U.S. NUCLEAR REGULATORY COMMISSION

Region I

Report No.:	94-09
Docket No.:	50-333
License No.:	DPR-59
Licensee:	New York Power Authority P.O. Box 41 Lycoming, New York 13093
Facility:	James A. FitzPatrick Nuclear Power Plant
Location:	Scriba, New York
Dates:	March 13, 1994 through April 23, 1994
Inspectors:	W. Cook, Senior Resident Inspector J. Tappert, Resident Inspector B. Welling, Reactor Engineer

Approved by: Peter W. Eselgroth 5/11/94

Peter W. Eselgroth, Chief — Date

Reactor Projects Section 1B, DRP

INSPECTION SUMMARY: Routine NRC resident inspection of plant operations, maintenance, engineering, and plant support.

RESULTS: See Executive Summary

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NOTE: The NRC inspection manual procedure or temporary instruction that was used as inspection guidance is listed for each applicable report section.

EXECUTIVE SUMMARY
James A. FitzPatrick Nuclear Power Plant
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Plant Operations:

The plant operated at full power until April 2 when the unit was shutdown for a scheduled maintenance outage. The shutdown was complicated by the failure of the B reactor feedwater pump discharge check valve, but operators were able to take compensatory action and continue the shutdown without further incident. Future modifications to the check valves are being planned and will be followed by the inspectors (**IFI 94-09-01**). The remainder of the inspection period, the NYPA staff performed a variety of maintenance and surveillance activities with few operational problems. On April 6, NYPA retracted an earlier 10 CFR 50.72 notification regarding control room habitability, based upon additional information and analysis.

Maintenance:

Numerous maintenance and surveillance activities were observed, including instrumentation isolation valve replacement and standby liquid control testing. No discrepancies or concerns were noted. Troubleshooting controls were reviewed. No specific site-wide procedures exist to provide guidance. However, the inspectors found that the normal work control process provides adequate controls.

Engineering:

An inspector followup item regarding emergency core cooling system pumps net positive suction head was closed. Calculations using correct strainer configuration verified adequate head was available. A deviation regarding non-safety related transfer switches was closed. Administrative controls were found sufficient to preclude cross-connecting separate vital power supplies. Review also found a number of longstanding temporary procedure changes. NYPA is taking steps to enhance their procedure revision process.

Plant Support:

Tours of the plant and drywell found radiological controls and housekeeping appropriate. Walkdown of the site's security perimeter noted a number of access control improvement initiatives. NYPA's response to a low flash point fuel load was reviewed and found to be acceptable.

Safety Assessment/Quality Verification:

The stand-down performed by the plant staff prior to entering into the maintenance outage was viewed as a positive and proactive initiative to improve personnel performance and minimize human performance errors during a period of high activity.

DETAILS

1.0 SUMMARY OF FACILITY ACTIVITIES

1.1 NYPA Activities

At the beginning of the inspection period the unit was operating at full reactor power. On April 2, a normal unit shutdown was conducted for a scheduled maintenance outage. Major outage activities included: 4160/600 volt transformer replacements; local leak rate testing; motor-operated valve testing; erosion/corrosion program pipe replacement; condenser tube inspections and plugging; surveillance testing; and preventive maintenance.

1.2 NRC Activities

The inspection activities during this report period included inspection during normal, backshift and weekend hours by the resident staff. There were 37 hours of backshift (evening shift) and 16.5 hours of deep backshift (weekend, holiday and midnight shift) inspections during this period.

Region based inspectors reviewed the inservice inspection (ISI) and the erosion/corrosion monitoring programs during the weeks of March 28, April 4, and April 11.

Senior NRC managers responsible for conducting FitzPatrick's Systematic Assessment of Licensee Performance (SALP) board visited the site during this inspection period. Visiting the site were Messrs. J. Wiggins, C. Hehl, R. Capra and J. Durr. The SALP Board was conducted on April 21, 1994 and the results will be documented by separate correspondence.

