U.S. NUCLEAR REGULATORY COMMISSION

Region I

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Facility Name:	James A. FitzPatrick Nuclear Power Plant
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EXECUTIVE SUMMARY

James A. FitzPatrick Nuclear Power Plant
NRC Inspection Report 50-333/97-07

Operations

- Overall, the licensee operated the plant safely and activities were performed in conformance with requirements. Effective controls were implemented to achieve safe operation of the plant.

- An improperly substituted component (tachometer generator brushes) for the recirculation system by a vendor ultimately resulted in plant single loop operation due to recirculation motor generator set oscillations. Operators demonstrated excellent use of procedures and control of the evolution.

  The licensee generated an action commitment tracking system item to plan replacement of the brushes for the other recirculation loop with a due date of about 1 year past the potential failure date of the brushes based on operating experience. The inspector considered that, based on the due date, this planned corrective action was not prudent and could result in an unplanned plant transient.

- Operator response, including procedure use, to indications of an uncoupled control rod were good. The licensee's analysis of the cause including the operability determination were thorough and corrective actions appeared appropriate. The control rod has had two previous indications which may have indicted that the uncoupling rod was misaligned. An additional rod may also be susceptible to becoming uncoupled based on previous work history and rod operating characteristics.

Maintenance

- Overall, maintenance and surveillance activities which were observed were well conducted, with good adherence to both administrative requirements and maintenance and surveillance procedures.

- The work activities associated with the "B" emergency diesel generator (EDG) were generally well conducted and had good management as well as supervisory oversight. An error that occurred during the installation of a limit switch operating arm in the EDG breaker indicate that continued licensee focus on attention to detail is warranted. Emergent maintenance issues, including the degraded voltage regulator transformer and contaminated fuel oil were adequately addressed.

- The licensee actions to address the potential for residual heat removal service water system degradation due to strainer gasket deterioration, including the operability review were appropriate. The previous modification to address strainer gasket cover leakage was ineffective in that the potential for the flow turbulence to destroy the gasket was not recognized.

- Generally, plant material condition was considered to be acceptable. However, there were several specific issues that detracted from the overall appearance and condition of the plant. The licensee adequately addressed the specific items which were noted.

- Incorrect oil was installed in several pumps. The procedure change program was not sufficiently controlled to ensure that work instructions to perform pump lubrication would be accurate. Additionally, review efforts were not through enough to identify the error. The licensee's operability review and corrective actions associated with the pumps were timely and satisfactory. The improper development of a maintenance procedure which caused the error was a violation.

Engineering

- The procedure written to control the evolution of moving spent fuel into the outer racks met the constraints placed on the task by the safety evaluation. However, it was not clear that the planned task did not involve an unresolved safety question as discussed in 10 CFR 50.59, and the issue will remain unresolved pending further evaluation.

Plant Support

- The radioactive liquid and gaseous effluent control programs were well implemented. Good management control and oversight of the radioactive liquid and gaseous effluent control programs was noted. The radiation monitoring system (RMS) calibration program was well-implemented. RMS reliability has been generally good. The air cleaning system program area was well-implemented. Monitoring and trending of air cleaning system performance parameters was a noted strength. The technical depth of quality assurance audits was good and chemistry laboratory quality assurance/quality control was very good.

- Initial operator actions to investigate and respond to a fire protection system alarm were appropriate, although it was questionable whether it is necessary to remove an automatic function of a fire water suppression system from service due to the false alarm. Apparently poor coordination and communication between different licensee departments resulted in the fire protection system being isolated for a longer period of time than was necessary.

- Procedures were in place to direct the appropriate response to fires in the control room and control room evacuation in the event of a relay room CO_2 system discharge. Operators were knowledgeable of equipment operation and familiar with the associated procedures.

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Attachment 1 - Partial List of Persons Contacted
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- Items Opened, Closed, and Discussed
- List of Acronyms Used

Report Details

Summary of Plant Status

The unit began this inspection period at 100 percent power. On August 31, reactor operators reduced power to less than 54 percent due to large oscillations on the "A" recirculation (RWR) motor generator (MG) set. On September 1, reactor power was reduced to 43 percent and single loop operations were conducted to complete repairs to the RWR MG set. Reactor power was returned to 100 percent on September 1. The plant continued operation at 100 percent through the end of the inspection period.

I. OPERATIONS

O1 Conduct of Operations[1]

01.1 Operational Safety Verification

a. Inspection Scope

The inspectors observed plant operation and verified that the facility was operated safely and in accordance with procedures and regulatory requirements. Regular tours were conducted of the plant with focus on safety related structures and systems, operations, radiological controls and security. Additionally, the operability of engineered safety features, other safety related systems and on-site and off-site power sources was verified. The inspectors performed a walk down of accessible portions of the following systems:

emergency diesel generator
intake structure
emergency service water
residual heat removal service water
high pressure coolant injection
reactor core isolation cooling

The inspection activities during this report period included inspection during normal, backshift and weekend hours. Regular tours were conducted of the following plant areas:

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[1]Topical headings such as O1, M8, etc., are used in accordance with the NRC standardized reactor inspection report outline. Individual reports are not expected to address all outline topics.

control room
secondary containment building
radiological control point
electrical switchgear rooms
emergency core cooling system pump rooms
security access point
protected area fence
intake structure
diesel generator rooms

