXXXXXXX	3	XXXX	0	
Sub Total - All piping & Equip. Removal.	XXX	XXXXXXXX	XXXXXXXX	58	377	XXXXXXXX	XXXXXXXX	4	0	1	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	30	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	48	55	XXXXXXXX	XXXXXXXX	0	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	462	XXXXXXXX	XXXXXXXX	4	0	1	

A/S 5 DATA COLLECTION FORM

"C" BOILER CHAMBER - AREA 16.29 - STEAM AND FEED WATER PIPING

File: TTAS5629

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-1	XXXXXXXX	F-1, L-3	36	42	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING	XXX	R1 R2 R7 R9	F-1 L-5 O-1	XXXXXXXX	XXXXXXXX	E1-1 E2-1 E3-2 E4-1 E5-4 E6-1	C1-10 C2-20 C3-4 C5-100 C7-2	XXXX	XXXX	XXXX	
1. Main Steam Piping on Steam Generator	75	XXXXXXXX		60	XXXXXXXX		C9-1 ROLL C10-1 ROLL C11-150 C12-10	XXXX	XXXX	XXXX	
2. Boiler Feedwater Piping, in all form	25	XXXXXXXX	XXXXXXXX	7	XXXXXXXX	XXXXXXXX		XXXX	XXXX	XXXX	
Sub Total - All piping & Equip. Removal.	100	XXXXXXXX	XXXXXXXX	XXXXXXXX	134	XXXXXXXX	XXXXXXXX	0	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	30	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	17	23	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
T O T A L S	100	XXXXXXXX	XXXXXXXX	XXXXXXXX	187	XXXXXXXX	XXXXXXXX	0	0	0	

A/S 5 DATA COLLECTION FORM

"AC" DEMINERALIZER CUBICLE - AREA 16.31 - PURIFICATION SYSTEM

File: TTAS5_31

ACTIVITY #31
M07-DWP-016-E

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-2	XXXXXXXX	F-1, L-3	164	196	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1 R2 R3 R4 R5 R7 R8 R9 R11 R12 R13	F-1 L-4 O-2		XXXXXXXX XXXXXXXX XXXXXXXX	E1-1 E2-1 E3-2 E4-1 E5-4 E6-1	C1-10 C2-20 C3-5 C4-50 C5-100 C7-2	XXXX XXXX XXXX	XXXX XXXX XXXX		
1. Purification Loop Demineralizer 07-E1-2	1			256	XXXXXXXX		C8-7 C9-2 ROLLS C10-1 ROLL	XXXX XXXX	XXXX	1	
2. Resin Charging Tank 08-E1-2	1	XXXXXXXX	XXXXXXXX	56	XXXXXXXX	XXXXXXXX	C11-150 C12-10	XXXX	XXXX	0	
Sub Total - All piping & Equip Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1590	XXXXXXXX	XXXXXXXX	5	XXXX	1	INCLUDES CONTAMINATED STRUCTURAL STEEL
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	36	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	100	132	XXXXXXXX	XXXXXXXX	0	XXXX	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1758	XXXXXXXX	XXXXXXXX	5	XXXX	1	

A/S 4 DATA COLLECTION FORM

"AC" BOILER CHAMBER ENCLOSURE - AREA 17

File: TTAS4_17

ACTIVITY #64

M07-DWP-017-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-3	XXXXXXXX	F-1, L-3	127	141	XXXXXXXX	XXXXXXXX	---	---	---	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11,	F 4 L 12 O 2			E1-6, E2-6 E3-6, E4-1 E5-8, E6-2 E7-1, E9-4	C1-60, C2-85 C3-15 C4-300 C5-2000 C6-500, C9-4				
1. Carbon Steel Piping											
<2 in. Diam.	942	R12, R13,		184	XXXXXXXX	E10-2, E12-1	C7-400 C8-40		XXXX		
2-6 in. Diam.	2021			315	XXXXXXXX		C10-2 C12-22		XXXX		
>2 in. Diam.	244			29	XXXXXXXX		C11-2000	4	XXXX	---	
2. Stainless Steel Piping											
<2 in. Diam.	448			82	XXXXXXXX	XXXXXXXX	XXXXXXXX		XXXX		
>2 in. Diam.	729	XXXXXXXX	XXXXXXXX	139				2		---	
3. Aluminum Piping											
6 in. Diam.	522	XXXXXXXX	XXXXXXXX	111	XXXXXXXX	XXXXXXXX	XXXXXXXX	1	XXXX	---	
Sub Total - All piping & Equip Removal.	XXX	XXXXXXXX	XXXXXXXX	987	1261	XXXXXXXX	XXXXXXXX	7	---	---	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	24	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	---	XXXXXXXX	F-1, L-3	178	193	XXXXXXXX	XXXXXXXX	---	XXXX	XXXX	
T O T A L S	4906	XXXXXXXX	XXXXXXXX	XXXXXXXX	1478	XXXXXXXX	XXXXXXXX	7	XXXX	XXXX	

