STEAM GENERATOR REPAIR PROGRAM

FOR

H.B. ROBINSON UNIT 2

RADIOLOGICAL PROGRESS REPORT 1

FOR THE PERIOD

FEBRUARY 1, 1984, THROUGH APRIL 30, 1984

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CAROLINA POWER & LIGHT COMPANY

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PERCENT COMPLETE

1.0 INTRODUCTION

1.1 Radiological Progress Report 1 is the initial interim report submitted on the progress of the Unit 2 Steam Generator Repair Program for the H.B. Robinson Steam Electric Plant. This and subsequent reports will provide information pertaining to the Steam Generator Repair Program as follows:

1.1.1 A report of predicted occupational radiation exposure and estimated occupational radiation exposure received for each major task.

1.1.2 A report on radiation dose reduction methods employed in accordance with the as low as reasonably achievable (ALARA) concept.

1.1.3 A report of liquid and airborne radioactivity released to the environment.

1.1.4 A report of volume and curie content of solid radioactive waste generated.

1.2 Major and subordinate tasks for the steam generator repair project are listed below. The percent complete is an estimation as of the end of this reporting period.

1.2.1 Construction of pedestal cranes, preparation of polar crane, and steam generator transfer platform. — 100

- Installed pedestal cranes.
- Performed maintenance and repairs on the polar crane.
- Installed steam generator skid beams at the equipment hatch.

1.2.2 Initial containment decontamination. — 100

- Decontamination of the containment vessel from an elevation of 275 feet to an elevation of 228 feet including pump bays.

1.2.3 Concrete and structural steel removal and replacement. — 50

- Removal and replacement of concrete and structural steel including scaffolding erection.

1.2.4 Defueling and fuel storage. — 100

- Disassembled the reactor vessel head.

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	• Removed the reactor vessel head from the pressure vessel.	
	• Removed fuel from the pressure vessel and transferred to the spent-fuel storage area.	
	• Replaced the reactor vessel head.	
	• Performed decontamination of the refueling cavity.	
1.2.5	Installation and removal of temporary shielding.	50
	• Install piping shields.	
	• Install shadow shields.	
	• Install steam generator platform shields.	
	• Install steam generator channel head shielding.	
1.2.6	Installation, maintenance, and removal of scaffolding, temporary lighting, power, and air conditioning.	50
	• Construct temporary scaffolding.	
	• Install temporary lighting and power.	
	• Install temporary service and breathing air.	
	• Install and remove temporary air conditioning systems.	
1.2.7	Installation, maintenance, and removal of contamination containments and temporary ventilation systems.	50
	• Install contamination control tents and associated air filtration treatment and handling equipment.	
1.2.8	Removal of insulation.	100
	• Removed insulation from steam generators and connecting piping.	
1.2.9	Removal of main steam piping.	100
	• Removed main steam piping.	
1.2.10	Removal of feedwater piping.	100
	• Removed feedwater piping.	
1.2.11	Removal of miscellaneous piping.	100
	• Removed blowdown valves.	
	• Removed CVCS line.	
1.2.12	Cutting and removal of steam generator upper assembly.	100
	• Removed manways on steam domes.	
	• Prepared steam dome internals for removal.	

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	• Cut and removed level transmitter. • Plasma arc cut steam domes from lower assembly. • Removed steam domes from containment.	
1.2.13	Cutting of channel head. • Set up cutting equipment. • Cut divider plate. • Cut lower assembly from channel head. • Rigged and moved lower assembly to operating deck.	100
1.2.14	Weld shield covers on lower assembly at:	100
	1.2.14.1 Channel head. • Installed heaters and blankets. • Welded shield plate. • Removed blowdown nozzles and handhold covers. • Welded shield plugs in blowdown nozzles and handholds.	
	1.2.14.2 Transition end. • Installed heaters and blankets. • Welded transition end shield plate.	
1.2.15	Removal of steam generator lower assembly. • Moved lower assemblies from operating deck to equipment hatch. • Moved lower assemblies from containment.	100
1.2.16	Lateral support ring removal. • Cut and removed bolts. • Removed snubbers. • Spread lateral support ring.	100
1.2.17	Channel head decontamination. • Removed manway strong backs and diaphrams. • Set up, operated, and removed alumina grit decontamination equipment. • Set up, operated, and removed alumina grit solidification equipment. • Set up, operated, and removed spent grit handling equipment.	100

		PERCENT COMPLETE
1.2.18	Refurbishment of upper assembly.	25
	• Decontamination of the outside of the dome.	
	• Weld prep of domes.	
	• Remove and replace feedwater ring.	
	• Modify moisture separator devices.	
1.2.19	Installation of lower assemblies, prep, and weld channel head.	10
	• Weld prep channel head.	
	• Rig and move steam generators into place.	
	• Set up and remove heaters and blankets.	
	• Preheat and perform girth weld.	
1.2.20	Prep and weld divider plate.	
1.2.21	Installation and welding of upper assemblies.	
	• Rig and move upper assemblies into containment.	
	• Move upper assemblies into place.	
	• Set up and remove heaters and blankets.	
	• Preheat and perform girth weld.	
1.2.22	Lateral support ring installation.	
	• Replace lateral support rings.	
	• Replace snubbers.	
	• Replace lateral support ring bolts.	
1.2.23	Install main steam piping.	
	• Replace main steam line piping.	
1.2.24	Install feedwater piping.	
	• Replace feedwater piping.	
1.2.25	Install insulation.	
	• Install insulation on all generators.	
1.2.26	Install miscellaneous piping.	
	• Replace blowdown valves.	
	• Replace CVCS line.	
1.2.27	Nonmanuals, (HP, QA, engineering, supervision, administration, etc.).	50
	• Nonmanual support personnel.	
1.2.28	Ongoing decon/cleanup and disposal of contaminated materials.	50

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- Continuing decontamination during the outage.
- Contaminated materials removal and disposal during the outage.

1.2.29 Miscellaneous testing/inspections.

- Primary system hydro.
- Secondary system hydro.

1.2.30 Steam generator storage activities. 95

- Rigging and transporting steam generators to storage facility.
- Placing steam generators into storage facility.
- Sealing storage facility.

1.2.31 Miscellaneous (work to support the steam generator repair project not included in the above task). 50

- Radiation controlled area inspections.
- General maintenance in the radiation controlled areas.
- Laundry operation functions.
- Tool and equipment issue and movement.

2.0 OCCUPATIONAL RADIATION EXPOSURE

2.1 General.

2.1.1 Minimizing occupational radiation exposure is of prime importance to CP&L and plays a major role in the steam generator repair project. Predicted estimates of personnel exposure were presented in Table 3.4.2 of the final Steam Generator Repair Report dated January 6, 1983.

2.1.2 Man-rem expenditure is assessed and the cumulative exposure is tracked for each major task.

2.2 Description of exposure data collection program.

2.2.1 To assess man-rem expenditure, a program is utilized to collect data and compare actual exposure to the estimated exposure summary presented in Table 3.4.2 of the Steam Generator Repair Report.

2.2.2 Generally, each major task is composed of a number of subtasks controlled by a construction document called a technical procedure. Each technical procedure details the activity to be performed. The technical procedure is reviewed by health physics to incorporate ALARA recommendations. The necessary radiation work permits (RWPs) are generated prior to starting the subtask. The RWPs generated for each subtask of a major task provide a composite summary of estimated man-rem expenditure through self-reading pocket dosimetry entries. Repair work not requiring technical procedures and specific documentation is categorized into one of the major tasks and radiologically controlled with an appropriate RWP.

2.2.3 Radiation exposures are documented in the following manner:

- Total exposure expended by RWP.
- Classification of RWPs into one of the major repair tasks.
- Comparing self-reading pocket dosimetry entries* to ALARA estimates.
- TLDs provide actual RWP exposures on a monthly basis or in accordance with administrative procedures.

2.3 Evaluation of exposure data.

2.3.1 The composite summary of worker exposure recorded on RWPs is totaled for all RWPs assigned to a major task. The composite self-reading pocket dosimetry exposure estimates recorded on RWPs assigned to a main task are utilized to evaluate actual exposure expenditure as compared to exposure forecast. This method has proven

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*SRPD exposure results are therefore used to track individual RCA entries and cumulative subtask exposure estimates. These devices have historically provided conservative estimates of individual exposure sufficient to provide assurance that administrative and legal occupational exposure limits are not exceeded.

to be effective and provides a conservative day-to-day estimate. This method will continue to be utilized throughout the steam generator repair project.