Control room instruments and plant computer indications were observed for correlation between channels and for conformance with technical specification (TS) requirements. The inspectors observed various alarm conditions and confirmed that operator response was in accordance with plant operating procedures. Compliance with TS and implementation of appropriate action statements for equipment out of service was inspected. Plant radiation monitoring system indications and coolant stack traces were reviewed for unexpected changes. Logs and records were reviewed to determine if entries were accurate and identified equipment status or deficiencies. These records included operating logs, turnover sheets, system safety tags, and temporary modifications. Control room and shift manning were compared to regulatory requirements and portions of shift turnovers were observed. Daily supervisor meetings were attended to assess personnel focus on risk significant items and plant priorities.

b. Observations and Findings

Overall, the licensee operated the plant safely. Plant activities were performed in accordance with procedures and effective controls were implemented for safe plant operation. Overall, equipment operability, material condition and housekeeping conditions were good.

c. Conclusions

Overall, the licensee operated the plant safely and activities were performed in conformance with requirements. Effective controls were implemented to achieve safe operation of the plant.

O1.2 Single Loop Operation

a. Inspection Scope

The inspector observed operator actions associated with single loop operations, including procedure use and verified that Technical Specification requirements were met.

Recirculation flow is varied by a variable speed pump. Pump speed is varied by controlling the frequency of the AC power source to the motor. The variable AC

power is derived from a variable speed generator driven by a motor through a variable speed fluid coupling. The voltage of the pump motor is regulated as a function of speed and the voltage regulator uses a tachometer generator to generate a speed signal to the voltage regulator to control the generator voltage as a function of speed.

b. Observations and Findings

On August 31, large oscillations on the "A" recirculation (RWR) motor generator (MG) amps and voltage were observed. Operators reduced power to less than 54% which was less than 70% required to be outside the unstable region and manually locked up the scoop tube to mitigate the MG set oscillations. Troubleshooting efforts were begun and it was determined that the tachometer generator was faulty. To affect repairs, the licensee removed the "A" RWR pump from service per operating procedure (OP)-27, Recirculation System Sect G.2, Emergency RWR Loop A shutdown with Reactor in Startup or Run Mode, and entered abnormal operating procedure (AOP) 8, Loss of Reactor Coolant Flow. The inspector noted excellent operator focus on plant parameters and appropriate concern for thermal hydraulic instability. Technical Specification 3.5.k, Single Loop Operation, requirements were met.

The tachometer generator was replaced in accordance with maintenance procedure (MP)-058.01, Recirc MG Set Outage Brush Maintenance. Operators ensured all requirements were met to restore the loop including surveillance test (ST) 26K, Recirc Loop Startup Differential Temperature Check, and returned the plant to normal operation.

The licensee performed an equipment failure evaluation and determined that the tachometer generator failure was caused by excessive brush wear, which damaged the commutator.

The inspector noted that the tachometer generator had been replaced during the 1996 refueling outage and the brushes had been replaced during a forced outage in May 1997. The licensee determined that brush life has shortened from 2 years to approximately 7 months beginning in February 1996 and investigated the reason. It was determined that the vendor had supplied different brushes than what was specified on the licensee's purchase order. The licensee's purchase order had stated "no substitutions authorized," however, the vendor had substituted brushes but did not indicate such on the documentation. The brushes have different design and consequently operating characteristics.

The inspector noted that the "B" tachometer generator brushes were replaced on May 27, 1997 and may therefore also be susceptible to similar failure after about 7 months of operation. Also, the uninterruptable power supply (UPS) MG set may be using an equivalent brush. The licensee has a brush monitoring program, however, the tachometer generator brushes are not visible. The licensee has generated an action commitment tracking system (ACTS) item to plan replacement of the "B" tachometer generator brushes. The inspector noted that the ACTS item

due date was December 31, 1998. Based on the operating experience concerning the brushes and the potential plant impact, it was not clear to the inspector why the brush replacement would not be pursued more aggressively.

c. Conclusions

An improperly substituted component for the RWR system by a vendor resulted in plant single loop operation. Operators demonstrated excellent use of procedures and control of the evolution.

The licensee generated an ACTS item with a due date of about 1 year past the potential failure date of a component based on operating experience. The inspector considered that the selection of this date for this planned corrective action was not prudent and could result in an unplanned plant transient. The licensee acknowledged the inspector's concern and is in the process of developing a plan to replace the brushes.

O2 Operational Status of Facilities and Equipment

O2.1 Uncoupled Control Rod Drive

a. Inspection Scope

On September 20, 1997 while performing control rod maneuvers for a sequence exchange, control rod drive (CRD) 18-19 became uncoupled. The inspector reviewed operator actions, applicable procedure and Technical Specification requirements and the operability assessment for the CRD.

b. Observations and Findings

Control rod 18-19 was originally at position 06. During the sequence exchange it was required to be withdrawn to position 48. While single notching the control rod from position 46 to 48, the CRD indicated that it was uncoupled and Abnormal Operating Procedure (AOP)-25, Uncoupled Control Rod, was entered. The CRD was inserted to position 44 to attempt to couple the drive to the blade. Subsequently, the CRD was withdrawn to position 48 and a coupling check was performed satisfactorily in accordance with ST -23B, Control Rod Coupling Integrity Test.

