ATTACHMENT 1

		INSTRUCTION API #1 REV. NO. 2	
	ALARA PROGRAM INSTRUCTION #1	CONTRACT 34540	
TITLE	GENERAL PROGRAM INSTRUCTION FOR MAINTAINING OCCUPATIONAL EXPOSURE TO RADIATION AS LOW AS IS REASONABLY ACHIEVABLE (ALARA)	PAGE NO. 1 of 8	
		BY	DATE
		PREPARED	MAN	2-8-84
PRODUCT	RECIRCULATION AND RHR PIPING REPLACEMENT - PEACH BOTTOM UNIT 2	CHECKED	MJG	2-8-84
		REVISED	MAN	6-8-84

1.0 Purpose

The purpose of this instruction is to define the Chicago Bridge and Iron (CBI) ALARA Program for the replacement of the Recirculation and RHR piping at Peach Bottom Atmoic Power Station Unit 2.

2.0 Reference

2.1 USNRC Regulatory Guide 8.8, "Information Relevent To Ensuring That Occupational Radiation Exposure At Nuclear Power Stations Will Be As Low As Is Reasonably Achievable".
2.2 USNRC Regulatory Guide 8.10, "Operating Philosophy For Maintaining Occupational Radiation Exposure As Low As Is Reasonably Achievable."
2.3 Code Of Federal Regulations, Title 10 Part 20, "Standards For Protection Against Radiation."
2.4 Code Of Federal Regulations, Title 10 Part 50, Appendix I, "Numerical Guides For Design Objectives And Limiting Conditions For Operation To Meet The Criterion As Low As Is Reasonably Achievable For Radioactive Material In Light-Water Cooled Nuclear Power Reactor Effluents."
2.5 ANSI N18.1 - 1971 "Selection And Training Of Nuclear Power Plant Personnel."
2.6 Peach Bottom Administrative Procedure A-83, "ALARA Program Administration Procedure."
2.7 Peach Bottom Health Physics Procedure HPO/CO-100 "Health Physics Guide Used In The Control Of Exposure To Radioactive Material".
2.8 Peach Bottom Health Physics Procedure HPO/CO-10A "Conduct In Controlled Area - Minimize Exposure."
2.9 NUREG 0041 "Manual Of Respiratory Protection Against Airborne Radioactive Materials".

General

This instruction is to be used as a guide whenever the Recirculation and RHR Piping replacement involves work in a radiation or contaminated area.

3.0 Introduction

All efforts to perform tasks in a radiation environment with minimum exposure to personnel are collectively called ALARA (As low as reasonably achievable). An ALARA program should not impose quantitive limits on exposure but rather establishe a philosophy to maintain exposures as low as reasonable by examining all possible alternatives prior to selection of a work method.

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Introduction: Con't.

The "Reasonably Achievable" aspect of the ALARA Program must take into account parameters such as cost, time, and quality in order for ALARA to be realistic and practical.

The following description of the CBI ALARA Program discusses the planning, preparation, and implementation efforts which will be used for the replacement of the Recirculation and RHR piping at Peach Bottom Power Station Unit 2.

4.0 Selection of Methods, Processes and Techniques

Prior to establishing written procedures, various methods, processes, and techniques will be evaluated. The group or groups responsible for review will examine the alternatives presented, point out the advantages and the disadvantages of each alternative, and decide the most desirable choice. Four parameters that will be considered are:

4.1 Radiation Exposure - Each technique discussed will be evaluated on the basis of collective radiation dose expected, as well as individual exposure estimates. A total estimate of radiation exposure will be compared to other alternatives. A technique that causes excessive exposure compared to another equally acceptable alternative will be discarded as not meeting ALARA objectives.

4.2 Cost - The cost of a particular choice must be considered in any analysis. Excessive costs to save a little exposure may not be a "Reasonably Achievable" alternative. Previous experience on major repair and maintenance outages at Nuclear Power Plants shows that most radiological control practices are cost effective in the final analysis.

4.3 Time - The time spent to complete a specific technique or method can be approached from two viewpoints. The first viewpoint looks at the length of time a particular technique will take (how long it will extend the outage as compared with other alternatives). The second viewpoint looks at the length of time a particular technique requires personnel to remain in radiation or contaimination areas. The more time a method or technique can save, the more attractive it may be from an ALARA standpoint.

