

STEAM GENERATOR REPAIR PROGRAM

FOR

TURKEY POINT UNIT 3

RADIOLOGICAL PROGRESS REPORT - NO. 3

FOR THE PERIOD

NOVEMBER 4, 1981 THROUGH DECEMBER 30, 1981

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FLORIDA POWER AND LIGHT COMPANY

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1.0 INTRODUCTION

Radiological Progress Report No. 3 contains information pertaining to the radiological aspects of the Unit 3 Steam Generator Repair Program (SGRP) for the period November 4 through December 30. 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. Completion of steam generator (S/G) storage compound.
2. Draining of S/G lower assemblies and placement of S/G lower assemblies in S/G storage compound.
3. Welding and closure of S/G lower assembly vent and drain fittings.
4. Removal of S/G transfer bridge.
5. Installation of S/G upper assemblies (includes upper girth weld, placement of secondary side internals, and stress relieving operations).
6. Installation of S/G lower assemblies (includes such operations as lower girth weld, channel head welding, and stress relieving).
7. Installation of main steam and feedwater piping.
8. Installation of concrete stop-logs, concrete forms, rebar and preparation for placement of new concrete.
9. Preparation of S/G divider plates for welding.
10. Preparation and installation of miscellaneous piping in S/G cubicles.

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 EXPOSURE

2.1 General

As indicated in previous progress reports, 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 30 December 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.

A detailed summary of the personnel exposure expended through this reporting period for preparatory, removal and installation activities are presented in Tables 3A, 3B and 3C 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, 3C and 4.

^{*}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.



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- 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 70% of the original total estimate. These exposures are recorded by computer acquisition as discussed in Progress Report No. 1. Table 2 includes all exposure expended through December 30, 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 removal and installation activities as indicated in Tables 3B and 3C.

Tables 3A and 3B show that the total occupational exposure accumulated for completed activities to date is approximately 248 and 552 person-rem respectively as compared to their respective original exposure estimates of 283 and 1,016 person-rem respectively. This indicates that the total actual exposure expended for the completed activities shown in Tables 3A and 3B was approximately 40% less than the total estimated exposures for those activities.

Table 3C shows that the total occupational exposure accumulated for installation activities in progress to date is approximately 612 person-rem as compared to the original exposure estimate of 644 person-rem. The exposure to date attributed to S/G lower assembly installation (approximately 440 person-rem) is significantly higher than the estimate of 204 person-rem (items 2 and 3 of Table 3C).

The information for all phase activities in progress or completed (as detailed in Tables 3A, 3B and 3C) is summarized in Table 4. The total exposure expended during this reporting period was approximately 550 person-rem. The exposure expended for miscellaneous phase activities (approximately 37 person-rem) is also included in this reporting period as shown in Table 4. Detailed exposure information for this phase will be presented in the next progress report.

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 Transfer of Steam Generator Lower Assemblies to S/G Storage Compound

As indicated in Radiological Report No. 2, the Unit 3 Steam Generator Lower Assemblies (SGLA's) were placed in temporary storage until the S/G storage compound was completed. To reduce dose rates in the temporary storage area, the SGLA's were filled with demineralized (DI) water. Vent and drain fittings were installed for this purpose. The resulting reduction in general area dose rates indicated that an exposure savings was realized. This savings cannot be easily quantified since the majority of personnel benefiting from the reduced dose rates were those proceeding to and from work areas.

Prior to placing the SGLA's in the completed storage compound, each SGLA was sampled for radioactivity and drained. Sample results indicated no significant activity; however, the water that was drained from the SGLA's and discharged was considered a controlled release. The small amount released was approximately .017 mCi with Co-60 the predominant isotope. This amount is included in Table 5.

The exposure expended as a result of transferring the SGLA's from the temporary storage area to the S/G storage compound and welding the SGLA temporary fill and drain fittings was approximately 13 person-rem.

Surveys taken outside the S/G storage compound after placement of the SGLA's indicated approximately 0.1 to 0.4 mR/hr contact with the walls and approximately 15 to 20 mR/hr contact with the roof of the storage compound. The compound is located in the Radiation Controlled Area (RCA).