The licensee determined that there were several possible causes for the uncoupled control rod drive. These possible causes included interference in the fuel cell, control blade locking mechanism failure, damaged control rod drive spud, damaged or misaligned control rod drive inner filter, debris in the upper portion of the control rod drive and incorrectly installed control rod drive uncoupling rod. The incorrectly installed control rod drive uncoupling rod was determined to be the most likely cause based on analysis and work history. If an uncoupling rod is placed in one of the flow holes rather than in its intended position, it could come in contact with the top of the inner filter. When this occurs the uncoupling rod will either prevent

the drive from reaching position 48 or the uncoupling rod will compress the locking mechanism and uncouple the control blade from the drive. The nature of the incorrectly installed uncoupling rod is such that when the drive is moved from position 46 to 48, there is a risk of inadvertently uncoupling the control rod.

The licensee elected to place the CRD at position 46 to prevent challenging the coupling integrity of the drive. The control rod had successfully passed six coupling checks since it became uncoupled which provided reasonable assurance that the control rod drive is coupled to the blade. Additionally, impact on reactivity management was determined to be nominal and scram systems have not been affected. The affected CRD has been satisfactorily scram time tested twice during the current operating cycle most recently in July, 1997 and the rod had not been at position 48 since then.

The inspector reviewed the work history of the control rod drive. The control rod drive had been in service since 1980. The inspector noted that the licensee had implemented the recommendations included in General Electric Services Information Letter (SIL) No. 052, Supplement 3, Control Rod Uncoupling Rod Replacement, dated March 17, 1989. The SIL described additional actions to minimize the probability of control rod uncoupling. However, since the rod had been in service prior to the recommended actions, it was not subject to the additional quality control.

The inspector also noted that the rod has had two previous indications in 1983 and again in 1993 which may have indicated that the uncoupling rod was misaligned. The problem was attributed to a reed switch problem when it may have been an indication that the control rod drive was incorrectly assembled. It was also noted that an additional rod, 18-07, may be susceptible to becoming uncoupled based on previous work history and rod operating characteristics. The licensee has scheduled these CRDs for replacement during the next refueling outage.

c. Conclusions

Operator response, including procedure use, to indications of an uncoupled control rod were good. The licensee's analysis of the cause including the operability determination were thorough and corrective actions appeared appropriate.

II. MAINTENANCE

M1 Conduct of Maintenance

M1.1 General Comments on Maintenance and Surveillance Activities

a. Inspection Scope

The inspectors observed selected maintenance activities to verify that activities were conducted in a manner sufficient to ensure reliable, safe operation of the

plant. The inspectors observed selected surveillance tests to determine whether the tests were conducted in accordance with technical specification and other requirements.

The inspectors observed all or portions of the following work activities:

- various High pressure coolant injection system maintenance
- 97-05166 345 KV line circuit breaker maintenance
- 97-06341 Hydraulic control unit 18-23 charging water header isolation valve
- 97-02280 Residual heat removal service water strainer inspection
- 97-07542 Filter fuel oil in emergency diesel generator
- 97-06549 Replace recirculation system motor generator Set "A" tachometer generator

The inspectors observed portions of the following surveillance activities:

- ST-8R Emergency Service Water Check Valve and Strainer Test
- ST-3A Core Spray Pump and Valve Operability Test
- ST-1B Main Steam Isolation Valve Fast Closure Test
- ST-9B Emergency Diesel Generator Full Load Test

b. Observations and Findings

The inspectors found the work performed under these activities to be professional and thorough. Technicians were experienced and knowledgeable of their assigned task. Activities were conducted appropriately and in accordance with procedural and administrative requirements. Good coordination and communication were observed during performance of the surveillance activities.

c. Conclusions

Overall, the above maintenance and surveillance activities were well conducted, with good adherence to both administrative requirements and maintenance and surveillance procedures.

M1.2 Emergency Diesel Generator Maintenance

a. Inspection Scope

The licensee entered a seven day limiting condition for operation (LCO) to conduct periodic maintenance on the "B" emergency diesel generator (EDG). The inspectors observed various portions of the activities, reviewed maintenance procedures and interviewed maintenance personnel to verify that the maintenance activities resulted in the reliable operation of safety related equipment. Activities observed included replacement of the EDG turbocharger in accordance with maintenance procedure MP-093.16, EDG Turbocharger Replacement, replacement

of a voltage regulator transformer, replacement of a 4160 KV breaker housing limit switch, post work testing of breaker protective relays and EDG fuel oil replacement.

b. Observations and Findings

The inspector observed the replacement of the EDG turbocharger and noted good participation by the EDG vendor and good management oversight and involvement. The inspector verified that quality assurance and tool calibration records were satisfactory. The inspector discussed the activities with maintenance technicians and found them knowledgeable of the work and sensitive to the maintenance procedure requirements.

The inspector observed the post work testing of the EDG output breaker protective relays in accordance with work request (WR) 97-02061-00. The maintenance and operation staff performed the post work testing in accordance with the work request. The inspector noted good self checking and peer checking by the technicians and solid procedure use.
The inspector observed the replacement of a limit switch in the EDG output breaker. The licensee discovered that the control room annunciator alarm panel was not correct for the restoration position of the breaker. Through further investigation, it was determined that the breaker housing limit switch was not closing, possibly due to dirt accumulation or degradation. When replacing the switch the maintenance crew had mistakenly restored the limit switch operating arm upside down. In this configuration the switch would not close upon breaker restoration which was again discovered during the tag removal process. The configuration was subsequently corrected by the maintenance staff and the breaker tested satisfactorily. The inspector considered this a personnel error by the electrical maintenance staff with minor safety significance, but warranting further attention by the licensee with regards to attention to detail and self checking.

