U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.	50-286
License No.	DPR-64
Report No.	98-09
Licensee:	New York Power Authority
Facility:	Indian Point 3 Nuclear Power Plant
Location:	P.O. Box 215 Buchanan, New York 10511
Dates:	November 16 - December 30, 1998
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EXECUTIVE SUMMARY

Indian Point 3 Nuclear Power Plant
NRC Inspection Report No. 50-286/98009

This inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covered a six-week period of resident and regional inspections.

Operations:

Information provided during observed shift turnover meetings was accurate and detailed. Control room communications were appropriate and consistent with operational directive expectations. Plant shutdown and return to full power activities were observed to be controlled well with adequate adherence to plant procedures. During various tours of the primary auxiliary building, some minor plant equipment and configuration deficiencies were observed. None of the deficiencies were deemed safety significant, nor resulted in inoperability of safety equipment; however, they indicate a lack of attention to detail during operator rounds, restoration from maintenance, or controls during surveillance testing. (Report detail O1)

Selected safety-related equipment required to be manipulated locally in support of emergency operating procedures and off normal operating procedures were properly labeled and associated instruments were within calibration. One identified deficiency on the 31 service water Zurn strainer differential pressure would have impacted the procedure as written; however, adequate backup indications existed to perform the local operation. (Report detail O2.1)

No significant operational errors or operating difficulties were identified which could be attributed to ineffective training. (Report detail O5.2)

Requalification examinations were well prepared, met the examination standards criteria, challenged the operators, and were appropriate evaluation tools. (Report detail O5.3)

Although there were some performance errors, the crew performed well overall in all three examination scenarios. The facility evaluators identified all performance deficiencies from both the job performance measures and the scenarios. Post scenario evaluations were critical and comprehensive and were considered a program strength. (Report detail O5.4)

The facility utilized effective methods for obtaining trainee feedback and for evaluating these comments, as well as plant and industry events, for revision of the training curriculum. Remediation and re-examination practices were appropriate. The facility monitored attendance and ensured missed training was made up. (Report details O5.5 and O5.6)

Maintenance:

The inspectors observed that the work performed to selected work requests (WRs) were conducted satisfactorily and in accordance with applicable maintenance and administrative procedures. The inspectors also confirmed that the equipment was within the scope of the maintenance rule and that the licensee was appropriately monitoring equipment performance. (Report detail M1.1)

Surveillances were conducted appropriately and in accordance with procedural and administrative requirements. As applicable, good coordination and communication with the control room was observed during performance of the surveillance. The test instrumentation was within calibration, and the acceptance criteria was achieved. (Report detail M1.1)

Good support from system engineering, operations and the health physics organization occurred during fuel reconstitution efforts in the spent fuel pool. The actions planned in response to the discovery of foreign material in the spent fuel pool were appropriate. (Report detail M2.1)

Maintenance personnel performed well during implementation of an emergent work package for the 33 auxiliary boiler feedwater pump. Inconsistent maintenance guidance for packing replacement existed and recent vendor information was not implemented for packing replacement. However, none of the above performance issues contributed to the failure of the packing. The cause of the failed pump packing could not be determined. (Report detail M2.2)

The licensee's response to a second failure of a chemical and volume control system drain valve weld was appropriate. The final resolution to the long standing vibration problem in the chemical and volume control system had not yet been developed. The implementation of the maintenance work package was performed in accordance with station procedures. Health physics and engineering support during the work activity was appropriate. (Report detail M2.3)

The licensee's performance regarding the November 18, 1998, identification, corrective actions and extent of condition review of the inadequate containment isolation leakage surveillance tests were good. However, there was an earlier opportunity to identify and correct this deficiency during the last refueling outage. The corrective actions with respect to the initial identification of this issue in August 1997 were poor. This is considered a violation of 10 CFR 50, Appendix B, Criterion XVI **(VIO 50-286/98009-02)**.