3.3 Contamination Control Envelopes and Ventilation

The use of contamination control envelopes and filtered ventilation system proved effective during S/G lower assembly installation. Welding and backgouging operations resulted in low-level airborne radioactivity levels in the channel heads and enclosures. Airborne concentrations in the 10^{-8} μ Ci/cc range were detected and confined to the enclosures with no significant airborne activity detected outside the S/G channel head enclosures.

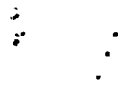
Use of the S/G filtered ventilation system (as described in previous reports) effectively maintained a negative pressure in the work area thereby preventing the release of airborne radioactivity outside the S/G channel head enclosures.

It is planned to utilize contamination control envelopes and filtered ventilation throughout S/G lower assembly installation activities.

3.4 Installation of Steam Generator Lower Assemblies (SGLA's)

Exposure reduction techniques utilized for S/G channel head remnant weld preparation as discussed in Radiological Progress Report No. 2 were also used for SGLA installation. These techniques included:

- a) Controlling access/egress to S/G work platforms from outside the biological shield wall where dose rates are typically ten times less than dose rates inside the shield wall.



- b) Installing contamination enclosures at the S/G manways to minimize airborne radioactivity and the spread of contamination to adjacent areas.
- c) Limiting access/egress to the S/G channel head through the S/G cold leg manway thereby allowing a filtered ventilation system to exhaust air from the S/G channel head hot leg manway.
- d) Utilizing ventilation duct work providing cool air as much as practical to provide some relief to workers in the channel head.
- e) Utilizing special channel head shielding for channel head welding and interior repair work whenever practical to reduce exposure rates.

The above techniques will continue to be utilized as necessary throughout the completion of SGLA installation.

To date the exposure expended as a result of SGLA installation is approximately 440 person-rem. Without the benefit of S/G channel head shielding, the exposure would be approximately 4400 person-rem. Thus, a conservative savings of approximately 4000 person-rem was realized. The exposure savings for all SGLA installation activities as a result of S/G channel head shielding will be discussed in a future report.

3.5 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.
- 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 should significantly improve worker comfort especially on the 58' elevation where a large majority of the work is scheduled.



- i) A communications system used by health physics 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.

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, 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. During this reporting period Unit 4 was shutdown for normal refueling and maintenance. The increase in activity released for this reporting period can be attributed to the fact that both Units 3 and 4 share effluent collection facilities. Thus, some of the effluent activity released as a result of the Unit 4 shutdown are included with the effluent activity totals in Table 5.

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 73% of the total activity released to date was in the form of relatively long-lived corrosion products. The remaining 27% was in the form of fission products (which include Cs-134 and Cs-137) and activation products. The total activity released to date is approximately 11% 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 well. As indicated in previous progress reports 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 26% of the total estimated activity projected to be released.



4.4 Solid Radioactive Waste

A summary of solid low-level radioactive waste generated and shipped to date as a result of Unit 3 steam generator repair activities is provided in Table 6. 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 86% 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.

5.0 CONCLUSIONS AND OBSERVATIONS

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

- a). For installation phase activities completed to date, the actual exposure expended is approximately 612 person-rem as compared to the original estimate of 644 person-rem. Approximately 72% (440 person-rem) of the actual exposure expended for installation activities is attributed to steam generator channel head interior weld repairs and lower assembly installation activities as compared to the original estimate of 204 person-rem for S/G channel head repair and lower assembly installation. This higher expended exposure is attributed to personnel working in radiation fields higher than originally estimated and performing weld repairs that also required more time in the higher radiation fields. With the majority of the higher exposure installation activity work nearing completion, the actual exposure expended for the entire project is expected to be lower than 2000 person-rem.
- b). Radioactive liquid 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 11% 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 86% of the estimate provided in the Gould Affidavit dated June 12, 1981.

Progress Report Number 4 will contain information from December 31, 1981 through March 3, 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 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.