While performing preventive maintenance on the EDG control panel, some charring on a transformer in the voltage regulating circuitry was noted. The exciter-regulator controls the generator voltage by controlling the amount of current delivered to the generator field. The transformer is one of three saturable transformers which when provided with the proper amount of current from the voltage regulator, provides the means for precise generator voltage regulation. The licensee did not have any spare parts at the facility nor could one be obtained as safety related equipment. The licensee was able to procure one from another facility and perform a commercial grade dedication of the replacement transformer. The inspector reviewed the commercial grade dedication plan of the replacement transformer, which was done in accordance with work activity control procedure (WACP) 10.1.25, The Dedication of Commercial Grade Items Utilized in Safety Related Applications. The plan included material description, summary of end use, seismic qualification, and selection of critical characteristics. The critical characteristics compared the damaged transformer with the new transformer, including part number, dimensions, weight, insulation resistance, and coil

resistance. The inspector questioned the licensee's ability to dedicate the component without any technical design information from the component manufacturer which was not available. This was of concern to the inspector because the licensee's procedure for commercial grade dedication relies, in part, on information from the vendor. Without this information the pre-installation testing was of limited scope. The licensee stated that the electrical performance would be verified during the post work testing with the machine running and at that time the component would be considered qualified. The post work testing was completed satisfactorily and proper voltage regulation response was verified by the licensee's operations staff.

The EDG fuel oil was replaced with fuel oil that was stored in temporary tanks. Difficulties were encountered during the tank fill process, due to clogging of the in-line filter from the temporary storage tanks to the EDG fuel oil storage tanks. The licensee changed the piping lineup from the bottom of the temporary tanks to the top of the tanks which resolved the fuel transfer problem. The EDGs were run multiple times following preventive maintenance activities. During the final run, fuel oil differential pressure began to trend up. The inservice filter was removed and found to contain a black substance which was later determined to be particulate matter, most likely contamination from the temporary fuel oil storage tanks. The licensee determined that at the rate of fouling, the filter would require change out every 5 hours. Filters were made available and the operations department was made aware of the concern. The filter that plugged is one of two engine driven fuel pump filters either of which can be placed into service during engine operation. Based on the rate of fouling and the availability of filters, the EDG was considered to be operable. Subsequently, the licensee filtered the fuel and subsequent fuel oil samples were satisfactory. EDG fuel oil samples showed that technical specification requirements were met however, particulate contamination exceeded the industry accepted maximum value.

Although the temporary tanks were inspected prior to use, the residue was not detected, most likely due to the difficulty of inspecting the tank, which caused the fuel contamination.

c. Conclusions

The work activity was generally well conducted and had good management oversight as well as the routine supervisory oversight. An error which occurred during the installation of a limit switch operating arm indicated that continued licensee focus on attention to detail is warranted. Emergent maintenance issues, including the degraded voltage regulator transformer and contaminated fuel oil were adequately addressed.

M1.3 Residual Heat Removal (RHR) Service Water System Strainer Degradation

a. Inspection Scope

On October 16, 1997, during routine preventive maintenance on the RHR service water system strainer, the strainer basket cover gasket was determined to be significantly degraded. The inspector reviewed the maintenance history, operability review and discussed the event with the licensee.

b. Observations and Findings

When the strainer was opened for preventive maintenance, the licensee identified that numerous pieces of the strainer basket cover gasket were in the strainer basket. The licensee determined that the gasket had been a full sheet gasket which had been torn up by flow turbulence. The pieces which were found were less than the area missing which implies that portions of the gasket material had degraded to an extent to pass through the strainer. The licensee wrote deficiency and event report (DER) 97-1425 to address the issue. The RHR service water system provides cooling for the RHR heat exchanger. An operability review was performed and surveillance test conducted which determined that there was no effect on the RHR heat exchanger.

The licensee determined that the cover gaskets had been in place since 1992 and had been previously inspected in February 1997. The strainer gasket had been installed as a modification in an attempt to address basket cover leakage. As an identical gasket was installed in the other train of RHR service water, the licensee intends to inspect the other train for similar problems at the next opportunity.

c. Conclusions

The licensee actions to address the potential for residual heat removal service water system degradation including the operability review were appropriate. The previous modification to address strainer gasket cover leakage was ineffective in that the potential for the flow turbulence to destroy the gasket was not recognized.

M2 Maintenance and Material Condition of Facilities and Equipment

a. Inspection Scope

On September 3, 1997, a routine plant tour was conducted with NRC management to assess general material condition and equipment status. Specific observations and the licensee's resolution to these observations are detailed below.

b. Observations and Findings

A plexiglass cover was installed on the "B" control rod drive (CRD) pump gear box which was a different configuration to the "A" CRD pump. The licensee determined that this cover was most likely installed to allow observation of gear box operation and did not affect the CRD pump. However, the installation of the cover was not documented by the design drawing and a problem identification (PID) number 76652 was written to address the cover.

Tape was noted on the "A" CRD pump suction flange. The licensee determined there was no apparent reason for the tape and a PID was generated to remove the tape.

Debris including a yellow rubber boot and gloves was noted in the east and west crescent areas in the reactor building. The licensee cleaned up the areas.

Emergency service water pump packing leakoff water is directed to the floor. The licensee had previously developed a modification, D1-95-108, to correct the pump packing bleed off lines and determined that there has not been any degradation of the pump support. The modification has not been scheduled.

