Commonwealth Edison
72 West Adams Street, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690 - 0767

September 28, 1989

Dr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Dresden Station Units 2 and 3
Radwaste Upgrade Project
Tank Room Pipe Replacement
NRC Docket Nos. 50-237 and 50-249

Reference: Generic Letter 84-07 from D.G. Eisenhut
to All Licensees of Boiling Water Reactors

Dr. Murley,

The purpose of this letter is to provide information concerning the Dresden Radwaste Upgrade Project tank room pipe replacement and, more specifically, the Commonwealth Edison Company (CECo) planning efforts to assure As Low As Reasonably Achievable (ALARA) personnel exposures associated with the project. We currently expect to begin the pipe replacement in the fourth quarter of 1989.

Although the referenced Generic Letter (84-07) is directed at licensees planning to replace "recirculation system piping (or other reactor coolant system pressure boundary piping)," it provides guidance regarding the need for prior NRC review which may be useful in other situations involving large projects with significant ALARA considerations. Although the subject radwaste project does not involve any reactor coolant system boundaries, ALARA aspects have been a primary consideration throughout the development of the pipe removal and replacement plan.

CECo has not identified any necessary Technical Specification changes or unreviewed safety questions related to this program. Although 10 CFR 50.59 is therefore applicable, i.e. no prior Staff review required, CECo believes it to be appropriate to submit the enclosed information (consistent with the GL 84-07 approach) sufficiently in advance of the project to allow Staff questions, if any, to be addressed.

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The following documents are therefore enclosed:

Attachment A: Project Summary

Attachment B: Dresden Nuclear Station Radwaste Upgrade Project Exposure Reduction Measures

Attachment C: ALARA Plan Document for Radwaste Pipe Replacement and Removal: Revision 0 dated April 1989

Attachment D: Job Specific Orientation Training

It should be noted that 51 personnel have been trained to date (35 Radiation Protection Technicians and 16 Contractors) per the Attachment D program.

Please contact this office should further information be required.

Very truly yours,

J. A. Silady
Nuclear Licensing Administrator

lm

Attachment

cc: A.B. Davis - Regional Administrator, Region III
B.L. Siegel - Project Manager, NRR
S.G. DuPont - Senior Resident Inspector, Dresden
R.L. Greger - EPRP Branch Chief, Region III

ATTACHMENT A

DRESDEN RADWASTE UPGRADE

PROJECT SUMMARY AND STATUS

Phase I of the Radwaste Upgrade Project restores the radwaste collection system piping and process pumps, upgrades the sampling capabilities and enhances the capability to monitor major inputs to radwaste. The scope of the Phase I restoration was determined after performing extensive nondestructive examination of piping, assessing operation and maintenance logs, and evaluating ALARA principles as they apply to the daily operation of the radwaste system. Phase I provides immediate benefit to the operation of the radwaste system from the vantage point of dose reduction benefits and reduces the amount of radwaste requiring burial. Although the potential scope of a second phase has been discussed, it is still being evaluated. If pursued, Phase II would provide longer term enhancements.

Phase I has progressed to the extent that dose reduction planning, engineering, and design is approximately 95% complete. Of the 37 modification packages, 25 have been approved for implementation with the balance in the review and approval process. The facility that will be used as a staging area for the installation of new piping and for the packaging and preparation of removed materials for shipping and disposal is currently in construction and approximately 95% complete. Instrumentation to assist in assuring ALARA principles have been installed in the basement, e.g. video camera and area radiation monitors. The project ALARA plan and the status of other exposure reduction measures are discussed in Attachments B and C.

Major materials, such as piping, valves, pumps, and sample sinks have been procured. Of the aforementioned materials, most have been shipped and are onsite. To date, over fifty (50) radiation protection and contractor personnel have received job-specific orientation training as outlined in Attachment D.

ATTACHMENT B

DRESDEN NUCLEAR POWER STATION

RADWASTE UPGRADE PROJECT

EXPOSURE REDUCTION MEASURES

DRESDEN NUCLEAR STATION
RADWASTE UPGRADE PROJECT
EXPOSURE REDUCTION MEASURES

MEASURE #1: TWO FULL SCALE TANK ROOM MODELS

BENEFITS: Scale models give the designer or planner a complete three dimensional integrated view of a new or as-built design. It is nearly impossible to accurately perform a "Big Picture" evaluation on two dimensional drawings.

Design Applications

Models are especially useful for design considerations such as:

- A scale model is the most reliable way that an entire system or area can be analyzed on a macroscopic basis. That is, how the system or component may impact other systems and/or activities not directly related to it.
- The need to include isolation and separation techniques or shielding can also be analyzed on the model.
- The routing of potentially radioactive piping in a new system can be evaluated on the model to minimize its contribution to radiation exposures in occupied areas.
- Alternate routes for as-built piping can also be analyzed to reduce their contribution to radiation exposures in occupied areas.
- A significant amount of maintenance time and exposure is expended in preparations such as building temporary work platforms, running service lines, installing temporary lighting, communications equipment, shielding, and rigging equipment. Analysis on the model in conjunction with maintenance personnel can identify all these needs so that permanent service connections, work platforms communications, lighting, rigging points or monorails, and mounts for routinely used temporary shielding can be included in design.
- Models are useful in evaluating and establishing radiation zones and in considering zone restrictions in additions or modifications.