2.4 Description and format of exposure data.

2.4.1 Table 2 presents a summary of the occupational radiation exposure expended in man-rem during this reporting period (from project commencement on February 1, 1984, through April 30, 1984) and compares them to the original exposure estimates. Pages 34 and 35 of Table 2 present the exposure estimates versus the estimated actual exposure in graphical form.

2.4.2 Miscellaneous items not specifically addressed but included in the man-rem expenditure are laundry operations, RC pump motor removal, and general maintenance such as equipment moved in and out and crane operations to support the repair project.

2.4.3 Task items indicating no estimated exposures have not commenced during this reporting period.

2.4.4 Table 3 presents a detailed summary by subordinate task of personnel exposure expended for the steam generator replacement repair project along with the original estimate for that subordinate task. The following comments are provided for clarification and should be considered when reviewing the data presented in Tables 2 and 3.

- Activity status indications are given to allow comparison of actual versus estimated man-rem expenditures.
- Activities indicated as in progress may require additional exposure prior to completion of the activity; therefore, a valid comparison at this time is not justified.

- For activities shown as complete, small amounts of additional exposure may be shown in subsequent status reports as a result of such factors as changes in procedures, work involved in activities related to support equipment, localized work area cleanup, etc.

2.4.5 Table 4 presents a summary of activities associated with plant modifications and testing not related to steam generator repair but is included in this report for informational purposes.

2.5 Discussion of exposure results.

2.5.1 A review of the data presented in Table 2 shows that the total occupational radiation exposure recorded for major tasks is approximately 50 percent of the original total estimate.

2.5.2 As presented in Table 2, the occupational exposure accumulated for steam generator repair activities completed during this reporting period is 550.14 man-rem. This value can be compared directly to the original estimate for the same completed activities which results in a projected dose of 1076 man-rem. Items deserving mention which were not included in the preplanning estimate but are included are installation of the service and breathing air system, reactor coolant pump motor removal, and ongoing laundry activities. Personnel exposure associated with these activities are included in the data and accompanying graphical illustration presented in Table 2 with the resultant man-rem expenditure still below the original estimate. A detailed breakdown of these activities and exposure is listed in Table 3.

3.0 APPLICATION OF DOSE REDUCTION TECHNIQUES (ALARA PRINCIPLES)

3.1 General.

3.1.1 This section summarizes the techniques and practices which have been used to provide dose reductions to personnel during the reporting period. Where the available

data permits, the following evaluations include a quantitative assessment of the man-rem savings which can be attributed to the techniques used. Detailed information on these ALARA techniques and how they relate to the overall steam generator replacement activities can be found in the SGRR.

3.2 Temporary shielding.

3.2.1 The use of temporary shielding is expected to result in significant exposure reduction throughout the project. Shielding records are maintained and include locations shielded, types of shielding installed, survey data prior to and after shielding, stress analysis results, and engineering approvals of freestanding supports used.

3.2.2 Various areas throughout the containment were evaluated for shielding needs. Numerous areas where radiation sources would cause significant exposure due to high traffic or occupancy were evaluated for shielding prior to installation. Various components of the steam generator channel head grit blast system were also shielded to reduce exposure rates in the local work area prior to commencement of this activity. The grit blast controls and feed system were remotely located in low-exposure rate areas.

3.2.3 The working platforms around the steam generator lower girth cut were designed to support up to 3 inches of temporary lead shielding. The design objective of this shielding effort was to provide a general work area exposure rate $\leq$ 20 mR/hr. The actual work area exposure rate was approximately 10 mR/hr.

3.2.4 Major ALARA techniques which resulted in significant man-rem savings during this reporting period are:

- The removal of insulation before an intensive containment decontamination without the need to erect numerous local protective containments.

- Refurbishment of the steam generator domes, weld preparation on main steam and feedwater pipe sections, and the cleaning and inspecting of the reactor head studs outside of containment in essentially background radiation areas.
- Steam generator channel head divider plate cuts were performed with a remotely operated robotic arm.
- Alumina grit blast decontamination of the steam generator channel heads which yielded decontamination factors $\geq$ 12.
- Steam generator channel head weld preparation was performed utilizing a computerized automated machining device, therefore, greatly reducing manpower requirements in this relatively high-exposure rate area. The weld bevel was machined such that the majority of the welding effort was performed outside of the channel head.

3.2.5 During this reporting period, the dose accumulated due to the installation of temporary shielding is approximately 7.150 man-rem. Installation and removal of shielding was predicted to utilize 60 percent of the estimated exposure for shielding installation and 40 percent for shielding removal. The original exposure estimate for shielding installation is approximately 87 man-rem. The lower actual expenditure is attributed to training selected personnel in specialized shielding techniques and mock-up training.

3.3 General containment decontamination.

3.3.1 A program for ongoing general containment decontamination was initiated at the start of the repair project. The program involved an extensive decontamination of the containment from the 275-foot refueling elevation to the 228-foot elevation. Major items/components that were planned for removal during the project were also decontaminated or packaged to control the spread of

contamination. In most areas of the 275-, 251-, and 228-foot elevations, loose surface contamination levels were reduced from a nominal 15000 dpm/100cm^2 to approximately 1000 dpm/100cm^2 or less. Contamination levels inside the biological shield wall are being maintained as low as practical consistent with work in progress. Where appropriate, floor covering (herculite or similar material) has been applied to minimize buildup of surface contamination and reduce cleanup time. A decontamination work force has been assigned to maintain an ongoing area decontamination effort. Surveys are taken on a routine basis to evaluate contamination levels so that timely decontamination activities can be initiated to maintain optimum radiological working conditions, avoid significant buildup, and minimize cross-contamination. As shown in Table 2, approximately 10.975 man-rem were expended to conduct the initial containment decontamination with an additional 71.645 man-rem expended to conduct ongoing decontamination activities during this reporting period.

3.3.2 The refueling cavity was also decontaminated to reduce exposure rates and minimize potential airborne activity during the storage of components in the cavity; 3.3 man-rem were accumulated to complete this activity.

3.3.3 Although it is difficult to quantify the exposure savings attributable to this technique, the practice of maintaining effective control of contamination, thereby reducing the potential for airborne contamination and eliminating the need for respiratory protection devices, is recognized as extremely beneficial in reducing exposure.

3.4 Steam generator (S/G) water level.

3.4.1 For shielding purposes, the water level in the secondary side was maintained such that the majority of the tube bundle was covered during the steam generator assemblies

girth cuts. General area exposure rates are four to five times lower with this water shield. The following tasks have benefited from the effect of maintaining a high water level in the S/G secondary.

- Installation of scaffolding in preparation for insulation removal.
- Steam generator steam dome removal.
- Installation of the shielding platform.
- Eighty percent precision machine cut of the steam generator channel heads.
- Expansion of the lateral support rings.
- Removal of the steam generator instrumentation lines.

3.4.2 The exposure expended for these tasks was approximately 51 man-rem. Without the benefit of water shielding, the exposure expended would have been approximately 225 man-rem thus a dose savings of approximately 174 man-rem.

3.5 Contamination control temporary local containments and ventilation.

3.5.1 To a large extent, initial containment cleanup and decontamination has minimized the need for extensive use of temporary local containment and temporary ventilation systems. However, in areas where significant cutting and grinding work must be performed on highly contaminated components, temporary local containments were and continue to be utilized to prevent airborne contamination in adjacent areas and minimize the spread of contamination.

3.5.2 One of the more significant applications of this technique has been applied to the area where the steam generator channel head severance cuts were made. These areas were enclosed to make the entire room a single containment. Portable high-efficiency (HEPA) filtration units continuously draw air from these containments while final cutting and grinding operations were in progress. The discharged filtered air from these portable

units was released to the plant stack via the containment ventilation system. Personnel working in these temporary local containments wore respiratory protection equipment during those operations having a potential for causing airborne activity.

3.5.3 Overall, the use of temporary local contamination control containments during the repair project is providing effective control of airborne contamination resulting from work activities such as cutting and grinding on contaminated components thus minimizing delays by allowing work to continue in adjacent areas.