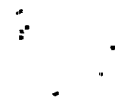


TABLE 2
PERSONNEL EXPOSURE SUMMARY - PER TASK
REPORTING PERIOD 24 JUNE 1981 TO 30 DECEMBER 1981
TURKEY POINT - UNIT 3

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	7,645	88	56.45
2. Construction of pedestal cranes, preparation of polar crane, miscellaneous cribbing platforms, and steam generator transfer bridge.	10,280	9,997	32	31.56
3. Removal, modification and reinstallation of steam generator upper assemblies and major piping.	24,600	54,754	256	219.45
4. Construction of temporary facilities and support services	19,120	10,865	215	32.12
5. General decontamination and disposal of contaminated materials/cleanup.	42,310	10,477	201	96.87
6. Removal and reinstallation of miscellaneous piping equipment and insulation.	8,850	13,442	125	99.31
7. Non-manuals (e.g. QC, Engineers, Health Physics).	68,540	31,672	436	140.48
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	7,991	166	97.64
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 30 DECEMBER 1981
TURKEY POINT - UNIT 3

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	613	29	23.30
12. Install new steam generator weld channel head.	11,000	38,843	204	439.69
13. Placement of steam generator in storage.	225	331	25	30.18
TOTAL	207,595*	194,277	2,084	1,448.76
Estimated Range			1730-2480	

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

* This estimated total was incorrectly reported in previous progress reports as 182,800. The correct total for the estimated task labor values should have been 207,595.

TABLE 3A
SUMMARY OF PREPARATORY ACTIVITY EXPOSURES
REPORTING PERIOD 4 NOVEMBER 1981 TO 30 DECEMBER 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	0.00	27.07	C
2. Reactor Cavity Decontamination and Inspection	0	373	0	0.00	5.58	C
3. Install Steam Generator Transfer Bridge	960	1,473	1.21	0.00	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	0.00	7.80	C
5. Install Cherry Pickers	2,430	2,990	7.15	0.00	17.88	C
6. Remove Reactor Coolant Pump Motors	0	386	0	0.00	2.43	C
7. Disconnect/ Remove Permanent Electrical Equipment and Cables	430	281	3.31	0.00	2.50	C
8. Install Temporary Power, Lighting and Electrical Cables	1,148	2,962	49.48	0.00	11.68	C
9. Remove Miscellaneous Steel	580	1,702	1.25	0.00	7.05	C
10. Install Temporary Containments and/or Ventilation Systems	245	1,740	4.29	0.00	12.62	C



TABLE 3A (Continued)
SUMMARY OF PREPARATORY ACTIVITY EXPOSURES
REPORTING PERIOD 4 NOVEMBER 1981 TO 30 DECEMBER 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	0.00	31.05	C
12. Install Scaffolding All Levels	1,440	1,895	13.27	0.00	9.95	C
13. Cut and Remove Concrete	5,334	3,913	58.00	0.00	45.49	C
14. Miscellaneous Activities	9,425	5,419	85.63	0.00	59.04	C
TOTAL - PHASE I	34,992	31,787	283.00	0.00	247.94	C



TABLE 3B
SUMMARY OF REMOVAL ACTIVITY EXPOSURES
REPORTING PERIOD 4 NOVEMBER 1981 TO 30 DECEMBER 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	0.00	70.80	C
2. Remove Feedwater Piping A, B & C steam generator	147	2,473	1.50	0.00	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	0.00	60.02	C
4. Install tube bundle shield covers A, B & C S/G	530	978	53.00	0.00	16.49	C
5. Cut divider plate & channel head A, B & C S/G - Rig to 58' elevation	1,722	5,087	97.14	0.00	72.07	C
6. Rig/lift A, B & C S/G Lower Assembly (L.A.) to cut/remove seismic ring	84	142	6.60	0.00	0.72	C
7. Install tube sheet shield cover A, B & C S/G	760	527	40.00	0.00	10.10	C
8. Lift A, B & C S/G U.A., invert and place in rack	525	2,143	6.75	0.00	11.79	C
9. Remove main steam piping A, B & C S/G	126	499	0.61	0.00	2.84	C
10. Install laydown cribbing for A, B & C S/G 58' elevation	252	199	2.65	0.00	0.49	C