DRESDEN NUCLEAR STATION
RADWASTE UPGRADE PROJECT
EXPOSURE REDUCTION MEASURES

Planning Applications

- Models are useful planning tools for selecting the best ingress/egress routes for a given area under concern.
- Problems such as sources of exposure, interferences, and the need for and analysis of dose reduction methods, work platforms, and services can be analyzed. If an outside work or staging area is required, the model is useful in evaluating options and selecting a location.
- They are also useful for briefing the workers, specifying the locations for which radiological survey data is required, and performing macroscopic time and motion projections.

Training Applications

The model can be used to train workers in systems and component locations, traffic routes, radiation zones and problem areas not directly associated with the work at hand that might impact radiation exposures or radiological conditions on the job.

Status

Two piping models were built depicting the as-built condition and the future piping configuration in the radwaste tank room. These models are currently being utilized for planning and training.

DRESDEN NUCLEAR STATION
RADWASTE UPGRADE PROJECT
EXPOSURE REDUCTION MEASURES

MEASURE #2: TANK TOP INSTALLATION MOCK-UP

BENEFITS:

Planning Applications

- A good mock-up is possibly the best planning tool available. Using the mock-up the planner can walk through the work evolutions and identify all tools, materials, and services or auxiliaries required for the job. In conjunction with the workers who will be performing the job he can develop and validate the procedures. The need for any special tools or equipment can be analyzed and the equipment selected can be tested and validated. Problems and potentials for problems can be studied and solutions and contingencies developed.

- The mock-up is useful for evaluating dose reduction potentials such as shielding needs and feasibility.

- A detailed time and motion study can be performed as the workers rehearse the actual job evolutions on the mock-up. This study in correlation with good survey data is the best available tool in establishing realistic dose estimates to determine the need for additional dose reduction techniques and establish a dose estimate.

Training Applications

- A good mock-up is by far the best training tool possible. There is no substitute for practice and experience.

- Mock-ups are useful for skills development for inexperienced workers and skills improvement and verification for experienced workers.

Training Applications cont'd

- Once all procedures are developed and any special equipment is verified workers who will be involved in the job should receive extensive training and practice in the procedures and with the equipment under as nearly as possible actual work conditions. Timing a given work crew's first attempt and comparing it to subsequent attempts can convincingly demonstrate the effectiveness of a mock-up as a training device.

- Mock-up activities will be photographed and video taped for future training to aid in orientating new workers that are assigned to tank top installation task in the field.

Status

The tank top mock-up is scheduled for late October. Currently finalizing mock-up training plans for tank top installation. These tank tops will be installed on the four tanks (Floor Drain Collector, Waste Collector, 2 Waste Neutralizer) in the radwaste tank room.

DRESDEN NUCLEAR STATION
RADWASTE UPGRADE PROJECT
EXPOSURE REDUCTION MEASURES

MEASURE #3: USE OF AUTOMATED WELD TECHNIQUES:

BENEFITS:

- Reduces the number of man-hours spent in high radiation areas.
- Reduces the number of personnel required to be hired in, trained, and utilized in welding operations.
- Reduce's individuals quarterly, yearly and lifetime exposures.
- Reduces total project cumulative exposures significantly as it did in Dresden's RPR.
- In most cases automated welding reduces the human error factor and prevents massive re-work of welds.
- Weld quality is superior than that of a manual weld.
- In progress welding operations can be monitored remotely in a no dose or low dose area.

Status

An order has been placed for the automated welding machines through the ENC-Construction Department on-site.

DRESDEN NUCLEAR STATION
RADWASTE UPGRADE PROJECT
EXPOSURE REDUCTION MEASURES

MEASURE #4: USE OF THE AREA RADIATION MONITORING SYSTEM

BENEFITS:

- Prevents redundant survey requirements and constant coverage activities.
- A.R.M.'s acts as a second "eye" for Health Physics personnel.
- Remote readouts allow for Health Physics personnel to monitor exposure rates in the tank room in a no dose or low dose area.
- Audible alarms allow for quick identification of changing or transient dose rates which could prevent possible over exposure.
- A.R.M.'s have a strip chart and gauge readout's for trending purposes.
- A.R.M.'s will be utilized in the exact work locations for worker exposure monitoring.

Status

Installation and testing of the twelve area radiation monitors is in progress in the tank room.

DRESDEN NUCLEAR STATION
RADWASTE UPGRADE PROJECT
EXPOSURE REDUCTION MEASURES

MEASURE #5: USE OF A CAMERA SYSTEM

BENEFITS:

- Limits the number of supervisory hands-on inspections required each day.
- Limits the number of field firewatches required.
- Aids Health Physics personnel in monitoring work in progress.
- Prevents gawkers of "informational" inspections in the tank room on a regular basis.
- Camera monitoring is performed in a no dose or low dose area.