2.0 PLANT OPERATIONS (71707,93702,92701)

2.1 Followup of Events Occurring During Inspection Period

2.1.1 April 2, 1994 Shutdown

At 3:00 p.m. on April 2, NYPA commenced a normal reactor shutdown for a scheduled maintenance outage. At 5:15 p.m. while securing the B reactor feedwater pump, the B feedwater pump discharge check valve apparently stuck open causing water to flow back through the pump, windmilling it at 3000 rpm. The operators isolated the B feed pump and restored normal reactor water level. However, the level transient caused a runback on the recirculation pump motor generators. Operator response to this event was appropriate.

The feedwater check valves have had a history of failures; however, the A reactor feedwater pump check valve has had the most failures. The B check valve was repaired during the maintenance outage. Modification packages (involving an advanced design) are being prepared for replacement of both discharge check valves for the upcoming November 1994 refueling outage. The inspectors will continue to follow this issue. **(IFI 94-09-01)**

2.1.2 10 CFR 50.72 Notification Retraction (URI 93-14-03 Update)

On April 6, the station staff notified the NRC Headquarters Duty Office of the retraction of an earlier 10 CFR 50.72 notification (February 24, 1994) made in reference to additional design deficiencies associated with the control room normal and emergency ventilation systems. The retraction of the February 24 notification was based upon closer examination of design basis documentation involving the as-built main steamline leakage collection system (MSLCS). As documented in the last routine resident inspector report (50-333/94-06, section 2.1.2) a 1974 control room habitability calculation was based upon 99 percent charcoal filter efficiency and immediate operator action to manually initiate emergency ventilation in the event of a radiological release. However, the engineering staff determined that this 1974 calculation was based upon a proposed MSLCS design and the failure of one main steam isolation valve (MSIV) to close.

Review of the as-built MSLCS design and supporting calculations (installed in the late 1970's) demonstrated that because of the redundancy in the system, 90 percent efficiency of the charcoal filter beds and manual operator action within 20 minutes of a radiological release was sufficient to show protection of the control room operators (as documented in the UFSAR). The inspectors reviewed this information with the technical services staff and found their review to have been well researched and organized. The documentation of this discussion updates unresolved item 93-14-03.

2.2 Engineered Safety Features System Walkdown

The inspector conducted partial control room and in-plant walkdowns of the following systems:

- Emergency diesel generators A and C
- High pressure coolant injection
- Reactor core isolation cooling

No discrepancies were noted during the inspection walkdowns of the above systems.

3.0 MAINTENANCE (62703,61726,92701)

3.1 Maintenance Observations

The inspectors observed and reviewed selected portions of preventive and corrective maintenance to verify compliance with codes, standards and Technical Specifications, proper use of administrative and maintenance procedures, proper QA/QC involvement, and appropriate equipment alignment and retest. The following activities were observed:

- Work Request (WR) 94-02306, replace valve isolation manifold and high side test/drain valve for reactor core plate differential pressure transmitter (02-3DPT-62 inst), performed on April 12 and 13, 1994. The inspector observed tubing fabrication and preparations for retest.

- WR 94-02720, packing leak on hydraulic control rod unit (HCU) outlet scram air-operated valve 03AOV-127 (HCU-42-43), performed on April 13, 1994. The packing leak was discovered on April 8, 1994. The work request was drafted assuming that the leak would be present when the valve was worked. However, the technicians stated that, because the system was depressurized, the leakage had stopped. The technicians indicated that their actions to correct the problem would be verified during the post-work test when the system was re-pressurized.

- WR 93-02200, A train standby liquid control (SLC) system bench test, inspection, and replacement per surveillance test MST-11.11. The inspector observed the re-installation of a SLC system piping spoolpiece, including gasket replacement and flange bolt torquing.

- WR 94-1653, A recirculation water (RWR) motor generator lube oil leak repairs. The inspector observed re-gasketing and assembly of joints. This was part of a concerted effort to reduce oil leaks plant wide.

No concerns were identified during inspector review of the above activities.

