



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

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Report No.: 50-302/84-13

Licensee: Florida Power Corporation
3201 34th Street, South
St. Petersburg, FL 33733

Docket No.: 50-302

License No.: DPR-72

Facility Name: Crystal River 3

Inspection at Crystal River site near Crystal River, Florida

Inspectors:	<u>P. G. Stoddart</u>	<u>5/30/84</u>
	P. G. Stoddart	Date Signed
	<u>T. R. Decker</u>	<u>5/30/84</u>
	T. R. Decker	

Accompanying Personnel: P. Brown, K. Hawley, S. Hawley and R. Hadley (Battelle Pacific Northwest Laboratory)

Approved by:	<u>W. G. Cline</u>	<u>5/30/84</u>
	W. Cline, Section Chief	Date Signed
	Division of Radiation Safety and Safeguards	

SUMMARY

Inspection Date: April 24 - 26, 1984

Area Inspected

This routine announced inspection involved 176 inspector-hours on site in the area of an emergency preparedness exercise.

Results

In the areas inspected, one violation was identified; no deviations were identified.

REPORT DETAILS

1. Persons Contacted

- *P. McKee, Nuclear Plant Manager
- *E. Howard, Site Director, Nuclear Operations
- *R. Fuller, Manager, Site Nuclear Service
- *B. Norris, Plant Engineering Superintendent
- *M. Collins, Safety and Reliability Superintendent
- *E. Neuschaefer, Supervisor, Radiological Emergency Planning
- *V. Roppel, Supervisor, Plant Engineering and Technical Services
- *P. Skramstad, Chem/Rad Superintendent
- *W. Johnson, Maintenance Superintendent
- *B. Crane, Manager, Nuclear Operations Training
- *J. Telford, Director, Quality Programs
- *W. Stephenson, Operations Engineer

Other licensee employees contacted included technicians, reactor operators, mechanics, security force members, and office personnel.

Other Organizations

- *G. Casto, Florida Power and Light, Turkey Point Plant
- *D. Mathena, Florida Power and Light, Corporate Emergency Planning

NRC Resident Inspector

- *T. Stetka

* attended the exit interview

2. Exit Interview

The inspection scope and findings were summarized on April 26, 1984, with those persons indicated in Paragraph 1 above.

During the exit interview, the violation noted in this report was discussed as a potential violation; however, the licensee made no comment on this matter at the exit. The inspector also noted, during the exit interview, that the procedure (EM-202) in use by the acting Emergency Coordinator was unusually time-consuming. The licensee made no comment on this observation at the exit. This matter was discussed with Mr. E. M. Howard on May 2, 1984. As a result of that discussion, it was understood that the licensee planned to review the matter and to provide: (1) a more usable edition of procedure EM-202; and (2) personnel trained in its use, by August 2, 1984.

3. Licensee Action on Previous Inspection Findings

Not Inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Exercise Scenario

The emergency response scenario developed by the licensee met the requirements of 10 CFR 50.47(b)(14), 10 CFR 50, Appendix E, Section IV.F, and specific criteria in NUREG-0654, Section II.N. Provisions had been made to test the integrated facility and corporate response functions, including a major portion of the basic elements within the licensee, State, and local government agency emergency plans and organizations.

The scenario was reviewed in advance of the scheduled exercise date and was discussed with licensee representatives on several occasions. Information on plant parameters and postulated environmental conditions in the original scenario were minimal; however, a number of corrections or additions to the scenario made just prior to the exercise resolved many of the potential problems.

The scenario contained provisions for testing such emergency preparedness program elements as emergency medical care and transport of a radioactively contaminated victim to an offsite medical facility, accident assessment and classification, communications, emergency management, radiological inplant and environmental monitoring, radiological protection and control, public information, accountability, and plant repair.

6. Assignment of Responsibility

This area was reviewed in accordance with the requirements of 10 CFR 50.47(b)(1), 10 CFR 50, Appendix E, Paragraph IV.A and the specific criteria in NUREG-0654, Section II.A.

The inspectors observed licensee actions in assigning organizational and functional responsibilities for personnel in the control room, technical support center (TSC), operations support center (OSC), and emergency operations facility (EOF). At each of these locations, staffing of the emergency organization appeared to be in accordance with the established plans and procedures.

