STEAM GENERATOR REPAIR PROGRAM

FOR

TURKEY POINT UNIT 3

RADIOLOGICAL PROGRESS REPORT - NO. 2

FOR THE PERIOD

AUGUST 23, 1981 THROUGH NOVEMBER 3, 1981

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FLORIDA POWER AND LIGHT COMPANY

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TABLES

1.0 INTRODUCTION

Radiological Progress Report No. 2 contains information pertaining to the radiological aspects of the Unit 3 Steam Generator Repair Program (SGRP) for the period August 23 through November 3. 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. Cutting and removal of concrete shield wall segments.

2. Installation of channel head contamination control envelopes and absolute filter ventilation system.

3. Removal of steam generator cubicle piping and miscellaneous items.

4. Removal of main steam and feedwater piping.

5. Cutting and removal of steam generator upper assemblies.

6. Upending of S/G upper assemblies, placement in rack and removal of secondary side internals.

7. Installation of steam generator lower assembly tube bundle shield covers.

8. Channel head decontamination (Alumina Grit-Blast method).

9. Cutting steam generator lower assembly channel heads and divider plates.

10. Rigging steam generator lower assemblies and installing tube sheet shield covers.

11. Removal of steam generator lower assemblies from reactor containment building and placement in temporary storage.

12. Filling steam generator lower assemblies with distilled (DI) water during temporary storage.

13. Preparation of channel head remnant for welding new steam generator lower assemblies.

14. Completing preparation of new steam generator lower assemblies outside reactor containment building.

15. Rigging new S/G lower assemblies into reactor containment building.

16. Construction on steam generator storage compound.

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

2.0 OCCUPATIONAL RADIATION EXPOSURES

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. I. 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 24 June 1981 to 3 November 1981).* 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.

*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, the accumulated dose reported may be considered as conservative.

A detailed summary of the personnel exposure expended through this reporting period for preparatory and removal activities are presented in Tables 3A and 3B 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 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 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 small amounts 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.

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 43% 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 November 3, 1981 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 and installation activities as indicated in Tables 3A, 3B and 4.

Tables 3A and 3B show that the total occupational exposure accumulated for completed activities to date is approximately 248 and 522 person-rem respectively as compared to their respective original exposure estimates of 283 and 991 person-rem respectively (completed activities only). This indicates that the total actual exposure expended for completed activities shown in Tables 3A and 3B is approximately 40% less than the total estimated exposures for those activities.

The information for all phase activities in progress or completed (as shown in Tables 3A and 3B) are summarized in Table 4. Installation activities in progress during this reporting period attributed to approximately 111 person-rem accumulated. Detailed exposure information for installation and miscellaneous phase activities will be presented in subsequent reports.

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 Temporary Shielding

The use of temporary shielding and the exposure reductions expected through its application have been described in Progress Report No. 1. As of this reporting period the dose accumulated related to the installation of temporary shielding is approximately 31 person-rem (See table 3A,item 11). As indicated in Progress Report No. 1, the original exposure estimate was approximately 2.6 person-rem. This increase is primarily attributed to the additional shielding of high occupancy/traffic areas beyond the original expected, which should result in a significant reduction in exposure to personnel performing various activities due to the lower general area radiation fields. Such high occupancy/traffic areas where shielding was installed include the following:

a. 58' Elevation

1. West end of refueling cavity opposite B S/G.

2. Pressurizer Mini-spray lines outside pressurizer cubicle.

b. 14' Elevation

1. Let-down valve station outside biological shield wall.

2. Refueling cavity drain valves - outside biological shield wall.

3. Regenerative Heat Exchanger - inside biological shield wall.

4. A, B & C RTD Loop Bypass lines - inside biological shield wall.

A small amount of this exposure expended is attributed to daily surveillance checks of temporary shielding areas to verify that the temporary shielding is still in place and that exposure rates in the area have not significantly changed.