3.5.4 Contamination containments are also utilized to enclose various items and components removed from the containment for placement in temporary storage.

3.6 Concrete cutting operations.

3.6.1 Several concrete cutting operations were completed during this reporting period. The type of concrete cutting equipment selected had a minimum potential for causing airborne contamination and spreading concrete dust throughout the containment because the cutting tools utilized water-cooled blades. The runoff water used for cooling the blades was collected, reused, and then processed through the radwaste system. The use of this equipment eliminated the need for containments--hence an exposure savings was realized together with a reduced amount of solid waste generated. The exposure attributed to concrete cutting and removal activities was approximately 3.625 man-rem as compared to the estimate of approximately 20 man-rem.

3.7 General ALARA techniques and practices.

3.7.1 In addition to the specific dose reduction techniques described, some of the more general practices employed to maintain adequate control of personnel radiation exposure include the following:

- A comprehensive health physics job coverage program provides adequate control and surveillance of the radiological conditions associated with repair project tasks. This program includes the use of radiation work permits (RWPs) that address specific radiological aspects involved and the proper measures necessary to perform the work. Also, in addition to health physics personnel assigned to monitor specific tasks, health physics and ALARA personnel survey the various work areas throughout containment to ensure that sound approved radiological work practices are being employed and to inspect for conditions which could cause significant changes in radiation exposure rates. These individuals are uniquely identified for assistance to personnel inside containment. Other health physics personnel monitoring specific activities are used strictly for that purpose and dedicate their time and attention to that specific task.
- An extensive radiation control training program includes instruction on the effects of radiation exposure, radiation protection practices and techniques, ALARA considerations, site emergency plan, and other related instructions that assist the individual in reducing personnel exposure and implementing sound radiation protection practices.
- Training for specific tasks through the use of mock-ups, photographs, full-scale models, and "dry" runs are conducted as appropriate. The S/G channel head mock-up is used to train personnel making channel head entries. Equipment similar to that used in the actual S/G is also used in the mock-up to familiarize personnel with the technique, to test work procedures in a nonradiation environment, and to practice use of the equipment prior to entering the relatively high exposure fields of the S/G channel head. Protective

clothing is worn during mock-up training as appropriate to simulate the working environment and to provide realistic time estimates of the task so that an estimate of the expected dose can be reverified and refined.

- The use of technical procedures serve to assure adequate preplanning and review of specific tasks with special emphasis placed on dose reduction considerations (ALARA).
- The utilization of incontainment "low-level radiation waiting areas" provide workers low-exposure rate areas during short-term idle periods. These areas are located where the exposure rates are relatively low (< 5 mR/hr on the average). These low-level radiation waiting areas are well posted, and workers are encouraged to use these areas whenever possible to minimize exposure.
- The ongoing decontamination program and periodic work area cleanup techniques are used to minimize the buildup of contamination levels and to reduce the amount of decontamination required for areas/materials removed from containment throughout the repair project.
- Continuous air monitoring devices with preset alarm capabilities are used to monitor airborne activity in the containment. In addition, periodic grab samples are taken routinely in general areas as well as for specific tasks.
- A local tool crib, weld rod rooms, and a document control room have been established in the containment to minimize lengthy work group stoppage while replenishing unanticipated needs for high-use items and documents. In addition, other work and lay-down areas are located in low-exposure rate areas.

3.7.2 Quantitative assessments are difficult to develop for the strong emphasis and detailed planning involved in implementation of these "general" techniques and practices; however, they continue to contribute significantly to the overall ALARA commitment for the repair project.

4.0 RADIOACTIVE EFFLUENTS AND SOLID WASTE

4.1 General.

4.1.1 Radioactive effluents, consisting of liquid and airborne releases, and low-level solid radioactive waste produced during this reporting period are summarized in Tables 5 and 6, respectively. The radionuclides reported and activity released during this reporting period are typical of those expected for the types of work activities conducted thus far in the Steam Generator Repair Program.

4.2 Liquid releases.

4.2.1 A summary of the volume and activity of liquid effluents released for the period February 1, 1984, through April 30, 1984, is provided in Table 5. Approximately 73 percent of the activity released (excluding tritium) was in the form of activated metals (e.g., Co-58, Co-60, Mn-54, and Ag-110m). The remaining activity (excluding tritium) included the following radionuclides--Cs-137 (9.1 percent), Cs-134 (6 percent), and radioiodines (1.7 percent). The total activity released (excluding tritium) during this reporting period is approximately 100 times lower than normal plant operations. For example, the total activity released during January while the plant was in operation was 3.24 E-01 curies as compared to 6.97 E-03, 2.96 E-03, and 3.73 E-03 curies for February, March, and April, respectively. The amount of tritium released during the reporting period was 3.3, 12.3, and 272 times lower for February, March, and April, respectively, than for January.

4.3 Airborne releases.

4.3.1 A summary of the airborne effluent activity released for the period February 1, 1984, through April 30, 1984, is also provided in Table 5. There were several sources of activity released during this period--mainly due to the ventilation of noble gases from the auxiliary building, waste gas decay tank releases, and containment purges following shutdown. Although this planned release occurred during this reporting SGRP period, the initial venting of containment is not considered a steam generator repair activity. Noble and halogen gases are not expected to contribute significantly to the activity released in airborne effluents during the remainder of the steam generator repair outage. The major contributors to the releases of airborne radioactivity will be particulates released during ventilation of the containment. During the repair, ventilation of the containment is maintained in order to keep the containment building under a negative pressure. Prior to its release, the air from the containment is directed to HEPA filter banks in order to minimize the concentration of radioactivity released to the environment. Releases from containment are continuously monitored. Based upon the above, the total activity released in airborne effluents due to the steam generator repair was five times lower in February, none was detectable in March and April, as compared to the activity released in January.

4.4 Solid radioactive waste.

4.4.1 A summary of low-level radioactive waste (LLW) shipments for the reporting period is provided in Table 6. The volume of LLW which had been packaged but not shipped prior to the close of the period is also provided. The LLW shipments during this reporting period were made to the Barnwell, South Carolina, low-level waste disposal facility.

4.4.2 A significant amount of LLW shipped was in the form of insulation and lagging materials which had been removed from piping and equipment within containment. The majority of the remaining waste volume shipped was compactable and noncompactable dry-active waste (DAW). Compactable DAW is comprised of paper, plastic, cloth, sheet metal, small components or tools, and other compressible nonreusable trash which is efficiently packaged using a high-density mechanical compactor to reduce its volume. Noncompactable DAW consists of insulation, large metal components, filters, and other nonreusable materials which cannot be practically compacted.

4.4.3 The total volume of solid LLW generated due to repair activities through this reporting period (excluding the steam generator lower assemblies) is approximately 45 percent of the total 60,000 cubic feet volume estimated in the SGRR. It should be noted that the volume of waste shipped is greater than the accumulated volume of waste generated. This is primarily attributed to additional LLW generated from other plant modifications being conducted during the steam generator repair project and waste which was stored on site prior to the project commencement. The total quantity of radioactivity shipped during this reporting period as a result of the SGRP was approximately 7 percent of the activity estimated in the SGRR. The remaining LLW generated is expected to be expeditiously shipped to a licensed burial facility.

5.0 CONCLUSIONS

5.1 The following conclusions are based on information contained in this report:

5.1.1 Based on the activities completed to date, the actual personnel exposure accumulated is significantly lower than the original estimated exposure (i.e., 550.14 and 1076, respectively). With the SGRP in progress for

approximately 13 weeks, the exposure accumulated to date for activities completed indicates that the planning for this project has served to provide a higher level of productivity with reduced personnel exposure. In addition, the temporary shielding effort was enhanced during implementation beyond that originally planned resulting in a net positive effect in estimated doses received. It is expected that this exposure trend will continue throughout the project. Subsequent reports will address any changes in exposure trends and the contributing factors applied to such changes.

5.1.2 Radioactive liquid effluents released are well within technical specification limits. The calculated activity (excluding tritium and gases) is approximately 0.2, 0.08, and 0.13 percent of 10CFR20, Table B, Column 2, limit for unidentified MPC for February, March, and April. The tritium activity was approximately 0.002, 0.0005, and 0.0003 percent of 10CFR20, Table B, Column 2, limit for February, March, and April, respectively.