A/S 4 DATA COLLECTION FORM
"BD" BOILER CHAMBER - AREA 18

File: TTAS4_18

ACTIVITY #'S 32, 33 & 34
M07-DWP-018-F

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-2	XXXXXXXX	F-1, L-3	327	343	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1,R2,R6,R7, R8,R9,R11, R12,R13,R14	F-1 L-4 O-1	XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX	XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX	E1-3,E2-8, E3-4,E5-3, E6-2,E9-2, E10-3	C1-30,C2-55,C3-7 C4-225,C5-350 C6-375,C7-125 C8-86,C10-57 C9-2 ROLLS C11-150,C12-18	10	XXXX XXXX XXXX XXXX XXXX	XXXX XXXX XXXX XXXX XXXX	
1. 07-F1-2 Heat Exchanger	1 ea.	XXXXXXXX	XXXXXXXX	40	XXXXXXXX	XXXXXXXX		XXXX	XXXX	1	
2. 07-F2-2 Heat Exchanger	1 ea.	XXXXXXXX	XXXXXXXX	40	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	1	
3. 45-G2-2 Pump	1 ea.	XXXXXXXX	XXXXXXXX	31	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
4. 8219-F-2,4 Cooling Unit	2 ea.	XXXXXXXX	XXXXXXXX	58	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
5. Duct 6" x 20"	81 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
6" X 18"	26 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
9" X 18"	21 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
12" X 18"	28 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
15" X 18"	22 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
25" X 30"	182 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
30" X 25"	11 LF	XXXXXXXX	XXXXXXXX	210	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
8" diam.	188 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
12" diam.	59 LF	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
6. Carbon Steel Piping											
<2 in. Diam.	1890	XXXXXXXX	XXXXXXXX	525	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
2-6 in. Diam.	911	XXXXXXXX	XXXXXXXX	294	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
>6 in. Diam.	257	XXXXXXXX	XXXXXXXX	109	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	

A/S 4 DATA COLLECTION FORM
"BD" BOILER CHAMBER - AREA 18

File: TTAS4_18

ACTIVITY #'S 32, 33 & 34
M07-DWP-018-F

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
7. Stainless Steel Piping											
<2 in. Diam.	2098	XXXXXXXX	XXXXXXXX	579	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
2-6 in. Diam.	1496	XXXXXXXX	XXXXXXXX	449	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
Sub Total - All piping & Equip. Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	2592	XXXXXXXX	XXXXXXXX	10	0	2	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	309	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	229	241	XXXXXXXX	XXXXXXXX	5	XXXX	XXXX	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	3785	XXXXXXXX	XXXXXXXX	15	0	2	

A/S 5 DATA COLLECTION FORM
"B" BOILER CHAMBER - AREA 18.11

File: TTAS5_11

ACTIVITY #'S 11, 12 & 13
M07-DWP-018-B

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK *	S1-1	XXXXXXXX	F-1, L-4	492	590	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1,R1,R3,R4, R5,R6,R7,R9, R10,R11,R12, R13,R14	F-2 L-8 O-2			E2-4,E3-2, E7-1,E12-1	C1-24,C2-15, C3-4,C4-125, C5-100, C6-110,C7-50				
1. U-Tube Steam Generator No. 205-F1-2					XXXXXXXX		C9-2 ROLLS	XXXX	XXXX		
- Steam Drum	1			40	XXXXXXXX		C10-1 ROLL	XXXX	XXXX	1	
- Heat Exchanger Drum	1			170	XXXXXXXX		C11-75	XXXX	XXXX	1	
- Risers & Downcomers	1 SET			120	XXXXXXXX		C12-10	XXXX	XXXX		
Sub Total - All piping & Equip Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1160	XXXXXXXX	XXXXXXXX	0	0	2	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	16	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	203	243	XXXXXXXX	XXXXXXXX	1	XXXX	XXXX	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	2009	XXXXXXXX	XXXXXXXX	1	0	2	

