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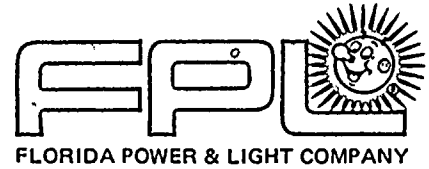
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SUBJECT: Forwards third radiological progress report for steam generator repair program.

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April 29, 1983
L-83-272

Office of Nuclear Reactor Regulation
Attention: Mr. Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Varga:

Re: Turkey Point Unit 4
- Docket No. 50-251
Steam Generator Repair Program
- Radiological Progress Report - No. 3

Please find attached our third Radiological Progress Report for the
Steam Generator Repair Program as required by Section 3.H.(2)(c) of
DPR-41.

Very truly yours,

Robert E. Uhrig
Vice President
Advanced Systems & Technology

REU/PLP/cab

Attachment

cc: J. P. O'Reilly, Region II
Harold F. Reis, Esquire

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1.0 INTRODUCTION

Radiological Progress Report No. 3 contains information pertaining to the radiological aspects of the Unit 4 Steam Generator Repair Program (SGRP) for the period February 3, 1983 through March 30, 1983. This information includes the following:

- a. An assessment and summary of the occupational exposure and labor expended for each reporting period (throughout the project).
- b. An evaluation of the effectiveness of dose reduction techniques (ALARA principles).
- c. An estimate of the radioactivity released in liquid and airborne effluents.
- d. An estimate of the solid radioactive waste generated including volume and radioactive content.

Significant project tasks performed during this reporting period included:

1. Removal of steam generator transfer bridge.
2. Installation of main steam and feedwater piping.
3. Complete installation of steam generator upper and lower assemblies.
4. Welding of steam generator divider plates.
5. Inspection and close-out of steam generators in preparation for testing.
6. Installation of insulation on steam generators.
7. Installation of miscellaneous piping in steam generator cubicles.
8. Installation of miscellaneous steel.
9. Installation of reactor coolant pump motors.
10. Installation of emergency containment coolers, control rod drive mechanism coolers and fans.
11. Installation of concrete stop logs, concrete forms, rebar and pouring of new concrete.
12. Preparation for and conducting of hot functional testing.
13. Cleanup activities (removal of scaffolding and support equipment, removal of temporary shielding).

Several on-going activities also performed during this period included: cleanup and decontamination; maintenance of temporary electrical power and lighting services, surveillance of temporary shielding, health physics support and project supervision.

2.0 OCCUPATIONAL RADIATION EXPOSURE

2.1 General

As indicated in Radiological Progress Report No. 1, occupational exposure to radiation may be considered the major radiological impact of the SGRP. The program developed to collect exposure information and provide accurate assessments of tasks performed is discussed in detail in Section 2.1 - 2.3 of Radiological Progress Report No. 1. This program was utilized throughout this reporting period. A description of the thirteen (13) major tasks is indicated in Table 1.

2.2 Description and Format of Exposure Data

Table 2 presents a summary of the occupational radiation exposure expended in person-rem and the labor expended in the radiation field in person-hours through this reporting period (i.e., from project commencement on 10 October 1982 to 30 March 1983).^{*} Also included are the original estimated expenditures. The following comments are provided for clarification and should be considered when reviewing the data presented in Table 2.

- a. Several activities performed during the repair effort which were not described in Table 1 have been appropriately placed into one of the major task categories in Table 2 and accordingly accounted for.
- b. Exposures received by certain pre-identified personnel (e.g., health physics, QC/QA, etc.) performing functions not directly attributable to any one task are listed separately in Item 7.
- c. Information detailing exposures reported for specific activities within a major task is contained in the data base. This information is utilized to "track" exposure for the time period of interest.
- d. Task items indicating no accumulated exposures have not commenced during this reporting period.

A detailed summary of the personnel exposure expended through this reporting period for preparatory, removal, installation and post-installation activities is presented in Tables 3A, 3B, 3C and 3D respectively. This summary includes both the labor and exposure expenditures and the original estimated expenditures. These tables list a more detailed breakdown of specific job activities which have been incorporated into

^{*}Self-reading pocket dosimeter (SRPD) results are used to report person-rem since exposure information is immediately available upon exit from the RCA and accordingly recorded in the computer data base. Since thermoluminescent dosimeters (TLD's) are processed primarily on a monthly basis this information could not be readily incorporated into the exposure expended for each specific activity. Historically, SRPD results are higher than TLD results primarily due to drift (caused by factors such as heat and humidity, and initial charging). Therefore, accumulated dose is reported conservatively.

the appropriate major task descriptions listed in Table 2. Table 4 presents a general summary of both labor and personnel exposure expended for each phase of the repair project with the original estimated expenditures. The following comments are provided for clarification and should be considered when reviewing the data presented in Tables 3A, 3B, 3C, 3D and 4.