Temporary shielding was also installed in A, B & C Channel head remnants after channel head decontamination and lower assembly removal. General area dose rates in the channel head remnants were reduced from levels of .8 - 1.5 R/HR to .05 - .1 R/HR. The shielding designed included the capability of removing the shielding through the S/G manways after channel head welding and interior repair work is completed. The exposure expended for this activity is included in exposure totals for decontamination of the channel head (See table 3B,item 11). Information pertaining to the exposure savings realized due to this shielding effort will be discussed in a future report.

3.3 Steam Generator (S/G) Water Level

Those repair project activities benefiting from the effect of maintaining a high water level in the S/G secondary included:

a) Installation of scaffolding in preparation of insulation removal.

b) Removal of insulation on shell assembly between 30'6 and 58' elevation.

c) Removal of steam generator instrumentation lines.

d) Removal of reactor coolant pump motors.

e) Concrete cutting and removal in S/G cubicles and in upper girth cut area.

f) Layouts of upper and lower shell girthcuts and setting up of equipment.

g) Installation of contamination control envelopes at channel head girth cut area.

h) Preparation and removal of S/G upper assembly.

i) Removal of S/G piping (blowdown lines, tubesheet drain lines, etc.).

j) Installation of tube bundle shield cover.

The doses expended for the above completed tasks were approximately 165 person-rem. Without the benefit of secondary side watershielding the exposure expended would have been in the approximate range of 600 to 825 person-rem. Thus a conservative exposure savings of approximately 435 person-rem was realized.

As discussed in Progress Report No. 1, it was necessary to place the steam generator lower assemblies (SGLA's) in temporary storage until the permanent storage compound is completed. The secondary side was filled with demineralized (DI) water to reduce dose rates in the temporary SGLA storage area. This addition of water has proved effective in:

a) Reducing dose rates in the general area of the SGLA's (e.g. lowering dose rates from 4 mR/hr @ 60 feet to approximately 1 mR/hr @ 60 feet).

b) Reducing the posting boundary of temporary radiation areas outside the radiation controlled area.

This water will be sampled for radioactivity and appropriate precautions taken prior to draining the SGLA's and placing them in the permanent storage compound.

3.4 Concrete Cutting Operations

The use of water-cooled concrete cutting tools resulted in no significant airborne radioactivity (typically less than 8×10^{-10} µCi/cc). The runoff water generated by this activity was sampled prior to and during discharge. Sample results indicated that the water contained a small amount of radioactivity. Approximately 1.3×10^{-4}Ci was discharged. This quantity is included with the data presented in Table 5 under liquid effluent releases. As shown in table 3A, item 13, the total exposure expended for concrete removal activities was approximately 46 person-rem, which is significantly lower than the estimate of 58 person-rem. In general, the concrete sections removed were decontaminated to levels less than 1000 dpm/100cm^2. Most of the concrete sections removed will be reinstalled at a later date.

3.5 Contamination Control Envelopes and Ventilation

The use of contamination control envelopes and filtered ventilation system proved effective during S/G channel head cutting operations. Plasma-arc cutting operations of the divider plate and channel head, and weld preparation activities resulted in low level airborne radioactivity levels in the enclosures. Typically airborne concentrations in the 10^{-8} µCi/cc range were detected and confined to the enclosures. Personnel working in the enclosures were wearing appropriate respiratory protection devices and protective clothing during those operations. No significant airborne activity was detected outside the S/G enclosures that required either local evacuation and posting of the adjacent area or the use of respiratory protection devices. It is expected that the enclosures will adequately contain airborne radioactivity throughout the weld preparation and initial welding of the new S/G lower assemblies . All ventilated air is exhausted from the S/G enclosure filtered ventilation system through the containment ventilation exhaust system via the plant stack which is continuously monitored during discharge. A contamination control enclosure was also installed for welding operations in the S/G channel heads and is discussed in Section 3.8.

Contamination containments were also utilized for various items and components removed from the reactor containment building and placed in temporary storage. Several large containment enclosures were constructed and utilized for the overhaul of large components such as reactor coolant pump motors, manipulator crane motor and control rod drive cooler motors and fans. These containments require very little assembly/disassembly time and provide adequate control for work performed on items with low levels of contamination (generally less than 5000 dpm/100cm^2).