3.1.1 Troubleshooting Activities

Several instances of inadequate control of troubleshooting activities have been documented at various Region I facilities. A review of FitzPatrick's troubleshooting process was conducted to assess the adequacy of their controls. The majority of troubleshooting activities are conducted by the maintenance and instrumentation and controls (I&C) departments. There is no site administrative procedure that specifically governs troubleshooting activities. Troubleshooting is controlled, along with other work, by Administrative Procedure 10.01, Problem Identification and Work Control. Additionally, the I&C department has supplemental controls in Instrumentation and Controls Standing Order (ICSO)-12, Generic Troubleshooting and Maintenance Procedures.

Troubleshooting is controlled through the normal work control process. After a deficiency is identified using the problem identification (PID) process, a work package is developed. The work package defines the scope of the work and provides direction on how it is accomplished, generally through work instructions, maintenance procedures, or referencing vendor technical manuals. The packages are developed by work planners and approved by all departments involved in the work. An ALARA group review is performed if work occurs in a radiologically controlled area. QA and operations departments perform a review if the work involves safety related or important to safety components. If during the course of the

troubleshooting the scope of the work must be expanded, a new sub-work request will be generated and the revised work package will be developed by the same organization responsible for the original package.

Troubleshooting controls have been generally effective in preventing unintended problems. One recent exception occurred on September 24, 1993 when a reactor scram occurred as a result of troubleshooting on the electro-hydraulic control (EHC) system. Plant management understood that this troubleshooting effort was a high risk evolution and reduced reactor power and took the turbine off-line. The scram occurred while trying to localize a ground on a 125 vDC bus, by lifting leads in the EHC system. One of the lifted leads caused the turbine bypass valves to close which led to a high pressure scram. This event was reported in licensee event report (LER) 93-20. With this notable exception, for which corrective actions have been taken, no other incidents have occurred as a result of troubleshooting. Though FitzPatrick does not use site-wide procedures to specifically control troubleshooting, the inspector concluded that the normal work control process provides adequate controls.

3.2 Surveillance Observations

The inspector observed and reviewed portions of ongoing and completed surveillance tests to assess performance in accordance with approved procedures and Limiting Conditions for Operation, removal and restoration of equipment, and deficiency review and resolution. The following tests were reviewed:

- ST-8Q, Testing of the emergency service water system (IST), on March 23, 1994.

- ST-19G, Electric bay unit cooler performance test with ESW flow, on March 23, 1994.

- ST-4X, HPCI Class 2 piping pressure test (ISI), on March 28, 1994.

  The inspector witnessed the start of ST-4X and verified that all prerequisites were satisfied. After the start of the high pressure coolant injection (HPCI) turbine, operators placed the residual heat removal (RHR) systems in the torus cooling mode, per procedure. After approximately 30 minutes of HPCI turbine operation, the shift supervisor secured the test due to the observed heat-up rate of the torus (initial temperature was approximately 70 degrees F and the rate of heat-up was approximately 10 degrees F per hour).

  Based upon the shift crew's calculations, a 10 degree F per hour heat-up with all RHR pumps and RHR service water pumps lined-up for torus cooling would have resulted in the torus upper temperature limit being exceeded prior to completing the minimum required four hour pressurization soak time. The inspector considered the actions taken by the shift supervisor and his crew appropriate, given the available information. Contributing to the heat-up rate was the fact that the HPCI system was

being operated at full recirculation flow and maximum turbine rpm. After experiencing this rapid heat-up rate, the plant staff determined that full pressurization could be achieved at a lower HPCI operating speed and therefore less heat input (turbine exhaust) to the torus. Accordingly, the procedure was revised and the test successfully re-run on April 2, 1994, during unit shutdown for the planned maintenance outage.