7. Emergency Organization

This area was reviewed in accordance with the requirements of 10 CFR 50.47(b)(2), 10 CFR 50, Appendix E, Paragraph IV.A, and the specific criteria in NUREG-0654, Section II.B.

Management of the simulated incidents was initially handled in the control room by the shift supervisor. The shift supervisor functioned as the interim emergency director until he was relieved by the Plant Manager (Nuclear Plant Manager). Actions were taken to establish the TSC and EOF during the Notification of Unusual Event (NOUE), approximately one hour prior to declaration of the Alert. The Operations Support Center (OSC) was activated following the declaration of the Alert. Early activation of the

TSC and EOF was stated to be a management decision to take the most conservative course and was based on deteriorating plant conditions and not as a result of the NOUE. At each of these locations, staffing of the emergency organizations appeared to be in accordance with the established plans and procedures.

8. Emergency Response Support and Resources

This area was observed to determine that arrangements for emergency response support and other resources had been made pursuant to 10 CFR 50.47(b)(3), 10 CFR 50, Appendix E, Paragraph IV.A, and the specific criteria in NUREG-0654, Section II.C.

State and local staff were accommodated at the near-site Emergency Operations Facility (EOF). Provisions were also made at the EOF to accommodate the news media in a Public Information area. Licensee contacts were made with offsite organizations and assistance resources from various agencies were prepared to assist as needed in the simulated emergency.

9. Emergency Classification System

This area was observed to determine that a standard emergency classification and action level scheme was in use by the nuclear facility licensee as required by 10 CFR 50.47(b)(4), 10 CFR 50, Appendix E, paragraph IV.C, and specific criteria in NUREG 0654, Section II.D.

The inspector noted that the licensee's emergency classification scheme was essentially similar to the scheme specified in NUREG-0654. However, the licensee uses the terms "site emergency" and "site area emergency" interchangeably throughout the emergency implementing procedures, as well as in the plant training programs. The emergency plan, however, is consistent in using "site area emergency". At one point in time, the licensee used only "site emergency" but initiated a change to "site area emergency" when the nonconformity to NUREG-0654 guidelines was noted.

Inspector Follow-up Item (302/84-13-01): Review the Plant Emergency Implementing Procedures to verify conformity with NUREG-0654 guidelines in the use of the term "site area emergency" as an emergency classification.

An emergency action level scheme was used to identify and classify the plant emergencies and to escalate to more severe emergency classes as the simulated emergencies progressed. During the medical emergency, the shift supervisor was incorrectly prompted to declare a Notification of Unusual Event. The emergency action levels require that a Notification of Unusual Event be declared when a radioactively contaminated injured individual is transported offsite for treatment. The prompt message, contained in the scenario, had the shift supervisor declaring the NOUE prior to the determination of the nature and severity of the accident and some 45 minutes prior to the time the contaminated injured individual actually left the site (See Section 13.a of this inspection report for related details of control room response to emergencies). Otherwise, licensee actions in this area were considered adequate and the inspector had no further questions.

10. Notification Methods and Procedures

This area was observed to determine that procedures have been established for notification by the licensee of State and local response organizations and emergency personnel, that the content of initial and followup messages to response organizations has been established, and that means to provide early notification to the populace within the plume exposure pathway have been established as required by 10 CFR 50.47(b)(5), 10 CFR 50, Appendix E, paragraph IV.D, and specific criteria in NUREG 0654, Section II.E.

An inspector observed that notification methods and procedures have been established and were used to provide information concerning the simulated emergency conditions to Federal, State and local response organizations and to alert the licensee's augmented emergency response organization. The inspector had no further questions in this area.

11. Emergency Communications

This area was observed to determine that provisions exist for prompt communications among principal response organizations and emergency personnel as required by 10 CFR 50.47(b)(6), 10 CFR 50, Appendix E, paragraph IV.E, and specific criteria in NUREG 0654, Section II.F.

Communications between the licensee's emergency response facilities and the emergency organization were adequate, with two exceptions. Trending information was not generally available in the TSC and the EOF on status boards. While one set of hard-copy trending information was available, as was a computer recall system, distribution of hard copies could be expanded to selected individuals where such information is essential to certain functions. General distribution of trending data on selected plant parameters would also be very useful. Radio communications between the TSC and the environmental monitoring team initially used proper procedures in identifying transmissions as exercise communications; however, after about 30 minutes, this protocol was no longer being used and messages could have been misinterpreted by anyone listening to these transmissions.