3.6 Decontamination of S/G Channel Heads

S/G channel head decontamination (Alumina-grit blast method) was also completed during this reporting period. As shown in table 3B, item 11, the personnel exposure expended for this effort was approximately 155 person-rem. The exposure estimated for this task was 214 person-rem. The equipment used was designed to minimize occupancy times in high exposure areas by allowing extensive remote operation. The temporary manway cover was constructed with quick-disconnect hoses and electrical connections to minimize working time at the manway.

To determine how many grit-blast passes over the channel head surfaces would be necessary (excluding tubesheet), TLD measurements were made on channel head surfaces prior to and after the first grit-blast sequence. Initial data indicated that the first pass achieved high surface decontamination factors (i.e., on the order of 80-100). Based on these results it was determined that two grit blast passes would be made in each channel head.

With the removal of the steam generator lower assembly, the major contributing source of exposure in the S/G channel remnant were the inlet and outlet nozzle and manway openings. The inlet and outlet nozzles were shield plugged resulting in dose rates in the channel remnant of approximately 400 mR/HR general area center of the channel head. Considering the tubesheet as a plane source reading 18 R/HR within 6 inches from contact, the dose rate approximately 4 feet from the tubesheet would be approximately 6 R/HR. However, dose rate measurements in the channel head center were approximately 12 R/HR. This indicates that a dose rate of 6 R/HR would be expected in the channel head remnant with the lower assembly (tubesheet) removed and no decontamination performed. Since the general area dose rates after decontamination and nozzle shielding indicated 400 mR/hr an effective dose reduction factor of approximately 15 was obtained.

The following activities have benefited from the decontamination of the channel head:

a. Removal of inflatable nozzle seals.

b. Installation of shielded nozzle seals.

c. Installation of special channel bowl shielding.

d. Marking and cutting of divider plate.

e. Inspection of loops and nozzle seal area.

The exposure expended for these activities to date is approximately 40 person-rem. The actual overall exposure savings realized to date as a result of channel head decontamination and shielding is approximately 185 person-rem. The following tasks are yet to be completed and are also expected to have the benefit of channel head decontamination and shielding:

a. Weld preparation of channel head remnants.

b. Welding channel head and divider plate.

c. Channel head Q.C. inspections.

d. Miscellaneous clean-up and closeout activities.

Assessment of the exposure savings attributed to channel head decontamination and shielding will be made in subsequent reports after all activities associated with this effort are completed.

3.7 Flame and Machine Cutting Operations

The steam generator upper assemblies were cut using a flame technique. This method was extremely fast and efficient and produced no significant airborne radioactivity. The exposure estimate for performing the steam generator upper assembly girth cuts, weld preparation of the cut and removing the upper assembly internals was approximately 126 person-rem (See table 3B, item 3). The actual exposure expended was approximately 60 person-rem. Channel head cuts on "B" and "C" S/G's were performed using plasma-arc cutting equipment. S/G "A" was machine-cut. All three S/G divider plates were plasma-arc cut. The exposures expended for channel head and divider plate cuts on "A" "B" and "C" S/G's were approximately 24, 8 and 17 respectively. Machine cut time on "A" S/G was approximately 6 days versus a flame-cut time of one day each for "B" and "C" S/G. Since the effect of performing a machine cut versus flame-cut may affect the exposure expended for weld preparation and weld build-up, an assessment of exposure expended for machine cut versus flame cut will be discussed in a future report. Generally, airborne radioactivity levels detected in the enclosure during channel head flame cutting operations were in the 10^{-8} µCi/cc range. Levels detected during machine cutting were generally less than 10^{-9} µCi/cc.