The inspector reviewed the heat balance calculations which were generated to support the initial draft of procedure ST-4X. The calculations were appropriately based and correct, but lacked the typical engineering rigor (independent review and verification) observed in other supporting engineering calculations. The inspector noted that there was no requirement for this calculation to be performed and that it was performed by a shift technical advisor vice a member of the technical services or site engineering staffs. In addition, discussions with station management determined that the torus upper temperature limit would most likely not have been exceeded on the March 28 attempt of ST-4X. It was determined that after sufficient differential temperature was established between the torus water and the RHR service water, the torus heat-up rate would have diminished and upper torus temperature limits not challenged. The inspector had no further questions.

No additional concerns were identified during inspector review of the above testing activities.

4.0 ENGINEERING (37700,93702,92700,92701)

4.1 Downcomer Bellows Shields

While conducting an inspection/tour of the torus, a staff engineer noted that all six of the downcomer bellows have a protective shield encasing them. The shields are fabricated of thin gage (1/8 inch) stainless steel plate and are affixed to the downstream end of the bellows by bolts. This leaves the upstream ends free-floating such that the thermal expansion of the bellows is not encumbered. Followup by the site engineering staff identified that these bellows shields are not annotated in as-built drawings, however, vendor drawings (Chicago Bridge and Iron Co.) clearly show the protective shields bolted at either end of the bellows and further restrained by rigid shipping brackets. Information obtained from the supplier indicate that the shields and shipping brackets provide protection to the more fragile bellows material during transport and installation.

The inspector determined that this issue was being tracked by a Deficiency Event Report (DER No. 94-0310). Discussions with the engineering staff identified that besides the lack of as-built drawings for this configuration detail, no information was available on the seismic qualification of these shields, it was unknown if these shields were addressed in the LOCA analysis with respect to loose materials or components impacting ECCS pump strainers, the mountings and adequacy of fasteners for seismic and dynamic loading was not completely known, and lastly, what specifically these shields were protecting the bellows from in the as-

built configuration. These issues were being addressed by the engineering staff at the conclusion of the inspection period. The inspectors identified no immediate safety concern with this configuration, in that, the unit was in cold shutdown at the time of discovery.

Subsequent to the conclusion of the inspection period, the inspector was provided a copy of site engineering memorandum JSED 94-0080, dated April 22, 1994, which addressed the issues stated above. The protective shields were left installed and the bolting for each shield was checked to ensure its adequacy. In two locations the bolts were missing and new bolts installed per a maintenance work request. The structural integrity calculations for hydro-dynamic and seismic loading were found acceptable. The shields were left installed to protect the bellows during future maintenance and testing activities. A preliminary review of JSD 94-0080 by the inspector found the resolution of the above items adequate for restart of the facility, and the inspector had no further questions at this time.

4.2 Previously Identified Items

4.2.1 (Closed) Inspector Followup Item (94-06-01): ECCS Strainer Performance

During NYPA's review of NRC Bulletin 93-02, Debris Plugging of Emergency Core Cooling Suction Strainers, Supplement 1, an error was found with JAF-CALC-MISC-01118. The calculation demonstrated that adequate net positive suction head was available to the ECCS pumps after plugging of the strainers with LOCA induced insulation debris. However, the calculation did not use an accurate suction pipe/strainer configuration and the actual strainer area was about half of what was used in the calculation.

NYPA then performed calculation JAF-CALC-MULTI-01482 to determine available net positive suction head for the ECCS pumps with the actual strainer configuration. The calculation, which uses less conservative assumptions to determine the volume of entrained debris, concluded that sufficient NPSH was available to ensure ECCS operability during a LOCA. The calculation takes credit for containment pressurization from the LOCA. While this approach is contrary to Regulatory Guide 1.1, Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal System Pumps, and the Standard Review Plan, FitzPatrick is not committed to RG 1.1 and their approach was accepted by the NRC staff in the plant's original safety evaluation report. After review of the revised calculation and other pertinent documents, the inspector had no further questions. This inspector followup item is closed. The inspector notes that NYPA is also revising ECCS NPSH calculations for their power up-rate licensing submittal.

