

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report Nr. 50-333/80-09

Docket No. 50-333

License No. DPR-54 Priority -- Category C

Licensee: Power Authority of the State of New York

P.O. Box 41

Lycoming, New York 13093

Facility Name: James A. FitzPatrick Nuclear Power Plant

Inspection at: Scriba, New York

Inspection conducted: May 14-16, 1980

Inspectors: J. A. Serabian
J. A. Serabian, Radiation Specialist

8-5-80
date signed

Ronald Baer
R. E. Baer, Radiation Specialist

8-6-80
date signed

Approved by: P. J. Knapp
P. J. Knapp, Chief, Radiation Support
Section, FF&MS

date signed
8/12/80
date signed

Inspection Summary:

Inspection on May 14-16, 1980 (Report No. 50-333/80-09)

Area Inspected: Special, unannounced inspection by two regional based inspectors to followup on the site release of radioiodine above the Technical Specification release rate limit. The inspection involved 32 inspector-hours on-site by two NRC regional based inspectors.

Results: One apparent item of noncompliance was identified (infraction - failure to adhere to Technical Specifications regarding release rates), Paragraph 3.a.

DETAILS

1. Persons Contacted

- *Mr. R. Pasternak, Resident Manager
- *Mr. V. Childs, Assistant to the Resident Manager
- *Mr. R. Baker, Superintendent of Power
- *Mr. R. Burns, Assistant to the Superintendent of Power
- *Mr. E. Mulcahey, Radiological and Environmental Services Superintendent
- *Mr. A. McKeen, Assistant to the Radiological and Environmental Services Superintendent
- *Mr. R. Converse, Operations Superintendent
- *Mr. J. Hoddy, Assistant to the Maintenance Superintendent

*Denotes those present at the exit interview.

2. Background

- References:
- (a) License Event Report (LER) 80-032/04L-01
 - (b) Telecopy Message from James A. FitzPatrick to USNRC, Region I, Dated May 14, 1980

On May 14, 1980, the NRC Region I (Philadelphia) Office was notified via the OPX System that a Limiting Condition for Operation (LCO) of (Environmental) Technical Specification 2.3.B.2 had been exceeded. The surveillance associated with Technical Specification (TS) 2.3.B "Airborne Effluents", requires that when the weekly analysis of plant effluent filter cartridges indicates an airborne release greater than 8% of the limit specified by TS 2.3.B.2, the surveillance frequency shall be reduced to a daily analysis. The licensee's analysis of the sample taken over the weekly period ending on May 12, 1980, showed 8.06% of the TS limit. The sample frequency was subsequently reduced to the daily period. When the daily sample was analyzed, it indicated an airborne effluent release rate value of 130% of the TS limit. The licensee identified the primary source of the release as being radioiodine (I-131) which had evolved out of solution from the refueling pool.

The inspectors asked licensee representatives what event caused the evolution of the radioiodine from the refueling pool and whether the radioactivity concentrations in the reactor coolant were at their usual levels. Licensee representatives stated that the reactor coolant had higher than usual radioactivity concentrations due to the fact that two transients had recently occurred which caused elevated reactor coolant radioactivity levels. On April 28 and on May 7, 1980, the plant experienced reactor scrams while at power. Through review of previous records of reactor coolant radioactivity levels, the inspectors verified that these elevated levels occur after such

transients. However, the most recent reactor coolant system radioactivity concentrations were higher than these transient levels. Licensee representatives stated that normally, after a singular reactor scram, the plant is returned to power. The reactor coolant radioactivity concentrations then gradually return to usual values (in part due to removal by reactor coolant system ion exchangers). The inspectors verified this trend by review of records of reactor coolant system radioactivity concentrations. Licensee representatives stated that the two scrams within the relatively short time frame had elevated reactor coolant radioactivity concentrations further. Moreover, after the second reactor scram on May 7, the licensee decided to commence the 1980 refueling outage ahead of schedule. The usual licensee procedure in preparation for refueling outages entails a gradual coastdown from power such that a transient is not experienced. This had been the case for the 1979 refueling outage so that the licensee was not oriented on the basis of prior operating experience.

After an initial investigation, the licensee identified the probable event which resulted in the significant evolution of radioiodine from the refueling pool. Through review of Radiation Work Permits and the Control Room Log Book (which the inspectors also verified), the licensee concluded that the removal of the gate separating the refueling pool water from the spent fuel pool water had been the initiating event. Specifically, when the gate was removed, higher temperature refueling pool water flowed and mixed (via convection) with spent fuel pool water. This, in turn, resulted in more flow from within the core region and therefore higher temperature water to mix. The higher temperature water in conjunction with the greater surface area (i.e., the surface area of the refueling pool and the spent fuel pool) resulted in evolution of the radioiodine from the reactor coolant.

The inspectors noted and expressed concern to licensee representatives that there were several precursors to the release which were apparently not oriented to (i.e., the two reactor scrams /transients/ within 10 days of each other, entering the refueling outage by means of a reactor scram rather than a coastdown, and the known elevated radioactivity concentration levels in the reactor coolant). A licensee representative stated that under similar conditions, in the future, more time would be permitted for removal of reactor coolant system radioactivity (via ion exchangers) prior to removal of the refueling pool gate.

3. Radiological Assessment

a. Assessment of Offsite Releases

Through review of the licensee's Weekly Vent/Stack Data Sheet for the period covering from May 12-13, 1980 (26 hours), an inspector noted the following.