A high radiation area boundary rope in the reactor core isolation cooling room was detached from the wall. The licensee reattached the rope and, during an extent of condition review, determined that there were four other radiation area boundary ropes which were not sufficiently attached. The radiation area boundaries were degraded but acceptable. The RES department response to this concern was considered to be aggressive.

A different colored oil was noted in the "A" residual heat removal (RHR) keep fill system pump. The licensee documented the condition on DER 97-1191 to evaluate the condition. This issue is discussed in section M3.1 below.

c. Conclusions

Generally, plant material condition was considered to be acceptable. However, there were several specific issues which detracted from the overall appearance and condition of the plant. The licensee adequately addressed the specific items which were noted.

M3 Maintenance Procedures and Documentation

M3.1 Incorrect Pump Bearing Oil (Violation 50-333/97007-01)

a. Inspection Scope

The inspectors noted that a different colored oil was in the "A" residual heat removal (RHR) keep fill system pump oil reservoir. The licensee documented the

condition on DER 97-1191 to evaluate the condition and determined that the incorrect pump bearing oil had been installed. The inspectors reviewed the DER, operability review and applicable procedures and discussed the error with licensee maintenance, planning and engineering personnel.

b. Observations and Findings

Through discussions with the oil manufacturer, the licensee determined that the incorrect oil which was installed had parameters which were similar to the proper oil except that the viscosity was slightly higher. Additionally, the licensee discussed use of the incorrect oil with the pump vendor and noted that bearing temperatures were satisfactory and the relatively short duration of running with the wrong oil (DTE-26) would not be harmful to the pump. Based on these discussions, the licensee's operability review determined that the oil was compatible with the correct oil and acceptable for the pump and therefore pump operation was not adversely affected in the near term. Additionally, two other pumps, both associated with the radioactive waste sump system, had also had the incorrect oil installed. The licensee elected to drain and refill the bearing lube oil for the affected pumps as recommended by the vendor and completed this activity on September 9, 1997.

The incorrect oil was installed in the "A" RHR keep fill system pump on August 22, 1997 under routine preventive maintenance which was completed using work instructions under WR 96-03759. Previously, pump oil changes were accomplished using a maintenance lubrication procedure which was used for multiple pumps. Due to an ongoing effort to reduce the number of maintenance procedures, the original maintenance procedure governing pump oil changes was converted to a work instruction. A set of work instructions was generated and was to be the basis for all pump lubrication. The work instructions were stored in a pre-plan that was copied to a preventive maintenance file which was used to generate individual work request work instructions. The pre-plan file was incorrectly created with an oil specification for DTE-26 instead of the correct oil, DTE-797. The error was "copied" to additional pump lubrication work instructions and was missed during work planning review.

Maintenance procedure, MP-101.06, Lubrication of Pumps, Rev. 12 has been withdrawn. However, the technical information in the procedure was incorrectly translated into work instructions which resulted in the incorrect oil being installed in several pumps. The improper development of a maintenance instruction is a violation **(50-333/97007-01)**.

c. Conclusions

The procedure change was not sufficiently controlled to ensure that work instructions to perform pump lubrication would be accurate. Additionally, review efforts were not through enough to identify the error. The licensee's operability review and corrective actions associated with the affected pumps were timely and satisfactory. The improper development of a maintenance procedure was a violation.

III. ENGINEERING

E1 Conduct of Engineering

E1.1 Moving Spent Fuel with the Reactor Building Crane (Unresolved Item 50-333/97007-02)

a. Inspection Scope

Currently, the spent fuel pool does not contain a sufficient number of empty cells to allow the core to be completely off loaded during the next refueling outage. To remedy this problem, the licensee has planned to install an additional spent fuel rack and to utilize cells that are currently inaccessible with the normal fuel servicing equipment. There are 113 spent fuel rack cells on the north, south, and east sides of the spent fuel pool that are inaccessible by the main hoist on the refuel bridge. The licensee prepared a 10 CFR 50.59 Nuclear Safety Evaluation to demonstrate that irradiated fuel assemblies can be moved within the spent fuel pool to the inaccessible locations using the 1000 lb. hoist on the reactor building crane. The inspector reviewed safety evaluation JAF-SE-97-003, Rev. 1, "Use of the Reactor Building Crane to Move Irradiated Fuel Assemblies in the Spent Fuel Pool" and irradiated fuel handling procedure, RAP 7.1.05E, Rev 1, Transfer of Fuel to Peripheral Spent Fuel Storage Locations in the Spent Fuel Pool, to verify that the proposed activity by the licensee does not involve an unreviewed safety question.

b. Observations and Findings

The proposed activity is the movement of spent fuel assemblies, within the spent fuel pool, using the reactor building crane, to rack locations inaccessible by the main hoist of the refuel bridge. The effective limits of travel of the refuel bridge (trolley), plus the main hoist mast, render 113 locations inaccessible using the refueling bridge. The licensee determined that modifications to the bridge to make cells accessible were not practical. The main hoist on the refuel bridge is the normal means of moving irradiated fuel within the pool and between the pool and the reactor vessel. The 1000 lb. hoist on the reactor building crane is routinely used to move new fuel from the storage pit to fuel preparation machine and to the fuel pool. The safety evaluation stated that the reactor building crane would be fitted with protective equipment and instrumentation similar to that available on

the main bridge hoist. Furthermore, rigging will be installed to prevent lifting the fuel assembly more than 24 inches above the storage racks by a backup "limit switch," a primary limit switch will stop the assembly six to twelve inches below the backup switch. The hoist has a mechanical load brake to control the lowering speed and prevent dropping the load in the event of an electric motor failure, and has an electric solenoid operated motor brake. An electronic crane scale or load cell with digital readout will be used to monitor the load and verify seating. Cells containing fuel assemblies to be move were tested with the refuel bridge prior to moving the assemblies with the reactor building crane hoist on June 9, 1997. To minimize movement of fuel, fuel will only be moved from adjacent cells (within two storage cell locations).