- a. Activity status indications are given to allow comparison of actual versus estimated person-rem expenditures.
- b. 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.
- c. For completed activities, it should be noted that a small amount of additional exposure and labor may appear sometime after completion is indicated, as a result of such factors as: field changes to procedures, work involving activity related to support equipment, localized work area cleanup, etc.
- d. Some activities were not estimated in the SGRR and have no estimated labor and exposure values indicated. These activities are controlled by RWP's which have an exposure estimate for the activity for purposes of exposure "tracking".

2.3 Discussion of Exposure Results

A review of the data presented in Table 2 shows that the total occupational radiation exposure recorded for all major tasks is approximately 60% of the original total estimate. Table 2 actual exposures are recorded by computer acquisition as discussed in Progress Report No. 1. Table 2 includes all exposure expended through March 30, 1983 and will continue to be used for accumulation of all personnel exposures through project completion. The exposure expended to date is primarily attributed to repair project preparatory, removal, installation and post-installation activities as indicated in Tables 3A, 3B, 3C, 3D and 4.

As discussed in Progress Report No. 2, Tables 3A and 3B show that the total actual exposure expended for preparatory and removal phase activities was approximately 51% less than the total estimated exposures for those activities.

Table 3C shows that the total occupational exposure accumulated for installation phase activities was approximately 563 person-rem as compared to the original exposure estimate of 644 person-rem. The exposure attributed to steam generator lower assembly installation (approximately 227 person-rem) was greater than the estimate of approximately 200 person-rem (item 2 and 3 of Table 3C). The exposure attributed to welding steam generator divider plates (approximately 59 person-rem) was significantly higher than the estimate of 15 person-rem (item 4 of Table 3C).

Table 3D shows that the total occupational exposure accumulated for post-installation phase activities in progress is approximately 56 person-rem as compared to the original exposure estimate of 141 person-rem.

The information for all phase activities in progress or completed (as shown in Tables 3A, 3B, 3C and 3D) is summarized in Table 4. The total exposure expended during this reporting period was approximately 367 person-rem.

3.0 APPLICATION OF DOSE REDUCTION TECHNIQUES (ALARA PRINCIPLES)

3.1 General

This section discusses the techniques and practices which have been effective in providing dose reductions to personnel during the reporting period. Where available data permits, the following evaluations include a quantitative assessment of the person-rem savings which can be attributed to the techniques used.

3.2 Contamination Control Envelopes and Ventilation

Enclosures for contamination control and a filtered ventilation system were utilized during installation of the steam generator lower assemblies which included divider plate welding. Welding and other operations associated with steam generator lower assembly installation resulted in low-level airborne radioactivity which was effectively controlled with the filtered ventilation system. At times, particularly during divider plate welding, it was necessary to install the filtered exhaust ductwork in the channel head with the work crews to provide adequate ventilation in the work area. Contamination control enclosures were modified as needed to maximize channel head accessibility. These modifications assured positive personnel access control as well as controlling the spread of relatively higher levels of contamination to surrounding areas.

3.3 Installation of Steam Generator Lower Assemblies (SGLAs)

Installation of the new SGLAs was completed during this reporting period. Exposure reduction techniques utilized for SGLA installation were discussed in Radiological Progress Report No. 2.

The exposure expended for installation of the SGLAs was approximately 227 person-rem as compared to the estimate of approximately 200 person-rem (item 2 and 3 of Table 3C). Without the benefit of decontamination and channel head shielding, the exposure would be approximately 5675 person-rem. Thus a conservative exposure savings of approximately 5450 person-rem was realized.

3.4 Welding of Steam Generator Divider Plates

Exposure reduction techniques similar to those techniques utilized during steam generator lower assembly installation (discussed in Radiological Progress Report No. 2) were employed during welding of the steam generator divider plates. These techniques included:

- a. Controlling access/egress to steam generator work platforms from outside the biological shield wall where dose rates are typically ten times less than dose rates inside the shield wall.
- b. Using contamination enclosures on the work platforms to minimize airborne radioactivity and the spread of contamination to adjacent areas.
- c. Utilizing filtered ventilation ducting to exhaust low-level airborne radioactivity from the work area.

- d. Use of channel head shielding whenever practical to reduce exposure rates during welding and repair operations.

The exposure expended for installation of the steam generator divider plates was approximately 59 person-rem as compared to the estimate of approximately 15 person-rem (item 4 of Table 3C). Without the benefit of channel head shielding and decontamination, the exposure expended would be approximately 1500 person-rem. Thus, a conservative savings of approximately 1440 person-rem was realized.