12. Public Education and Information

This area was observed to determine that information concerning the simulated emergency was made available for dissemination to the public as required by 10 CFR 50.47(b)(7), 10 CFR 50, Appendix E, paragraph IV.D, and specific criteria in NUREG-0654, Section II.G.

Information was provided to the media and the public in advance of the exercise. The information included details on how they would be notified and what the initial actions of the public should be in an emergency. A rumor control program was in place. An emergency news center (ENC) was established in the near-site EOF, about ten miles from the reactor site. The facility was adequately equipped and coordinated. Press conferences were held on an hourly basis and press releases were available.

13. Emergency Facilities and Equipment

This area was observed to determine that adequate emergency facilities and equipment to support an emergency response have been provided and are maintained as required by 10 CFR 50.47(b)(8), 10 CFR 50, Appendix E, paragraph IV.E, and specific criteria in NUREG 0654, Section II.H.

An inspector observed the activation, staffing and operation of the emergency response facilities and evaluated equipment provided for emergency use during the exercise.

- a. Control Room - An inspector noted that the procedure in use by the Emergency Coordinator (Shift supervisor) was bulky and difficult to use in a timely manner. It was noted that the shift supervisor spent 46 minutes out of the first hour of the event addressing telephone notification procedures and that significant operational events, such as the shutdown of a reactor coolant pump and plant shutdown (both simulated) took place without the apparent knowledge or consent of the shift supervisor.

A review of the manner in which procedure EM-202, dated November 2, 1983, was implemented illustrates some of the problems encountered. For example, Sections 1.3.2 and 6.3 authorize the shift supervisor, in his capacity as Emergency Coordinator, to designate someone to act as liaison (communicator) during an emergency; an inspector observed that no such action was taken by the shift supervisor prior to his relief by the Nuclear Plant Manager.

Section 1.4.1, defining "unusual event", is misleading and does not specify the criterion for transport of the individual to an offsite facility as part of the EAL. This led to a premature declaration of the NOUE as the result of an erroneous scenario prompt message, which placed the Emergency Coordinator (Shift Supervisor) in the position of being rushed into making a number of offsite notifications approximately 45 minutes earlier than required.

Section 7.3 directs the Nuclear Plant Manager to contact the acting Emergency Coordinator, be briefed on the current status of the accident and implementation of the radiological emergency response plan, and then assume the responsibility of Emergency Coordinator; an inspector observed that the Nuclear Plant Manager did not formally relieve the shift supervisor as Emergency Coordinator until 56 minutes after his initial arrival in the Control Room.

Inspector Followup Item (50-302/84-13-02): Revise plant procedure EM-202 and provide training in its use for all personnel required to act as Emergency Coordinator.

- b. Technical Support Center (TSC) - The TSC was activated and staffed prior to notification of the existence of simulated emergency conditions leading to an Alert emergency classification, primarily

because the EOF was activated by direction of the Director, Site Nuclear Operations. The rationale given for these actions was that the scenario message sheets indicated a deteriorating condition in the reactor such that a prudent manager would activate his emergency facilities prior to exceeding the specific EALs so that the facilities could be operational as early as possible.

The TSC was activated promptly following the decision to activate. The TSC staff appeared to be knowledgeable concerning their emergency responsibilities. However, the TSC technical support function could have been used more effectively. For example, there appeared to be no direct concerted effort to identify the source or cause of the radioactive gas leak, with personnel apparently preferring to let the scenario reveal the source or cause through controller prompting. Communication and notification activities appeared to function smoothly and promptly. The TSC appeared to have adequate equipment for support of the assigned staff.

- c. Operations Support Center (OSC) - The OSC was staffed promptly upon activation by the Emergency Coordinator. An inspector observed that teams were formed promptly, briefed and dispatched efficiently. The inspector had no further questions in this area.
- d. Emergency Operations Facility (EOF) - The EOF was located in the licensee's Nuclear Operations Training Center near the town of Crystal River, approximately ten miles from the reactor site. The facility appeared to be adequately equipped and staffed to support the emergency response effort.