3.8 Weld Preparation of S/G Channel Head Remnants

Weld preparation of the S/G channel head remnants and divider plates and welding of the new S/G lower assembly channel head commenced late in this report period. To minimize exposure during machine weld preparation of the channel head, a remotely operated machining tool is utilized as much as practical. Once the new steam generator lower assemblies were fit to the channel head remnant, access to continue prepping and welding was directed to the S/G manways. To minimize personnel exposures on the S/G platforms, access/egress to the S/G work platforms is controlled from outside the biological shield wall where dose rates are typically ten times less than dose rates inside the shield wall.

A contamination enclosure was installed at the S/G manways to minimize airborne radioactivity in the vicinity of the platform and confine the spread of contamination during weld preparation and welding. Access/egress to the channel head is conducted through the coldleg S/G manway with an absolute filtered ventilation blower exhausting from the hotleg manway. This is made possible since a section of the divider plate was removed to support stress relieving and weld operations thus permitting access to the entire channel head. Those hoses and leads required are directed through the manway ventilation attachment. This serves to keep the cold leg manway free of the hoses and leads which would impede access/egress to and from the channel head area. Since the welding of the channel head and divider plate require preheating, temperatures in the channel head are generally greater than 100°F. To provide some relief, ventilation duct work with cool air has been directed to the enclosure at the cold leg manway opening allowing the cool air to be drawn into the channel head work area. The air is then exhausted through the S/G filtered ventilation system and containment ventilation exhaust system. As stated earlier the normal containment ventilation exhaust system is continuously monitored during discharge.

A summary of the exposures expended for weld preparation and welding of the channel head and divider plates will be discussed in future reports.

3.9 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) Use of in-containment tool cribs and weld rod rooms. A detailed description of these techniques and practices are discussed in Progress Report No. 1.

In addition to the techniques and practices discussed above the following techniques were employed during this reporting period:

h. Installation of a cooler system in Reactor Containment Building (RCB) to improve worker comfort. Although this system was not designed to cool the entire RCB, it should significantly improve worker comfort especially on the 58' elevation where a large majority of the work is scheduled.

i. A communications system strictly for health physics use was installed 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.

Experience has shown that the practices and techniques discussed in this section have contributed significantly to an effective overall dose reduction (ALARA) program for the repair project. Updates will be discussed in future reports.

4.0 RADIOACTIVE EFFLUENTS AND SOLID WASTE

4.1 General

Radioactive effluents, compromised 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 source of liquid releases for the Unit 3 repair project . As shown in Table 5 the composition of radioactive isotopes detected remain relatively unchanged from those detected during the previous period. Approximately 71% of the total activity released to date was in the form of relatively long-lived corrosion products. The remaining contributions were Cs-137 approximately 19% and Cs-134 approximately 10%. The total activity released to date is approximately 3% of the total estimated activity to be released during the repair project on Unit 3.

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. As indicated in progress Report No. 1 the particulates detected were typical of radionuclides expected as a result of an extended shutdown. The total activity released through this reporting period is less than 3% of the total estimated activity projected to be released.

4.4 Solid Radioactive Waste

A summary of solid low-level radioactive waste generated from Unit 3 steam generator repair activities during this reporting period is provided in Table 6. Also included in Table 6 is a summary of the solid low-level radioactive waste shipped to date. The low-level waste shipments during this reporting period were made to both the Barnwell, South Carolina and Richland, Washington Low-Level Waste Disposal Facilities. The total volume of solid low-level radioactive waste generated due to repair project activities through this reporting period (excluding the steam generator lower assemblies) is approximately 54% of the volume estimated in the Gould Affidavit dated June 12, 1981. It should be noted that the final volume of waste shipped may be 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.

Table 6 of Radiological Progress Report No. I for the Steam Generator Repair Program of Turkey Point Unit 3 contains an error. The entry identified as "Non-Compacted Dry Active Waste" shipped to Barnwell, S.C. in a steel liner on 8/11/81 should have been 150 cu-ft. rather than 200 cu-ft. Therefore, the total low-level waste shipped during the reporting period (June 24, 1981 - August 22, 1981) was 3,945 cu-ft. There is no change to the estimated amount of activity that was shipped during that period.

