

FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT
EMERGENCY PLAN IMPLEMENTING PROCEDURE 3100035E
REVISION 3

1.0 TITLE:

Off-site Radiological Monitoring

/R3

2.0 REVIEW AND APPROVAL:

Reviewed by Facility Review Group _____ July 7, 1981

Approved by A. D. Schmidt Vice Pres. Pwr.Res. July 13, 1981Revision 3 Reviewed by FRG _____ DECEMBER 12, 1983Approved by [Signature] V. P. Nuc. Energy JAN 9 19843.0 SCOPE:3.1 Purpose:

This procedure gives guidelines for collecting off-site monitoring data and calculating of thyroid and whole body doses for the off-site monitoring team personnel based on off-site radiological monitoring.

/R3

3.2 Authority:

This procedure implements the St. Lucie Plant Radiological Emergency Plan.

4.0 PRECAUTIONS:

4.1 The Radiation Team Leader shall control the exposures of the off-site and on-site out-of-plant monitoring teams within 10 CFR 20 limits unless higher levels are authorized by the Emergency Coordinator or Recovery Manager. These higher limits should be less than 5 Rem whole body and 25 Rem thyroid.

4.2 Estimated dose projections based on field measurements should be compared with the dose projections based on plant release or plant status. The results of these comparisons shall be brought to the attention of those persons involved in the Protective Action Recommendation decision making process.

/R3

4.3 Doses to personnel in the OSC shall be maintained to the limits of 4.1.

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5.0 RESPONSIBILITIES:

- 5.1 The Emergency Coordinator, or his designee, is responsible for ensuring that off-site monitoring is performed during plant emergencies which involve the release of radioactive material to the environment.
- 5.2 The Emergency Coordinator is responsible for determining the protective actions that will be recommended to off-site agencies. The TSC Supervisor is responsible for notification of off-site agencies of the recommended protective actions.
- 5.3 The Radiation Team Leader or his designee is responsible for the activation and direction of off-site monitoring team(s).
- 5.4 The Radiation Team Leader is responsible for providing off-site monitoring data to the TSC Supervisor and to the EOF upon its declaration of operability.
- 5.5 The State of Florida's Department of Health and Rehabilitative Services assumes responsibility for off-site monitoring and dose projections after arrival of the state team and leader. The transfer of this responsibility from the plant to the state will be made when the State informs the plant that they are ready.
- 5.6 The TSC Supervisor shall inform the appropriate off-site agencies concerning off-site field monitoring data until relieved of this responsibility by the Recovery Manager.
- 5.7 When the EOF is manned and operational, the dose assessment group assumes responsibility for direction of the field teams, through the Radiation Team Leader.

6.0 REFERENCES:

- 6.1 St. Lucie Plant Radiological Emergency Plan
- 6.2 Florida Radiological Emergency Management for Nuclear Power Plants.
- 6.3 HP-202, "Off-site Environmental Monitoring During Emergencies".
- 6.4 St. Lucie Plant Emergency Plan Implementing Procedures.

7.0 RECORDS AND NOTIFICATIONS:

- 7.1 Off-site monitoring data will be recorded on forms similar to Appendix A.
- 7.2 Calculated whole body and thyroid doses for the field monitoring team personnel will be recorded on forms similar to Appendix D.

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8.0 INSTRUCTIONS:

- 8.1 Upon the classification of an ALERT level emergency the on-site out-of-plant field monitoring team shall be activated and the off-site field teams may be activated at the discretion of the Emergency Coordinator. At the SITE AREA and GENERAL EMERGENCY Level, the on-site and off-site field monitoring teams shall be activated. The staffing and control of these teams is the responsibility of the Radiation Team Leader.
- 8.2 The Radiation Team Leader shall determine monitoring points based upon meteorological conditions and population zones.
- 8.2.1 Preselected monitoring points are listed in Appendix B and indicated on the area maps contained in the off-site monitoring kits. The preselected points are possible monitoring points and may be used as reference points to direct monitoring teams.
- 8.3 Communication with monitoring teams will be through the FPL two-way radio system or telephone.
- 8.4 Monitoring teams will take direct radiation readings and air samples and analyze air samples for radioiodine (I-131) concentration.
- 8.4.1 Radioiodine (I-131) analysis will normally be performed using portable analyzers with scintillation detectors.
- NOTE: In the event radioiodine (I-131) analysis cannot be done in the field, the Radiation Team Leader will provide for the transport of air samples to the plant site for analysis.
- 8.5 Field monitoring data will be recorded on forms similar to Appendix A.
- 8.6 The Radiation Team Leader will inform the TSC Supervisor of the results and forward the results to the EOF when it is declared operational.
- 8.7 Doses to field teams are computed by using the measured gamma dose rates and iodine (I-131) concentrations in the plume and the time the team was in the plume. Record the information on forms similar to Appendix D.