The inspector discussed the safety evaluation and the procedure with the licensee and determined that the commitments and restrictions placed on the activity by the safety evaluation were captured in the revised fuel handling procedure. The inspector had a concern that the cells which were to receive the assemblies may have debris in them which could cause difficulties in moving the fuel. The licensee stated that most of the cells were previously tested to ensure there would be no binding of the assemblies. The newer racks did not have testing done because they were tested prior to installation. The inspector noted that albeit, the racks were new, there had been two refueling outages since they were installed and therefore some what susceptible to foreign material which could cause problems in the future. The licensee acknowledged the comment and considered it for review.

The inspector reviewed the technical specifications and the FSAR and did not find any requirements which prohibited the use of the reactor building crane to move irradiated fuel. However the FSAR, did not discuss the activity. In review of previously issued TS amendment No. 175, dated December 31, 1991, for increasing the capacity of the spent fuel pool, the NRC staff in approving the installation of the racks, noted that the fuel handling procedures in, and around, the pool will be the same as those procedures that were in effect prior to the proposed modification. The inspector concluded that had it been known at the time of the TS change that the fuel handling procedures were going to be different than those in place, then the staff would have taken that into account during their review. The licensee has placed administrative controls on fuel movement pending resolution of the issue.

c. Conclusions

The procedure written to control the evolution of moving the spent fuel into the outer racks met the constraints placed on the task by the safety evaluation. However, it was not clear that the planned task did not involve an unresolved safety question as discussed in 10 CFR 50.59, and the issue will remain unresolved (URI) pending further NRC review **(50-333/97007-02)**.

E8 Miscellaneous Engineering Issues

E8.1 (Closed) LER 50-333/97003: Potential Overpressurization of Containment Penetrations Due to Thermal Expansion. On February 13, 1997 the licensee determined that overpressurization of containment penetrations could potentially be a condition outside of the design basis of the plant. The licensee discovered the condition while responding to NRC Generic Letter 96-06, Assurance of Equipment Operability and Containment Integrity During Design Basis Accident Conditions. The licensee determined that pressurization of these penetrations due to thermal expansion of entrapped fluid between the containment isolation valves was not considered during the design of the plant.

The licensee reviewed 584 containment penetrations and determined that 8 required further review. The licensee's detailed operability determination, JPN-97-019, Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions, determined that containment integrity is maintained and safety functions are not compromised for the susceptible containment penetrations. The memorandum provides a summary of the detailed evaluation, and identifies modifications to eliminate the susceptibility of thermal overpressurization. Long term corrective actions by the licensee include modification to three containment penetrations X-19 drywell equipment drain sump discharge, X-224 and X-226, reactor core isolation cooling (RCIC) and high pressure coolant injection (HPCI) torus suction penetrations respectfully. The corrective actions are planned to be completed prior to start-up from the next refueling outage.

IV. PLANT SUPPORT

R1 Radiological Protection and Chemistry (RP&C) Controls

a. Inspection Scope

The radiological liquid and gaseous effluent control program inspection was conducted which included: (1) plant tours; (2) review of selected chemistry procedures used to conduct the effluent control programs; (3) the 1996 Annual Radioactive Effluent Release Reports; (4) the Offsite Dose Calculation Manual (ODCM); and (5) the impact of hydrogen water chemistry and the ability to comply with 40 Code of Federal Regulations (CFR) 190.

b. Observations and Findings

No discrepancies pertaining to release permits were found. The Annual Effluent Report was found to be complete. The ODCM contained required and site-specific parameters; no discrepancies were found.

No significant discrepancies were noted during plant tours.

No discrepancies pertaining to 40 CFR 190 were identified. The licensee had maintained a maximum hydrogen injection rate of 18.5 standard cubic feet per minute (SCFM) as noted in the last inspection of this program area.

c. Conclusions

Good management control and oversight of the radioactive liquid and gaseous effluent control programs was noted.

R2 Status of RP&C Facilities and Equipment

R2.1 Calibration of Effluent/Process/Area/Accident Radiation Monitoring Systems (RMS)

a. Inspection Scope

The inspectors reviewed the most recent calibration results for the following effluent and process RMS to determine the implementation of the Technical Specification (TS) requirements and Updated Final Safety Analysis Report (UFSAR) commitments:

- Liquid Radwaste Discharge Monitor,
- Liquid Radwaste Flow Rate,
- Service Water Discharge Monitor,
- Main Steam Line Radiation Monitors,
- Reactor Building Closed Loop Cooling Radiation Monitor,
- Main Stack - Normal and High Range Noble Gas Monitors,
- Main Stack Flow Rate
- Refuel Floor Exhaust Radiation Monitor,
- Reactor Building Exhaust Radiation Monitor,
- Turbine Building Exhaust - Normal and High Range Monitors,
- Radwaste Building Exhaust - Normal and High Range Monitors, and
- Offgas Radiation Monitor

b. Observations and Findings

No discrepancies in either the radiological or Instrumentation & Controls (I&C) portions of RMS calibrations were noted. Good use and development of calibration factors was noted.