Release Rate (uCi/sec)	0.116
Release Rate due to I-131 only (uCi/sec)	0.115
Total Activity Released of I-131 (uCi)	9.991
Percent of Technical Specification Limit	130.34

Inspectors also noted that 96% of the release rate contribution was from the refueling floor vent. (The plant stack, radwaste building vent, turbine building vent, and reactor building vent comprised the remaining contribution.)

Technical Specification 2.3.B., "Airborne Effluents", states in Section 2 that the release rate of halogens (e.g., I-131) and particulates with half-lives greater than eight days released to the environs shall not exceed a rate, Q, in Curies/sec of I-131 equivalent such that:

$$\frac{Q_{sFITZ}}{2.6E-6} + \frac{Q_{sNMP-1}}{2.3E-6} + \frac{Q_{vFITZ}}{8.9E-8} \leq 1$$

Where:

Q_{sFITZ} = the release rate from the plant stack at the FitzPatrick facility;

Q_{sNMP-1} = the release rate from the plant stack at the Nine Mile Point, Unit 1, facility; and

Q_{vFITZ} = the release rate from vents at the FitzPatrick facility.

The inspectors noted that the licensee had exceeded the release rate, such that the rate was 1.3 times (or 130%) of the specified limit and as such constituted an instance of noncompliance against Technical Specification 2.3.B.2. (50-333/80-09-01).

The inspectors noted that Technical Specification 2.3.B.4., requires that when the aforementioned limit is exceeded, the licensee must initiate appropriate corrective action in order to bring the release within the limit. Licensee representatives informed the inspectors that the corrective action in this regard, entailed isolating the refueling floor ventilation, then processing the refueling floor air through the Standby Gas Treatment System (which includes charcoal filters for I-131 removal) to the plant stack (for an elevated release for improved atmospheric dispersion). In addition, portable air filtration units were set up on the refueling floor and the refueling

pool was covered with a plastic tarp (to prevent further evolution of I-131 since this was felt to have been the source). The inspectors reviewed licensee vent/stack data sheets and verified that the corrective actions had brought the release rates well within the limit.

An inspector asked the licensee representative how, when work on the refueling floor resumed, ventilation was restored to normal flow-path, and the airborne effluent sample frequency was returned to a one week sample period, a significant release (e.g., approaching or exceeding a Technical Specification limit) would be detected in a timely manner. The licensee representative stated that a curve has been developed which correlates air sample data of the refueling floor area (collected and analyzed for the purpose of determining concentrations of airborne radioactivity which plant personnel may be exposed to) with the airborne effluent release rate. These personnel work area air samples are commonly taken several times per work shift.

The licensee's assessment of the offsite release also included offsite dose calculations, analysis of environmental air samples, analysis of milk from local farms, and removal and readout of environmental thermoluminescent dosimeters (TLD).

On the basis of the effluent air sample results and assuming the worst case meteorological conditions, the licensee calculated a maximum total whole body dose of 0.332 mRem at the site boundary had an individual been present for the 26 hour period over which the release occurred.

The licensee's environmental group analyzed onsite and offsite environmental air samples (which were capable of radioiodine collection). The samples were taken over the period from May 12-15, which covers the period of the release. None of the nine onsite air sample stations indicated the presence of I-131 and none of the six offsite air sample stations indicated the presence of I-131.

Licensee environmental monitoring personnel collected milk samples from six local farms on May 19, 1980. Analysis of these samples indicated that no I-131 was present.

On May 17, 1980, licensee environmental monitoring personnel collected the environmental TLDs (ahead of the normal schedule) for readout. The results indicated no readily discernible change from the normal trend.

b. Onsite Exposures

Through review of Radiation Work Permits (PWP), the licensee identified those personnel who were present on the refueling floor during the

period that the significant evolution of I-131 from the refueling pool occurred. Air samples collected on the refueling floor during this period indicated that the highest I-131 value was 72.5% of the value listed in 10 CFR Part 20, Appendix B, Table I, Column 1. RWP sign-in logs indicate that seven individuals were on the refueling floor at that time, who were signed in under RWP No. 437 (S), "Remove Fuel Pool Side of Tell-Tale Gate". This RWP specified that full face iodine canisters were required for work. The inspectors verified through review of the RWP sign-in log that the individuals received no unusually high external radiation exposure during their work. (The range of exposures was from 20 mRem to 80 mRem). For assessment of possible internal deposition of radioiodine, each of the individuals was subject to a whole body count between May 13-15. The inspectors reviewed the results of these measurements and noted that they indicated that I-131 was not present. The inspectors reviewed the licensee's MPC-hour accounting for the individuals for the week which covered the release on May 12-13. The inspectors noted that the 40 MPC-hour control measure was not exceeded and that the highest value was 6 MPC-hours.

The inspectors noted that the potential for airborne radioiodine first existed on May 12, 1980, when the reactor head was removed. MPC-hour values for all personnel who had worked on the refueling floor from that time up to (and including) May 13, 1980, were reviewed. The inspectors noted that none of the individuals (approximately 56) had exceeded the 40-hour control measure.

4. Exit Interview

The inspectors met with the licensee management representatives (denoted in Paragraph 1) at the conclusion of the inspection. An inspector summarized the scope and findings of the inspection. The licensee representative stated that an ad hoc committee had been formed to further investigate the cause of the release, to take corrective steps to limit future releases, and to recommend steps which should be taken during future outages in order to preclude releases similar to one which occurred on May 12-13, 1980. The committee's written report to the Plant Operations Review Committee was made due by May 19, 1980.