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8.0 INSTRUCTIONS: (continued)

8.7 (continued)

8.7.1 Thyroid dose estimates for exposure within the first 24 hours after reactor shutdown shall be done using the nomogram in Appendix C. For exposures occurring after the 24 hour period, thyroid dose estimates shall be done utilizing the appropriate equation listed below:

A. Exposures occurring after 24 hours but up to 72 hours:

$$\text{Thyroid dose (Rem)} = 2.12 \text{ E} + 6 \text{ (x) I-131 conc, } \mu\text{C/cc (x) exposure duration (hours)}$$

B. Exposures occurring past the 72 hour period:

$$\text{Thyroid dose (Rem)} = 1.86 \text{ E} + 6 \text{ (x) I-131 conc, } \mu\text{C/cc (x) exposure duration (hours)}$$

8.7.2 Whole body exposure estimates are determined by multiplying the gamma exposure rate by the exposure duration.

8.8 If it appears that a team will receive doses in excess of those listed in 4.1, the Radiation Team Leader will make the necessary arrangements for replacing the team.

8.9 When the EOF is manned and operational, the previously gained off-site monitoring data will be forwarded to the dose assessment group in the EOF.

8.10 When the EOF is manned and operational, the dose assessment group in the EOF will select the locations for off-site monitoring and forward that information to the TSC where the teams will be dispatched. The EOF may select to take over total control of the field teams, and if so, the EOF will coordinate the field team activity with the TSC.

8.11 Comparisons of field measurements to dose projections should be done with caution.

8.11.1 Appendix E is provided, as an example, as a vehicle for this comparison.

8.11.2 Dose estimates should be based on the same exposure duration as the projection, usually 2 hours.

8.11.3 Dose estimates to an adult in the general public can be calculated using the methodology in Step 8.7.

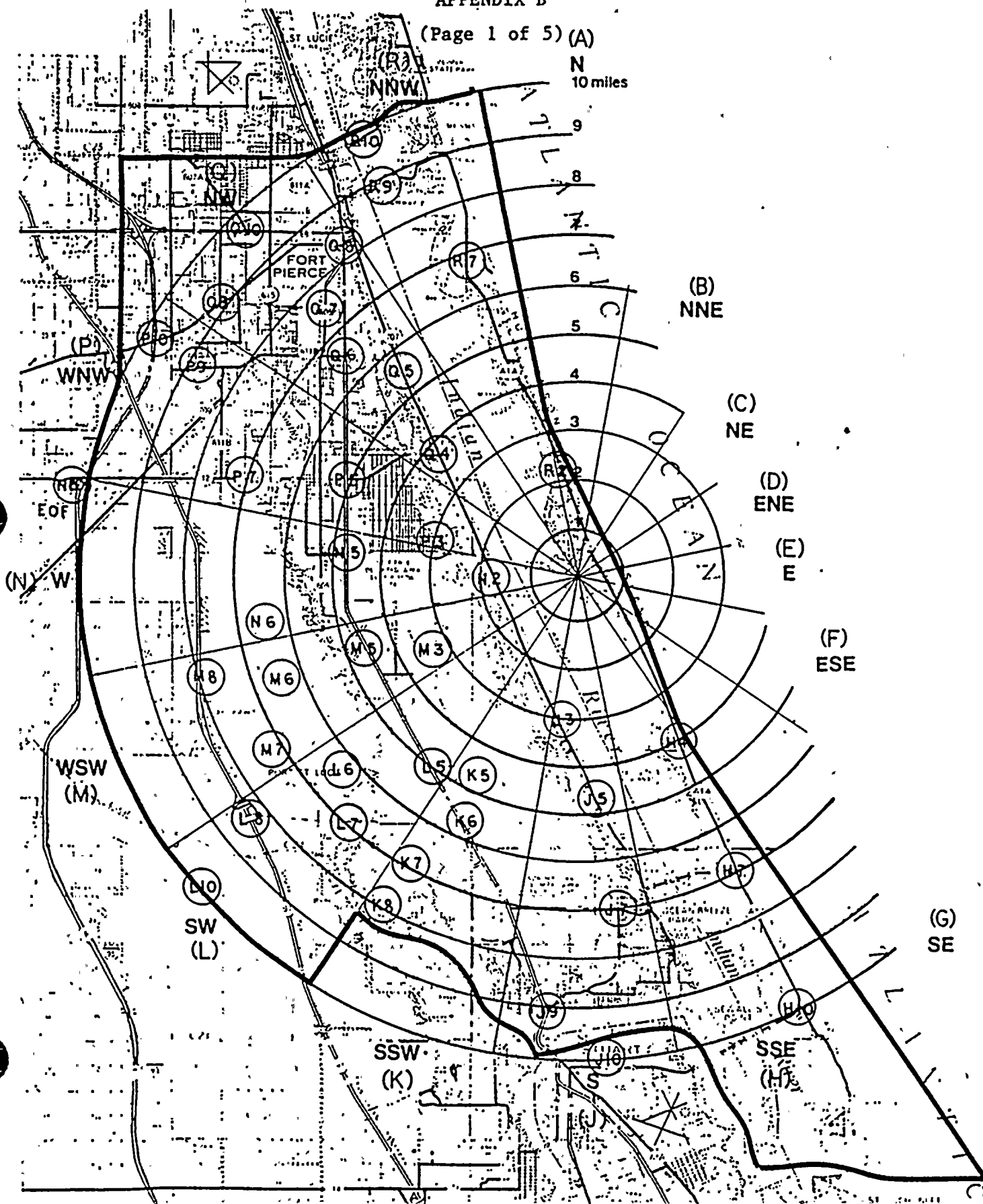
8.11.4 Dose estimates to a child thyroid can be determined by multiplying the adult thyroid dose estimate value by two (2).