Engineering:

The operability determination for a discrepancy between the FSAR containment accident analysis and the current plant configuration was thorough and appropriate to the circumstance. The supporting technical documentation satisfied the licensee's operability

criteria for the interim; and the long term resolution of this discrepancy is currently under development. (Report detail E2.1)

The licensee performed a critical review of the corrective action program by performing a "common-cause" analysis of numerous plant challenges that occurred in mid-1998. The effectiveness of corrective action program enhancements developed as a result of this assessment has not been evaluated. (Report detail E2.2)

The licensee's root cause evaluation of the December 1997 breaker failure event was comprehensive. The licensee's corrective actions were extensive, thorough and completed in a reasonable time. The corrective actions taken as a result of the licensee's evaluation of the December 1997 event adequately preclude a repeat occurrence with their present breaker overhaul vendor. The licensee's failure to adequately control the work performed by their original breaker maintenance service vendor was a violation of 10 CFR 50, Appendix B, Criterion VII, but was not cited in accordance with Section VII.B.1 of the NRC enforcement manual. (Report detail E8.2)

Plant Support:

Overall, the conduct of the emergency preparedness drill was good and the self assessment was thorough in identifying discrepancies and providing for program enhancements. The licensee's partial participation emergency exercise drill was developed and implemented in accordance with NYPA's emergency response procedures and the NRC guidelines for emergency preparedness. (Report detail P1.1)

Although there were some operator performance oversights, the crew performed well overall in the emergency preparedness exercise scenario. (Report detail P5)

TABLE OF CONTENTS

Table of Contents (cont'd)

Report Details

Summary of Plant Status

Indian Point Unit 3 began this inspection period at full power. On November 18, 1998, a plant shutdown was initiated to investigate the adequacy of the containment isolation valve leakage testing (Report detail O2.1). On December 2, 1998, the reactor was brought critical and full power was achieved on December 5, 1998. On December 13, 1998, power was reduced to sixty percent due to a moisture separator vent chamber steam leak on the secondary side of the plant. The unit was returned to full power on December 16, 1998, and maintained full power for the remainder of the inspection period.

I. OPERATIONS

O1 Conduct of Operations

a. Inspection Scope (71707)

The inspection consisted of observations of shift turnover meetings, control room communications, verification of equipment protective tagouts, verification of equipment status within the primary auxiliary building, containment isolation valve walkdowns, and routine tours within the facility. Additionally, the inspectors observed control room activities during the plant shutdown on November 19, 1998, and the return to full power on December 5, 1998.

b. Observations and Findings

The inspector observed accurate and detailed shift turnover meetings. Control room communications were appropriate and consistent with operational directive expectations.

On December 29, 1998, the inspector verified the adequacy of protective tagout 98-1599 to isolate the 32 safety injection pump. The pump was isolated to repack valve AC-8024, (Component Cooling Water Discharge Valve). The tags were properly applied and afforded adequate protection to the maintenance workers.

On December 23, 1998, the inspector walked down portions of the primary auxiliary building using nuclear plant operator log sheets. All parameters were within the log specification and consistent with the readings taken by the nuclear plant operator.

On December 21, 1998, the inspector verified the correct position of various automatic and non-automatic containment isolation valves. The verification also included a review of any outstanding deficiencies that could raise question of containment closure or leakage capability. The inspector referenced system operating procedure (SOP)-CB-1A, "Periodic Verification of Containment Integrity," to verify the expected correct position of the containment isolation valves. The inspection confirmed that the isolation valves were in their correct position, and the three outstanding problem identification descriptions (PIDs) on the forty-two (42) isolation valves did not result in inoperability from a containment isolation function.

On December 20, 1998, the inspector performed a walkdown of the 32 auxiliary boiler feed pump (ABFP) steam admission piping and pump support equipment such as instrument air lines and oil supplies. Overall, the piping and support equipment were satisfactory; however, the inspector did note a recurring problem with the turbine governor oiler being left in a potentially degraded condition. On two occasions, the inspector noted that this oiler had only a thin line of oil remaining in the site glass or was empty. The 32 ABFP turbine governor is oil lubricated through the use of a wick type oiler, this style of oiler delivers a steady drip onto the turbine governor bearing. System engineering has provided communication memos to operations outlining vendor recommendations and operability concerns. The wick oiler system reservoir can remain empty for a 24 hour period per the discussions with the vendor, without rendering the pump inoperable. The licensee has adequately addressed the operability issues associated with this unique oiler; however, the inspector questioned the guidance provided to operators regarding maintaining an adequate level of oil in the reservoir. The inspector concluded that although there were no operability concerns with the pump due to this oiler, the licensee had not fully addressed maintenance of the oil level in the wick type oiler.