TABLE 3B (Continued)
SUMMARY OF REMOVAL ACTIVITY EXPOSURES
REPORTING PERIOD 4 NOVEMBER 1981 TO 30 DECEMBER 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	0.00	155.12	C
12. Remove miscellaneous piping from A, B & C S/G cubicles	1,410	6,050	17.62	0.00	29.79	C
13. Remove A, B & C S/G L.A. from RCB and transfer to storage compound	225	322	25.00	12.47	30.18	C
14. Maintain temporary power lighting and electrical cables	2,100	1,578	55.00	0.00	4.70	C
15. Maintain/erect/remove scaffolding	840	5,686	8.40	0.00	29.85	C
16. Ongoing decon activities/remove and dispose contaminated materials	14,500	2,914	62.40	0.00	16.57	C
17. Miscellaneous Activities	33,800	5,103	221.93	0.00	31.00	C
PHASE ACTIVITY TOTALS	69,129	61,252	1016.00	12.47	552.48	C

TABLE 3C
SUMMARY OF INSTALLATION ACTIVITY EXPOSURES
REPORTING PERIOD 4 NOVEMBER 1981 TO 30 DECEMBER 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. Installation of A, B & C S/G Upper Assemblies	17,540	6,534	73.70	9.69	9.69	C
2. Weld Preparation of A, B & C S/G Channel Head Remnants	840	4,552	7.71	4.25	69.09	C
3. Installation and Welding of A, B & C S/G Lower Assemblies	8,360	33,934	182.00	362.20	370.61	I
4. Installation of A, B & C S/G Main Steam Piping	1,250	495	5.50	0.69	0.69	I
5. Installation of A, B & C S/G Feedwater Piping	1,680	1,954	6.80	7.03	7.03	I
6. Welding of A, B & C S/G Divider Plates	1,554	12	15.10	1.29	1.29	I
7. Install Insulation A, B & C Steam Generators	3,486	9	29.40	0.00	0.00	I
8. Maintain Temporary Power, Lighting and Electrical Cables	2,850	6,301	65.00	12.59	13.99	I
9. Maintain/Erect/Remove Scaffolding	2,840	9,794	21.80	21.86	31.81	I
10. Ongoing Decon Activities/ Remove/Dispose Contaminated Materials	14,500	5,113	62.40	25.26	41.01	I

TABLE 3C (Continued)
 SUMMARY OF INSTALLATION ACTIVITY EXPOSURES
 REPORTING PERIOD 4 NOVEMBER 1981 TO 30 DECEMBER 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. Miscellaneous Activities	27,190	22,699	174.59	55.81	66.36	I
PHASE ACTIVITY TOTALS	82,000	91,397	644.00	500.67	611.57	
Total Phase III (Completed Tasks Only)	18,290	10,086	81.41	13.94	78.78	

TABLE 4
PERSONNEL EXPOSURE SUMMARY PER PHASE
REPORTING PERIOD 4 NOVEMBER 1981 TO 30 DECEMBER 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	0.00	247.94	C
Removal	69,129	61,252	1,016	1,016	12.47	552.48	C
Installation	82,000	91,397	644	644	500.67	611.57	I
Miscellaneous ^a	7,433	9,841	141	38	36.77	36.77	I
Project totals	193,554	194,277	2,084	1,981	549.91	1448.76	NA
(Completed Phases Only)	104,121	93,039	1,299	1,299	N/A	800.42	NA

^aMiscellaneous - includes cleanup, storage and miscellaneous preparations prior to start-up.

^bNA - not applicable at this time.



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TABLE 5
SUMMARY OF RADIOACTIVE EFFLUENT RELEASES
REPORTING PERIOD 4 NOVEMBER 1981 TO 30 DECEMBER 1981
TURKEY POINT - UNIT 3