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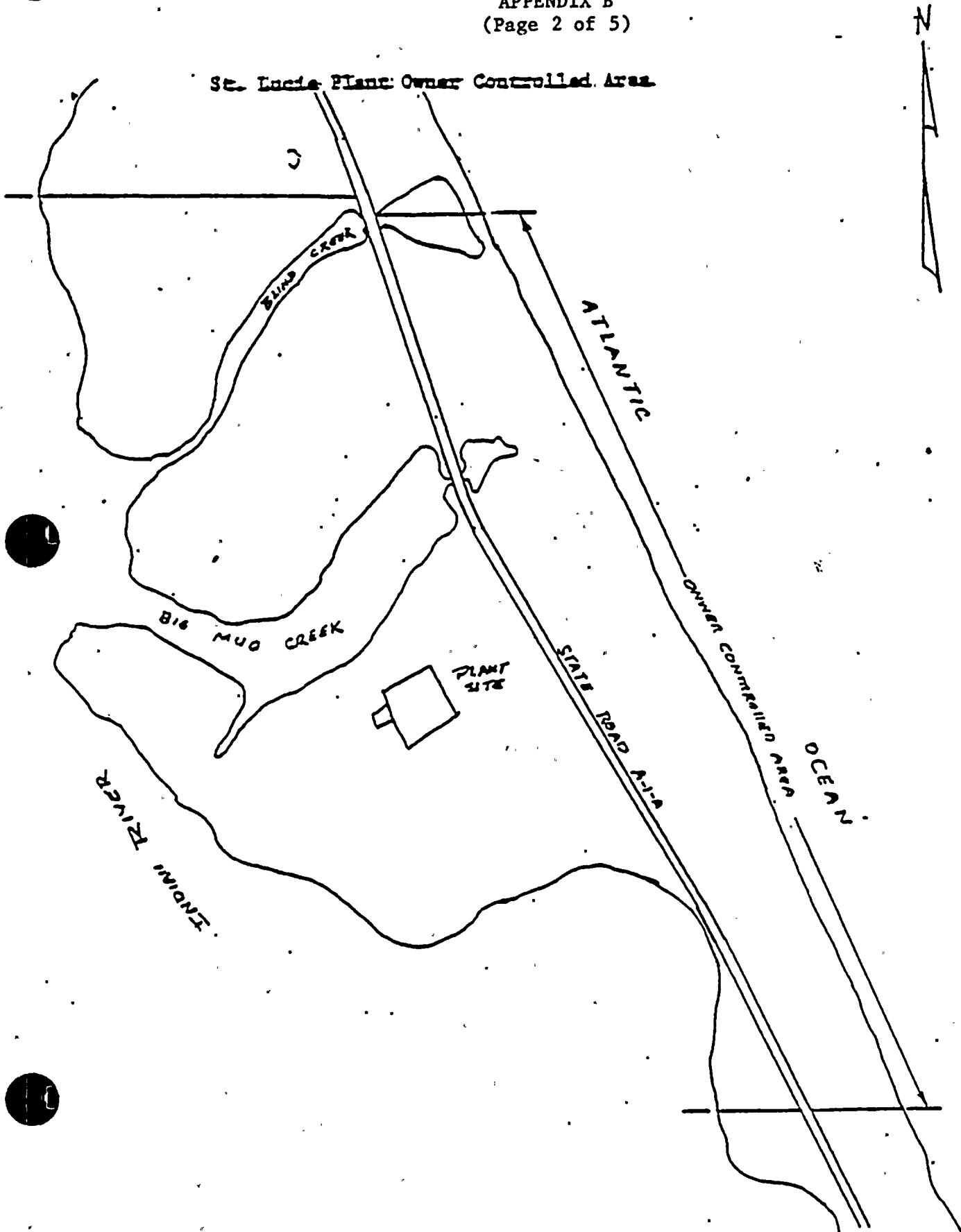




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St. Lucie Plant Owner Controlled Area





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PRESELECTED OFF-SITE MONITORING POINTS