5.1.3 Airborne releases of gaseous radioactivity attributed to repair project activities are 0.02, 0.0004, and 0.0008 percent of 10CFR20, Table B, Column 2, limit for unidentified MPC for February, March, and April, respectively. The activity associated with airborne releases for repair project activities is expected to decrease as the project progresses. The airborne activity discharged through the entire repair effort will be well below the technical specification limits.

5.1.4 Solid low-level radioactive waste generated to date (excluding the SGLAs) for the SGRP represents approximately 45 percent of the volume estimate provided in the SGRR. The total quantity of activity shipped was significantly below the activity estimated in the SGRR.

5.2 In order to coincide with the routine preliminary radioactive effluent release reports generated at the plant site, subsequent SGRP radiological progress reports will present information based on the reporting periods used at the plant site. Therefore, Progress Report 2 will contain information from May 1, 1984, through July 31, 1984.

TABLE 1

Description of Major Tasks

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

TASK	TASK DESCRIPTION
1. Construction of pedestal cranes, preparation of polar crane, miscellaneous cribbing platforms, and steam generator transfer platform.	This task included work associated with installing pedestal cranes, performing maintenance, repairs on and upgrading polar crane capacity, and installing skid beams and associated cribbing at the equipment hatch for the steam generator transfer.
2. Initial containment decontamination.	This task included the general area decontamination of the containment after insulation removal from the steam generators, associated piping, and equipment.
3. Concrete and structural steel removal and replacement.	This task includes the work associated with removal and replacement of concrete and structural steel.
4. Defueling and fuel storage.	This task included the disassembly of the reactor vessel head, removal of the head from the reactor pressure vessel, removal of the fuel from the pressure vessel, and transferring to spent-fuel storage, reactor vessel head replacement, and decontamination of the refueling cavity.

TABLE 1 (continued)

Description of Major Tasks

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

TASK	TASK DESCRIPTION
5. Installation and removal of shielding.	This task includes the installation and removal of temporary shielding to include piping, shadow, steam generator platform, and steam generator channel head shields.
6. Installation, maintenance, and removal of scaffolding, temporary lighting and power.	This task includes the installation, maintenance, and removal of temporary scaffolding, lighting, power and service and breathing air.
7. Installation, maintenance, and removal of contamination containments and temporary ventilation systems.	This task includes the installation and removal of contamination containments and associated air filtration treatment and handling equipment.
8. Removal of insulation.	This task included the removal of insulation from the steam generators and connecting piping.
9. Removal of main steam piping.	This item included the removal of the main steam piping from the steam generators and relocating the piping to a low-radiation area outside the containment for refurbishing.

TABLE 1 (continued)

Description of Major Tasks

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

TASK		TASK DESCRIPTION
10.	Removal of feedwater piping.	This item included the removal of the feedwater piping from the steam generators and relocating the piping to a low-radiation area outside the containment for refurbishing.
11.	Removal of miscellaneous piping.	This item included the removal of blowdown valves and CVCS piping.
12.	Cutting and removal of steam generator upper assembly.	This item included the preparation of the steam dome internals for removal, cutting, and removing level transmitters, removing steam dome manways, plasma arc cutting of the steam domes from the lower assemblies, and removing the steam domes from containment for refurbishing.
13.	Cutting of channel head.	This task included setting up the cutting equipment and performing the separation cuts on the channel head and divider plate.

TABLE 1 (continued)

Description of Major Tasks

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

TASK	TASK DESCRIPTION
14. Weld shield cover on lower assembly at: a. Channel head b. Transition end	This task included the installation of heaters and blankets on both ends of the lower assembly and welding cover plates in place. Also included was the removal of handhold covers and blowdown nozzles and welding shield plugs over these openings.
15. Removal of steam generator lower assembly.	This task included moving the lower assembly from the operating floor to the equipment hatch, loading the lower assembly onto the "J" frame, and moving the lower assembly from the containment to the outside loading platform.
16. Lateral support ring removal.	This task included cutting and removal of the lateral support ring bolts, removing snubbers, and spreading the lateral support ring to facilitate lifting the lower assembly.
17. Channel head decontamination.	This task included removing manway strong backs and diaphrams; the setup, operation, and removal of the aluminum grit decontamination equipment; the setup, operation, and removal of the spent grit handling equipment; and the setup, operation, and removal of the spent grit solidification system.

TABLE 1 (continued)

Description of Major Tasks

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

TASK	TASK DESCRIPTION
18. Refurbishment of upper assembly.	This task includes the decontamination of the exterior of the steam domes, welding preparation of the steam domes, removing and replacing steam domes feedwater ring, and modification of moisture separator devices.
19. Installation of lower assembly prep and weld channel head.	This task includes weld preparation of the channel heads, rigging and moving the new steam generators into place, set up and remove heaters and blankets, preheat and postheat lower assemblies and channel heads, and perform girth welding.
20. Weld divider plates.	This task includes preparing the divider plate welding surfaces for welding and performing the divider plate welds.
21. Installation and welding of upper assembly.	This task includes rigging and moving the steam generator upper assembly into containment, set up and remove heaters and blankets, preheat and postheat upper and lower assemblies, and perform girth welding.

TABLE 1 (continued)

Description of Major Tasks

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

TASK	TASK DESCRIPTION
22. Lateral support ring installation.	This task includes compressing the lateral support ring and installing lateral support ring bolts and snubbers.
23. Install main steam piping.	This task includes moving the main steam lines into place; installing heaters and blankets; and preheat, postheat, and weld main steam line piping.
24. Install feedwater piping.	This item includes moving the feedwater piping into place; installing heaters and blankets; and preheat, postheat, and weld feedwater piping.
25. Install insulation.	This item includes installation of insulation on all steam generators and associated piping.
26. Install miscellaneous piping.	This task includes the installation of blowdown valves and CVCS piping.
27. Nonmanuals, (HP, QA, engineering, supervision, administration, etc.)	This category includes the support required throughout the repair project period for nonmanual personnel.

TABLE 1 (continued)

Description of Major Tasks

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

TASK	TASK DESCRIPTION
28. Ongoing decon/cleanup, and disposal of contaminated material.	This task includes continuing decontamination of contaminated materials and removal and disposal through the repair project period.
29. Miscellaneous testing/ inspections.	This item encompasses the surveillance requirements for primary and secondary hydrostatic testing.
30. Steam generator storage activities.	This task included rigging and transporting the steam generators to the storage facility and placing the steam generators into and sealing the storage facility.
31. Miscellanous (work not covered in Tasks 1 through 30).	This category includes tasks such as decontamination, inspection, and general maintenance in areas outside containment; general maintenance inside the containment building; laundry operations; containment building inspections; moving tools and equipment into and out of the containment building; and disconnecting and shipping the reactor coolant pump motors for refurbishment.

TABLE 2

Personnel Exposure Summary Per Task
for Steam Generator Replacement

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

	TASK DESCRIPTION	PERSONNEL EXPOSURE* (MAN-REM) ESTIMATED	ACTUAL	% TASK COMPLETE
1.	Construction of pedestal cranes, preparation of polar crane, miscellaneous cribbing platforms, and steam generator transfer platform.	25	3.600	100
2.	Initial containment decontamination.	20	10.975	100
3.	Concrete and structural steel removal and replacement.	20	8.800	50
4.	Defueling and fuel storage.	40	34.275	100
5.	Installation and removal of shielding.	145	7.150	50
6.	Installation, maintenance, and removal of scaffolding, temporary lighting, and power.	185	47.875	50

*Actual exposures are estimated by self-reading pocket dosimeter totals.

TABLE 2 (continued)

Personnel Exposure Summary Per Task
for Steam Generator Replacement

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

	TASK DESCRIPTION	PERSONNEL EXPOSURE* (MAN-REM) ESTIMATED	ACTUAL	% TASK COMPLETE
7.	Installation, maintenance, and removal of contamination containments and temporary ventilation systems.	30	16.525	50
8.	Removal of insulation.	85	25.250	100
9.	Removal of main steam piping.	5	1.500	100
10.	Removal of feedwater piping.	5	1.000	100
11.	Removal of miscellaneous piping.	70	3.780	100
12.	Cutting and removal of steam generator upper assembly.	80	4.975	100
13.	Cutting of channel head.	95	30.600	100
14.	Weld shield cover on lower assembly at:			
	a. Channel head	10	8.650	100
	b. Transition end	10	1.975	100

*Actual exposures are estimated by self-reading pocket dosimeter totals.