3.5 Reactor Head Preparation for Hot Functional Testing

Hot functional operations were in progress at the close of this reporting period. Certain pre-hot functional and post-hot functional testing activities will have the benefit of shielding. These activities include the following work on the reactor head:

1. Installation and removal of instrument port conoseals.
2. Detensioning and tensioning of the reactor head.
3. Installation and removal of reactor head studs.

A report on the exposure savings realized as a result of reactor head shielding will be discussed in a subsequent report when all activities associated with the hot functional test are completed.

3.6 General Techniques and Practices

In addition to the assessment of dose reduction techniques described above, it is important to note some of the more general techniques and practices employed to maintain adequate control of personnel radiation exposure. These practices include the following:

- a) A comprehensive health physics program which includes an extensive training and radiological surveillance program.
- b) Use of repair project process sheets.
- c) Utilization of "in-containment" low-level radiation waiting areas.
- d) Use of portable area radiation monitors to provide workers on the spot continuous exposure rate information.
- e) Ongoing decontamination and periodic work clean-up program.
- f) Use of continuous air samplers in addition to periodic grab samples.
- g) Controlled access to containment tool cribs and weld rod rooms. A detailed description of these techniques and practices are discussed in Progress Report No. 1.

- h) Use of a cooler system in the Reactor Containment Building (RCB) to improve worker comfort. Although this system was not designed to cool the entire RCB, it significantly improved worker comfort especially on the 58' elevation where a large majority of the work was scheduled.
- i) A communications system used by Health Physics personnel and located in the vicinity of each S/G enclosure to allow direct communication with the Health Physics Shift Supervisor. This system enables the health physics technician to maintain continuous communication with the shift supervisor thereby minimizing delays (and person-rem expended) on the job.
- j) Multi-badging for evaluation of personnel exposure for those tasks performed in relatively complex radiation fields.
- k) Use of temporary lead shielding in high occupancy/traffic areas.
- l) Increased frequency of TLD readouts for purposes of obtaining actual exposure information for personnel working in the S/G channel heads and other relatively high exposure areas.

Quantitative assessments are difficult to develop for these "general" techniques and practices which contribute significantly to the overall ALARA commitment for the repair project. An update on these techniques and practices will be discussed in future reports.

4.0 RADIOACTIVE EFFLUENTS AND SOLID WASTE

4.1 General

Radioactive effluents, comprised of liquid and airborne releases, and low-level solid radioactive waste produced during this reporting period and throughout the repair project to date are summarized in Tables 5 and 6 respectively.

4.2 Liquid Releases

Laundry operations continue to be the major volume of liquid releases for the Unit 4 SGRP. As shown in Table 5 the composition of radioactive isotopes detected remain relatively unchanged from those detected during the previous period. Approximately 40% of the total activity released to date (excluding tritium) was in the form of activated metals (e.g. Co-58, Co-60, Mn-54, Ag-110m). The remaining activity (excluding tritium) included the following radionuclides: Cs-137 (21%), Cs-134 (11%), Cs-136 (0.3%) and radioiodines (28%). The total activity released (excluding tritium) to date is approximately 13% of the activity projected to be released for Unit No. 4 during the repair project (refer to Table 5.2-7 of the SGRR). The amount of tritium which has been released from SGRP activities, remains approximately 25% of the amount that was estimated (Table 5.2-7 of the SGRR).

4.3 Airborne Releases

Airborne releases for this reporting period originated primarily from continuous ventilation of the containment during repair activities. A summary of airborne releases is shown in Table 5. The particulates detected are typical of

radionuclides expected as a result of an extended shutdown. The total activity released to date that is attributed to repair project activities is approximately 18% of the total estimated activity projected to be released.

4.4 Solid Radioactive Waste

A summary of low level radioactive waste (LLW) shipments from Unit 4 during the reporting period is provided in Table 6. The amount 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 both the Barnwell, South Carolina and Richland, Washington Low-Level Waste Disposal Facilities. The majority of the waste volume shipped was compactable and non-compactable dry active waste.

The total volume of solid LLW generated due to repair project activities through this reporting period (excluding the SGLA's) is approximately 25% greater than the total volume estimated in the Gould Affidavit dated June 12, 1981. It should be noted that the volume of waste shipped is less than the accumulated volume of waste generated. This can be primarily attributed to additional volume reduction techniques used prior to shipment, which are not accounted for when initially generated. The total quantity of radioactivity shipped through this reporting period as a result of the Unit 4 SGRP was less than 49% 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 AND OBSERVATIONS

The total exposure expended for installation phase activities was approximately 563 person-rem as compared to the estimate of 644 person-rem. Approximately 51% (286 person-rem) of the total exposure expended during the installation phase was attributed to the installation of the SGLAs.