The inspectors noted that despite the age of RMS, reliability has been good. Various parameters were trended. There were few open work orders at the current time.

c. Conclusions

The RMS calibration program was well-implemented. RMS reliability has been generally good.

R2.2 Air Cleaning Systems

a. Inspection Scope

The inspectors reviewed the licensee's most recent surveillance test results (visual inspection, in-place high efficiency particulate (HEPA) leak tests, in-place charcoal leak tests, air capacity tests, pressure drop tests, and laboratory tests for the iodine collection efficiencies) for: (1) the standby gas treatment system; (2) the control room ventilation system; (3) technical support center system; and (4) the radwaste building air cleaning system.

b. Observations and Findings

All test results were within the licensee's TS acceptance criteria. Two individuals within the Engineering Department had been assigned to manage the station ventilation systems. All TS and UFSAR tests were conducted at the prescribed frequencies. Unsatisfactory test results were analyzed and corrective actions were implemented in a timely manner. The inspectors noted that attention given to the air cleaning systems was good. The system engineers monitored and trended the performance of the air cleaning systems.

During discussions with the ventilation system engineers, the inspectors were informed that additional surveillances on non-TS related ventilation systems were under development.

c. Conclusions

The air cleaning system program area was well-implemented. Monitoring and trending of air cleaning system performance parameters was a noted strength.

R7 Quality Assurance (QA) in RP&C Activities

a. Inspection Scope

The inspection consisted of: (1) review of the 1997 audits; (2) QA policy of the measurement laboratory; and (3) implementation of the measurement laboratory quality control (QC) program for radioactive and gaseous effluent samples.

b. Observations and Findings

The inspectors reviewed QA Audit Reports A97-05J and A97-06J. These audits included the implementation of: (1) the ODCM and TS requirements; (2) semi-

annual radioactive effluent reporting requirements (Regulatory Guide 1.21); and (3) laboratory QC program. Audit team members identified several findings and observations including recommendations. The audit team identified several matters for enhancing the radioactive liquid and gaseous effluent control programs, but no items were of regulatory significance.

Audit team members were composed of the licensee's technical staff, technical specialists from other utilities, and consultants. The depth of the audit was good.

The inspectors considered chemistry laboratory QA/QC to be very good.

c. Conclusion

The technical depth of the QA audits was good and .ry laboratory QA/QC was very good.

S1 Conduct of Security and Safeguards Activities

S1.1 Operational Safeguards Response Evaluation (OSRE)

An OSRE team inspection was conducted from September 15-18, 1997. The inspection consisted of security system observations, staff interviews, observation of weapons familiarity and proficiency, observation of response drills and conduct of table-top exercises. Inspection results will be documented in separate correspondence.

F1 Control of Fire Protection Activities

F1.1 Fixed Water Suppression System

a. Inspection Scope

During a routine control room tour, the inspector noted that the fixed water suppression system isolation valve to the turbine lube oil storage room was shut. The inspector discussed the condition with operators, and fire protection personnel and reviewed fire protection procedure requirements.

b. Observations and Findings

On October 9, during fire pump testing, a flow alarm occurred on the fire system header to the turbine lube oil fire suppression system. Operators responded appropriately by investigating the condition and subsequently isolated the system pending investigation of the cause of the alarm. No other compensatory action was taken nor was required by procedures. The fixed water suppression system is described in FSAR 9.8.3.1.4, Fixed Water Suppression System, and is a wet pipe system.

The fire protection supervisor felt that a false alarm had been generated, possibly due to a malfunction in the expansion tank. As it was a false alarm, once the initial condition was investigated, there was no apparent reason to keep the system isolated. Approximately two days after the event, the system was returned to service by opening the isolation valve.

c. Conclusions

Initial operator actions to investigate and respond to the fire protection system alarm were appropriate, although it was not clear whether it is necessary to remove an automatic function of a fire water suppression system from service due to a false alarm once conditions are reviewed. Apparently poor coordination and communication between different licensee departments resulted in the fire protection system being isolated for a longer period of time than was necessary.

F2 Status of Fire Protection Facilities and Equipment

F2.1 Control Room Fire Suppression System

a. Inspection Scope

The inspector reviewed the licensee's fire suppression system in the control room and plant procedures for the use of the fire fighting equipment in the control room. The inspector included in the review procedures for inadvertent actuation of the fire suppression systems and review of the UFSAR basis for the systems.

b. Observations and Findings

The control room does not have an automatic fire suppression system (AFSS). Fire suppression is via portable CO_2 cylinders and one fire hose station. The FSAR does not specifically address fire protection in the control room, however section 9.8.3.1.3 addresses interior hose stations and states that all points in safety related areas can be effectively reached by at least one hose stream. Abnormal operating procedure AOP-43, Shutdown From Outside The Control Room, addresses fighting control room fires and attempting to access the control room utilizing standard fire fighting equipment.

Recent industry events have called into question procedures for responding to automatic actuation of fire suppression systems in the control room. This is not applicable for the licensee's control room. However, AOP-63, Relay Room CO_2 Discharge, directs actions to be taken in the event that the relay room CO_2 system is required for fire fighting. The relay room is directly underneath the control room and in the past, leakage of CO_2 gas from the relay room AFSS activation has called into question the atmosphere of the control room. The system does not auto-initiate, manual initiation is required. The procedure directs evacuation of personnel in areas that could be effected by the discharge and specifically addresses the control room. The procedure directs essential control room

personnel to don control room breathing air provided for by the cascade air system or self contained breathing apparatus (SCBA). The remainder of the procedure discusses ventilation lineups and atmospheric sampling to establish habitability in adjacent areas.