TABLE 2 (continued)

Personnel Exposure Summary Per Task
for Steam Generator Replacement

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

	TASK DESCRIPTION	PERSONNEL EXPOSURE* (MAN-REM) ESTIMATED	ACTUAL	% TASK COMPLETE
15.	Removal of steam generator lower assembly.	25	5.850	100
16.	Lateral support ring removal.	25	13.500	100
17.	Channel head decontamination.	105	75.040	100
18.	Refurbishment of upper assembly.	20	0.925	25
19.	Installation of lower assembly prep and weld channel head.	310	18.250	10
20.	Weld divider plates.**	80	0	0
21.	Installation and welding of upper assembly.**	15	0	0
22.	Lateral support ring installation.**	45	0	0
23.	Install main steam piping.**	5	0	0

*Actual exposures are estimated by self-reading pocket dosimeter totals.

**Task not started during this reporting period.

TABLE 2 (continued)

Personnel Exposure Summary Per Task
for Steam Generator Replacement

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

	TASK DESCRIPTION	PERSONNEL EXPOSURE* (MAN-REM) ESTIMATED	ACTUAL	% TASK COMPLETE
24.	Install feedwater piping.**	10	0	0
25.	Install insulation.**	100	0	0
26.	Install miscellaneous piping.**	75	0	0
27.	Nonmanuals, (HP, QA, engineering, supervision, administration, etc.)	295	93.900	50
28.	Ongoing decon/cleanup and disposal of contaminated material.	150	74.445	50
29.	Miscellaneous testing/inspections.**	5	0	0
30.	Steam generator storage activities.	30	7.225	95
31.	Miscellaneous	--	54.075	50
	TOTAL	2120	550.140	

*Actual exposures are estimated by self-reading pocket dosimeter totals.

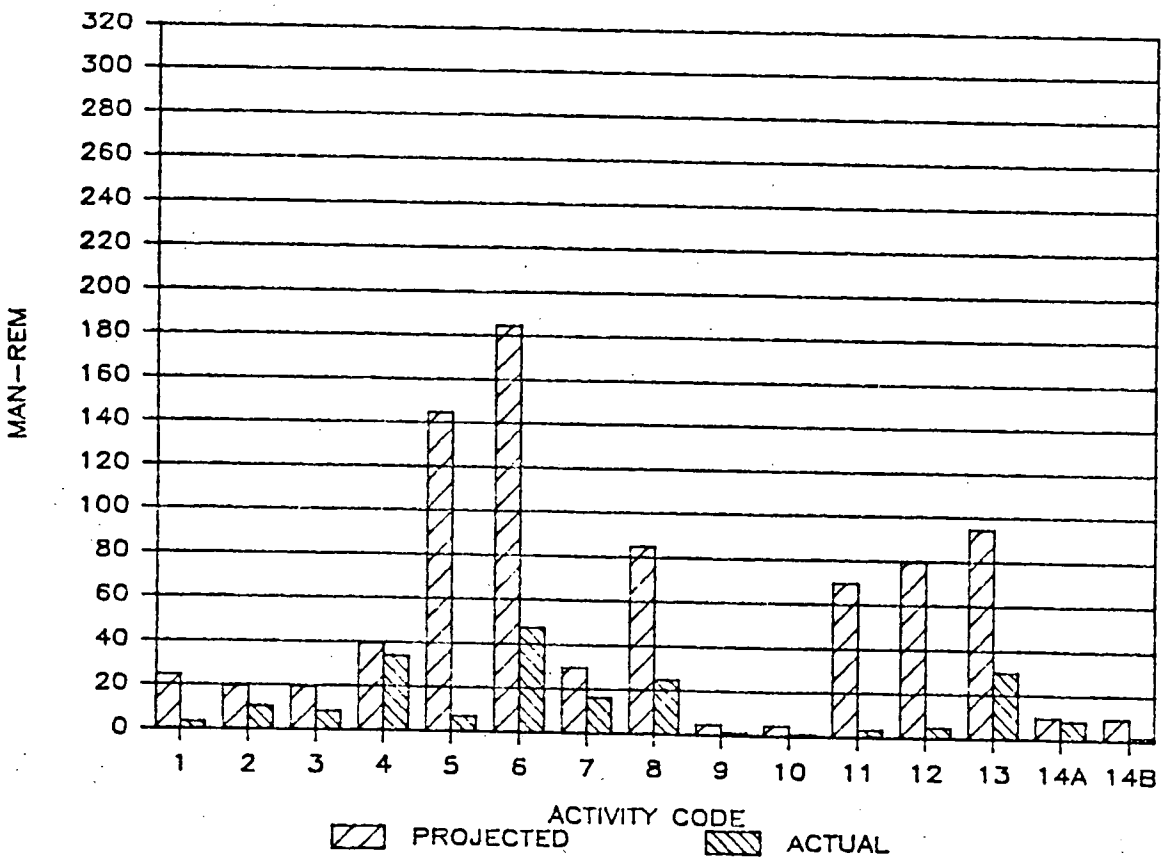
**Task not started during this reporting period.

TABLE 2 (continued)