The exposure expended for post-installation phase activities through this reporting period is approximately 56 person-rem as compared to the estimate of 141 person-rem. As discussed in Section 2.2 of this report, several post-installation activities not originally estimated may result in the total exposure for the post-installation phase exceeding that estimate. The effect of these activities on the total exposure for the post-installation phase will be discussed in the next progress report.

Table 4 shows that the total labor expended to date is approximately 21% above the total labor estimate projected for the Unit 4 SGRP. With clean-up and post-hot functional activities remaining, it is projected that the total actual labor for the Unit 4 SGRP will be approximately 28% above that originally estimated.

The total occupational radiation exposure expended to date is approximately 60% of the original total estimate. With project completion expected in early May, it is projected that the total exposure for the Unit 4 SGRP will be in the range of 1300 to 1400 person-rem. This exposure range is approximately 33% to 38% lower than the original total estimate for the Unit 4 SGRP.

- a) Radioactive liquid effluents released are well within the total estimate projected to be released in Table 5.2-7 of the repair report. The calculated activity (excluding tritium) is approximately 13% while the tritium activity is approximately 25% of the total estimated activity in the SGRR.
- b) Airborne releases of radioactivity attributed to repair project activities are below the estimates provided in the SGRR. The activity associated with airborne releases for the remaining portion of the repair project is not expected to exceed the estimate indicated in the SGRR since the remaining work to be performed as a result of the SGRP includes primarily clean-up and post-hot functional activities.
- c) Solid low level radioactive waste generated to date (excluding the SGLA's) for the Unit No. 4 SGRP is approximately 25% greater than the estimate provided in the Gould Affidavit dated June 12, 1981. Some conservatism is employed in assigning the volume of waste generated to the Unit 4 SGRP even though some of the work was not directly related to the repair project. The total quantity of radioactivity shipped was below the activity estimated in the SGRR.

Progress Report Number 4 will contain information from 30 March, 1983 through project completion (early May, 1983). This final report will also contain a summary for those tasks where the actual person-rem expended was significantly greater than the estimated values. This summary will include a discussion of the lower expended exposure for the Unit 4 SGRP as compared to the Unit 3 SGRP and recommended changes in techniques and methods that should be evaluated to determine their effects on further reducing exposure for steam generator replacement - channel cut method.

TABLE 1
DESCRIPTION OF MAJOR TASKS

| TASK | TASK DESCRIPTION |
|--|---|
| 1. Concrete and structural steel removal and placement. | 1. This task includes all work associated with removal/replacement of concrete and structural steel. Removal items include: Erection of scaffolding to remove piping and electrical components, cut/removal of the concrete shield wall above EL 58' and the floor slab at EL 58', the concrete shield wall below EL 58', and removal of structural steel. Replacement items include: Installation of rebar and cadweld splices, erection of form work and shoring, concrete placement, and installation of structural steel. |
| 2. Construction of pedestal cranes, preparation of polar crane, miscellaneous cribbing platforms, S/G transfer bridge. | 2. This task includes installation/removal of the pedestal crane foundations, assembly and erection of cranes and the polar crane trolley, and disassembly and removal of cranes and the polar crane trolley. |
| 3. Removal, modification and reinstallation of S/G upper assemblies and major piping. | 3. Items included in this task are: Erection/removal of scaffolding from EL 58' to EL 93', removal/installation of insulation and piping, upper assembly girth cut, cutting internal pipe and structural members inside the S/G, upper assembly modifications, and the upper assembly girth weld. |
| 4. Construction of temporary facilities and support services. | 4. The major exposure items in this task are: Routing of welding leads, installation of temporary power for small tools and lighting in the area near the S/G (most will be inside the secondary shield wall between EL 14' and EL 30'6"), and maintenance of temporary power and lighting for the entire outage. |
| 5. General decontamination and disposal of contaminated materials/cleanup. | 5. This task includes general area decontamination of the containment prior to commencement of major work, continuous containment decontamination for the entire outage, and removal and disposal of contaminated material for the entire outage. |