* Includes insulation removal

A/S 5 DATA COLLECTION FORM
"D" BOILER CHAMBER - AREA 18.12

File: TTAS5_12

ACTIVITY 11, 12 & 13
M07-DWP-018-B

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK *	S1-1	XXXXXXXX	F-1, L-3	390	468	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1,R2,R3,R4 R5,R6,R7,R9 R10,R11,R13,	F-2 L-8 O-2				C1-28,C2-17, C3-5,C4-135 C5-90,C6-98				
1. Straight Tube Steam Generator No. 205-F1-4					XXXXXXXX	E2-4,E3-2 E7-1,E14-1	C7-60, C9-2 ROLLS	XXXX	XXXX		
- Steam Drum	1			246	XXXXXXXX		C10-1 ROLL	XXXX	XXXX	1	
- Heat Exchanger Drum	1			170	XXXXXXXX		C11-85	XXXX	XXXX	1	
- Risers & Downcomers	1 SET			264	XXXXXXXX		C12-11	XXXX	XXXX		
Sub Total - All piping & Equip Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1521	XXXXXXXX	XXXXXXXX	0	0	2	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	16	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	257	308	XXXXXXXX	XXXXXXXX	1	XXXX	XXXX	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	2313	XXXXXXXX	XXXXXXXX	1	0	2	

* Includes insulation removal

A/S 5 DATA COLLECTION FORM

"D" BOILER CHAMBER - AREA 18.12 - PRIMARY PIPING & PUMP

File: TTAS5_12

ACTIVITY #10

M07-DWP-018-A

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	XXX	XXXXXXXX	F-1, L-3	106	125	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R2-2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R13 R14	F-1 L-4 O-2	XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX	XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX	E2-6 E3-1 E4-1 E5-3 E7-1	C2-14 C3-3 C4-100 C5-100 C7-1 C9-1 Roll C10-2 Roll C11-60 C12-18	XXXX XXXX XXXX XXXX XXXX XXXX	XXXX XXXX XXXX XXXX XXXX XXXX	XXXX XXXX XXXX XXXX XXXX XXXX	
1. Reactor Coolant Pump No. 205-G1-4	1	XXXXXXXX	XXXXXXXX	102	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	1	
2. Reactor Coolant Loop Check Valve 05-H7-4	1	XXXXXXXX	XXXXXXXX	67	XXXXXXXX	XXXXXXXX	XXXXXXXX	1	XXXX	XXXX	
3. Reactor Coolant Piping	56	XXXXXXXX	XXXXXXXX	435.5	XXXXXXXX	XXXXXXXX	XXXXXXXX	3	XXXX	XXXX	
Sub Total - All piping & Equip Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	768	XXXXXXXX		4	0	1	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	16	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	57	72	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	981	XXXXXXXX	XXXXXXXX	4	0	1	

A/S 5 DATA COLLECTION FORM
"BD" DEMINERALIZER CUBICLE - AREA 18.14

File: TTAS5_14

ACTIVITY #14
M07-DWP-018-E

Category or Components	Qty ea. or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-3	XXXXXXXX	F-1, L-4	182	218	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1,R2,R3,R4, R5,R7,R8,R9, R10,R11,R12 R14	F-1 L-4 O-1			E1-3,E2-2, E3-9,E4-1, E5-4,E6-1, E8-2,E12-1	C1-36,C2-20 C3-4,C4-150 C5-150,C6-250 C7-100,C8-75				
1. Purification Loop Demineralizer 07-E1-1	1			199	XXXXXXXX		C9-5 ROLLS C10-1 ROLL	XXXX	XXXX	1	
2. Resin Charging Tank 08-E8-1	1	XXXXXXXX	XXXXXXXX	108	XXXXXXXX	XXXXXXXX	C11-100,C12-12	1	XXXX	XXXX	
Sub Total - All piping & Equip Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1257	XXXXXXXX	XXXXXXXX	1	0	1	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	16	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK *	XXX	XXXXXXXX	F-1, L-4	303	374	XXXXXXXX	XXXXXXXX	10	XXXX	XXXX	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1865	XXXXXXXX	XXXXXXXX	11	0	1	