<u>SURVEY POINT</u>	<u>LOCATION</u>	<u>DISTANCE FROM PLANT (MILES)</u>	<u>EPZ SECTOR</u>
R2	S.R. A1A, NNW of plant site (Little Mud Creek Bridge)	2.3	NNW
R7	Intersection of S.R. A1A and Clipper Blvd. (Entrance to Ocean Village)	6.7	NNW
R9	S.R. A1A, NNW of plant site (West of Fire Dept. at Siren)	8.6	NNW
R10	East side of North Bridge (S.R. A1A)	9.6	NNW
04	Intersection of Indian River Dr. (S.R. 707) and White Rd., East of White City and South of Fort Pierce	3.7	NW
05	Intersection of Indian River Dr. (S.R. 707) and Rio Vista Dr.	5.4	NW
06	Intersection of U.S. 1 and Edwards Rd. (S.R. 611.B), Southside of Ft. Pierce near railroad crossing	6.4	NW
07	Intersection of Oleander Blvd. (S.R. 605) and Virginia Ave.	7.4	NW
08	Intersection of U.S. 1 and Delaware Ave.	8.1	NW
09	Intersection of Okeechobee Rd. (S.R. 70) and Hartman Rd. (S. 41st St. near siren)	9.1	NW
010	Intersection of Orange Ave. (S.R. 68) and Angle Rd.	9.6	NW
P3	Intersection of Bartow St. and Yucca Dr.	3.2	WNW
P5	Intersection of U.S. 1 and Midway Rd. (S.R. 712) White City	5.2	WNW

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PRESELECTED OFF-SITE MONITORING POINTS

<u>SURVEY POINT</u>	<u>LOCATION</u>	<u>DISTANCE FROM PLANT (MILES)</u>	<u>EPZ SECTOR</u>
P7	Intersection of Midway Rd. (S.R. 712) and Christiansen Rd. (at siren)	7.1	WNW
P9	Intersection of McNeil Rd. and Edwards Rd. (611B)	8.7	WNW
P10	Intersection of Okeechobee Rd. (S.R. 70) and I-95	9.7	WNW
N2	S.R. 707 West of plant site (at siren)	2.0	W
N5	Intersection of U.S. 1 and Saeger Rd. (south of White City)	4.8	W
N6	Intersection of St. James Dr. and Airosa Blvd.	6.4	W
N10	St. Lucie's EOF, Intersection of S.R. 712 and I-95	10.2	W
M3	East end of N. Mediterranean Blvd.	3.4	WSW
M5	Intersection of U.S. 1 and Prima Vista Blvd., Port St. Lucie	4.8	WSW
M6	Intersection of Prima Vista Blvd. and Airosa Blvd.	6.5	WSW
M7	Intersection of Airosa Blvd. and Whitmore Dr.	7.3	WSW
M8	Intersection of Prima Vista Blvd. and Bayshore Blvd.	7.8	WSW
L5	Intersection of U.S. 1 and Walton Rd., Port St. Lucie	4.8	SW
L6	Intersection of Floresta Dr. and Thornhill Dr.	6.4	SW
L7	Intersection of Whitmore Drive and Port St. Lucie Blvd.	7.2	SW