TABLE 1 (continued)
DESCRIPTION OF MAJOR TASKS

| TASK | TASK DESCRIPTION |
|--|--|
| 6. Removal and reinstallation of miscellaneous piping, equipment and insulation. | 6. This task includes removal of insulation from the steam generator and main steam and feedwater piping, installation of insulation on the new steam generators, and removal/installation of miscellaneous items. |
| 7. Non-manuals (e.g., QC, Engineers, HPs). | 7. The non-manual category includes health physics, quality control, and engineering personnel, visitors, and Bechtel personnel required for the entire outage. |
| 8. Decontamination of the channel head. | 8. Included in this task are mechanical grit blast decontamination of the channel head, and installation of inflatable plugs in the reactor coolant piping. |
| 9. Cut channel head and remove old S/G lower assembly. | 9. This task includes installation of tenting and temporary shielding, cutting the transition cone, and channel head, and rigging and removal of the lower assembly to the containment equipment hatch. |
| 10. Weld shield cover on lower assembly; a. At channel head b. At transition end | 10. The only item in this task is welding of steel plates at each end of the steam generator to provide shielding and to prevent leakage. |
| 11. Cut and remove old divider plate, weld new divider plate. | 11. The divider plate was detached from the tubesheet as part of Task 9. Removal and placement of the divider plate to the channel head is included in this task. |
| 12. Install new S/G, weld channel head. | 12. This task includes erection/removal of scaffolding, rigging and moving the new steam generator, installation/removal of hydroplugs, channel head welding and grinding, and removal of the inflatable plugs in the reactor coolant pipes. |
| 13. Placement of steam generator in storage. | 13. This task includes transporting of the S/G from the containment equipment hatch into the storage compound and construction of a roof once the S/G's are in the compound. |

TABLE 2
PERSONNEL EXPOSURE SUMMARY - PER TASK
REPORTING PERIOD 3 FEBRUARY 1983 TO 30 MARCH 1983

TURKEY POINT - UNIT 4

| TASK DESCRIPTION | LABOR EXPENDED IN RADIATION FIELD (PERSON-HOURS) | | PERSONNEL EXPOSURE ^a (PERSON-REM) | |
|--|--|--------|---|--------|
| | ESTIMATED | ACTUAL | ESTIMATED | ACTUAL |
| 1. Concrete and structural steel removal and replacement. | 13,660 | 21,872 | 88 | 69.26 |
| 2. Construction of pedestal cranes, preparation of polar crane, miscellaneous cribbing platforms, and steam generator transfer bridge. | 10,280 | 2,135 | 32 | 4.83 |
| 3. Removal, modification and reinstallation of steam generator upper assemblies and major piping. | 24,600 | 43,100 | 256 | 203.23 |
| 4. Construction of temporary facilities and support services | 19,120 | 30,164 | 215 | 70.41 |
| 5. General decontamination and disposal of contaminated materials/cleanup. | 42,310 | 40,314 | 201 | 167.24 |
| 6. Removal and reinstallation of miscellaneous piping equipment and insulation. | 8,850 | 17,862 | 125 | 97.83 |
| 7. Non-manuals (e.g. QC, Engineers, Health Physics). | 68,540 | 43,199 | 436 | 157.89 |
| 8. Decontamination of the channel head. | 1,840 | 5,554 | 214 | 90.71 |
| 9. Cut channel head and remove old steam generator lower assembly. | 3,240 | 4,916 | 166 | 45.59 |
| 10. Weld shield cover on lower assembly: | | | | |
| a. at channel head | 760 | 1,124 | 40 | 16.39 |
| b. at transition end | 530 | 916 | 53 | 14.82 |

TABLE 2 (continued)PERSONNEL EXPOSURE SUMMARY - PER TASKREPORTING PERIOD 3 FEBRUARY 1983 TO 30 MARCH 1983TURKEY POINT - UNIT 4

| TASK DESCRIPTION | LABOR EXPENDED IN RADIATION FIELD (PERSON-HOURS) | | PERSONNEL EXPOSURE ^a (PERSON-REM) | |
|---|--|---------|---|----------|
| | ESTIMATED | ACTUAL | ESTIMATED | ACTUAL |
| 11. Cut and remove old divider plate, weld new divider plate. | 2,640 | 3,065 | 29 | 62.10 |
| 12. Install new steam generator weld channel head. | 11,000 | 36,881 | 204 | 237.60 |
| 13. Placement of steam generator in storage. | 225 | 200 | 25 | 6.14 |
| TOTAL | 207,595 | 251,302 | 2,084 | 1,244.04 |
| Estimated Range | | | 1730-2480 | |

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

TABLE 3A
SUMMARY OF PREPARATORY ACTIVITY EXPOSURES
REPORTING PERIOD 3 FEBRUARY 1983 TO 30 MARCH 1983
TURKEY POINT - UNIT 4