* Includes packaging contaminated structural steel

A/S 4 DATA COLLECTION FORM
"BD" BOILER CHAMBER ENCLOSURE - AREA 19

File: TTAS4_19

ACTIVITY # 35
M07-DWP-019-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-3	XXXXXXXX	F-1, L-4	87	109	XXXXXXXX	XXXXXXXX	---	---	---	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1, R2, R3, R7, R9, R11, R12,	F-2, L-6 O-2			E1-6, E2-8, E3-4, E5-4, E6-1, E9-2, E10-1, E12-1	C1-50, C2-75 C3-11 C4-200 C5-1500 C6-500 C7-200 C8-100 C9-5 rolls C10-4 rolls C11-250 C12-20				
1. Carbon Steel Piping											
<2 in. Diam.	626			57	XXXXXXXX				XXXX	XXXX	
2-6 in. Diam.	3080			496	XXXXXXXX				XXXX	XXXX	
>6 in. Diam.					XXXXXXXX			4	XXXX	XXXX	
2. Stainless Steel Piping											
<2 in. Diam.	604			80	XXXXXXXX	XXXXXXXX			XXXX	XXXX	
2-6 in. Diam.	1551			268	XXXXXXXX	XXXXXXXX			XXXX	XXXX	
>6 in. Diam.	88	XXXXXXXX	XXXXXXXX	15	XXXXXXXX	XXXXXXXX		3	XXXX	XXXX	
3. Aluminum Piping											
6 in. Diam.	88	XXXXXXXX	XXXXXXXX	70	XXXXXXXX	XXXXXXXX	XXXXXXXX	---	XXXX	XXXX	
Sub Total - All piping & Equip Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	1512	XXXXXXXX	XXXXXXXX	7	XXXX	XXXX	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	24	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	--	XXXXXXXX	F-1, L-3	184	206	XXXXXXXX	XXXXXXXX	---	---	---	
T O T A L S	5949	XXXXXXXX	XXXXXXXX	XXXXXXXX	1742	XXXXXXXX	XXXXXXXX	7	XXXX	XXXX	

A/S 4 DATA COLLECTION FORM
AUXILIARY CHAMBER - AREA 20

File: TTAS4_20

ACTIVITY #'S 15, 16, 17, 18 & 19
M07-DWP-020-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-4	R3	F-1, L-3	543	621	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1, R2, R3 R5, R7, R9, R11, R12	F-2 L-6 O-1			E1-4, E2-6 E3-4, E5-4 E6-1, E6-1 E9-1, E10-1	C1-144 C2-6 CASES C3-24 C4-500 C5-2200 C6-1500 C7-20 C8-144 C9-6 ROLLS C10-4 ROLLS C11-500 C12-20				
1. 09-G2-3,4 Blow-off Discharge Pumps	2 ea.			40	XXXXXXXX			XXXX	XXXX	XXXX	
2. 09-G2-1,2 Flash Tank Discharge Pumps	2 ea.			52	XXXXXXXX			XXXX	XXXX	XXXX	
3. 09-F1-1 Water Cooler	1 ea.			28	XXXXXXXX			XXXX	XXXX	XXXX	
4. 036-E1-1,2 Neutron Detector Tanks	2 ea.			88	XXXXXXXX			XXXX	XXXX	XXXX	
5. 36-G1-1 Recir. Pump	1 ea.			18	XXXXXXXX			XXXX	XXXX	XXXX	
6. 433-G6-4003 Circulation Blower	1 ea.			34	XXXXXXXX			XXXX	XXXX	XXXX	
7. 8219-F1-5,6 Cool.Units	2 ea.			46	XXXXXXXX			XXXX	XXXX	XXXX	
8. Duct 5" x 14"	5 LF			SEE NEXT PAGE							
6" x 6"	70 LF				XXXXXXXX			XXXX	XXXX	XXXX	
6" x 12"	77 LF				XXXXXXXX			XXXX	XXXX	XXXX	
7" x 14"	77 LF				XXXXXXXX			XXXX	XXXX	XXXX	
9" x 28"	3 LF				XXXXXXXX			XXXX	XXXX	XXXX	
10" x 14"	6 LF				XXXXXXXX			XXXX	XXXX	XXXX	
11" x 28"	8 LF				XXXXXXXX			XXXX	XXXX	XXXX	