4.4 Quality Control - The quality control aspect of a particular technique is of utmost importance if there is a direct impact on plant safety or integrity. However, if items worked on are to be scrapped, quality control will be of little or no significance.

5.0 Administrative Control

5.1 The CBI ALARA Administrator is assigned to serve as a member of the Project Team. The ALARA Administrator will attend the Plan of the Day and Daily Progress Meetings and act as a liaison between CBI Administration/Craft and the CBI Radiological Engineers. Attend Plant ALARA Committee Meeting to Report and discuss the the Progress of the CBI ALARA Program. The CBI ALARA Administrator or his designated alternate will call CBI preplanning meetings during the outage with the radiological Engineers and craft personnel to discuss ALARA objectives and radiological poroblems associated with the job.
Meetins will be called whenever:

5.1.1 A major task is about to be undertaken.

5.1.2 A line or system is about to be breached which could constitute a significant radiological hazard.

5.1.3 Radiation levels in the work areas have significantly changed.

5.2 Pre-planning meetings will be held in order to discuss the following methods to reduce exposure.

5.2.1 Identifying areas where exposures can be reduced.

5.2.2 Dividing the job into smaller, easier to handle work packages.

5.2.3 Identification of high radiation areas around work areas.

5.2.4 Assigning responsibilities for actions to be taken.

5.2.5 Review of particular job assignments to ensure individuals understand job functions.

5.2.6 Review with workers radiation protection requirements and notifications.

5.3 After completion of work, a post-task ALARA review will be held. The Shift Radiological Engineer will schedule and chair the meeting, and discuss the success of the actions taken as a result of the pre-job planning, and suggested improvements

6.0 Responsibilities

6.1 The Radiological Engineers main job functions are as follows:

6.1.1 Maintain an overall knowledge of work in progress, and the general radiological conditions associated with that work.

6.1.2 Attend Plan-Of-The-Day and/or Daily Progress Meetings and serve as liason between functional groups pertaining to matters of radiation safety to include liaison with the Program ALARA Coordinator, the PECO Senior Health Physicist, Support Health Physicist, and applied Health Physicist.

6.1.3 Provide technical assistance concerning radiological safety problems.

6.1.4 Keep Site Manager informed of radiological safety problems, and the actions being taken to resolve those problems.

6.1.5 Review radiological surveys performed by Health Physics Personnel so that general exposure levels and local hot spots in the work area are identified. Review shielding, containments, ventilation, and other methods of reducing radiation and contamination levels.

6.1.6 Discuss most efficient ingress and egress routes for personnel at work sites.

6.1.7 Review work on a continuing basis. The Radiological Engineers will work closely with plant Health Physics and Craft Foremen to ensure they are aware of man-rem budgets, and actual totals for the various portions of work being performed.

6.1.8 Keep track of individual and collective exposures on a routine basis. Work with CBI Project and Field Engineers and Craft Foremen to effectively utilize craft labor.

6.1.9 Ensure that CBI personnel and subcontractor personnel are adhering to Radiation Work Permit (RWP) procedures for their particular job assignments.

6.1.10 Keep personnel informed about current radiological conditions.

6.1.11 Ensure that personnel understand their job function and job location.

6.1.12 Ensure RWP's for the day/shift/job are written and initiated to support the work schedule.

7.0 Man-Rem Estimate

7.1 An estimate of collective radiation exposure for the Recirculation and RHR Piping Replacement will be made in order to establish man power needs. The estimate will assist management in determining areas of emphasis for shielding and decontamination.

7.2 Man-Rem subtotals for each task will be used as a guideline for comparing actual man-rem accumulations during the course of the piping replacement.

7.3 Changes to the job scope will be evaluated when comparing actual and estimated man-rem totals.

7.4 Temporary shielding will be used in areas where it can be shown to be effective. When temporary shielding is being considered, it must be shown that shielding installation, maintenance and removal will not exceed the projected man-rem savings.

7.5 Reviews to determine the necessity for shielding will include the following factors:

7.5.1 Detailed radiation surveys of the work areas to identify the general levels, radiation levels at 12 to 18 inches from the surface of the radiation source, and contact radiation levels.