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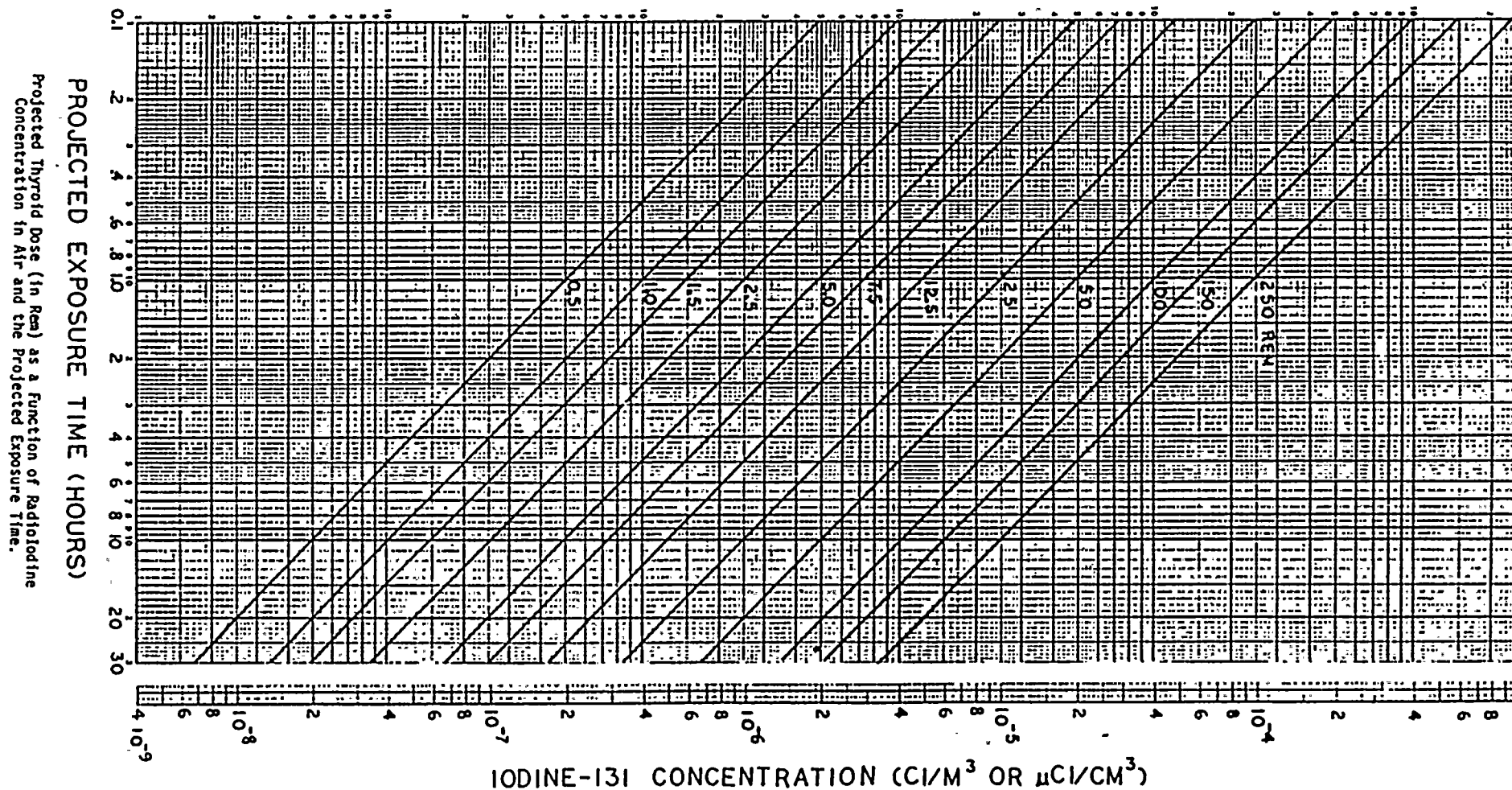
<u>SURVEY POINT</u>	<u>LOCATION</u>	<u>DISTANCE FROM PLANT (MILES)</u>	<u>EPZ SECTOR</u>
L8	Intersection of Port St. Lucie Blvd. and Fla. Turnpike	8.4	SW
L10	Intersection of Port St. Lucie Blvd. and Cairo Ave.	10	SSW
K5	Intersection of Lennard Rd. and Blossom Rd.	4.7	SSW
K6	Intersection of U.S. 1 and Port St. Lucie Blvd., Port St. Lucie	5.7	SSW
K7	Intersection of Morningside Blvd. and Westmoreland Blvd.	7.1	SSW
K8	Intersection of Morningside Blvd. and River Vista Dr.	8.0	SSW
J3	Intersection of Walton Rd. and Indian River Dr. (S.R. 707)	3.4	S
J5	Intersection of Indian River Dr. (S.R. 707) and Mockingbird Hill Rd. (near siren)	4.7	S
J7	Intersection of Commercial Rd. (S.R. 707A) and Savannah Rd. (S.R. 723)	7.0	S
J9	Intersection of Savannah Rd. (S.R. 723) and U.S. 1	9.2	S
J10	Martin Memorial Hospital	10.0	S
H4	S.R. A1A, south of plant (at siren) North to entrance to Nettle's Island	4.0	SSE
H7	Intersection of S.R. A1A and the Jensen Beach turnoff (A1A Alt.)(at siren)	6.9	SSE
H10	Intersection of S.R. A1A and Ocean Blvd. (Elliott Museum)	9.8	SSE



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APPENDIX C

Adult Thyroid Dose
 As a Function of I-131 Concentration and Stay Time
 (Child Thyroid Dose = Adult Dose X 2)