A/S 4 DATA COLLECTION FORM
AUXILIARY CHAMBER - AREA 20

File: TTAS4_20

ACTIVITY #'S 15, 16, 17, 18 & 19
M07-DWP-020-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
Duct 12" x 42"	9 LF				XXXXXXXX			XXXX	XXXX	XXXX	
15" x 28"	17 LF	REFER TO	REFER TO		XXXXXXXX	REFER TO	REFER TO	XXXX	XXXX	XXXX	
28" x 24"	89 LF	PREVIOUS	PREVIOUS		XXXXXXXX	PREVIOUS	PREVIOUS	XXXX	XXXX	XXXX	
28" x 26"	101 LF	PAGE	PAGE		XXXXXXXX	PAGE	PAGE	XXXX	XXXX	XXXX	
28" x 28"	55 LF				XXXXXXXX			XXXX	XXXX	XXXX	
28" x 30"	18 LF				XXXXXXXX			XXXX	XXXX	XXXX	
28" x 44"	7 LF				XXXXXXXX			XXXX	XXXX	XXXX	
38" x 44"	9 LF				XXXXXXXX			XXXX	XXXX	XXXX	
10 in. Diam.	66 LF				XXXXXXXX			XXXX	XXXX	XXXX	
14 in. Diam.	100 LF				XXXXXXXX			XXXX	XXXX	XXXX	
22 in. Diam.	26 LF				XXXXXXXX			XXXX	XXXX	XXXX	
48 in. Diam.	87 LF			976	XXXXXXXX			XXXX	XXXX	XXXX	
9. Water Tank	1 ea.			12	XXXXXXXX			XXXX	XXXX	XXXX	
10.Metering Pumps	3 ea.			69	XXXXXXXX			XXXX	XXXX	XXXX	
11.Carbon Steel Piping											
<2 in. Diam.	4704			986	XXXXXXXX			XXXX	XXXX	XXXX	
2-6 in. Diam.	2136			903	XXXXXXXX			XXXX	XXXX	XXXX	
>6 in. Diam.	351			410	XXXXXXXX			XXXX	XXXX	XXXX	
12.Stainless Steel Piping											
<2 in. Diam.	2536			879	XXXXXXXX			XXXX	XXXX	XXXX	
2-6 in. Diam.	2609			571	XXXXXXXX			XXXX	XXXX	XXXX	
Sub Total - All piping & Equip Removal.				5112	6562			16	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	437	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	XXXXXXXX
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1 L-3 0-1	XXXXXXXX	912	XXXXXXXX	XXXXXXXX	5	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	8533	XXXXXXXX	XXXXXXXX	21	0	0	

A/S 4 DATA COLLECTION FORM

AUXILIARY CHAMBER CONCRETE ENCLOSURE - AREA 21 - COMPONENTS AND PIPING

File: TTAS4_21

ACTIVITY #'S 65, 66, 67 & 68
M07-DWP-021-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	S1-8	R3	F-1, L-3	322	368	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1 R2 R3 R4 R5 R6 R7 R9 R10	F-2 L-7 O-2			E1-2 E2-6 E3-3	C1-108 C2-6 CASES C3-18				
1. 453-G2-4005 Recir. Pump	1 ea.	R11 R12		18	XXXXXXXX	E4-1	C4-500	XXXX	XXXX	XXXXXX	
						E5-4	C5-1500				
2. 453-F1-4001-2 Ht. Exch.	1 ea.			126	XXXXXXXX	E6-1	C7-6 BOXES	XXXX	XXXX	2	
						E9-2	C8-240				
3. 20-E5-1 Drainage Tank	1 ea.			210	XXXXXXXX		C10-1 ROLL	XXXX	XXXX	XXXXXX	
							C11-250				
4. 47-G2-1,2 Drain.Pumps	2 ea.			16	XXXXXXXX		C12-60	XXXX	XXXX	XXXXXX	
5. Raw Waste Receive & Pumps	2 ea.			18	XXXXXXXX			XXXX	XXXX	XXXXXX	
6. 20-G2-1,2 Drain. Pumps	2 ea.			28	XXXXXXXX			XXXX	XXXX	XXXXXX	
7. Carbon Steel Piping											
<2 in. Diam.	3838				XXXXXXXX				XXXX	XXXXXX	
2-6 in. Diam.	3380				XXXXXXXX				XXXX	XXXXXX	
>6 in. Diam.	459			2252	XXXXXXXX			12	XXXX	XXXXXX	
8. Asbestos Removal	N/A	R4 R12		359	XXXXXXXX			XXXX	XXXX	XXXXXX	
9. Decon. Gravity Drain	150	R4 R9 R10 R11		1089	XXXXXXXX			XXXX	6	XXXXXX	
Sub Total - All piping & Equip Removal.	7827			XXXXXXXX	5232			12	6	2	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	36	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK *	XXX	R3	F-1, L-3	662	756	XXXXXXXX	XXXXXXXX	4	2	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	6392	XXXXXXXX	XXXXXXXX	16	8	2	