The use and monthly surveillance of the control room cascade air system is addressed by radiation protection procedure RP-RESP-2.04, Revision 0, Cascade Air System. The procedure provides direction on use of the control room and the post accident sampling system (PASS) emergency cascade air systems. The system consists of two or three air cylinders connected in parallel to a regulating valve and supply hoses. Several air line respirators are stored next to the system in the control room for future use. The monthly surveillance verifies adequate cylinder pressure, proper low pressure alarm response and regulator performance.

Emergency Plan Implementing Procedure SAP-2, Emergency Equipment Inventory, Revision 22, performs a quarterly inventory and inspection of emergency equipment. Attachment 12 of this surveillance includes the cascade air system equipment and the eight SCBA. The pre-fire plans also identify the fire fighting equipment and SCBA in the control room. The inspector verified the numbers in the procedure matched the equipment in the control room and were sufficient in quantity for control room personnel.

c. Conclusions

Procedures were in place to direct the appropriate response to fires in the control room and control room evacuation in the event of a relay room CO_2 system discharge. Operators were knowledgeable of equipment operation and familiar with the associated procedures.

V. MANAGEMENT MEETINGS

X1 Exit Meeting Summary

The inspectors presented the inspections results to members of the licensee management at the conclusion of the inspection on November 14, 1997. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

X2 Review of UFSAR Commitments

A recent discovery of a licensee operating their facility in a manner contrary to the Updated Final Safety Analysis Report (UFSAR) description highlighted the need for a special focused review that compares plant practices, procedures and/or parameters to the UFSAR description. While performing the inspections discussed in this report, the inspector reviewed the applicable portions of the UFSAR that

related to the areas inspected. The inspector verified that the UFSAR wording was consistent with the observed plant practices, procedure and/or parameters.

X3 Management Meeting Summary

On September 4, 1997, the NRC Systematic Assessment of Licensee Performance (SALP) management meeting was conducted at the licensee's training center auditorium.

X4 Licensee Organizational Realignment

On October 6, 1997, the licensee announced an organizational change which was effective on October 20. W. Josiger, previously Vice President (VP) - Engineering was assigned as VP - Special Activities. In this role, he will work on NYPA's participation in the New York Nuclear Operating Company (NYNOC). H. Salmon, Previously VP - Operations was assigned as VP - Engineering. The VP - Operations position will be eliminated with the result being that the Site Executive Officer will report directly to J. Knubel, Sr. VP and Chief Nuclear Officer.

ATTACHMENT 1

PARTIAL LIST OF PERSONS CONTACTED

Licensee

P. Brozenich, Operations Manager
M. Colomb, Site Executive Officer
W. Hamblin, Chemistry Supervisor
A. Jarvis, Chemistry General Supervisor
D. Lindsey, General Manager, Operations
A. McKeen, Radiological and Environmental Services Manager
E. Mulcahey, Radiological Engineering General Supervisor
D. Ruddy, Director, Design Engineering
D. Topley, General Manager, Maintenance
A. Zaremba, Licensing Manager

INSPECTION PROCEDURES USED

37551	Onsite Engineering
62707	Maintenance Observations
61726	Surveillance Observations
71707	Plant Operations
71750	Plant Support
84750-01	Radioactive Waste Treatment, and Effluent and Environmental Monitoring

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-333/97007-01	VIO	Technical information in a procedure was incorrectly translated into work instructions which resulted in the incorrect oil being installed in several pumps
50-333/97007-02	URI	Possible unreviewed safety question concerning moving spent fuel into the outer racks using the overhead crane vice refueling bridge.

Closed

50-333/97003	LER	Potential Overpressurization of Containment Penetrations Due to Thermal Expansion

Discussed

None

LIST OF ACRONYMS USED

AFSS	Automatic Fire Suppression System
ACTS	Action Committment Tracking System
AOP	Abnormal Operating Procedure
BWR	Boiling Water Reactor
CFR	Code of Federal Regulations
CRD	Control Rod Drive
DER	Deficiency and Event Report
EDG	Emergency Diesel Generator
ESF	Engineered Safety Feature
FR	Federal Register
HEPA	High Effciency Particulate
HPCI	High Pressure Coolant Injection
I&C	Instrumentation and Controls
IR	Inspection Report
LER	Licensee Event Report
MG	Motor Generator
MP	Maintenance Procedure
NRC	Nuclear Regulatory Commission
NYNOC	New York Nuclear Operating Company
ODCM	Offsite Dose Calculation Manual
OP	Operating Procedure
OSRE	Operational Safeguards Response Evaluation
PASS	Post Accident Sampling System
PID	Problem Identification
QA	Quality Assurance
QC	Quality Control
RCA	Radiological Controlled Area
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RMS	Radiation Monitoring System
RP	Radiation Protection
RP&C	Radiological Protection and Chemistry
RWR	Recirculation
SCBA	Self Contained Breathing Apparatus
SCFM	Standard Cubic Feet Per Minute
SIL	Services Information Letter
TS	Technical Specification
UPS	Uninterruptible Power Supply
URI	Unresolved Item
WACP	Work Activity Control Procedure
UFSAR	Updated Final Safety Analysis Report
VIO	Violation