5.0 CONCLUSIONS AND OBSERVATIONS

The following general conclusions and observations are based upon information contained in this report:

a) For activities completed to date, the actual exposure expended is significantly lower than the original estimated exposure (i.e., 770 versus 1274 person-rem respectively). With the removal phase activities approximately 95% completed, the actual exposure for completed removal activities is approximately 47% less than the estimated exposures. With the completion of removal activities, most of the relatively higher exposure activities will be completed. It is not unreasonable to project that this should lower the actual exposure totals for the entire project by 10 to 20%. Updates on this projected exposure trend will be discussed in subsequent reports.

b. Radioactive effluents continue to remain within the total release estimate presented in Table 5.2-7 of the repair report. The calculated activity is less than 3% of the estimated total activity in the Steam Generator Repair Report (SGRR).

c. Airborne releases of radioactivity remain below the estimate indicated in the SGRR. No radioiodine or gaseous activity was detected. Airborne activity discharged throughout the Unit 3 repair project is not expected to exceed the estimate indicated in the SGRR.

d. Solid low-level radioactive waste generated to date (excluding the steam generator lower assemblies) represents approximately 54% of the estimate provided in the Gould Affidavit dated June 12, 1981.

Progress Report Number 3 will contain information from November 4, 1981 through December 30, 1981.

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 asembly 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 24 JUNE 1981 TO 3 NOVEMBER 1981

TURKEY POINT - UNIT 3

	TASK DESCRIPTION	LABOR EXPENDED IN RADIATION FIELD (PERSON HOURS) ESTIMATED	ACTUAL	PERSONNEL EXPOSURE[a] (PERSON-REM) ESTIMATED	ACTUAL
1.	Concrete and structural steel removal and replacement.	13,660	5,615	88	52.53
2.	Construction of pedestal cranes, preparation of polar crane, miscellaneous cribbing platforms, and steam generator transfer bridge.	10,280	9,314	32	30.38
3.	Removal, modification and reinstallation of steam generator upper assemblies and major piping.	24,600	32,684	256	155.55
4.	Construction of temporary facilities and support services	19,120	5,163	215	19.42
5.	General decontamination and disposal of contaminated materials/cleanup.	42,310	6,417	201	67.99
6.	Removal and reinstallation of miscellaneous piping equipment and insulation.	8,850	11,436	125	92.08
7.	Non-manuals (e.g. QC, Engineers, Health Physics).	68,540	12,734	436	94.66
8.	Decontamination of the channel head.	1,840	6,503	214	155.12
9.	Cut channel head and remove old steam generator lower assembly.	3,240	6,601	166	91.56
10.	Weld shield cover on lower assembly:				
	a. at channel head	760	526	40	10.10
	b. at transition end	530	978	53	16.49

TABLE 2 (continued)

PERSONNEL EXPOSURE SUMMARY - PER TASK

REPORTING PERIOD 24 JUNE 1981 TO 3 NOVEMBER 1981

TURKEY POINT - UNIT 3

	TASK DESCRIPTION	LABOR EXPENDED IN RADIATION FIELD (PERSON HOURS) ESTIMATED	ACTUAL	PERSONNEL EXPOSURE[a] (PERSON-REM) ESTIMATED	ACTUAL
11.	Cut and remove old divider plate, weld new divider plate.	2,640	598	29	22.01
12.	Install new steam generator weld channel head.	11,000	4,770	204	73.25
13	Placement of steam generator in storage.	225	166	25	17.71
	TOTAL	182,800	103,505	2,084	898.85
	Estimated Range			1730-2480	

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

TABLE 3A
SUMMARY OF PREPARATORY ACTIVITY EXPOSURES
REPORTING PERIOD 23 AUGUST 1981 TO 3 NOVEMBER 1981
TURKEY POINT - UNIT 3