Status

The camera monitoring system is in place in the tank room. Two cameras are mounted and one camera is mobile.

DRESDEN NUCLEAR STATION
RADWASTE UPGRADE PROJECT
EXPOSURE REDUCTION MEASURES

MEASURE #6: USE OF RADIO COMMUNICATIONS

BENEFITS:

- Allows for more efficient use of manpower.
- Supervision can monitor work for immediate transmittals and communications.
- Radiation protection personnel can contact workers immediately if problems arise or if exposure rates change.
- Radio's aid in coordination of tool needs and equipment requirements.
- Radiation protection personnel can more efficiently perform surveys utilizing outside help to record survey information in a low or no dose area.

Status

10 sets of radios have been purchased for this project with the option to purchase more as necessary.

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ATTACHMENT C

April 7, 1989

SUBJECT: ALARA Plan for the Radwaste Upgrade Project, 8461-P-103, Revision 0; dated April 1989.

TO: E.D. Eenigenburg
Dresden Station Manager

The BWR Engineering Department has reviewed and approves the subject plan to be utilized to maintain radiation exposure As Low As Reasonably Achievable for the Dresden Radwaste Upgrade Project.

Please review the attached ALARA Plan and indicate your approval by signing this form and returning it to Marcia Jackson; 35 FNW no later than April 28, 1989.

If you have any questions please call Marcia Jackson at extension 8493.

Prepared by: M. A. Jackson Date: 4/10/89
M.A. Jackson
BWR Engineer

Approved by: Richard Mirochna for Date: 4/11/89
W.B. Fancher
Dresden/Quad Cities
Project Engineer

Approved by: D M Saccomando Date: 4/12/89
D. M. Saccomando
Dresden Radiation
Protection Manager

Approved by: ED Eenigenburg Date: 5-13-89
E.D. Eenigenburg
Dresden Station Manager

cc; D. Saccomando
D. Wheeler
D. Reece
E. Huerta - Pavia

ALARA PLAN FOR THE RADWASTE

UPGRADE PROJECT

8461-P-103

REVISION 0

APRIL 1989

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1.0 INTRODUCTION

1.1 The purpose of the Dresden Radwaste Upgrade Project ALARA plan is to describe the coordination and implementation techniques to be utilized in maintaining occupational radiation exposures (ORE) to personnel as low as reasonably achievable. Occupational exposure that is accrued without a net benefit (i.e., net benefit being a positive action to advance work of the Radwaste Upgrade Project) is contrary to both the basic concept of radiation safety and regulatory requirements. To prevent unnecessary ORE, reduction in radiation levels and time spent in radiation fields can be achieved through effective planning, engineering, and training. This plan discusses the strategies to be implemented in the area of ALARA work planning and exposure management.

The overall intent of this plan is to establish specific methods for compliance with the Commonwealth Edison and Dresden ALARA program and procedures. This plan supplements, but does not supersede or replace existing Commonwealth Edison and Dresden procedures.

1.2 GOALS

The goals of the project from a project planning and exposure management standpoint are:

1. Integration of radiological engineering with other engineering disciplines in preparing for and conducting the Radwaste Upgrade Project.

2. Minimization of Health Physics impact on schedule impediments through maximization of radiological engineering and project preplanning and preparation.

3. Effective management of ALARA and Health Physics capabilities as to provide timely, useful information to CECo management and project work groups.

4. Provide systematic evaluations and recommendations regarding use of radiological engineering controls and overall ALARA impact of proposed contingency plans and courses of action.

5. Enforce worker radiation safety requirements.

6. Reduce project cumulative exposure and individual's exposure to the lowest level possible.

2.0 IMPLEMENTATION OF OPERATIONAL ALARA

To ensure the implementation of effective techniques in reducing exposure to workers assigned to this project, a four phase program will be conducted consisting of:

a. Pre-Job Planning
b. Pre-Job Briefings
c. Applications During Job Performance, and ALARA Surveillance
d. Post-Job ALARA Reviews

Dresden Station Procedures DAP 12-7 "Dresden Station ALARA Program" and DAP 12-9 "ALARA Action Reviews" will be followed. The following ALARA plan supplements and expands upon the requirements established in the Dresden Station Procedures.

2.1 PRE-JOB PLANNING

Due to the numerous tasks associated with this project, the interferences encountered in the work area, and the need to maintain radwaste processing during this upgrade project, the pre-job planning will be conducted in the following four phases:

1. Pre-planning of the entire project to the fullest extent practical to establish the order in which individual work tasks will be accomplished.
2. Determine initial exposure estimates for each work instruction and establish ALARA goals.
3. Performance of detailed preplanning reviews of individual work instructions to incorporate radiological engineering into the construction work effort.
4. Perform a final ALARA review of the work instruction with associated work travelers and initiate radiation work permits.

