



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
230 PEACHTREE STREET, N.W. SUITE 1217
ATLANTA, GEORGIA 30303

Report No.: 50-302/77-22

Docket No.: 50-302

License No.: DPR-72

Licensee: Florida Power Corporation
P. O. Box 14042
St. Petersburg, Florida 33733

Facility Name: Crystal River Unit 3

Inspection at: Crystal River Site, Crystal River, Florida

Inspection conducted: November 14-18, 1977

Inspectors: S. C. Ewald
W. J. Millsap

Reviewed by: A. F. Gibson
A. F. Gibson, Chief
Radiation Support Section
Fuel Facility and Materials Safety Branch

12/28/77
Date

Inspection Summary

Inspection on November 14-18 (Report No. 50-302/77-22)

Areas Inspected: Routine, unannounced inspection of radioactive waste management including a review of gaseous releases, effluent control instrumentation, solid waste handling, and a review of licensee event reports and previously identified items. The inspection involved 62 inspector-hours on site by two NRC inspectors.

Results: No items of noncompliance or deviations were identified.

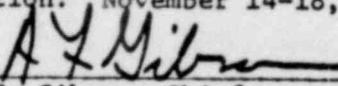
DETAILS I

Prepared by: 

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Radiation Support Section
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12/28/77
Date

Dates of Inspection: November 14-18, 1977

Reviewed by: 

A. F. Gibson, Chief
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Safety Branch

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1. Individuals Contacted

- *G. P. Beatty, Jr., Nuclear Plant Manager
- P. F. McKee, Assistant Nuclear Plant Manager
- *J. R. Wright, Chemical and Radiation Protection Engineer
- *J. L. Harrison, Assistant Chemical and Radiation Protection Engineer
- *G. D. Perkins, Health Physics Supervisor
- *R. E. Fuller, Plant Engineer
- G. M. Williams, Compliance Plant Engineer
- J. E. Mack, Plant Engineer
- E. G. Beall, Chief Chemical and Radiation Protection Technician
- *J. Cooper, Compliance Auditor
- R. N. Stuart, Nuclear Operator

*Denotes those attending the exit interview.

2. Licensee Action on Previous Inspection Findings

- a. (Closed) Make up System Letdown Line Shield. This item was discussed in RII Rpt. No. 50-302/76-24. The inspector observed the installed shielding during a plant tour on November 15. Surveys performed by the inspector showed typical radiation levels to be on the order of 1 mrem/hr. The inspector had no questions.
- b. (Closed) Doors to High Radiation Areas. This item was discussed in RII Rpt. Nos. 50-302/76-22 and 50-302/77-2. The inspector discussed the modification of two doors in the reactor building with the Health Physics Supervisor who stated that supplemental barriers were installed to prevent an individual from reaching around the gate and opening it from the outside. The inspector had no further questions.

- c. (Closed) Unresolved Item 77-8/1, Maintenance of Effluent Records. This item was discussed in RII Rpt. Nos. 50-302/77-8, 50-302/77-10, and 50-302/77-14. A review of liquid release records showed all missing data has been recovered. Missing data relative to gaseous releases is discussed in paragraph 5.
- d. (Open) Decontamination Room This item was discussed in RII Rpt. Nos. 50-302/76-24, 50-302/77-2, 50-302/77-10, and 50-302/77-14. The inspector reviewed the proposed installation as described in several Maintenance Approval Records (MAR's) and plant schematics. The proposed facility is discussed further in paragraph 8.
- e. (Closed) Noncompliance (50-302/77-14) Noncompliance Valve in Waste Gas System (WDV-857). The inspector reviewed the licensee response dated October 11, 1977. One element of the stated corrective action involved implementation of the computerized Maintenance Approval Record (MAR) tracking system which would assure the use of current diagrams and schematics in future maintenance and design changes. Discussion with licensee representatives revealed the MAR system has not been completely effective in the elimination of outdated documents. The inspector discussed various additional internal precautions, that assure only current documents are used, with licensee representatives and had no further questions. The inspector noted, as an additional precaution, the MAR's are now circulated to all sections to assure all related procedures are updated as necessary and all groups are aware of any design changes.

3. Unresolved Items

Unresolved Items are items about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations.