The staffing of the EOF was prompt and efficient. Management control of personnel and emergency functions was adequate. An inspector observed some difficulties in the operation of the dose assessment computer: some of these difficulties were operator-related, some were concerned with the slow functioning of the computer and the dose assessment software, and at least one malfunction of the computer was observed. Licensee representatives stated that the computer was being replaced with a larger capacity model and that a new software program would be installed along with the new computer. These changes, together with operator training, should resolve the dose assessment difficulties. These items will be reviewed in a subsequent inspection.

Federal guidance (NUREG-0654 which incorporates EPA 520/1, Manual of Protective Action Guide and Protective Actions for Nuclear Incidents) on the use of calculated offsite radioiodine doses specifies the use of the child thyroid dose with protective action guides (PAGs) for determining protective action recommendations for the offsite population. During the exercise, an inspector observed that the dose assessment group working in the EOF was calculating the offsite dose using adult thyroid dose values instead of child thyroid dose values. This resulted in the posted values for iodine dose being only one-half of the proper values.

An inspector's review of the associated dose assessment procedures EM-204(A), EM-204(B) and EM-204(C) showed that EM-204(A) and EM-204(C) both were specific in the matter of reporting offsite iodine dose in terms of the child thyroid. However, EM-204(B), while addressing the computer program operation, did not specifically discuss reporting of either the adult thyroid dose or the child thyroid dose. The licensee was subsequently advised that failure to specify use of child thyroid in radiiodine dose assessment procedures was a violation of 10 CFR 50.47 (b)(10). The requirements of 10 CFR 50.47(b)(10) specify the development of protective actions during an emergency which are consistent with Federal Guidance. The Federal Guidance in NUREG-0654 incorporates EPA 520/1, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents which specifies the use of the child thyroid for dose assessment purposes. (VIOLATION 50-302/84-13-03)

14. Accident Assessment

This area was observed to determine that adequate methods, systems and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use as required by 10 CFR 50.47(b)(9), 10 CFR 50, Appendix E, paragraph IV.B, and specific criteria in NUREG 0654, Section II.I.

The accident assessment program includes both an engineering assessment of plant status and an assessment of radiological hazards to both onsite and offsite personnel resulting from the accident.

During the exercise, the engineering accident assessment team in the TSC appeared to be lacking in decisiveness and initiative in analyzing the plant status in that they appeared to make no effort to identify the source of radioactive gas leakage from the plant or to make recommendations to the Site Emergency Manager concerning possible mitigation actions to minimize or prevent the release and to terminate the emergency condition. Rather, they appeared to wait for the controller prompts to identify the source of release and the necessary mitigating actions to terminate the release.

Radiological assessment activities were spread over several licensee groups. A group in the TSC effectively estimated the radiological impact in the plant based on inplant monitoring and on-site measurements. Radiological effluent data was received in the TSC and relayed to the EOF. The TSC and EOF calculations of off-site doses were computed in parallel and compared on a timely basis. The results were also compared with the data obtained from the offsite monitoring groups.

The post-accident sampling system (PASS) was used to collect a sample of primary coolant as part of the drill. The PASS control console is located in the Chem/Rad laboratory facility on the lower level of the Control Complex and is capable of sampling and analyzing post-accident samples

remotely. The sample collection portion of the PASS appeared to function properly. However, the computer-controlled radiological analysis portion of the system did not operate properly and the results were considered invalid. Source of the difficulty appeared to be in the computer software program but the definitive cause of the problem was not established or corrected prior to the termination of the exercise. A licensee representative stated that a manufacturer's representative had been on site earlier in the week in an attempt to correct PASS system problems. Resolution of the PASS operational problems will be reviewed in a subsequent inspection.

The offsite monitoring team performed effectively. However, an inspector noted a delay in dispatching the team involving improper-fitting keys. It appeared that new keys had been made for the team vehicles but that the new keys had not been tested for proper operation; such testing should be an integral part of the team equipment periodic inspections and inventories.

15. Protective Responses

This area was observed to determine that guidelines for protective actions during the emergency, consistent with Federal guidance, have been developed and in place, and that protective actions for emergency workers, including evacuation of nonessential personnel, were implemented promptly as required by 10 CFR 50.47(b)(10), and specific criteria in NUREG 0654, Section II.J.

The inspector observed that protective actions were instituted for onsite emergency workers which included periodic radiation surveys in the facility, evacuation of nonessential personnel, and continued accountability of emergency response personnel.