2.1.1 PREPLANNING TASK ORDER

In preplanning the order in which individual tasks will be accomplished, the following criteria will be applied:

a. Removal of high dose rate components first
b. Accessibility to work (interferences from other systems/components)
c. Length of time system can be taken out of service
d. Station operational mode in which the system can be taken out of service
e. Job preparation lead times
f. Coordination with Radwaste Operations and Station Operations
g. Replacement material availability

The overall intent of this phase is to eliminate unnecessary exposure from out-of-service corroded piping and components in the area, recognize and eliminate interferences from other systems and components in the area that will impede work and plan the tasks so that necessary radwaste processing can still occur.

2.1.2 INITIAL EXPOSURE ESTIMATES AND ALARA GOALS

A preliminary ALARA review will be conducted for each of the work instructions to realistically estimate the number of man-hours that will be required for work in the radiologically controlled area and to estimate the associated collective exposure. These exposure estimates will be used to create the ALARA Goals for each Work Instruction.

Annual ALARA Goals will also be established by determining the number of Work Instructions to be completed in a calendar year and summing the estimated exposures. These Annual ALARA Goals will be provided to the Dresden Station Radiation Protection Manager. The estimated exposures for Work Instructions to be completed each quarter will be summed to create a Quarterly ALARA Goal to use in tracking the progress of this project.

2.1.3 WORK INSTRUCTIONS

A Work Instruction will be prepared for each identified task. These Work Instructions will contain:

- Detailed work tasks to be implemented by the construction workers.
- Identification of dose reduction measures that are to be applied in conjunction with the work task. These include: shielding, decontamination, mock-up training, worker practices, etc.
- Radiological precautions and identification of evaluations likely to result in significant and/or rapid changes in radiological conditions.
- Evaluate the reasonableness of proposed manhours to perform work and to identify alternate methods.
- Detailed tool and equipment lists.
- Detailed replacement parts and component lists.
- Quality Control holdpoints.
- Health Physics holdpoints.
- Detailed drawings.

To effectively select applicable ALARA techniques, the ALARA action review pre-job checklist (Attachment 3 of DAP 12-9) will be used, when performing reviews of project work instructions. The PAC's Engineer, Job Foreman, and the RUP ALARA/ Health Physics Coordinator will be responsible for review and incorporation of the ALARA techniques in the detailed Work Instructions. Section D of the pre-job checklist (attachment 3 of DAP 12-9) will be expanded to include additional dose reduction techniques specifically identified to support the Work Instruction. A list of the additional ALARA considerations to be incorporated into Section D have been included as attachment 1.

The degree of effort and documentation of the preplanning phase will be in accordance with the requirements established in Dresden Procedures DAP 12-7 and DAP 12-9. All work packages will be reviewed by the Project Planning Committee to incorporate ALARA techniques. Project status and exposure updates will be presented to the Dresden Station ALARA committee quarterly. Additionally if a specific radiaiton work permit is estiamted to exceed 25 man-rem, the pre-job checklist and associated work travelers will be presented to the Station ALARA committee for review, recommendations, and approvals.

2.1.4 FINAL ALARA REVIEW AND RWP INITIATION

Prior to initiating work under a Work Instruction and its associated travelers, the most current work space physical configuration information and radiological survey data will be reviewed by the effected job supervisor/planner and the RUP ALARA/HP Coordinator to ensure the ALARA checklist has incorporated the appropriate ALARA techniques. Once the ALARA checklist is refined and approved by the RUP ALARA/HP Coordinator the checklist will be used as a tool during the pre-job briefings.

A final collective exposure estimate will be based on the exposure reduction techniques that were selected during preplanning. As required by DAP 12-9, this final exposure estimate will be recorded on Attachment 1 of DAP 12-9 "JOB EXPOSURE ESTIMATE FORM" and will be the exposure estimate on the RWP. An RWP package will be initiated for the work travelers which will list the exposure reduction techniques to be implemented.

2.2 PRE-JOB BRIEFINGS

As required by DAP 12-9, for Work Instructions or its associated travelers where the cumulative exposure is estimated to exceed 3 man-rem or exposure to airborne radioactivity is expected to exceed 2 MPC-hours, a formal briefing will be held. This briefing will chaired by the PACS's cognizant engineer or his representative to cover technical content of the job and the RUP ALARA/HP Coordinator or his representative will cover radiological considerations. All personnel supporting and performing this work will attend this briefing. Attachment 7 of DAP 12-9, "Worker Pre-Job Briefing Guidelines for Job Supervisors", will be used to ensure that all points are covered during the briefing. Additionally, prior to any entry into a radiologically controlled area the job foreman shall inform the affected construction personnel of the exact work task, or tasks that are to be performed during that specific entry. Areas to be covered during the job foreman briefing at a minimum are:

- Exact job location
- Access/egress routes
- Contingency plans if problems are encountered
- ALARA techniques to be incorporated
- Contaminated waste disposal methodology
- Equipment status requirements
- Radiological Conditions

The Radiological Protection Technicians are to assist the Construction Foreman in this effort by ensuring that the workers understand the RWP requirements and by providing the workers with data on the radiological conditions in the work area, such as the higher and lower dose rate areas and other suggestions that will aid the workers in maintaining their exposures ALARA.