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APPENDIX D

OFF-SITE MONITORING TEAM PERSONNEL DOSE WORKSHEET

Team _____ Date _____

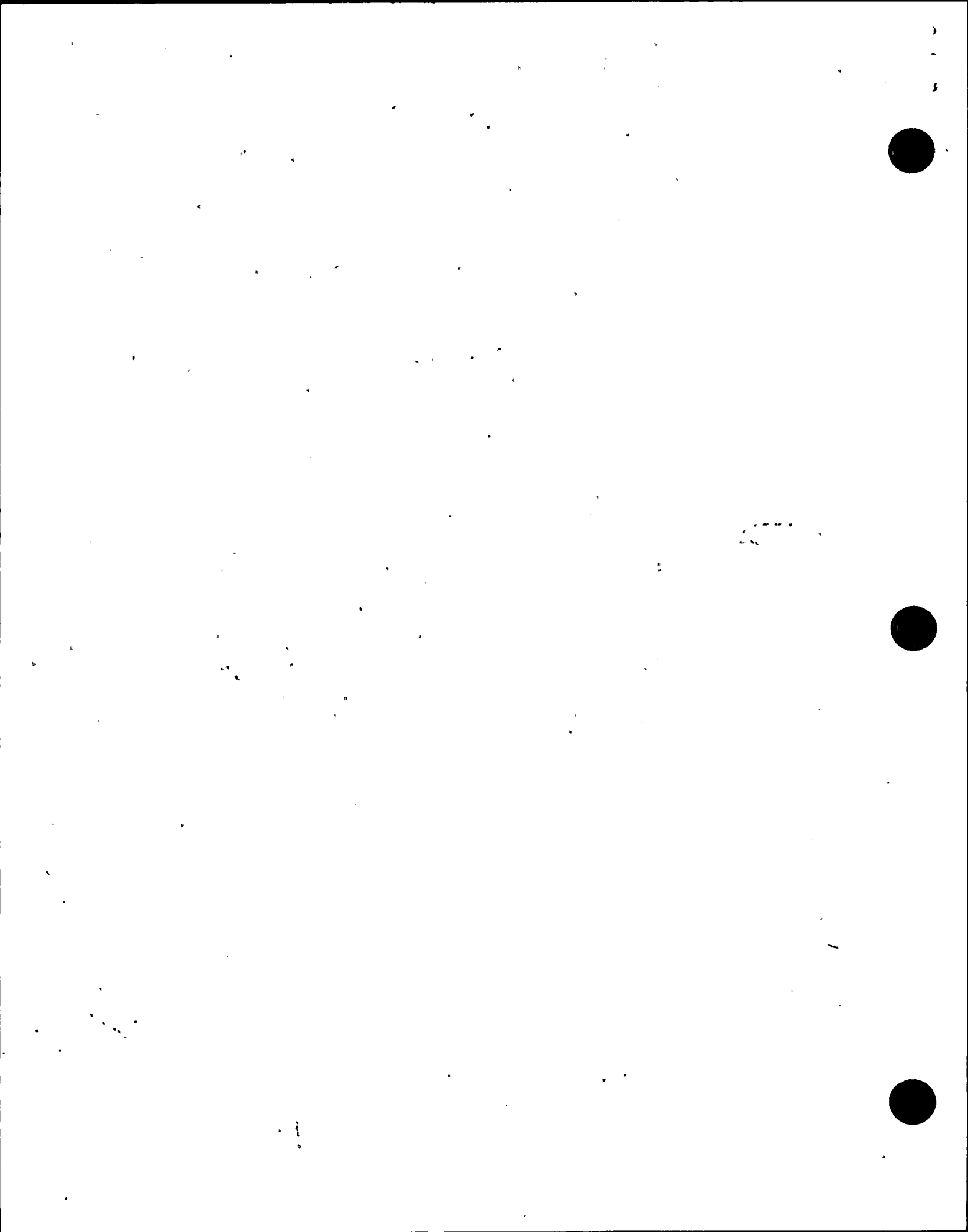
Survey Location	Time Of Sample	Gamma Dose Rate (mrem/hr)	I-131 ($\mu\text{Ci/cc}$)	Time In Plume (hour)	Previous Gamma Doses mrem	Gamma Dose mrem	Total Gamma Dose mrem	Previous Thyroid Doses mrem	Thyroid Dose mrem	Total Thyroid mrem

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APPENDIX E

OFF-SITE DOSE COMPARISON

Survey Location	Time of Survey	Down Wind Direction	Projected Exp. Time	Estimated W.B. Dose	Projected W.B. Dose	Estimated Thyroid Dose	Projected Thyroid Dose	Comments/Initial



FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT
EMERGENCY PLAN IMPLEMENTING PROCEDURE 3100050E
REVISION 7

1.0 TITLE:

MAINTAINING EMERGENCY PREPAREDNESS - EMERGENCY EXERCISES, DRILLS, TESTS,
AND EVALUATIONS

2.0 REVIEW AND APPROVAL:

Reviewed by Facility Review Group _____ July 25, 1975

Approved by K. N. Harris Plant Manager _____ July 29, 1975

Revision 7 Reviewed by FRG _____ March 23 1984

Approved by *Edw...* for V.P. Nuclear Energy _____ 4-10 1974

3.0 SCOPE:

3.1 Purpose

This procedure provides instructions for conducting periodic emergency exercises, drills, and tests.

3.2 Discussion

Periodic exercises and drills will be conducted in order to test the state of emergency preparedness of participating personnel, organizations, and agencies. Each exercise or drill will be conducted to:

1. Ensure that participants are familiar with their respective duties and responsibilities
2. Verify the adequacy of the Emergency Plan and Emergency Procedures
3. Test the communication network and systems
4. Check the availability of emergency supplies and equipment
5. Verify the operability of emergency equipment

These exercises and drills will simulate emergency conditions and may be scheduled such that two or more exercises or drills are conducted simultaneously.

The results of the exercises will form the basis for corrective action to eliminate identified deficiencies, and will be discussed during a post-exercise evaluation.

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MAINTAINING EMERGENCY PREPAREDNESS -
EMERGENCY EXERCISES, DRILLS, TESTS, AND EVALUATIONS

3.0 SCOPE: (continued)

3.3 Authority

This procedure implements the St. Lucie Plant Radiological Emergency Plan.

4.0 PRECAUTIONS:

4.1 Every emergency alarm or announcement shall be assumed to be true unless an announcement is made to the contrary.

5.0 RESPONSIBILITIES:

5.1 The FPL Emergency Planning Supervisor shall be responsible for planning, scheduling, and coordinating all major emergency drills or exercises involving off-site agencies. When an exercise is to be conducted, the Emergency Planning Supervisor shall:

1. Schedule a date for the exercise in coordination with the Health Physics Supervisor and the primary state and county emergency response agencies.
2. Request that the Health Physics Supervisor assign personnel to assist the Emergency Planning Supervisor prepare a scenario.
3. Coordinate all FPL efforts with other participating personnel, organizations, and agencies.
4. Obtain the approval of the Plant Manager.
5. Offer federal, state and local observers the opportunity to evaluate the exercise.
6. Discuss and evaluate the exercise with observers and principal participants.
7. Ensure that for all identified deficiencies, corrective measures are recommended.
8. Prepare and retain documentation for record keeping.