Personnel Exposure Summary Per Task
for Steam Generator Replacement

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

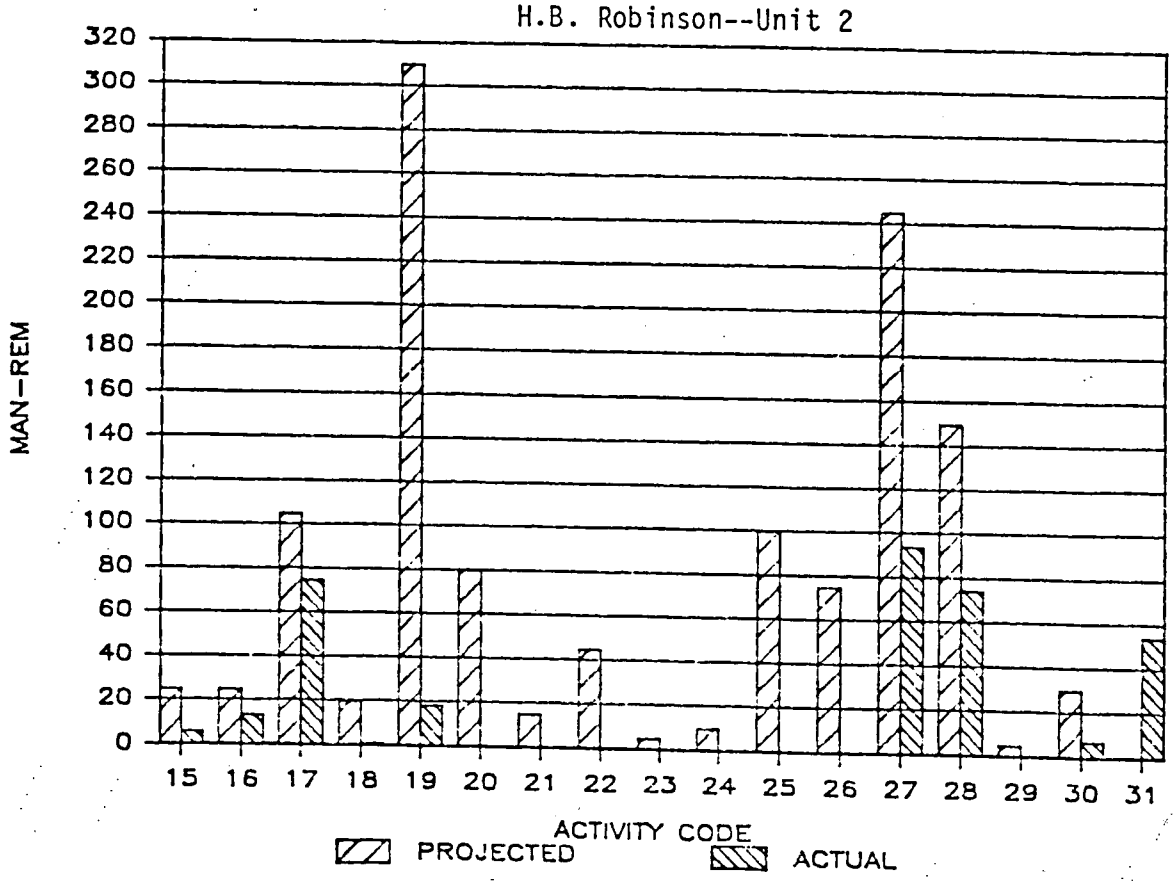


1. Construction of pedestal cranes, preparation of polar crane, misc. cribbing platforms and S/G xfer platform.
2. Initial containment decontamination.
3. Concrete and structual steel removal and replacement.
4. Defuel and fuel storage.
5. Installation and removal of shielding.
6. Installation, maint. and removal of scaffolding, temp. lighting and power.
7. Installation, maint. and removal of contaminated containments and temp. ventillation systems.
8. Removal of insulation.
9. Removal of main steam piping.
10. Removal of feedwater piping.
11. Removal of misc. piping.
12. Cutting and removal of S/G upper assembly.
13. Cutting of channel head.
14A. Weld shield cover on lower assembly at channel head.
14B. Weld shield cover on lower assembly at transition end.

Table 2 (continued)

Personnel Exposure Summary Per Task
for Steam Generator Replacement

Reporting Period February 1, 1984, through April 30, 1984



15. Removal of steam generator lower assembly.
16. Lateral support ring removal.
17. Channel head decontamination.
18. Refurbishment of upper assembly.
19. Installation of lower assembly prep and weld channel head.
20. Weld divider plates.
21. Installation and welding of upper assembly.
22. Lateral support ring installation.
23. Install mainsteam piping.
24. Install feedwater piping.
25. Install insulation.
26. Install misc. piping.
27. Nonmanuals (HP, QA, Eng., supervision, administration, etc.)
28. Ongoing decon/clean up & disposal of contaminated material.
29. Misc. testing/inspection.
30. S/G storage activities.
31. Misc. work not covered in the above tasks.

TABLE 3

Detailed Summary of Activity Exposures
Reporting Period February 1, 1984, to April 30, 1984
H.B. Robinson--Unit 2

ACTIVITY DESCRIPTION	PROJECTED EXPOSURE (Man-Rem)	ACTUAL EXPOSURE FOR REPORTING PERIOD (Man-Rem)	ACTUAL EXPOSURE EXPENDED TO DATE- (Man-Rem)	ACTIVITY STATUS (C--complete) (I--in progress) (NS--not started)
1. Construction of pedestal cranes, polar crane work, miscellaneous cribbing platforms, and steam generator transfer platforms.	25	3.600	3.600	
a. Installed pedestal cranes.		0.200	0.200	C
b. Bush hammered concrete for pedestal crane.		0.650	0.650	C
c. Disassembled manipulator crane.		0.525	0.525	C
d. Installed cavity platform.		2.050	2.050	C
e. Install and remove skid beams.		0.175	0.175	I
2. Initial containment decontamination.	20	10.975	10.975	
a. CV--all levels		6.550	6.550	C
b. CV--pump bays		4.425	4.425	C

TABLE 3 (continued)

Detailed Summary of Activity Exposures
Reporting Period February 1, 1984, to April 30, 1984
H.B. Robinson--Unit 2

ACTIVITY DESCRIPTION	PROJECTED EXPOSURE (Man-Rem)	ACTUAL EXPOSURE FOR REPORTING PERIOD (Man-Rem)	ACTUAL EXPOSURE EXPENDED TO DATE (Man-Rem)	ACTIVITY STATUS (C--complete) (I--in progress) (NS--not started)
3. Concrete and structural steel removal and replacement.	20	8.800	8.800	
a. "A" pump bay chip concrete.		4.475	4.425	C
b. Head storage area cut concrete.		0.150	0.150	C
c. Cut "A," "B," and "C" steam generator bioshield walls.		2.525	2.525	C
d. Removed structural steel above equipment hatch.		0.325	0.325	C
e. Cut and removed steel platform by elevator.		0.375	0.375	C
f. Core bore and wet cut "A," "B," and "C" steam generator bioshield walls.		0.950	0.950	C
4. Defueling and fuel storage.	40	34.275	34.275	
a. Changed out Detectors N-31 and N-36		0.775	0.775	C
b. Decon internals lifting rig.		1.625	1.625	C
c. Removed missle shield, cable trays, and duct work.		0.700	0.700	C

TABLE 3 (continued)

Detailed Summary of Activity Exposures
Reporting Period February 1, 1984, to April 30, 1984
H.B. Robinson--Unit 2

ACTIVITY DESCRIPTION	PROJECTED EXPOSURE (Man-Rem)	ACTUAL EXPOSURE FOR REPORTING PERIOD (Man-Rem)	ACTUAL EXPOSURE EXPENDED TO DATE (Man-Rem)	ACTIVITY STATUS (C--complete) (I--in progress) (NS--not started)
d. Removed insulation, conoseals, disconnected thermocouples and detention, and removed stud bolts.		19.900	19.900	C
e. Changed out air motor on transfer system.		0.325	0.325	C
f. Repaired stud hoist.		0.225	0.225	C
g. Painted cavity floor.		0.400	0.400	C
h. Retracted flux thimbles		0.225	0.225	C
i. Removed and replaced blind flange		0.975	0.975	C
j. Installed cavity filter.		0.250	0.250	C
k. Lifted and stored reactor head.		3.225	3.225	C
l. Removed and replaced upper internals.		0.775	0.775	C
m. CV defuel.		0.775	0.775	C
n. SFP moved fuel and inspected.		0.400	0.400	C
o. Misc CV work.		0.200	0.200	C
p. Misc SFP work.		0.200	0.200	C
q. Decon cavity.		3.300	3.300	C
5. Installation and removal of shielding.	145	7.150	7.150	

TABLE 3 (continued)

Detailed Summary of Activity Exposures
Reporting Period February 1, 1984, to April 30, 1984
H.B. Robinson--Unit 2

	ACTIVITY DESCRIPTION	PROJECTED EXPOSURE (Man-Rem)	ACTUAL EXPOSURE FOR REPORTING PERIOD (Man-Rem)	ACTUAL EXPOSURE EXPENDED TO DATE (Man-Rem)	ACTIVITY STATUS (C--complete) (I--in progress) (NS--not started)
a.	CV all areas.		6.700	6.700	I
b.	Steam generator bowls.		0.450	0.450	I
6.	Installation, maintenance, and removal of scaffolding, temporary lighting, power, temporary service, and breathing air.	185	47.875	47.875	
a.	CV install temporary lighting.		15.750	15.750	I
b.	CV install temporary breathing air.		5.525	5.525	I
c.	Erected scaffolds for lateral support work.		5.100	5.100	C
d.	Erected channel head platforms.		10.125	10.125	C
e.	Sorted and transported scaffold.		0.025	0.025	C
f.	Erect and remove scaffold in pump bays.		0.825	0.825	I
g.	Erect and remove scaffold around steam domes.		0.250	0.250	I
h.	Installed and removed scaffold for insulation removal.		10.275	10.275	C

TABLE 3 (continued)

Detailed Summary of Activity Exposures
Reporting Period February 1, 1984, to April 30, 1984
H.B. Robinson--Unit 2

ACTIVITY DESCRIPTION	PROJECTED EXPOSURE (Man-Rem)	ACTUAL EXPOSURE FOR REPORTING PERIOD (Man-Rem)	ACTUAL EXPOSURE EXPENDED TO DATE (Man-Rem)	ACTIVITY STATUS (C--complete) (I--in progress) (NS--not started)
7. Installation, maintenance, and removal of contamination containments and temporary ventilation systems.	30	16.525	16.525	
a. Installed stand-under HEPA filters.		0.025	0.025	C
b. Erect and remove duct work.		14.200	14.200	I
c. Install air handling equipment.		2.300	2.300	I
8. Removal of insulation.	85	25.250	25.250	
a. Removed insulation from "A," "B," "C" steam generators.		19.150	19.150	C
b. Supported insulation removal on all levels of CV.		6.100	6.100	C
9. Removal of main steam piping.	5	1.500	1.500	
a. Set up, cut, and removed main steam piping.		1.500	1.500	C
10. Removal of feedwater piping.	5	1.000	1.000	