(77-22-01) Effluent Monitor Correlation

Environmental Technical Specifications 2.4.1.N and 2.4.2.I state, in part, "the relationship between effluent concentration and monitor readings should be established" for liquid and gaseous effluents respectively. Discussion with licensee representatives revealed no correlations have been made as of yet, however the data base for such a correlation is available. This item is discussed further in paragraph 6(b).

(77-22-02) Monitor Setpoints

Discussion with licensee representatives and review of procedures revealed an apparent lack of appropriate controls over radiation area monitor setpoints and various process monitor setpoints. The specific findings are discussed in paragraph 6(c).

(77-22-03) Waste Gas Loop Seal Modifications

This item was discussed in RII Rpt. No. 50-302/77-14. The inspector reviewed the engineering study recommendations relative to the waste gas system. This engineering study was performed in response to numerous unplanned gaseous releases resulting from blown loop seals. (see paragraph 4(b)). The specific recommendations of this study are in various stages of review and implementation as determined by discussion and a review of the status of specific MAR's. The inspector noted that temporary measures (such as extending the Miscellaneous Waste Evaporator Loop Seal) have resulted in no recent unplanned releases from blown loop seals. The inspector stated this item would remain open until full implementation of the necessary design changes is achieved.

4. Licensee Event Reports (LER)

- a. (Closed) LER Nos. 77-61E and 77-73E: These items were discussed in RII Rpt. No. 50-302/77-14. These events involved unplanned gaseous releases resulting from leaks in the waste gas system. The inspector reviewed the supplemental information detailing the cause and corrective action dated August 23, 1977. The inspector had no further questions.
- b. (Closed) LER Nos. 77-93E and 77-103E: These events involved unplanned gaseous releases resulting from blown loop seals. The inspector discussed temporary measures and the results of a generic engineering study with licensee representatives. The design changes discussed in the engineering study are in various stages of implementation and review. The inspector stated the specific LER's would be closed but that implementation of the above design changes would be considered an unresolved item (77-22-03) and reviewed in subsequent inspections.
- c. (Closed) LER Nos. 77-27, 77-105E, and 77-116E: These events involved unmonitored gaseous releases during reactor building purges as a result of the pump on the effluent monitor RMA1 being inoperable. The licensee has installed and tested an additional purge trip resulting from a high flow indication on the RMA1 channel. The high flow trip is based on a vacuum measurement. Loss of vacuum indicates either high flow (resulting from particulate filter rupture) or failure of the purge monitor pump. The inspector had no questions.
- d. (Open) LER Nos. 77-107 and 77-126E: These events involved unplanned gaseous releases resulting from leakage past the isolation valves in the hydrogen gas supply line from the makeup tank and subsequent leakage from the hydrogen supply

line to the environment. The inspector reviewed the stated corrective action and discussed temporary precautions being taken with the Health Physics Supervisor. Corrective action entails installation of a resilient seat-manual isolation valve to prevent back leakage from the Makeup Tank gas space. Currently the hydrogen line has a check valve and a motor operated valve for isolation. MAR No. 77-10-2, tracking the installation of the manual valve, was initiated on October 12, 1977, and is currently under review by corporate staff. Temporary precautions include frequent radiation surveys of the hydrogen line by chem/rad staff to determine when activity is in the hydrogen line. The line is then purged to clear the activity from the system. The inspector stated these items would remain open pending installation and testing of the proposed manual isolation valve.

- e. (Closed) LER Nos. 77-91 and 77-121: The first LER concerns a spike in dose equivalent I-131 following a reactor trip. LER-121 reported an unplanned gaseous release resulting from primary liquid offgasses associated with a spill. The spill was the result of a valve packing failure in the makeup pump area. The inspector reviewed the LER's and discussed the events with licensee representatives. The inspector reviewed the corrective action and had no questions.

5. Gaseous Releases

- a. An inspector reviewed a sample of radioactive gaseous releases from January to November 1977 and reviewed all releases during April and September 1977. The Assistant Chem/Rad Engineer supplied the inspector with a tabulation of discrepancies and missing data identified by licensee review. Missing data was revealed for three effluent channels; (1) Reactor Building Purges, (2) Auxiliary Building releases and (3) Condenser Vacuum releases. The inspector reviewed licensee estimates of releases where data was missing and had no questions.
- b. Discussion with licensee representatives about the causes of this problem revealed the the basic problem apparently stems from a lack of full understanding of gaseous release procedures and a lack of prompt followup and verification efforts for each release. Each of the channels involve multiple analyses such as separate determinations for noble gas, tritium, halogen, particulate and alpha activity. The analyses are frequently preformed during several shifts increasing the possibility of one piece of data being lost or misplaced. Other related causes include a recognized shortage of health physics staff,

a technician "pool" system where an individual might function in several different areas during a workshift, a lack of appropriate training and guidance for chem/rad staff relative to releases, and improper or incomplete labeling of data.