4.2.2 (Closed) Deviation (90-19-01): Non-Safety Related Transfer Switch

On August 14, 1990, the NRC issued a Notice of Deviation. The deviation cited FitzPatrick's use of non-safety related manual transfer switches to supply the EPIC uninterruptable power supply (UPS). The transfer switch received power through either of two normally closed breakers from the redundant vital load centers. The NRC determined

that this configuration compromised the plant's ability to demonstrate that the single failure criteria was met. On September 18, 1990, NYPA responded to the deviation and disagreed with the NRC staff's position. On March 2, 1994, after a detailed review of the initial findings and NYPA's response, the NRC affirmed it's original position that the two normally closed supply breakers compromised the plant's ability to resist a single failure. However, the NRC also noted that Operating Procedure (OP)-46A, 4160V and 600V Normal AC Power Distribution, had been revised to administratively prohibit concurrent closure of both upstream supply breakers. Based on the administrative controls and the time elapsed since the Notice was issued, the NRC retracted the Notice of Deviation.

The inspector's final review of this issue verified that the revisions to OP-46A properly administratively controlled the upstream supply breakers. The inspector also reviewed OP-38C, EPIC UPS, which can be used to manipulate the upstream supply breakers. The inspector's controlled copy of the procedure included steps to shut both supply breakers. Further review found that the master copy in the control room had a temporary change entered in 1990 to preclude shutting both breakers. The procedure was not revised to incorporate the temporary change during the last biannual review, nor was it required to be by Administrative Procedure 2.04, Control of Procedures, which allows the responsible procedure owners to exercise discretion in incorporating temporary changes. Further review found that several operating procedures had temporary changes that were older than two years. This is not a significant safety problem because plant operations are conducted using only the master copy or a copy of the master. NYPA is currently reviewing their procedure change and revision process. They intend to require incorporation of temporary changes during biannual reviews or earlier limited revisions. Additionally, other departments are able to provide temporary changes to controlled copy holders. However, this is not practical for operations department procedures which have approximately 45 controlled copies. The operations staff intends to reduce the number of controlled copies and thus reduce the corresponding administrative burden in maintaining them. This would also allow simpler distribution of temporary changes. NYPA's actions in response to this issue have not been finalized, but the proposed actions appear to be appropriate and will enhance the procedure control and revision process. In regards to the deviation, administrative controls were verified to be in place to preclude simultaneous shutting of both supply breakers. Deviation 90-19-01 is closed.

5.0 PLANT SUPPORT (64704,71707,83750,40500,92701)

5.1 Radiological Controls

Periodic walkthroughs by the inspectors of all areas in the plant identified generally good radiological control practices and housekeeping. Postings of high radiation and contaminated areas were appropriate, worker radiation control practices observed were in keeping with ALARA standards, and work activity coverage by the radiation protection technicians was good. The inspectors conducted a tour of the drywell, accompanied by a radiation protection

technician, and found the radiological controls and housekeeping conditions appropriate for the level of maintenance work activity in progress for the outage. No problems were identified.

5.1.1 Emergency Diesel Generator (EDG) Fuel Oil Analysis

On March 29, 1994, the FitzPatrick staff was notified by one of its vendors (Herguth Laboratories, Inc.) that a March 8, 1994 sample of #2 diesel fuel was analyzed as having its flash point low out of specification. The Technical Specification 4.9.C.1 (applicable to the monthly diesel fuel storage tank sample) limit for flash point is a minimum of 125°F. The analyses by the vendor resulted in a 122°F flash point and 124°F on the recheck. This sample was taken by the Quality Assurance (QA) staff per Quality Assurance Procedure (QAP)-7.3, for a tanker load of #2 diesel fuel (low sulfur) received on March 8, 1994.

The inspector determined a receipt inspection visual analysis was performed by the QA staff and included a test for viscosity, specific gravity, clarity and brightness. The sample was taken immediately upon arrival and before addition of the fuel to the diesel fuel storage tanks. A second sample vial was also provided to the procurement engineering staff for shipment to a vendor laboratory for detailed analysis. The March 8 diesel fuel load was satisfactory by the QA visual sample and the contents of the fuel tanker were distributed evenly between all four of the EDG fuel tanks (approximately 700 gallons pumped to each 30,000 gallon capacity storage tank).