	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	6,020	2,108	45.00	0.0	27.07	C
2.	Reactor Cavity Decontamination and Inspection	0	373	0	0.0	5.58	C
3.	Install Steam Generator Transfer Bridge	960	1,473	1.21	1.06	7.80	C
4.	Remove Emergency Containment Coolers, Control Rod Drive Mechanism Coolers and Fans, Manipulator Crane, and Rerate Polar Crane and Load Test	6,860	5,157	11.83	1.79	7.80	C
5.	Install Cherry Pickers	2,430	2,990	7.15	1.31	17.88	C
6.	Remove Reactor Coolant Pump Motors	0	386	0	0.52	2.43	C
7.	Disconnect/ Remove Permanent Electrical Equipment and Cables	430	281	3.31	0.17	2.50	C
8.	Install Temporary Power, Lighting and Electrical Cables	1,148	2,962	49.48	7.07	11.68	C
9.	Remove Miscellaneous Steel	580	1,702	1.25	4.81	7.05	C
10.	Install Temporary Containments and/or Ventilation Systems	245	1,740	4.29	7.53	12.62	C

TABLE 3A (Continued)
SUMMARY OF PREPARATORY ACTIVITY EXPOSURES
REPORTING PERIOD 23 AUGUST 1981 TO 3 NOVEMBER 1981
TURKEY POINT UNIT 3

	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.	Install Temporary Shielding	120	1,388	2.58	22.68	31.05	C
12.	Install Scaffolding All Levels	1,440	1,895	13.27	0.33	9.95	C
13.	Cut and Remove Concrete	5,334	3,913	58.00	12.12	45.49	C
14.	Miscellaneous Activities	9,425	5,419	85.63	40.19	59.04	C
	SUBTOTAL - PHASE I (All Tasks Completed)	34,992	31,787	283.00	99.58	247.94	C

TABLE 3B
SUMMARY OF REMOVAL ACTIVITY EXPOSURES
REPORTING PERIOD 23 AUGUST 1981 TO 3 NOVEMBER 1981
TURKEY POINT - UNIT 3

	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 steam generator	3,850	7,669	77.00	6.01	70.80	C
2.	Remove Feedwater Piping A, B & C steam generator	147	2,473	1.50	9.45	9.95	C
3.	Cut A, B & C S/G Upper Assembly (U.A.) and remove and modify U.A. internals	6,318	13,379	126.40	60.02	60.02	C
4.	Install tube bundle shield covers A, B & C S/G	530	978	53.00	16.49	16.49	C
5.	Cut divider plate & channel head A, B & C S/G - Rig to 58' elevation	1,722	5,083	97.14	72.07	72.07	C
6.	Rig/lift A, B & C S/G Lower Assembly (L.A.) to cut/remove seismic ring	84	142	6.60	0.72	0.72	C
7.	Install tube sheet shield cover A, B & C S/G	760	527	40.00	10.10	10.10	C
8.	Lift A, B & C S/G U.A., invert and place in rack	525	2,143	6.75	11.79	11.79	C
9.	Remove main steam piping A, B & C S/G	126	499	0.61	1.15	2.84	C
10.	Install laydown cribbing for A, B & C S/G 58' elevation	252	195	2.65	0.49	0.49	C

TABLE 3B (Continued)
SUMMARY OF REMOVAL ACTIVITY EXPOSURES
REPORTING PERIOD 23 AUGUST 1981 TO 3 NOVEMBER 1981
TURKEY POINT - UNIT 3

	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.	Conduct channel head decontamination A, B & C S/G	1,840	6,503	214.00	148.81	155.12	C
12.	Remove miscellaneous piping from A, B & C S/G cubicles	1,410	6,050	17.62	17.28	29.79	C
13.	Remove A. B & C S/G L.A. from RCB and transfer to storage compound	225	166	25.00	17.71	17.71	I
14.	Maintain temporary power, lighting and electrical cables	2,100	1,578	55.00	4.70	4.70	C
15.	Maintain/erect/remove scaffolding	840	5,686	8.40	29.85	29.85	C
16.	Ongoing decon activities/remove and dispose contaminated materials	14,500	2,914	62.40	16.57	16.57	C
17.	Miscellaneous Activities	33,800	5,103	221.93	31.00	31.00	C
PHASE ACTIVITY TOTALS		69,129	61,088	1016.00	454.20	539.98	
	TOTAL - PHASE II (Completed Tasks Only)	68,904	60,922	991.00	436.49	522.27	