- c. The inspectors discussed appropriate corrective measures to preclude future losses of data with licensee management. The Chem/Rad staff shortage is a recognized problem and the licensee is in the process of hiring qualified personnel to substantially increase the total staff. The administration of the chem/rad technicians has been modified so that a technician functions primarily in one specific area (i.e. health physics, radwaste, or chemistry) and rotates areas on a fixed schedule (currently rotations are on a weekly basis). This should reduce the number of people involved in a specific analysis and thus reduce the possibility of data being lost. The increased staff will also make time available for followup work to verify all components of an analysis are complete. An improved training program for health physics staff is under development and the Chem/Rad Engineer stated the new program would be implemented by January 1, 1978. New procedures, computer codes, and guidance for making releases are in various stages of development and the Assistant Chem/Rad Engineer stated these would be ready for implementation by February 1, 1978. The inspector had no specific questions relative to these items but noted they are all relatively long term actions and stated some immediate corrective steps were necessary as well.
- d. Specific steps that could be taken to preclude loss of data in the interim period until the above corrective actions are taken were discussed in detail with licensee management. The Assistant Chem/Rad Engineer stated the following three steps would be implemented immediately to serve as interim corrective measures: (1) gaseous release check off sheets would be modified to include separate check offs for each specific piece of data required, thus assuring all analyses are performed, (2) a central, organized file for storing all pieces of data would be installed to preclude misplaced data, (3) chem/rad staff would be instructed to label each piece of data more specifically to assure proper collation of data. The inspector stated these corrective steps, both interim and long term, would be reviewed in subsequent inspections.

6. Effluent Control Instrumentation

- a. Calibrations, Test and Checks. An inspector reviewed recent calibration and test data and revealed no items of noncom-

pliance or deviations. Standard Technical Specification Table 4.3-2 and 4.3-3 require channel checks be performed once per shift (at least once every 12 hours) for the reactor building purge gaseous channel (RMA1g) and the reactor coolant leak detection channels for gaseous and iodine activity (RMA6g and RMA6i). Shift checks of fuel pool area monitors are also required when fuel is in the pool. Discussion with operations personnel and a review of Surveillance Procedures SP-300 (Operating Daily Surveillance Log) and SP-443 (Master Surveillance Plan) revealed a check on the alarm status and strip chart recorder operability are made on a shift basis. Any alarms or malfunction indications are noted for each of three monitor panels in the control room. Licensee management stated this practice would be reviewed in light of the technical specification definitions. The inspector stated this item would be reviewed in future inspections.

- b. Monitor Correlation. Environmental Technical Specifications 2.4.1.N and 2.4.2.I state, for liquid and gaseous monitors respectively, that "the relationship between effluent concentration and monitor readings should be established." Discussion with the Assistant Chem/Rad Engineer revealed no correlations of this type have been made but that the data is available for performing such analyses in the future. The inspector stated that, at a minimum, correlations should be performed to evaluate the adequacy of monitor setpoint determinations. The inspector stated this item would remain unresolved (77-22-01) pending a review of the technical specification requirements and industry practices.

- c. Monitor Set Points

The inspector reviewed procedures and techniques used to determine effluent monitor setpoints and discussed control over these and of other monitor setpoints with licensee representatives. Setpoints for effluent channels are determined for each release based on the isotopic mix of the effluent, dilution flows, etc. The auxiliary building ventilation monitor alarm is set to 300 counts per minute (cpm) and a review of licensee calculations show this to be very conservative relative to site release limits. The inspector reviewed a draft copy of Chemistry Procedure No. CH-280-L, "Radiation Monitoring System Operating Parameters." This procedure was drafted to provide guidance for chem/rad personnel in setting various warning and alarm setpoints for all radiation monitor channels. Discussion with licensee representatives revealed no approved controls or procedures are in effect governing the establishment

and periodic verification of setpoints as well as conditions under which setpoints may be changed and what authority is required to make such changes. The inspector stated a setpoint program addressing three main aspects (a procedure controlling the setpoints, documented bases for the setpoints and a program for periodic verification of setpoints) of monitor setpoints would be appropriate. The inspector stated this item would remain unresolved (77-22-02) pending further review of accepted industry practices and license conditions.