5.2 When an exercise or a major drill is to be conducted, the Health Physics Supervisor shall assure that the following is accomplished:

1. Assign personnel to prepare a scenario.
2. Coordinate through the Emergency Planning Supervisor all activities which involve off-site personnel organizations or agencies.
3. Schedule a date for this activity in coordination with the Emergency Planning Supervisor and assign observers.

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5.0 RESPONSIBILITIES: (continued)

5.2 (continued)

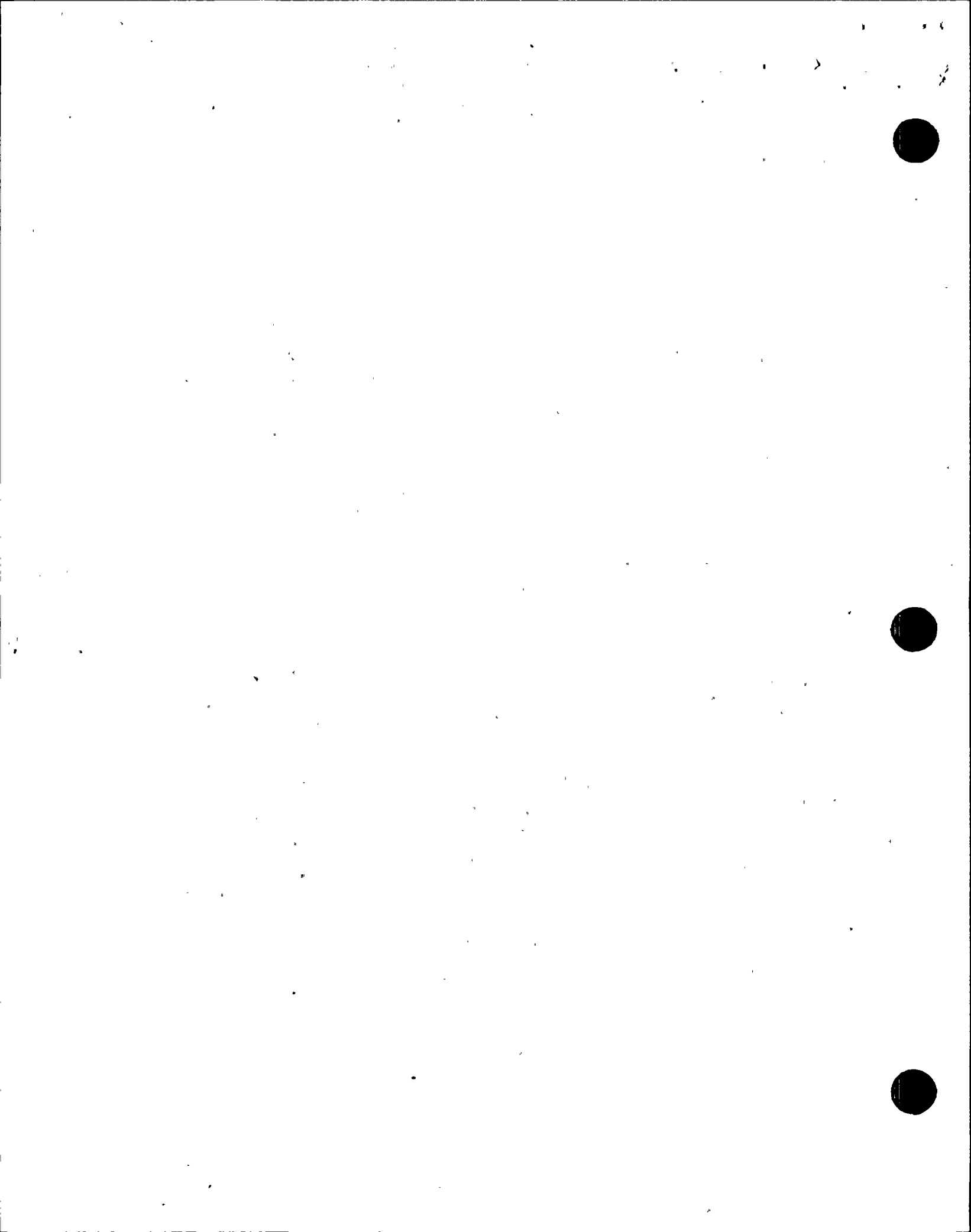
4. Obtain approval of Plant Manager.
5. Review evaluations of exercise or drill with the observers and the Facility Review Group.
6. Ensure that deficiencies which are identified are addressed with corrective measures.
7. Prepare and submit documentation to the Emergency Planning Supervisor for record keeping.