7.5.2 Estimates will be made of the number of individuals who will occupy a particular work area and length of time spent in those areas.

7.5.3 The number of skilled craftsmen needed to complete a job in certain areas will be given consideration.

7.5.4 Flushing of "Hot Spots" or specific area decontamination will be considered as an alternative to shielding. In some instances, flushing and decontamination will be attempted before shielding is erected.

7.5.5 Required controls will be applied to all areas which are classified as high radiation areas. Access to such areas will be restricted to keep personnel from receiving unnecessary exposures.

8.0 Radiation Training

All personnel will be required to attend the General Employee Training and Radiological Safety Class at the Peach Bottom Training Center. Specific task training will be specified on a case by case basis.

9.0 Specialized Equipment

Pipefitters and welders will be given extensive training on specialized equipment such as pipe cutting machines and automatic welding equipment. Training will concentrate on set-up and removal operations for the equipment. Since the set-up and removal times are usually time consuming, significant radiation exposure savings will be achieved by performing those operations as efficiently as possible.

10.0 Mock-up Training

A mock-up facility will be fabricated on site in order to simulate the work area around the Recirculation and RHR piping and associated systems. The training in the mock-up will include the use of anti-contamination and respiratory protection equipment prescribed for work in the drywell. The mock-up training will also include glove bag and tent training whenever required. Mock-up training is intended to accomplish the following objectives:

10.1 Familiarize workers with the physical orientation and restraints of the work area.

10.2 Confirm that tools and equipment will function as intended and no additional items are needed.

10.3 Identify possible ways of improving or simplifying the task from the standpoint of job performance, quality control, and radiological control.

10.4 Determine that temporary shielding or contamination control arrangements will function as intended and will not be counter productive with respect to ALARA objectives.

11.0 Radiation Control

Man-power will be estimated on the basis of the existing radiation levels, and historical dose exposure during drywell entries.

Routine evaluations will be performed as a planning aid to determine the adequacy of craft manpower to perform skilled work in high radiation areas. Radiation exposures will be measured daily and added to previous accumulations in order to control individual exposures within the established limits for each calendar quarter. Daily exposures will also be grouped under various job categories so that estimated man-rem exposures can be measured and compared to existing man-rem in order to evaluate the effectiveness of the ALARA Program.

Considerable pre-installation work will be accomplished. Weld preps and other machining will be done on piping spool pieces and elbows outside of radiation areas, whenever possible.

12.0 Contamination Control

12.1 Anti-contamination clothing and equipment will be worn routinely for entry into the drywell and other designated areas. Additional protective equipment will be prescribed on the Radiation Work Permits for unusual conditions which may be encountered.

12.2 The Recirculation and RHR piping will be decontaminated in order to reduce radiation and contamination levels.

12.3 Portable filtered ventilation units will be used as a control measure to reduce the possibility of airborne contamination during certain operations.

12.4 A general policy of wrapping contaminated materials, will be followed. This practice is effective in minimizing the spread of contamination when items are transported from one area to another. Emphasis will be placed on good housekeeping throughout the project to maintain clean and safe work areas.

13.0 Airborne Activity Control and Respiratory Protection

The airborne activity levels of work areas will have an overall effect on the accomplishment of work from an ALARA standpoint.
Routine air samples along with job specific air samples will be taken and evaluated to determine the respiratory protection requirements for the workers.
Constant air monitors will also be used to determine airborne activity levels during long term jobs and for alerting personnel to immediate increases in activity.
The objective of the Respiratory Program will be to limit potential internal uptake due to airborne radioative material, when it is impossible to apply process or other engineering controls to limit the concentration of radioactive materials in air.

14.0 Radioactive Material Handling, Packaging, and Shipping Requirements

All handling and packaging of radioactive materials will be in strict accordance with Peach Bottom Station procedures. In addition, CBI Radiological Engineers will require specific packaging, isotopic anaylsis, and surveying for certain materials prior to turn-over to station personnel.

The packaging and shipping of radioactive materials will comply with Nuclear Regulatory Commission, Department of Transportation, and Peach Bottom Station requirements.