7. Solid Waste

An inspector reviewed solid waste shipments and records for the previous twelve months. The inspector noted that frequently radiation levels on packaged waste are listed as less than some value, i.e. <0.1 mrem/hr. Several instances occurred where levels were listed as <1 mrem/hr, <2 mrem/hr or <5 mrem/hr. The inspector stated that a measured radiation level should be recorded rather than an upper limit. The Health Physics Supervisor stated that procedures do not specify the instrument to be used and this is apparently part of the problem and agreed that radiation levels should be recorded whenever they can be measured. The inspector reviewed a draft copy of Radiation Protection Procedure No. RP-305, "Determination of Curie Content of Packaged Radioactive Waste." This procedure, based on published empirical data, appears to provide a significant improvement in quantifying radwaste activity. The inspector had no questions or other comments.

8. Decontamination Facility

- a. The inspector reviewed Requests for Engineering Information (REI) Nos. PD-408 and PD-651 and MAR Nos. 77-2-25 and 77-2-26 detailing the installation of a decontamination facility for tools, equipment and other materials. The inspector noted two items of concern based on these documents that have been identified by the Health Physics Supervisor. These concerns relate to liquid discharge paths and ventilation.
- b. The documents referenced above show all liquids being disposed via transfer through a drain to the auxiliary building sump. Liquids from this sump are processed through an evaporator to monitor tanks for sampling and subsequent discharge from the site. The organic solvents used for equipment decontamination are not compatible with evaporator processing. The Health Physics Supervisor stated recommendations have been made to drain those solvents to the concentrated waste tank for processing via solidification.

- c. The REI's and MAR's listed above show the only ventilation for the decontamination room to be a single 8 inch duct about 12 feet above the floor with a design flow of 610 cubic feet per minute. The inspector and Health Physics Supervisor estimated the room volume to be about 4000 cubic feet resulting in approximately 10 changes of air volume per hour. The inspector and Health Physics Supervisor performed a qualitative smoke test of the room ventilation on November 16 that showed essentially no airflow at occupancy areas. Further smoke tests showed most of the air flow to the 8 inch duct to be coming from outside the room through a cable chase penetration about 14 feet above the floor. Based on these tests the inspector stated the proposed ventilation is inadequate to protect personnel from airborne activity.
- d. The above items were discussed in detail with the Assistant Plant Manager and in a subsequent Plant Review Committee meeting. Licensee management acknowledged these concerns and stated they would be fully reviewed prior to use of the facility. The inspector stated guidance relative to ventilation criteria for this area could be found in typical standard requirements for contamination hood flows. The Health Physics Supervisor stated that an extensive air sampling program to evaluate the installed ventilation system would be carried out to assume adequate control of airborne activity. The inspector noted that the Director, Power Production stated last August that construction and installation work would be completed by December 30, 1977.

9. Facility Tours

The inspector toured the facility on five occasions and identified two areas of concern. The first item relates to numerous open penetrations for cable trays, piping, etc., to areas where contamination may be a problem. Examples include a two foot square penetration to the waste drumming area from the auxiliary building, several cable and pipe penetrations between the hot and cold machine shops, and several 8 inch square penetrations into the proposed decontamination room. The inspector stated this type of problem could compound any contamination control problems that might arise in the future. The second item of concern involves the laundry facility. Laundries are frequently contaminated areas with low but detectable radiation levels. The location of the laundry such that personnel leaving the radiation controlled area must walk by the laundry door will compound contamination control problems associated with the laundry. Radiation levels in laundry areas may approach 1 mrem/hr. This could seriously effect the friskers used for personnel contami-

nation monitoring and also the analyses performed in the isotopic counting room across the hall. Licensee management acknowledged the inspectors comments and stated these problems would be reviewed.

10. Exit Interview

At the conclusion of the inspection on November 18, 1977, the inspector met with management representatives (denoted in paragraph 1). The inspector summarized the scope and findings of the inspection. Items discussed in detail included three new unresolved items, and the inspectors concerns relative to the laundry area, maintainance of caseous effluent records, shift checks of radiation monitoring instrumentation, and the status of the decontamination facility.