2.3 APPLICATION DURING JOB PERFORMANCE AND ALARA SURVEILLANCE

A review of the effectiveness of ALARA measures will take place while work is in progress. Several resources are employed during this on-the-job ALARA monitoring and surveillance.

All personnel performing or supporting the work on this project will be informed that the exposure reduction techniques established during the preplanning phase are requirements which are to be implemented the same as any other RWP requirements. They should also recommend any controls, techniques, changes in methods or tools which may work more effectively than those determined during the preplanning phase.

The PACS Lead Engineer, PACS Cognizant Engineer, Construction Foreman, Group Leader - Health Physics Operations and ALARA, RUP ALARA/HP Coordinator, RPT Foreman and Radiation Protection Technicians, all have the responsibility of routinely reviewing job performance to ensure that the applicable dose reduction techniques are being effectively implemented. Attachment 2 of this plan entitled, "Work in Progress and ALARA Tracking Form" will be used to document ALARA surveillance activities in relation to work performance evaluations.

2.4 POST-JOB ALARA REVIEWS

Post-job ALARA reviews are conducted on significant, dose intensive activities. These reviews include information gathered during the course of on the job ALARA monitoring and surveillance as well as post-job analysis.

The progress of tasks under the work packages will be tracked on a weekly basis utilizing the Work in Progress and ALARA Tracking Form as discussed in Section 2.3 of this plan. This form will be updated by the RUP Assistant Implementation Coordinator and RUP ALARA/HP Coordinator to keep a running account of the problems experienced performing the jobs, the ALARA techniques that worked well, recommended improvements to reduce exposure and corrections to problems encountered while performing the jobs.

The requirements of DAP 12-9, will be implemented in conducting post-job reviews. Data accumulated during the performance of the jobs, routinely recorded on the Work in Progress and ALARA Tracking Form, will be consolidated on Attachment 5, DAP 12-9, "ALARA Post Job Review Sheet".

3.0 DOSE TRACKING AND REPORTS

3.1 DOSE TRACKING

Exposures received while working on this project will be measured and recorded following the normal practices established by Dresden Station Procedures. Identification of exposure received due to work on this project will be separately identified by RWP number and specific Job Codes entered into the normal Dresden Station computerized dose tracking system (Radiation Evaluation Program).

The Dresden Station ALARA Group will be responsible for providing computer generated reports. Daily reports by individual and by RWP, weekly reports by RWP and bi-weekly reports by job codes and personnel codes are available and will be used as an aid in dose tracking.

Dose tracking will be used to compare accumulated exposure against the estimated dose for each work traveler and associated radiation work permits. (Refer to Attachment 2). This Work in Progress and ALARA Tracking Form is to be updated weekly to track the progress of each radiation work permit. When the actual exposure received deviates significantly from the estimated exposure, the causes are to be identified on the Work in Progress and ALARA Tracking Form. If problems exist causing the exposures to be higher, the recommended corrective actions are to be recorded and work packages modified to incorporate the improvements.

3.2 REPORTS

3.2.1 WEEKLY REPORT

A Radwaste Upgrade Project Report will be written on a weekly basis and distributed to Commonwealth Edison Corporate ALARA, the Dresden RPM, and the PACS Lead Engineer. The report will summarize the work accomplished to date with associated exposure data, project status versus scheduled goals, radwaste packaging and shipping activities, problems and resolutions, and any incidents such as contaminated individuals.

3.2.2 QUARTERLY REPORT

A quarterly report will be written and distributed as above. The report will summarize the work accomplished to date with the associated exposure data, project status versus quarterly goals and lessons learned.

3.2.3 FINAL REPORT

A final report will be written upon completion of all of the work packages associated with this project. This report will include:

- Chronological summary of the project
- Preplanning activities
- Dose reduction achieved
- Summary of accumulated dose
- Radiological conditions encountered
- Lessons learned (problems encountered and their resolution)
- Quantity and disposal of radwaste

3.3 RECORDS MANAGEMENT

Records generated by the project will be handled and stored in accordance with existing and the most current Commonwealth Edison and Dresden records handling procedures.

4.0 ALARA TRAINING

Training will be conducted for all craft personnel involved in the Radwaste Upgrade Project. The Nuclear General Employee Training (N-GET) Program will be the responsibility of and will be conducted by the Dresden Training Organization.

In addition to NGET, the craft workers assigned to work on this project will receive (Job Specific Orientation Training). The PACS Lead Engineer is responsible for assuring and maintaining records that all craft workers assigned to this project have received the orientation training prior to starting work under this project. The Job Specific Orientation Training for craft workers shall consist of but not limited to the following topics:

- Location of job
- Location of required services
- Location of tools and equipment
- Job overview
- Work instructions and procedures
- Radiological and safety hazards in work environment
- Dose reduction techniques applicable to job
- Use of models
- Use of mockups
- ALARA responsibilities

Job Specific Orientation Training program shall be developed and administered by the RUP/ALARA HP Coordinator. This training program shall be reviewed and approved by the Dresden Station RPM.