TABLE 3 (continued)

Detailed Summary of Activity Exposures
Reporting Period February 1, 1984, to April 30, 1984
H.B. Robinson--Unit 2

	ACTIVITY DESCRIPTION	PROJECTED EXPOSURE (Man-Rem)	ACTUAL EXPOSURE FOR REPORTING PERIOD (Man-Rem)	ACTUAL EXPOSURE EXPENDED TO DATE (Man-Rem)	ACTIVITY STATUS (C--complete) (I--in progress) (NS--not started)
	a. Set up, cut, and removed feedwater piping.		1.000	1.000	C
11.	Removal of miscellaneous piping.	70	3.780	3.780	
	a. Cut and removed steam generator blowdown line valve.		0.580	0.580	C
	b. Cut and removed CVCS line and cap.		1.675	1.675	C
	c. Installed indication on blowdown lines.		1.525	1.525	C
12.	Cutting and removal of steam generator upper assemblies.	80	4.975	4.975	
	a. Removed level transmitter valves on "A," "B," and "C" steam generator steam domes.		0.025	0.025	C
	b. Cleaned transition weld on "A," "B," and "C" steam generators.		0.400	0.400	C
	c. Removed steam generator secondary manways.		0.050	0.050	C

TABLE 3 (continued)

Detailed Summary of Activity Exposures
Reporting Period February 1, 1984, to April 30, 1984
H.B. Robinson--Unit 2

ACTIVITY DESCRIPTION	PROJECTED EXPOSURE (Man-Rem)	ACTUAL EXPOSURE FOR REPORTING PERIOD (Man-Rem)	ACTUAL EXPOSURE EXPENDED TO DATE (Man-Rem)	ACTIVITY STATUS (C--complete) (I--in progress) (NS--not started)
d. Buffed and MT lugs.		0.100	0.100	C
e. Installed and removed heater blankets.		1.125	1.125	C
f. Cut, welded, and ground steam generator transition welds.		0.925	0.925	C
g. Cut steam generator wrappers and removed steam domes.		2.350	2.350	C
13. Cutting of channel heads.	95	30.600	30.600	
a. Removed sample tubing.		1.550	1.550	C
b. Set up and cut channel heads.		15.525	15.525	C
c. Cut divider plates.		4.450	4.450	C
d. Plunge cut, severance cut, and attached boot.		8.125	8.125	C
e. Painted outside area of steam generators.		0.950	0.950	C
14. Weld shield covers on lower assemblies.				

TABLE 3 (continued)

Detailed Summary of Activity Exposures
Reporting Period February 1, 1984, to April 30, 1984
H.B. Robinson--Unit 2

ACTIVITY DESCRIPTION	PROJECTED EXPOSURE (Man-Rem)	ACTUAL EXPOSURE FOR REPORTING PERIOD (Man-Rem)	ACTUAL EXPOSURE EXPENDED TO DATE (Man-Rem)	ACTIVITY STATUS (C--complete) (I--in progress) (NS--not started)
a. Channel head.	10	8.650	8.650	
1. Installed heater blankets.		3.200	3.200	C
2. Drained steam generators and welded nozzle plugs.		3.775	3.775	C
3. Buffed channel head weld.		1.675	1.675	C
b. Transition end.	10	1.975	1.975	
1. Ground and welded shield plate on top of generators.		1.975	1.975	C
15. Removal of steam generator lower assemblies.	25	5.850	5.850	
a. Installed shims on support legs.		0.550	0.550	C
b. Rigged steam generators out of CV.		5.300	5.300	C
16. Lateral support ring removal.	25	13.500	13.500	
a. Cut and removed bolts to remove snubbers and spread ring.		13.325	13.325	C
b. Removed tubing.		0.175	0.175	C

TABLE 3 (continued)

Detailed Summary of Activity Exposures
Reporting Period February 1, 1984, to April 30, 1984
H.B. Robinson--Unit 2

	ACTIVITY DESCRIPTION	PROJECTED EXPOSURE (Man-Rem)	ACTUAL EXPOSURE FOR REPORTING PERIOD (Man-Rem)	ACTUAL EXPOSURE EXPENDED TO DATE (Man-Rem)	ACTIVITY STATUS (C--complete) (I--in progress) (NS--not started)
17.	Channel head decontamination.	105	75.040	75.040	
	a. Assembled, disassembled, and operated Westinghouse decon equipment.		35.315	35.315	C
	b. Assembled and disassembled spent grit system and solidified spent grit.		0.400	0.400	C
	c. Removed strong backs and diaphrams from steam generator manways.		2.075	2.075	C
	d. Installed, maintained, and removed grits fixture, nozzle seats, and manway flanges.		37.250	37.250	C
18.	Refurbishment of upper assemblies.	20	0.925	0.925	
	a. Remove swirl vanes.		0.300	0.300	I
	b. Rework steam domes.		0.575	0.575	I
	c. Radiography steam domes.		0.050	0.050	I

TABLE 3 (continued)

Detailed Summary of Activity Exposures
Reporting Period February 1, 1984, to April 30, 1984
H.B. Robinson--Unit 2

ACTIVITY DESCRIPTION	PROJECTED EXPOSURE (Man-Rem)	ACTUAL EXPOSURE FOR REPORTING PERIOD (Man-Rem)	ACTUAL EXPOSURE EXPENDED TO DATE (Man-Rem)	ACTIVITY STATUS (C--complete) (I--in progress) (NS--not started)
19. Installation of lower assemblies, prep, and weld channel head, preheat, and postheat.	310	18.250	18.250	
a. Cleaned steam generator channel heads, removed nozzle seats, inspected loop seals.		5.825	5.825	C
b. Cut and machine snipe windows, cut out divider plate manways, install heater blankets outside on channel head and prep weld surface.		12.275	12.275	I
c. Rig steam generators into CV.		0.150	0.150	I
20. Weld divider plates.	80	0	0	NS
21. Installation and welding of upper assemblies, preheat, and postheat.	15	0	0	NS
22. Lateral support ring installation.	45	0	0	NS

TABLE 3 (continued)

Detailed Summary of Activity Exposures
Reporting Period February 1, 1984, to April 30, 1984
H.B. Robinson--Unit 2

ACTIVITY DESCRIPTION	PROJECTED EXPOSURE (Man-Rem)	ACTUAL EXPOSURE FOR REPORTING PERIOD (Man-Rem)	ACTUAL EXPOSURE EXPENDED TO DATE (Man-Rem)	ACTIVITY STATUS (C--complete) (I--in progress) (NS--not started)
23. Install main steam piping.	5	0	0	NS
24. Install feedwater piping.	10	0	0	NS
25. Install insulation.	100	0	0	NS
26. Install miscellaneous piping.	75	0	0	NS
27. Nonmanual (HP, QA, engineering, supervision, etc.)	295	93.900	93.900	
a. CV all levels HP surveillance.		57.250	57.250	I
b. CV pump bays HP surveillance.		19.675	19.675	I
c. Inspections and surveillance.		16.975	16.975	I

TABLE 3 (continued)

Detailed Summary of Activity Exposures
Reporting Period February 1, 1984, to April 30, 1984
H.B. Robinson--Unit 2

ACTIVITY DESCRIPTION	PROJECTED EXPOSURE (Man-Rem)	ACTUAL EXPOSURE FOR REPORTING PERIOD (Man-Rem)	ACTUAL EXPOSURE EXPENDED TO DATE (Man-Rem)	ACTIVITY STATUS (C--complete) (I--in progress) (NS--not started)
28. Ongoing decon/cleanup and disposal of contaminated materials.	150	74.445	74.445	
a. Decon, cleanup, and trash removal.		71.645	71.645	I
b. Trash compaction, solidification, and shipments.		2.800	2.800	I
29. Miscellaneous testing/inspections.	5	0	0	NS
30. Steam generator storage activities.	30	7.225	7.225	
a. Rig and transport steam generator to tomb, place in tank, and close tomb doors.		7.225	7.225	I
31. Miscellaneous work not covered in the above task.		54.075	54.075	
a. Decon respirator.		0.725	0.725	I