Based upon the March 29 vendor notification, the FitzPatrick staff immediately sampled each EDG storage tank for a detailed analysis. A preliminary operability determination of the adequacy of the diesel fuel in all four storage tanks concluded that the diesel fuel in the storage tanks was satisfactory. The inspector learned that this assessment was based upon the satisfactory flash point analysis results of the most recent tank samples (3/21/94 with flash points of A-136°F, B-135°F, C-138°F, and D-138°F). The inspector found this basis satisfactory, in that, the monthly samples taken on March 4, had significant margin to the Technical Specification limit and would only be diluted slightly by the fuel delivery. This assessment was supported by the subsequent analysis. The March 29 samples were express mailed to the vendor and the analysis results were provided to NYPA on March 31. All storage tank samples were satisfactory (A-138°F, B-140°F, C-138°F, and D-136°F).

Discussions with licensee representatives determined that the dilution of high sulfur content diesel fuel with kerosene may have contributed to the lower flash point. Contamination of the tanker with more volatile fuels (like kerosene) or the use of additives to lower the sulfur content could also have contributed to the lower flash point. Since the tanker used by the fuel supplier also is used for delivery of other type fuels, contamination could be introduced due to inadequate cleaning between loads. NYPA has emphasized to the supplier the need for better controls (cleaning) of the delivery truck for shipments made to FitzPatrick and stated that future problems with fuel contamination may jeopardize their purchase contract.

The inspector reviewed chemistry department records and logs for diesel fuel samples for the previous quarter and found no problems or trends indicating lowering diesel fuel flash point concerns. The inspector concluded that NYPA's response to this event was appropriate.

5.2 Security

On April 12, the inspectors conducted a comprehensive walkdown of the station protected area perimeter and associated security guard force monitoring and access control stations. The inspectors were accompanied by the security department manager. No discrepancies were identified and a number of access control improvement initiatives were noted.

5.3 Plant Housekeeping

See section 5.1.

6.0 SAFETY ASSESSMENT/QUALITY VERIFICATION (40500)

6.1 Review of Licensee Event Reports

The inspectors reviewed the following Licensee Event Reports (LERs) and found them to be well written, concise, accurate, and properly submitted for NRC staff review within the guidelines of 10 CFR 50.73. The following LERs are closed:

- 93-14, Incomplete logic system functional testing, dated June 25, 1993. The event was inspected and was documented in report 50-333/93-16.

- 94-01, High pressure coolant injection system declared inoperable due to turbine shaft seal leakage, dated March 22, 1994, and 94-01, Supplement 1, dated April 6, 1994. The event and corrective maintenance on the HPCI turbine were reviewed and discussed in report 50-333/94-06.

The inspector identified no additional concerns or problems with NYPA's response to these events.

6.2 Pre-maintenance Outage Stand-down

On March 29, 1994, just prior to unit shutdown for the scheduled maintenance outage, station management initiated a pre-maintenance outage stand-down to reinforce the need to perform work in the upcoming outage right the first time, safely, and on schedule. The stand-down lasted approximately one hour, was attended by all station personnel, and was conducted in five different locations at the site by five different station managers. The managers facilitating the discussions used a prepared outline and handouts for each employee. This initiative was a follow-on to corrective actions taken in response to an increase in personnel performance errors experienced during the Fall 1993 maintenance

outage. The inspector reviewed the stand-down discussion outline and handout and found them to be comprehensive and well structured. This activity was viewed by the inspector as a positive and proactive initiative to improve station employee performance.

7.0 MANAGEMENT MEETINGS (30702,71707)

7.1 Exit Meetings

At periodic intervals during the course of this inspection, meetings were held with senior facility management to discuss inspection scope and findings. In addition, at the end of the period, the inspectors met with licensee representatives and summarized the scope and findings of the inspection as they are described in this report. The licensee did not take issue with any of the findings reviewed at this meeting.