Based on the identified type of work task and work location, mock-up training may be required as deemed necessary by the RUP ALARA Coordinator and the PACS Cognizant Engineer. It is the repsonsibility of the PACS Lead Engineer and the RUP ALARA Coordinator to identify when mock-ups are to be utilized during performance of the project.

5.0 RADWASTE SYSTEM RADIOLOGICAL COORDINATION

Activities by Radwaste and Operations staff such as resin transfer or liquid radwaste processing will have a direct impact on the radiological conditions in the Radwaste Facility Tank Room and Pump Aisle. To preclude any unforeseen change in radiological conditions from work being performed in these areas, the radwaste operations which may effect the area have been identified. These operations have been listed on the Checklist for Coordinating Radwaste Pipe Replacement and Removal Activities with Station Operations and Radwaste Operations and is included as Attachment 3.

On a daily basis the RUP Implementation Coordinator or his designee will initiate the checklist and forward a copy to the Radwaste Shift Foreman to complete details on planned radwaste operations that may effect work in the area during the planned period of entries. The Radwaste Shift Foreman will keep a copy of the checklist in the Radwaste Waste Control Room and return a signed copy to the RUP Implementation Coordinator. The information on this checklist will be used for planning and scheduling activities to coordinate work periods during the most favorable radiological conditions.

Directly before entries are made to the tank room or pump aisle, the Radwaste Shift Foreman on duty will be contacted to confirm that conditions remain as listed. The Radwaste Shift Foreman also has directions listing who to notify if conditions change. This close daily coordination and cooperation will aid in both ensuring maximum availability for needed radwaste operations and minimizing the adverse effect of radwaste operations on radiological conditions in the area.

6.0 EXPOSURE MANAGEMENT APPLICATIONS AND CONTROLS

Due to the potential for accumulating high individual and collective exposures on this project, several radiation protection devices and techniques will be employed to reduce exposure. Examples of some of these applications are:

- Dositec Area radiation monitors
- TV camera and monitor usage
- Headset/radio communications
- PCM-1 monitors
- Eberline 200 area radiation monitors
- Portable ventilation units
- Containment enclosures
- Hydrolazing applications
- Pipe caps
- Shielding materials
- Control of tank water levels
- Detailed radiological surveys
- Continuous air monitors
- Alarming Dosimetry

As the project progresses, the aforementioned controls will be evaluated and modified if required. Additionally, new techniques and equipment will continually be evaluated to investigate their applications to the project.

7.0 PROJECT RADIATION EXPOSURE MAN-REM ESTIMATE

Initial estimates to perform this project is 1958 man-rem over a two year time period. The areas that have the highest exposures in the Tank Room are the floor drain collector tank and neutralizer A tank southeast area. Highest exposure areas in the pump aisle are in the east quadrant. As the project progresses, exposure estimates will be refined utilizing the most current radiological survey data and also take in account the latest ALARA applications. A study was performed that concluded, if at a minimum the below listed exposure mitigating measures are agressively incorporated, the project exposure could be reduced by as much as 35-45 percent.

EXPOSURE MITIGATING MEASURES	POTENTIAL REDUCTION
- Pre-planning	5%
- Current and detailed surveys in conjunction with pipe source term removal	25%
- Tool, materials at work area	2%
- Crew size minimization	5%
- Use of photos and video cameras	2%
- Access/egress identifications	1%
- Operational procedures, flushing, filling, draining etc.	2%
- Adequate ladders/scaffolding available	1%
- Power source identified	0.5%
- Adequate lighting available	0.5%
- Temporary shielding	0.5%

On-going evaluations will be performed to measure the impact of the exposure mitigating applications in the field in relation to their effectiveness and usefulness. These evaluations will then be incorporated into the refinement of the project exposure estimate.

ADDITIONAL ALARA CONSIDERATIONS SPECIFIC TO THE DRESDEN RADWASTE UPGRADE PROJECT

In addition to the generic exposure reduction techniques listed in Sections A through C of Attachment 2, DAP 12-9, "ALARA Action Review Pre-Job Checklist", the following items should be considered when reviewing and determining effective dose reduction techniques to be applied to specific Work Instructions. These items complement and expand upon the generic considerations already listed in Section A through C. The considerations applicable to a specific Work Instruction should be added to Section D of the "ALARA Action Review Pre-Job Checklist".