TABLE 3 (continued)

Detailed Summary of Activity Exposures
Reporting Period February 1, 1984, to April 30, 1984
H.B. Robinson--Unit 2

ACTIVITY DESCRIPTION	PROJECTED EXPOSURE (Man-Rem)	ACTUAL EXPOSURE FOR REPORTING PERIOD (Man-Rem)	ACTUAL EXPOSURE EXPENDED TO DATE (Man-Rem)	ACTIVITY STATUS (C--complete) (I--in progress) (NS--not started)
b. General maintenance in areas outside the containment building.		4.700	4.700	I
c. General maintenance in the containment building.		33.975	33.975	I
d. Sort and clean laundry.		0.675	0.675	I
e. Containment building hands-on inspection.		7.875	7.875	I
f. Containment building issue tools.		0.175	0.175	I
g. Moved equipment into cavity.		2.075	2.075	C
h. Remove equipment from containment building.		2.875	2.875	I
i. Disconnected and removed reactor coolant pump motors from containment and shipped.		1.000	1.000	C
TOTALS	2120	550.140	550.140	

TABLE 4

Summary of Activity--Exposures Other Than
Steam Generator Replacement Activities
Reporting Period February 1, 1984, to April 30, 1984
H.B. Robinson--Unit 2

	ACTIVITY DESCRIPTION	PROJECTED EXPOSURE (Man-Rem)	ACTUAL EXPOSURE FOR REPORTING PERIOD (Man-Rem)	ACTUAL EXPOSURE EXPENDED TO DATE (Man-Rem)	ACTIVITY STATUS (C--complete) (I--in progress) (NS--not started)
1.	Steam generator eddy current inspection prior to commencing SGR activities.		35.650	35.650	C
2.	In-service inspection including removal of insulation, prep welds, and seismic design verification.		87.775	87.775	I
3.	Plant modifications other than steam generator replacement.		15.760	15.760	I
4.	Miscellaneous inspection, coverage, and work not covered in the above item or the steam generator replacement activities.		100.600	100.600	I
	TOTAL		239.785	239.785	

TAB[illegible]5

Summary of Radioactive Effluent Releases

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

LIQUID EFFLUENT RELEASES	RADIOACTIVITY RELEASED IN LIQUID EFFLUENTS (CURIES)				
RADIONUCLIDE	FEBRUARY	MARCH	APRIL	TOTAL ACTIVITY RELEASED THIS REPORTING PERIOD	TOTAL RELEASED DURING S/G REPAIR TO DATE
Ag-110m	1.74 E-04	2.07 E-05	7.87 E-05	2.73 E-04	2.73 E-04
Co-58	1.70 E-03	2.46 E-04	6.12 E-04	2.56 E-03	2.56 E-03
Co-60	3.29 E-03	2.35 E-03	1.46 E-03	7.10 E-03	7.10 E-03
Cs-134	5.09 E-05	9.72 E-05	6.18 E-04	7.66 E-04	7.66 E-04
Cs-136	*	*	*	*	*
Cs-137	1.99 E-04	1.54 E-04	8.98 E-04	1.25 E-03	1.25 E-03
I-131	2.14 E-04	1.17 E-05	*	2.26 E-04	2.26 E-04
I-133	*	*	*	*	*
Sb-124	1.07 E-03	2.06 E-05	3.18 E-05	1.12 E-03	1.12 E-03
Mn-54	3.16 E-05	1.07 E-05	3.59 E-05	7.82 E-05	7.82 E-05
Others**	2.41 E-04	4.93 E-05	--	2.90 E-04	2.90 E-04
TOTAL	6.97 E-03	2.96 E-03	3.73 E-03	1.37 E-02	1.37 E-02
Tritium Released (curies)	2.40 E+00	6.39 E-01	2.88 E-02	3.07 E+00	3.07 E+00
Liquid Effluent Volume Released (liters)	1.17 E+05	3.66 E+05	2.41 E+05	VOLUME RELEASED THIS REPORTING PERIOD 7.24 E+05	VOLUME RELEASED DURING S/G REPAIR TO DATE 7.24 E+05

*Not detectable.

**Others include Na-24, Nb-95, Cr-51, F-18, Te-132, Nb-97.

TABLE 5 (Continued)

Summary of Radioactive Effluent Releases

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

AIRBORNE RELEASES	RADIOACTIVITY RELEASED IN AIRBORNE EFFLUENTS (CURIES)			TOTAL ACTIVITY RELEASED THIS REPORTING PERIOD	TOTAL RELEASED DURING S/G REPAIR TO DATE
A. NOBLE GASES					
RADIONUCLIDE	FEBRUARY	MARCH	APRIL		
Ar-41	*	*	*	*	*
Kr-85	1.07 E-03	*	*	1.07 E-03	1.07 E-03
Kr-85m	*	*	*	*	*
Kr-88	*	*	*	*	*
Xe-131m	3.07 E-03	*	*	3.07 E-03	3.07 E-03
Xe-133	7.67 E•00	*	*	7.67 E•00	7.67 E•00
Xe-133m	3.44 E-03	*	*	3.44 E-03	3.44 E-03
Xe-135	*	*	*	*	*
Xe-135m	*	*	*	*	*
TOTAL	7.68 E•00	0.00	0.00	7.68 E•00	7.68 E•00
TRITIUM	2.34 E-01	1.38 E-01	1.86 E-01	5.58 E-01	5.58 E-01
B. HALOGENS					
I-131	1.29 E-04	2.12 E-05	1.95 E-06	1.52 E-04	1.52 E-04
I-133	*	*	*	*	*
TOTAL	1.29 E-04	2.12 E-05	1.95 E-06	1.52 E-04	1.52 E-04

*Not detectable.

TABLE 5 (continued)

Summary of Radioactive Effluent Releases

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

AIRBORNE RELEASES	RADIOACTIVITY RELEASED IN AIRBORNE EFFLUENTS (CURIES)				
C. PARTICULATES RADIONUCLIDE	FEBRUARY	MARCH	APRIL	TOTAL ACTIVITY RELEASED THIS REPORTING PERIOD	TOTAL RELEASED DURING S/G REPAIR TO DATE
Ba-140	*	*	*	*	*
Co-57	*	*	*	*	*
Co-58	*	8.83 E-08	*	8.83 E-08	8.83 E-08
Co-60	2.70 E-06	1.35 E-06	3.55 E-07	4.41 E-06	4.41 E-06
Cr-51	*	*	*	*	*
Cs-134	*	*	*	*	*
Cs-136	*	*	*	*	*
Cs-137	*	*	*	*	*
I-131	*	*	*	*	*
La-140	*	*	*	*	*
Mn-54	*	*	*	*	*
Nb-95	*	*	*	*	*
Ru-103	*	*	*	*	*
TOTAL	2.70 E-06	1.44 E-06	3.55 E-07	4.50 E-06	4.50 E-06

*Not detectable.

TABLE 6

Summary of Solid Low-Level Radioactive Waste

Reporting Period February 1, 1984, through April 30, 1984

H.B. Robinson--Unit 2

I. SOLID LOW-LEVEL RADIOACTIVE WASTE GENERATED FROM STEAM GENERATOR REPAIR

WASTE FORM	VOLUME LLW* IN CU FT FOR REPORTING PERIOD	VOLUME LLW IN CU FT TO DATE
Compacted Dry Active Waste	5450	5450
Noncompacted Dry Active Waste	18115	18115
Resin and Filter Media	240	240
Channel Head Decontamination Waste	595	595
Miscellaneous (Evaporator Bottoms)	2317	2317
Totals	26717	26717

II. SOLID LOW-LEVEL REPAIR ACTIVITY WASTE SHIPPED

REPORTING PERIOD DATE	VOLUME LLW* SHIPPED FOR REPORTING PERIOD	ESTIMATED ACTIVITY** CURIES
February 1, 1984--April 30, 1984	30506***	11.130

*LLW low-level (radioactive) waste.

**Predominant radionuclides ^{137}Cs, ^{60}Co, ^{58}Co, ^{51}Cr, ^{55}Fe, ^{95}Nb.

***Shipped volume includes waste generated by other work not associated with the steam generator repair project.