TABLE 4
PERSONNEL EXPOSURE SUMMARY PER PHASE
REPORTING PERIOD 23 AUGUST 1981 TO 3 NOVEMBER 1981
TURKEY POINT - UNIT 3

PHASE DESCRIPTION	ESTIMATED LABOR EXPENDED TO-DATE (PERSON-HOURS)	ACTUAL LABOR EXPENDED TO-DATE (PERSON-HOURS)	TOTAL ESTIMATED EXPOSURE (PERSON-REM)	ESTIMATED EXPOSURE EXPENDED TO-DATE (PERSON-REM)	ACTUAL EXPOSURE FOR REPORTING PERIOD (PERSON-REM)	ACTUAL EXPOSURE EXPENDED TO-DATE (PERSON-REM)	PHASE STATUS (C-COMPLETE) (I-IN PROGRESS) (NS-NOT STARTED)
Preparation	34,992	31,787	283	283	99.58	247.94	C
Removal	69,129	61,088	1,016	1,016	454.20	539.98	I
Installation	49,000	10,630	644	458	110.93	110.93	I
Miscellaneous[a]	0	0	141	0	0	0	NS
Project totals	153,121	103,505	2,084	1,757	664.71	898.85	NA
(Completed Phases Only)	34,992	31,787	283	283	99.58	247.94	NA

[a]Miscellaneous - includes cleanup, storage and miscellaneous preparations prior to start-up.

[b]NA - not applicable at this time.

TABLE 5
SUMMARY OF RADIOACTIVE EFFLUENT RELEASES
REPORTING PERIOD 23 AUGUST 1981 TO 3 NOVEMBER 1981
TURKEY POINT - UNIT 3

1981

I. LIQUID EFFLUENT RELEASES	RADIOACTIVITY RELEASED IN LIQUID EFFLUENTS, (CURIES)					
ISOTOPE	AUGUST 8/19-9/1	SEPTEMBER 9/2-9/30	OCTOBER 10/1-10/28	NOVEMBER 10/29-11/4	TOTAL ACTIVITY RELEASED THIS REPORTING PERIOD	TOTAL RELEASED DURING S/G REPAIR TO DATE
Co-58	9.07E-05	1.80E-04	1.39E-03	1.29E-03	2.95E-03	3.68E-03
Co-60	4.66E-04	1.00E-03	1.39E-03	5.78E-04	3.43E-03	5.04E-03
Cs-134	3.86E-04	1.17E-04	3.20E-04	1.29E-04	9.52E-04	1.34E-03
Cs-137	5.26E-04	2.60E-04	4.64E-04	1.70E-04	1.42E-03	2.38E-03
Fe-59	*	*	*	*	*	4.47E-05
Mn-54	8.20E-06	1.30E-05	6.32E-05	4.08E-05	1.25E-04	2.27E-04
Zn-65	*	*	*	*	*	*
I-131	*	*	*	*	*	*
Nb-95	8.71E-06	*	*	2.72E-05	3.59E-05	6.67E-05
Sb-124	*	*	*	2.58E-05	2.58E-05	1.22E-04
Sb-125	*	*	*	*	*	1.29E-05
TOTAL	1.49E-03	1.57E-03	3.63E-03	2.26E-03	8.95E-03	1.29E-02
Liquid Effluent Volume Released (Liters)	3.72E+05	1.22E+06	1.25E+06	3.40E+05	VOLUME RELEASED THIS REPORTING PERIOD 3.18E+06	VOLUME RELEASED DURING S/G REPAIR TO DATE 4.59E+06

*Not detectable

TABLE 5 (Continued)
SUMMARY OF RADIOACTIVE EFFLUENT RELEASES
REPORTING PERIOD 23 AUGUST 1981 TO 3 NOVEMBER 1981
TURKEY POINT - UNIT 3