The inspector observed the licensee's program for personnel accountability. Upon sounding of the site evacuation alarm, personnel appeared to proceed promptly to the designated assembly areas. Initial accountability appeared to be completed in about 28 minutes. Accountability was continued until all but two personnel were accounted for at approximately 45 minutes after sounding of the site evacuation alarm. The two missing persons were subsequently determined to have left the site earlier.

The protective measures decision-making process was observed by an inspector. Since the EOF was declared operational at approximately the same time as the TSC, all protective action decision-making was handled by the EOF Director, in accordance with established procedures. Protective action recommendations to State and local government agencies appeared to have been made in a prompt, correct manner.

16. Radiological Exposure Control

This area was observed to determine that means for controlling radiological exposures in an emergency, have been established and implemented for emergency workers and that they include exposure guidelines consistent with the EPA recommendations as required by 10 CFR 50.47(b)(11), and specific criteria in NUREG 0654, Section II.K.

An inspector noted that radiological exposures were controlled throughout the exercise by issuing emergency workers supplemental dosimeters and by periodic surveys in the emergency response facilities. Exposure guidelines were in place for various categories of emergency actions. The inspector considered the exposure control program adequate.

17. Medical and Public Health Support

This area was observed to determine that arrangements have been made for medical services for contaminated injured individuals as required by 10 CFR 50.47(b)(12), 10 CFR 50, Appendix E, paragraph IV.E, and specific criteria in NUREG 0654, Section II.L.

The scenario described an individual who had slipped and fallen in a puddle of water in the auxiliary building waste gas valve alley, with the fall resulting in an open facial wound, probable rib injury, and radioactive contamination of the face and right leg of the injured individual. An inspector observed the emergency first aid treatment, the transportation of the injured man, and his treatment at Shand's Teaching Hospital at Gainesville, Florida. Personnel at Shand's Teaching Hospital performed effectively, but a number of problems were observed on-site and during transport of the victim.

The first responders at the scene of the accident appeared to be slow in arriving, even though their duty station was in close proximity to the scene. The first responders appeared to make little or no effort to determine the nature and extent of the victim's injuries but did survey the victim for radioactive contamination. No attempt was made to check the victim's vital signs until 28 minutes from the time of initial notification and little effort was made to comfort the victim, treat for shock, or to control bleeding. The plant medical doctor and a trained emergency medical technician (EMT) arrived on the scene 30 minutes after the initial notification. Prior to their arrival, the victim had been moved onto a backboard; however, no preliminary examination had been made to check for possible back or spinal injuries before moving the victim and no medically-trained personnel were present to approve or supervise the move.

The plant doctor and the EMT worked rapidly and efficiently once they arrived on the scene. However, little or no contamination control was employed during their examination and treatment. The victim was removed from the area and placed in an ambulance for transport 58 minutes following the initial notification of the injury.

Contamination control practices in the ambulance during transport from the site to the hospital appeared to need improvement. No attempt was made to decontaminate the affected areas and several instances of potential cross-contamination of personnel and articles of equipment were observed.

Most of the above problems were considered by the inspector to reflect inadequate training. Similar problems were noted in the 1983 Crystal River

exercise and an Inspector Followup item identified at that time is considered to remain open (302/83-06-06).

18. Recovery and Re-entry Planning

This area is a function of the Corporate Command Center (CCC) at St. Petersburg, Florida, some 75 miles distance from the site. The CCC functions were not inspected during this exercise.

19. Exercise Critique

The licensee's critique of the emergency was observed to determine that deficiencies identified as a result of the exercise and weaknesses noted in the licensee's emergency response organization were formally presented to licensee management for corrective actions as required by 10 CFR 50.47(b)(14), 10 CFR 50, Appendix E, paragraph IV.E, and specific criteria in NUREG 0654, Section II.N.

The exercise critique was conducted on April 26, 1984, shortly after the conclusion of the exercise. Licensee management, key exercise participants and NRC representatives were present. The licensee discussed areas of the exercise in which items for possible improvement were identified. The inspector determined that the critique was adequate to meet the requirements specified above. The inspector summarized NRC findings with those present.

20. Federal Evaluation Team Report

The report by the Federal Evaluation Team (Regional Assistance Committee and Federal Emergency Management Agency Region IV staff) concerning the activities of offsite agencies during the exercise will be forwarded by separate correspondence.