1981

I. LIQUID EFFLUENT RELEASES			RADIOACTIVITY RELEASED IN LIQUID EFFLUENTS (CURIES)	
ISOTOPE	NOVEMBER 11/5-12/2	DECEMBER 12/3-12/30	TOTAL ACTIVITY RELEASED THIS REPORTING PERIOD	TOTAL RELEASED DURING S/G REPAIR TO DATE
Co-57	7.60E-06	*	7.60E-06	7.60E-06
Co-58	6.01E-03	1.17E-02	1.77E-02	2.14E-02
Co-60	2.58E-03	3.15E-03	5.73E-03	1.08E-02
Cs-134	4.26E-04	7.33E-05	4.99E-04	1.84E-03
Cs-137	6.80E-04	1.95E-04	8.75E-04	3.26E-03
Fe-59	5.12E-05	3.37E-04	3.88E-04	4.33E-04
Mn-54	3.32E-04	1.97E-04	5.29E-04	7.56E-04
Zn-65	*	*	*	*
I-131	*	*	*	*
Nb-95	2.83E-04	*	2.83E-04	3.50E-04
Sb-124	6.13E-05	1.36E-03	1.42E-03	1.54E-03
Sb-125	*	3.55E-03	3.55E-03	3.56E-03
Ag-110m	6.98E-05	5.68E-04	6.38E-04	6.38E-04
Zr-95	2.02E-04	2.63E-04	4.65E-04	4.65E-04
TOTAL	1.07E-02	2.14E-02	3.21E-02	4.50E-02
Liquid Effluent Volume Released (Liters)	1.20E+06	1.34E+06	VOLUME RELEASED THIS REPORTING PERIOD 2.54E+06	VOLUME RELEASED DURING S/G REPAIR TO DATE 7.13E+06

*Not detectable



TABLE 5 (Continued)
SUMMARY OF RADIOACTIVE EFFLUENT RELEASES
REPORTING PERIOD 4 NOVEMBER 1981 TO 30 DECEMBER 1981
TURKEY POINT - UNIT 3

1981				
I. AIRBORNE RELEASES	RADIOACTIVITY RELEASED IN AIRBORNE EFFLUENTS (CURIES)			
A. NOBLE GASES			TOTAL ACTIVITY RELEASED THIS REPORTING PERIOD	TOTAL RELEASED DURING S/G REPAIR TO DATE
ISOTOPE	NOVEMBER 11/5-12/2	DECEMBER 12/3-12/30		
Kr-87	*	*	*	*
Kr-88	*	*	*	*
Xe-133	*	*	*	*
Xe-133m	*	*	*	*
Xe-135	*	*	*	*
Xe-138	*	*	*	*
TOTAL	*	*	*	*
B. HALOGENS				
I-131	*	*	*	*
I-133	*	*	*	*
TOTAL	*	*	*	*

*Not Detectable



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TABLE 5 (Continued)
SUMMARY OF RADIOACTIVE EFFLUENT RELEASES
REPORTING PERIOD 4 NOVEMBER 1981 TO 30 DECEMBER 1981
TURKEY POINT - UNIT 3

1981

I. AIRBORNE RELEASES		RADIOACTIVITY RELEASED IN AIRBORNE EFFLUENTS (CURIES)		
C. PARTICULATES				
ISOTOPE	NOVEMBER 11/5-12/2	DECEMBER 12/3-12/30	TOTAL ACTIVITY RELEASED THIS REPORTING PERIOD	TOTAL RELEASED DURING S/G REPAIR TO DATE
Ce-141	*	*	*	*
Ce-144	*	*	*	*
Co-58	4.0E-06	8.6E-06	1.26E-05	2.32E-05
Co-60	1.1E-05	1.2E-04	1.31E-04	1.67E-04
CS-134	6.7E-07	5.0E-07	1.17E-06	1.84E-06
Cs-137	1.2E-06	2.3E-06	3.50E-06	7.83E-06
Fe-59	*	*	*	*
Mn-54	4.8E-07	7.4E-08	5.54E-07	7.37E-07
Zn-65	*	*	*	*
Nb-95	9.4E-08	*	9.40E-08	1.15E-07
TOTAL	1.74E-05	1.31E-04	1.49E-04	2.01E-04

*Not Detectable

TABLE 6
SUMMARY OF SOLID LOW-LEVEL RADIOACTIVE WASTE
REPORTING PERIOD 4 NOVEMBER 1981 TO 30 DECEMBER 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	5,670	10,605
Non-Compacted Dry Active Waste	675	4,030
Resin and Filter Media	425	1,020
Channel Head Decontamination Waste	85	717.5
Miscellaneous	200	2,775
Totals	7,055	19,147.5

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
4 November 81 - 30 December 81	6,430	5.43
Totals	17,075	29.53

^a LLW Low-level (radioactive) waste.

^b Predominant isotopes ¹³⁷Cs, ⁶⁰Co, ⁵⁸Co.