*INCLUDES LSA PACKAGING

A/S 4 DATA COLLECTION FORM
REACTOR ENCLOSURE - AREA 23

File: TTAS4_23

ACTIVITY #20
M07-DWP-023-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used: LSA	Drums	1-Piece	Remarks and Comments
A. SCAFFOLDING & PREP. WORK	S1-4	XXXXXXXX	F-1, L-3	98	117	XXXXXXXX	XXXXXXXX	---	---	---	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1,R2,R3,R4 R5,R7,R9,R10 R11,R12,R14	F-2, L-6			E1-3,E2-2 E3-2,E4-1 E5-2,E8-1 S1-1,S3-2	C1-24,C2-20 C3-2,C4-100 C5-100,C7-50 C8-24,C10-50				
1. Reactor Enclosure Leakage Collection Tank	1 ea.	XXXXXXXX	XXXXXXXX	21	XXXXXXXX		C9-1ROLL,C11-8	XXXX	XXXX	XXXX	
2. Reactor Enclosure Leakage Collect. Pumps	2 ea.	XXXXXXXX	XXXXXXXX	21	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
3. SIS Piping 6"	N/A	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
4. Overhead Carbon Steel Piping <2 in. Diam.	230	XXXXXXXX	XXXXXXXX	58	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
2-6 in. Diam.	295	XXXXXXXX	XXXXXXXX	74	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
>6 in. Diam.	205	XXXXXXXX	XXXXXXXX	52	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
5. Overhead Stainls. Steel Piping <2 in. Diam.	120	XXXXXXXX	XXXXXXXX	17	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
2-6 in. Diam.	290	XXXXXXXX	XXXXXXXX	44	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
>6 in. Diam.	XXX	XXXXXXXX	XXXXXXXX		XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
6. Aluminum Overhead Piping 6 in. Diam.	70	XXXXXXXX	XXXXXXXX	45	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
Sub Total - All piping & Equip Removal.	1210	XXXXXXXX	XXXXXXXX	XXXXXXXX	542	XXXXXXXX	XXXXXXXX	7	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	12	16	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	F-1, L-3	105	124	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
T O T A L S	1210	XXXXXXXX	XXXXXXXX	XXXXXXXX	799	XXXXXXXX	XXXXXXXX	7	0	0	

T/S 4 DATA COLLECTION FORM
CONTAMINATED EQUIPMENT ROOM - AREA 29

File: TTAS4_29

ACTIVITY #84
M07-DWP-029-A

Category or Components	Qty ea or LF	Radiation Controls Employed	Crew Mix	Actual Performance Man-hours	Time Card Man-hours	List of Equipment Used	List of Consumables	# of Containers used			Remarks and Comments
								LSA	Drums	1-Piece	
A. SCAFFOLDING & PREP. WORK	XXX	XXXXXXXX	F-1, L-2	27	32	XXXXXXXX	XXXXXXXX	0	0	0	
B. PIPE & EQUIP. REMOVAL HANDLING & PACKAGING		R1 R2 R3 R4 R9 R11 R14	F-1 L-3 O-1			E1-2 E3-1 E4 E9-2	C1-6 C2-8 C3-1 C4-25 C5-30 C7-25 C9-1 Roll				
1. Trench Piping 3 in. Diam.	418			231	XXXXXXXX		C10-1 Roll	XXXX	XXXX	0	
Sub Total - All piping & Equip Removal.	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	264			2	0	0	
C. TRAINING OR OTHER NON-SPECIFIED EFFORTS	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	14	XXXXXXXX	XXXXXXXX	XXXX	XXXX	XXXX	
D. CLEAN-UP WORK	XXX	XXXXXXXX	L-2	32	35	XXXXXXXX	XXXXXXXX	0	0	0	
T O T A L S	XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	345	XXXXXXXX	XXXXXXXX	2	0	0	