1. Have the number of welds, cuts, pipe hangers and supports been minimized?
2. Are parallel pipe runs in the same area attached to a single pipe support or hanger?
3. Have the location of welds, cuts, pipe hangers and supports been moved away from hot spots?
4. Is there adequate accessibility to perform the cuts and welds? (Interferences from other pipes, equipment, walls, floors, hangers, scaffolding)
5. Have the pipe hangers and supports in the pump aisle been designed to support up to 500 additional pounds for support of temporary shielding for future work in the area?
6. Have prefabricated stainless steel to carbon steel transition pieces been specified, so that all welds to the old carbon steel piping in the radiological controlled area will be carbon steel to carbon steel?
7. Has prefabrication weld preparation in a shop area been specified for all new piping to be installed in the area?
8. Has the maximum prefabrication been specified for all pipe hangers, pipe supports and other components to be installed in the area?
9. Have welders been qualified to perform welds in the same restrictive, closely confined spaces in which they will be required to perform welds in the area?
10. Has rigging or blocking for support been specified for the pipes and components being cut out or replaced?
11. Have all lines and valves that need to be taken out of service to perform the work instruction been identified?
12. Has the method of marking and identifying locations for cuts and installation of components been identified?
13. Is the method employed in cutting and welding the most time saving considering restrictions in the area, a high probability of a successful cut or weld, and weld preparation time?
14. For pipes and components to be removed from and installed in the area, has the pathway for removal, clearances along removal pathway, rigging, need for transverse transfer and need to lower and raise been specified?
15. Have staging locations, and loading and dose rate restrictions been specified for pipe and components to be removed from the area?
16. Have low dose rate areas been identified for helpers and fire watches when they are not needed at the immediate work location?
17. Has the work crew size been reduced to the minimum needed to work safely and efficiently?
18. Have additional personnel been staged in low dose rate areas to aid in pipe or component removal, placement and alignment?

19. Has an adequate communication system been considered when the workers are required to be in respirators?
20. For coordination and scheduling of this job, what other work is planned in the area at the same time?
21. Will this job or the other jobs planned to occur at the same time change the radiological conditions in the area by creating airborne, causing increased contamination or liquid spills, increase or change dose rates?
22. Has decontamination of the area been considered to improve working conditions and reduce dose rates (considering the period of time the decon will be effective and the dose saved on the job versus dose required to decon)?
23. Has draining, filling, flushing, deconning, and shielding been considered to reduce dose rates a the specific work location?
24. For the specific work locations, is there sufficient scaffolding installed, need for removal of restrictions in the immediate area, a safe pathway for access to the work site?
25. Have areas for equipment preparation, staging areas and laydown area been selected and prepared?
26. Are updated photographs, drawings and models available for briefing the workers?
27. Have the specific locations for cuts and installation been clearly marked and identified?
28. Are detailed surveys of the immediate work area available to identify the dose rates to the workers, hot spots and low dose rate waiting areas?
29. Can remote controlled video cameras be installed for replacement crews and foreman to observe the work in progress and for videotapes of previous work for future crew briefings?

ATTACHMENT 2

WORK IN PROGRESS & ALARA TRACKING FORM

Work Package: ____________________

Dresden RWP Numbers: ____________________

Entry Date	Estimated Man-Hrs	Actual Man-Hrs	Percent Complete*	Estimated Man-rem	Actual Man-rem	Man-rem Diff.(%)*
Totals						

*Act./Est. x 100 *Act./Est. x % Complete

Record causes if Man-rem Higher or Lower Than Estimate including problems experienced performing the jobs and techniques that worked well.

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________

Record recommended improvements to reduce exposure and corrections to problems encountered performing the jobs.

1. ____________________ ________ ________
2. ____________________ ________ ________
3. ____________________ ________ ________
4. ____________________ ________ ________
5. ____________________ ________ ________

Signed: ____________________ Date: ________
Assistant Implementation Coordinator

Signed: ____________________ Date: ________
RUP ALARA/HP Coordinator

Attach additional pages if necessary

Attachment 3

CHECKLIST FOR COORDINATING
RADWASTE PIPE REPLACEMENT AND REMOVAL ACTIVITIES
WITH STATION OPERATIONS AND RADWASTE OPERATIONS

Radwaste Area requiring Entry: ______________________________

Purpose of Entry: ______________________________

____

Planned Date and Time of Entry: ______________________________

Person to Contact if Below Status Changes: ____________________ __________
(Tel.Ext.)

****

Planned Status and Operations
Affecting the Radwaste Facility Tank Room & Pump Aisle

****

The Radwaste Shift Foreman is to enter the following information:

Spent Resin Transfers: ________ ________ ________ ________
(From) (To) (Time) (Date)

Sludge Transfers: ________ ________ ________ ________
(From) (To) (Time) (Date)

Liquid Radwaste Transfers: ________ ________ ________ ________
(From) (To) (Time) (Date)

Levels in Liquid Radwaste Tanks: WCT __________ gal. FDCT __________ gal.

NEUT A __________ gal. NEUT B __________ gal.

Contact Station Operations for Status of RBEDT:

RBEDT Pump Down Scheduled to Occur Prior to 0700 on Date of Entry __________
(Init.)

Unit 2 RBED Tank Level __________ % Unit 3 RBED Tank Level __________ %

Other Activities in Area: ____________________ ________ ________
(Description) (Time) (Date)

Initial Contact			Follow-Up Contacts					
Signature	Date	Time	Date	Time	Init.	Date	Time	Init.