| ACTIVITY DESCRIPTION | ESTIMATED LABOR (PERSON-HOURS) | ACTUAL LABOR EXPENDED TO DATE (PERSON-HOURS) | ESTIMATED EXPOSURE (PERSON-REM) | ACTUAL EXPOSURE FOR REPORTING PERIOD (PERSON-REM) | ACTUAL EXPOSURE EXPENDED TO-DATE (PERSON-REM) | ACTIVITY STATUS (C-COMplete) (I-IN PROGRESS) |
|---|--------------------------------------|---|---------------------------------------|--|--|---|
| 1. Initial Containment Decontamination. | 4,816 | 3,276 | 45.00 | 0.00 | 18.39 | C |
| 2. Reactor Cavity Decontamination. | 0 | 162 | 0.00 | 0.00 | 1.51 | C |
| 3. Reactor Cavity Liner Plate Inspection. | 0 | 300 | 0.00 | 0.00 | 6.04 | C |
| 4. Install S/G Transfer Bridge. | 960 | 147 | 1.21 | 0.00 | 0.29 | C |
| 5. Remove Emergency Containment Coolers. | 140 | 78 | 1.68 | 0.00 | 0.24 | C |
| 6. Remove CRDM Coolers and Fans. | 67 | 215 | 0.28 | 0.00 | 1.34 | C |
| 7. Rerate Polar Crane and Load Test. | 4,571 | 1,481 | 9.49 | 0.00 | 2.97 | C |
| 8. Disassemble Manipulator Crane and Store. | 0 | 128 | 0.00 | 0.00 | 0.91 | C |
| 9. Install Cherry Pickers. | 2,430 | 266 | 6.06 | 0.00 | 1.35 | C |
| 10. Remove Reactor Coolant Pump Motors. | 0 | 397 | 0.00 | 0.00 | 2.59 | C |

TABLE 3A (Continued)
SUMMARY OF PREPARATORY ACTIVITY EXPOSURES
REPORTING PERIOD 3 FEBRUARY 1983 TO 30 MARCH 1983
TURKEY POINT - UNIT 4

| ACTIVITY DESCRIPTION | ESTIMATED LABOR (PERSON-HOURS) | ACTUAL LABOR EXPENDED TO DATE (PERSON-HOURS) | ESTIMATED EXPOSURE (PERSON-REM) | ACTUAL EXPOSURE FOR REPORTING PERIOD (PERSON-REM) | ACTUAL EXPOSURE EXPENDED TO-DATE (PERSON-REM) | ACTIVITY STATUS; (C-COMplete) (I-IN PROGRESS) |
|---|--------------------------------------|---|---------------------------------------|--|--|--|
| 11. Disconnect/Remove Permanent Electrical Equipment and Cables. | 430 | 304 | 1.93 | 0.00 | 0.79 | C |
| 12. Install Temporary Power, Lighting and Electrical Items. | 1,148 | 4,458 | 49.50 | 0.00 | 18.55 | C |
| 13. Remove Miscellaneous Steel. | 580 | 3,532 | 6.21 | 0.00 | 8.20 | C |
| 14. Install/Maintain S/G Temporary Containments and Ventilation. | 1,008 | 1,013 | 17.63 | 0.00 | 2.92 | C |
| 15. Install Temporary Shielding. | 120 | 1,193 | 2.38 | 0.00 | 11.27 | C |
| 16. Install Scaffolding-all levels. | 1,440 | 5,203 | 3.31 | 0.00 | 34.19 | C |
| 17. Cut and remove concrete 30'6 and 58' Elevation. | 5,334 | 4,173 | 52.30 | 0.00 | 38.91 | C |
| 18. Project non-manual support. | 6,927 | 7,207 | 60.00 | 0.00 | 35.57 | C |
| 19. On-going Decontamination Activities. | 1,204 | 1,092 | 8.19 | 0.00 | 6.13 | C |

TABLE 3A (Continued)
SUMMARY OF PREPARATORY ACTIVITY EXPOSURES
REPORTING PERIOD 3 FEBRUARY 1983 TO 30 MARCH 1983
TURKEY POINT - UNIT 4

| ACTIVITY DESCRIPTION | ESTIMATED LABOR (PERSON-HOURS) | ACTUAL LABOR EXPENDED TO DATE (PERSON-HOURS) | ESTIMATED EXPOSURE (PERSON-REM) | ACTUAL EXPOSURE FOR REPORTING PERIOD (PERSON-REM) | ACTUAL EXPOSURE EXPENDED TO-DATE (PERSON-REM) | ACTIVITY STATUS (C-COMLETE) (I-IN PROGRESS) |
|--|--------------------------------------|---|---------------------------------------|--|--|--|
| 20. Containment Tool and Weld Rod Room Support. | 1,232 | 506 | 7.55 | 0.00 | 0.35 | C |
| 21. Remove/dispose of contaminated materials. | 900 | 3,009 | 7.41 | 0.00 | 18.64 | C |
| 22. Crane operation/maintenance. | 685 | 3,722 | 1.36 | 0.00 | 7.63 | C |
| 23. Miscellaneous Activities. | 1,000 | 7,560 | 1.51 | 0.00 | 11.21 | C |
| Total - Phase I | 34,992 | 49,422 | 283 | 0.00 | 229.99 | |