6.0 REFERENCES:

- 6.1 St. Lucie Plant Radiological Emergency Plan
- 6.2 NUREG 0654

7.0 RECORDS AND NOTIFICATIONS:

- 7.1 Log entries
- 7.2 Written evaluation to FRG, Plant Manager, and Emergency Planning Supervisor by the Health Physics Supervisor
- 7.3 Consolidated exercise summary by the Emergency Planning Supervisor



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MAINTAINING EMERGENCY PREPAREDNESS -
EMERGENCY EXERCISES, DRILLS, TESTS, AND EVALUATIONS

8.0 INSTRUCTIONS:

8.1 The following emergency exercises, drills, and tests shall be conducted at the frequency indicated:

1. Exercises (Integrated Drills)

A major radiological emergency response exercise shall be conducted at least once every twelve (12) months (plus or minus three months) to demonstrate the effectiveness of the Emergency Plan. This exercise shall be conducted as a Site Area Emergency or General Emergency and will provide for the coordination with and participation of off-site emergency response personnel organizations and agencies including those of federal, state, and local governments. The emergency scenario shall be varied from year to year. Provisions shall be made to start at least one exercise between 6:00 PM and midnight and at least one exercise between midnight and 6:00 AM every six years. The "Affected Unit" in the exercise should be changed from year to year.

This emergency response exercise shall be critiqued by Florida Power & Light Company observers/evaluators and other observers as appropriate from federal, state, and local agencies.

2. Radiological Monitoring Drill

A radiological monitoring drill shall be conducted at least once every twelve (12) months (plus or minus three months). These drills will include collection and analysis of sample media (e.g., water, air). This drill should include testing of communications and understanding of communications between the RTL and the teams.

3. Health Physics Drills

The Health Physics Department shall conduct Health Physics drills semi-annually and one of the semi-annual drills may be incorporated into the radiological monitoring drill.

4. Medical Emergency Drill

A medical emergency drill involving a simulated contaminated individual, with provisions for activation of the plant First Aid and Personnel Decontamination Team and participation by local support services (i.e., ambulance and off-site medical treatment facility) shall be conducted at least once every twelve (12) months (plus or minus three months).



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MAINTAINING EMERGENCY PREPAREDNESS -
EMERGENCY EXERCISES, DRILLS, TESTS, AND EVALUATIONS

8.0 INSTRUCTIONS: (continued)

8.1 (continued)

5. Fire Emergency Drill

Fire drills are conducted in accordance with Technical Specifications to test the operational readiness (personnel, equipment and procedures) to control and extinguish a fire on-site. The drills also serve to evaluate and document the response of on-site personnel and participating off-site agencies to varying fire situations. The communication links and notification procedures are tested at least semi-annually during fire emergency drills. A post-drill critique is held after each fire drill completed to identify possible areas for improvement in equipment and/or procedures.

6. Communications Tests

Communications with the Bureau of Emergency Management, Department of Health and Rehabilitative Services, and St. Lucie and Martin County Disaster Preparedness Coordinators within the plume exposure pathway Emergency Planning Zone (EPS) will be tested monthly.

At least one communication drill per year, involving information exchange to the off-site response agencies (state, counties, etc.), will be unannounced. Since the details of the annual exercise are held confidential, the unannounced communications drill can be conducted in conjunction with the annual exercise. /R7

8.2 Conducting Drills

1. The Nuclear Plant Supervisor (NPS) shall evaluate the plant conditions and ascertain that the drill will not adversely affect plant equipment or operations.
2. The Health Physics Supervisor shall designate specific members of the plant staff to act as controllers and evaluators during the drill. These controllers and evaluators shall be familiar with the procedures and proper actions to be taken associated with their post during the drill. Additionally, briefings shall be conducted to indicate what purpose the drill will service and what specific areas the controllers and evaluators should be concerned with.

These controllers and evaluators shall be posted throughout the plant area to observe and record the actions of plant personnel during the drill and to verify alarm audibility.

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MAINTAINING EMERGENCY PREPAREDNESS -
EMERGENCY EXERCISES, DRILLS, TESTS, AND EVALUATIONS

8.0 INSTRUCTIONS: (continued)

8.2 (continued)

3. After receiving a signal of alarm indicating that an emergency condition exists, which has been initiated as part of the drill, the NPS shall take action as required by the Emergency Plan.
4. At the termination of the drill, the NPS shall announce over the PA system that the drill is over. This shall be repeated along with any required instructions.

8.3 Evaluation of Drills and Exercises

1. Following a drill, the Health Physics Supervisor shall assimilate all information and data concerning the emergency procedure drill, hold a critique on the drill, and present a summary of the critique to the FRG.

The FRG shall recommend changes to the Emergency Plan Implementing Procedures as necessary.

2. Following an exercise, the Emergency Planning Supervisor, plant management, FPL controllers and evaluators and principal participants in the exercise will meet to discuss and evaluate the exercise.

The evaluation shall be based on the ability of participants to follow emergency procedures, the adequacy of emergency procedures, and the adequacy of emergency equipment and supplies. Plant management shall be responsible for necessary changes in the Plant Emergency Procedures and for recommending and/or submitting changes in the Emergency Plan to the Emergency Planning Supervisor.

3. The FRG shall submit a written evaluation following an exercise to the Emergency Planning Supervisor. These comments will be incorporated, with comments from other principal participants and controllers and evaluators, into a consolidated exercise summary. The summary will be distributed as described in the "Duties and Responsibilities of the Emergency Planning Supervisor" procedure.