Radwaste Shift Foreman

ATTACHMENT D

JOB SPECIFIC ORIENTATION TRAINING

FOR

DRESDEN RADWASTE UPGRADE PROJECT

I. PROGRAM

Job Specific Orientation Training

II. SUBJECT

Radwaste Piping Upgrade Project

III. LESSON TOPICS

- Job Locations
- Job Overview
- Radiological & Safety Hazards
- Exposure Reduction Techniques
- Use of Models & Mock-ups
- Individual ALARA Responsibilities
- Work Instructions & Procedures
- ALARA Plan

IV. DURATION

1-2 hours

V. OBJECTIVES

A. Terminal Objective
Upon completion of the course, the student will demonstrate his/her knowledge of the aforementioned lesson topics by successfully completing a written examination or completion of a job orientation verification sheet.

B. Enabling Objectives
Upon completion of this session, the participant will fully understand the lesson topics and lesson sub-topics as outlined in the lesson body.

VI TRAINING AIDS/HANDOUTS

A. Rad Waste Model

B. Survey Maps of Work Areas

C. Photographs

VII LESSON BODY

A. Job Locations

1. Tank Room
2. Pump Aisle
3. Access/Egress Facility

B. Job Overview

1. Pre-Planning Phase
2. Pipe Removal & Re-Installation Phase
3. Restoration Phase

C. Radiological & Safety Concerns

1. Radiological Transient Conditions
2. Safety Considerations
3. Emergency Actions

D. Exposure Reduction Techniques Utilizing the Time Concept - Individual ALARA Responsibilities

Minimize personnel time in radiation areas by:

1. Advance planning and preparation.
2. Review of previous experience with similar projects.
3. Identification of personnel, equipment, and support facility requirements, including critical skills and equipment.
4. Advance preparation of support equipment, tools, and facilities.
5. Advance preparation of work areas.
6. Planning, scheduling, and coordination of tasks.
7. Optimization of work crew size.
8. Scheduling for critical path items.

E. Distance - separation of personnel from radiation sources

1. Identification of radiation exposure areas and sources (note importance of knowing variation with plant status or operating conditions).
2. Movement of non-essential activities to low radiation areas.
3. Where feasible, movement of equipment to be serviced to low radiation areas, or removal of "hot" items or equipment from the area where operations are conducted.
4. Use of communications and remote viewing equipment.
5. Remote handling of tools and equipment.
6. Utilization of mechanical and automatic cutting and welding machines.
7. Use of remote monitoring instrumentation.

F. Exposure Reduction Techniques Utilizing the Shielding Concept

1. Temporary shielding of hot spots.
2. Shielding of dose intensive work areas.
3. Filling empty pipes, tanks, or systems.
4. Use of protective clothing or equipment to reduce beta radiation exposure; e.g., gloves, goggles, or face shields.

G. Special Briefings

1. Content
2. Purpose
3. End Results

H. Use of Models and Mock-Ups

1. Model description and its applications.
2. Mock-up applications.
3. Mock-up and model usage benefits.

I. Work Instructions and Procedures

1. Design work plans with ALARA concepts.
2. Review cycles with applicable departmental reviews and holdpoints.
3. Develop person-rem estimates.
4. Controls and document work.

J. ALARA Plan

1. Purpose
2. Concept
3. Use

SUMMARY:
At the end of the orientation training session, the worker will have been presented all the necessary information to gain a general understanding of the overall project. The course content will have covered radiation protection concerns, project scope, safety considerations and individual ALARA considerations.

RADWASTE UPGRADE PROJECT

COURSE SUMMARY SHEET

TRAINING RECORD ATTENDANCE SHEET

JOB SPECIFIC ORIENTATION TRAINING

RADWASTE UPGRADE PIPE REPLACEMENT

COURSE CONTENT:

- JOB SCOPE/OVERVIEW
- WORK LOCATIONS
- RADIOLOGICAL & SAFETY HAZARDS
- INDIVIDUAL ALARA RESPONSIBILITIES & EXPOSURE REDUCTION TECHNIQUES
- USE OF MODELS AND MOCK-UPS
- WORK INSTRUCTIONS AND PROCEDURES
- JOB PLANNING AND BRIEFINGS

OBJECTIVE:

UPON COMPLETION OF THIS SESSION EACH PARTICIPANT WILL UNDERSTAND THE PROJECT SCOPE IN GENERAL TERMS AND BE FULLY AWARE OF THE NATURE OF THE PROJECT IN RELATION TO RADIOLOGICAL AND SAFETY CONCERNS.

______________________/ ____________
EVALUATORS SIGNATURE DATE

ATTACHMENT: TRAINING RECORD ATTENDANCE SHEET

RADWASTE UPGRADE PROJECT

TRAINING SESSION DATE: ______________________________

LOCATION: ______________________ DURATION: ______________

TOPIC: ______________________________

____

____

ATTENDANCE:

PRINT NAME	SIGNATURE	DEPARTMENT

____

TRAINING INSTRUCTOR