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TABLE 3B
SUMMARY OF REMOVAL ACTIVITY EXPOSURES
REPORTING PERIOD 3 FEBRUARY 1983 TO 30 MARCH 1983
TURKEY POINT - UNIT 4

| ACTIVITY DESCRIPTION | ESTIMATED LABOR (PERSON-HOURS) | ACTUAL LABOR EXPENDED TO DATE (PERSON-HOURS) | ESTIMATED EXPOSURE (PERSON-REM) | ACTUAL EXPOSURE FOR REPORTING PERIOD (PERSON-REM) | ACTUAL EXPOSURE EXPENDED TO-DATE (PERSON-REM) | ACTIVITY STATUS (C-COMplete) (I-IN PROGRESS) |
|---|--------------------------------------|---|---------------------------------------|--|--|---|
| 1. Remove insulation from A, B, & C S/G's. | 3,500 | 6,721 | 77.00 | 0.00 | 63.64 | C |
| 2. Remove feedwater piping A, B, & C S/G's. | 147 | 2,932 | 1.50 | 0.00 | 10.76 | C |
| 3. Remove main steam piping A, B, & C S/G's. | 125 | 331 | 0.61 | 0.00 | 1.76 | C |
| 4. Remove miscellaneous piping from A, B, & C S/G cubicles. | 1,410 | 1,370 | 17.62 | 0.00 | 18.11 | C |
| 5. Conduct channel head decontamination A, B, & C S/G's. | 1,835 | 5,547 | 214.00 | 0.00 | 90.71 | C |
| 6. Cut A, B, & C S/G upper assemblies. | 630 | 683 | 33.30 | 0.00 | 2.88 | C |
| 7. Lift A, B, & C S/G upper assemblies, invert and place in racks. | 525 | 1,575 | 6.75 | 0.00 | 7.74 | C |
| 8. Cut A, B, & C S/G channel heads. | 714 | 2,115 | 60.24 | 0.00 | 22.33 | C |
| 9. Install tube bundle shield covers A, B, & C S/G's. | 525 | 916 | 53.00 | 0.00 | 14.82 | C |

TABLE 3B (Continued)
SUMMARY OF REMOVAL ACTIVITY EXPOSURES
REPORTING PERIOD 3 FEBRUARY 1983 TO 30 MARCH 1983
TURKEY POINT - UNIT 4

| ACTIVITY DESCRIPTION | ESTIMATED LABOR (PERSON-HOURS) | ACTUAL LABOR EXPENDED TO DATE (PERSON-HOURS) | ESTIMATED EXPOSURE (PERSON-REM) | ACTUAL EXPOSURE FOR REPORTING PERIOD (PERSON-REM) | ACTUAL EXPOSURE EXPENDED TO-DATE (PERSON-REM) | ACTIVITY STATUS; (C-COMplete) (I-IN PROGRESS) |
|---|--------------------------------------|---|---------------------------------------|--|--|--|
| 10. Cut A, B & C S/G divider plates. | 252 | 317 | 3.36 | 0.00 | 3.64 | C |
| 11. Lift A, B & C SGLA, cut and remove seismic rings. | 1,089 | 221 | 77.16 | 0.00 | 3.59 | C |
| 12. Install tube sheet shield covers A, B & C S/G's. | 755 | 1,124 | 40.00 | 0.00 | 16.39 | C |
| 13. Remove A, B & C SGLA's from reactor containment building and place in storage compound. | 225 | 200 | 25.00 | 0.00 | 6.14 | C |
| 14. Maintain temporary power, lighting & electrical items. | 2,100 | 2,793 | 55.00 | 0.00 | 5.93 | C |
| 15. Maintain, erect, and remove scaffolding. | 840 | 7,308 | 8.40 | 0.00 | 31.47 | C |
| 16. On going decontamination activities. | 10,900 | 2,540 | 32.76 | 0.00 | 12.74 | C |
| 17. Remove/dispose of contaminated materials. | 3,600 | 7,617 | 29.62 | 0.00 | 37.65 | C |