1981

I. AIRBORNE RELEASES	RADIOACTIVITY RELEASED IN AIRBORNE EFFLUENTS (CURIES)					
A. NOBLE GASES ISOTOPE	AUGUST 8/19-9/1	SEPTEMBER 9/2-9/30	OCTOBER 10/1-10/28	NOVEMBER 10/29-11/4	TOTAL ACTIVITY RELEASED THIS REPORTING PERIOD	TOTAL RELEASED DURING S/G REPAIR TO DATE
Kr-87	*	*	*	*	*	*
Kr-88	*	*	*	*	*	*
Xe-133	*	*	*	*	*	*
Xe-133m	*	*	*	*	*	*
Xe-135	*	*	*	*	*	*
Xe-138	*	*	*	*	*	*
TOTAL	*	*	*	*	*	*
B. HALOGENS						
I-131	*	*	*	*	*	*
I-133	*	*	*	*	*	*
TOTAL	*	*	*	*	*	*

*Not Detectable

TABLE 5 (Continued)
SUMMARY OF RADIOACTIVE EFFLUENT RELEASES
REPORTING PERIOD 23 AUGUST 1981 TO 3 NOVEMBER 1981
TURKEY POINT - UNIT 3

1981

I. AIRBORNE RELEASES	RADIOACTIVITY RELEASED IN AIRBORNE EFFLUENTS (CURIES)					
C. PARTICULATES ISOTOPE	AUGUST 8/19-9/1	SEPTEMBER 9/2-9/30	OCTOBER 10/1-10/28	NOVEMBER 10/29-11/4	TOTAL ACTIVITY RELEASED THIS REPORTING PERIOD	TOTAL RELEASED DURING S/G REPAIR TO DATE
Ce-141	*	*	*	*	*	*
Ce-144	*	*	*	*	*	*
Co-58	*	7.0E-06	7.4E-07	5.4E-07	8.28E-06	1.06E-05
Co-60	1.6E-06	1.6E-05	2.4E-06	2.6E-06	2.26E-05	3.61E-05
CS-134	2.3E-08	2.0E-07	1.1E-07	7.5E-08	4.08E-07	6.68E-07
Cs-137	8.8E-08	3.4E-07	4.4E-07	2.6E-07	1.13E-06	4.33E-06
Fe-59	*	*	*	*	*	*
Mn-54	*	5.3E-08	*	*	5.3E-08	1.83E-07
Zn-65	*	*	*	*	*	*
Nb-95	*	*	*	2.1E-08	2.1E-08	2.1E-08
TOTAL	1.71E-06	2.36E-05	3.69E-06	3.50E-06	3.25E-05	5.19E-05

*Not Detectable

TABLE 6

SUMMARY OF SOLID LOW-LEVEL RADIOACTIVE WASTE

REPORTING PERIOD 23 AUGUST 1981 TO 3 NOVEMBER 1981

TURKEY POINT - UNIT 3

I. SOLID LOW-LEVEL RADIOACTIVE WASTE GENERATED FROM U-3 S/G REPAIR

WASTE FORM	VOLUME LLW[a] IN CU-FT FOR REPORTING PERIOD	VOLUME LLW IN CU-FT TO DATE
Compacted Dry Active Waste	2,730	4,935
Non-Compacted Dry Active Waste	2,700	3,355
Resin and Filter Media	595	595
Channel Head Decontamination Waste	632.5	632.5
Miscellaneous	250	2,575
Totals	6,907.5	12,092.5

II. SOLID LOW-LEVEL REPAIR ACTIVITY WASTE SHIPPED

REPORTING PERIOD DATES	VOLUME LLW[a] SHIPPED IN CU-FT	ESTIMATED ACTIVITY[b] CURIES
24 June 81 - 22 August 81	3,945	1.48
23 August 81 - 3 November 81	6,700	22.62
Totals	10,645	24.10

[a] LLW Low-level (radioactive) waste.

[b] Predominant isotopes ^{137}Cs, ^{60}Co, ^{58}Co.