TABLE 3B (Continued)
SUMMARY OF REMOVAL ACTIVITY EXPOSURES
REPORTING PERIOD 3 FEBRUARY 1983 TO 30 MARCH 1983
TURKEY POINT - UNIT 4

| ACTIVITY DESCRIPTION | ESTIMATED LABOR (PERSON-HOURS) | ACTUAL LABOR EXPENDED TO DATE (PERSON-HOURS) | ESTIMATED EXPOSURE (PERSON-REM) | ACTUAL EXPOSURE FOR REPORTING PERIOD (PERSON-REM) | ACTUAL EXPOSURE EXPENDED TO-DATE (PERSON-REM) | ACTIVITY STATUS (C-COMPLETE) (I-IN PROGRESS) |
|--|--------------------------------------|---|---------------------------------------|--|--|---|
| 18. Project non-manual support. | 27,725 | 6,410 | 214.72 | 0.00 | 24.58 | C |
| 19. Containment tool and weld rod room support. | 840 | 39 | 2.52 | 0.00 | 0.09 | C |
| 20. Crane operation and maintenance. | 3,015 | 2,334 | 5.44 | 0.00 | 4.05 | C |
| 21. Miscellaneous Activities. | 8,377 | 1,364 | 58.00 | 0.00 | 16.60 | C |
| Total - Phase II | 69,129 | 54,457 | 1,016 | 0.00 | 395.62 | |

TABLE 3C
SUMMARY OF INSTALLATION ACTIVITY EXPOSURES
REPORTING PERIOD 3 FEBRUARY 1983 TO 30 MARCH 1983
TURKEY POINT - UNIT 4

| ACTIVITY DESCRIPTION | ESTIMATED LABOR (PERSON-HOURS) | ACTUAL LABOR EXPENDED TO DATE (PERSON-HOURS) | ESTIMATED EXPOSURE (PERSON-REM) | ACTUAL EXPOSURE FOR REPORTING PERIOD (PERSON-REM) | ACTUAL EXPOSURE EXPENDED TO-DATE (PERSON-REM) | ACTIVITY STATUS (C-COMplete) (I-IN PROGRESS) |
|--|--------------------------------------|---|---------------------------------------|--|--|---|
| 1. Remove S/G upper assembly internals and install/modify A, B and C S/G secondary internal components.. | 11,260 | 6,286 | 93.10 | 0.00 | 14.01 | C |
| 2. Weld preparation of A, B & C S/G channel head remnants. | 840 | 1,757 | 7.71 | 0.00 | 12.69 | C |
| 3. Install/weld A, B & C SGLA's (includes post-weld heat treatment). | 8,696 | 27,143 | 191.64 | 105.80 | 213.77 | C |
| 4. Install/weld A, B & C S/G divider plates. | 1,554 | 2,760 | 15.10 | 58.46 | 58.46 | C |
| 5. Install/weld A, B & C S/G upper assemblies. | 6,280 | 8,432 | 23.82 | 4.68 | 13.60 | C |
| 6. Installation of A, B & C S/G main steam piping. | 1,250 | 996 | 5.50 | 0.80 | 2.28 | C |
| 7. Installation of A, B & C S/G feedwater piping. | 1,680 | 1,013 | 6.80 | 1.23 | 1.89 | C |
| 8. Install insulation A, B & C S/G's. | 3,486 | 2,435 | 29.40 | 4.17 | 4.17 | C |
| 9. Maintain temporary power, lighting and electrical items. | 2,850 | 7,819 | 65.00 | 8.03 | 19.14 | C |

TABLE 3C (Continued)
SUMMARY OF INSTALLATION ACTIVITY EXPOSURES
REPORTING PERIOD 3 FEBRUARY 1983 TO 30 MARCH 1983
TURKEY POINT - UNIT 4

| ACTIVITY DESCRIPTION | ESTIMATED LABOR (PERSON-HOURS) | ACTUAL LABOR EXPENDED TO DATE (PERSON-HOURS) | ESTIMATED EXPOSURE (PERSON-REM) | ACTUAL EXPOSURE FOR REPORTING PERIOD (PERSON-REM) | ACTUAL EXPOSURE EXPENDED TO-DATE (PERSON-REM) | ACTIVITY STATUS (C-COMPLETE) (I-IN PROGRESS) |
|--|--------------------------------------|---|---------------------------------------|--|--|---|
| 10. Maintain/erect/remove scaffolding. | 2,840 | 17,625 | 20.67 | 35.16 | 58.58 | C |
| 11. On-going decontamination activities. | 10,920 | 5,096 | 32.76 | 7.36 | 14.41 | C |
| 12. Remove/dispose of contaminated materials. | 3,600 | 14,931 | 29.62 | 33.54 | 54.16 | C |
| 13. Project non-manual support. | 14,460 | 25,448 | 86.27 | 44.40 | 74.37 | C |
| 14. Containment Tool & Weld rod room support. | 840 | 458 | 2.52 | 0.49 | 0.84 | C |
| 15. Crane operation/maintenance. | 2,740 | 5,296 | 5.43 | 2.33 | 4.11 | C |
| 16. Miscellaneous activities. | 8,704 | 5,044 | 28.66 | 4.67 | 16.12 | C |
| Total Phase III | 82,000 | 132,539 | 644 | 311.12 | 562.60 | |