During various tours of the primary auxiliary building, some plant equipment and configuration deficiencies were noted. None of the deficiencies were deemed safety significant, nor resulted in inoperability of safety equipment. The deficiencies involved missing fasteners on a junction box, poor lagging condition on the steam generator blowdown lines and valve VC-PCV-1236 (Containment Air Sample Inlet Isolation Valve), improper tubing support for valve IV-1544 (Isolation Seal Water System Supply to Boron Injection Tank Isolation Valve), and leakage from valve SI-1884 (Safety Injection Discharge Drain Valve). During containment isolation valve testing (reference report detail O2.1), the inspector observed that the test pressure supply lines crossed various contamination boundaries without proper support and controls to minimize the spread of contamination.

New York Power Authority (NYPA) initiated PID 42785 to properly support valve IV-1544, confirmed PID 40140 existed for damaged steam generator blowdown insulation, added missing screws to the junction box and performed an extent of condition walkdown of other electrical junction boxes within the primary auxiliary building, and replaced the insulation on valve VC-PCV-1236 under work request (WR) 98-00002-11. The inspector notified health physics personnel of the leakage on SI-1884, and test pressure supply lines crossing contamination boundaries. The supply lines were immediately corrected, and short-term action was to improve coordination between operations and health physics personnel in the implementation of isolation valve testing. No spread of contamination was noted by NYPA.

The inspectors observed the activities in the control room during the plant shutdown in November and the return to full power in early December. Overall, activities were well controlled and both the shutdown and start up adhered to plant procedures. Operators continued to implement good communication practices and maintained the presence of an additional licensed operator at the control board during reactivity manipulations.

c. Conclusions

Information provided during observed shift turnover meetings was accurate and detailed. Control room communications were appropriate and consistent with operational directive expectations. Plant shutdown and return to full power activities were observed to be controlled well with adequate adherence to plant procedures. During various tours of the primary auxiliary building, some minor plant equipment and configuration deficiencies were observed. None of the deficiencies were deemed safety significant, nor resulted in inoperability of safety equipment; however, they indicate a lack of attention to detail during operator rounds, restoration from maintenance, or controls during surveillance testing.

02 Operational Status of Facilities and Equipment

O2.1 Local Operation of Safe Shutdown Equipment

a. Inspection Scope (71707)

The inspection scope consisted of inspector walkdown of various plant locations that are used in system operating procedure (SOP)-ESP-1, "Local Operation of Safe Shutdown Equipment." The walkdown was performed to verify correct valve labeling, adequate lighting, and if any conditions exist that would inhibit an nuclear plant operator (NPO) from performing actions required in SOP-ESP-1.

b. Observations and Findings

The purpose of SOP-ESP-1 is to provide operator guidance on manipulation of safety equipment outside the control room as referenced in various emergency operating procedures and off normal operating procedures. The inspector performed a walkdown of three local operations involving the main steam isolation valves (MSIVs), the atmospheric dump valves, and the service water pump zurn strainers.

The inspector verified that components were properly labeled and that lighting in the particular areas was acceptable. The inspector confirmed that no outstanding deficiencies existed on components to open the MSIVs locally or to control the atmospheric dump valves locally. For local operation of the 31 service water zurn strainer, an outstanding PID tag 41121, dated August 1998, existed on the differential pressure indication. The deficiency involved a failure to calibrate the local indication. This instrument indication provides information for an important procedural decision step. The instrument reading dictates when to initiate manual backwash of the strainer. The licensee informed the inspector that the control room annunciator for high differential pressure was functional and would provide a backup indication to the nuclear plant operator.

The inspector confirmed that the steam generator pressure indicators used to dictate control of the atmospheric dump valves were within their calibration

frequency, and that the amount of nitrogen used in the backup bottles was verified on a daily basis during plant log readings.

c. Conclusions

Selected safety-related equipment required to be manipulated locally in support of emergency operating procedures and off normal operating procedures were properly labeled and associated instruments were within calibration. One identified deficiency on the 31 service water zurn strainer differential pressure would have impacted the procedure as written; however, adequate backup indications existed to perform the local operation.

O5 Operator Training and Qualification

O5.1 Licensed Operator Requalification Program Evaluation General Scope

The scope of the inspection included review of recent events, examination quality, observation of one operating crew during their operating test, and observation of a crew during an emergency preparedness exercise. The inspection objectives were to ensure that the requalification program ensures safe operation through adequate evaluation of the licensed operators.

O5.2 Operational Events at the Facility

a. Inspection Scope (71001)

Recent facility operating history was reviewed for significant operator errors that could be attributed to ineffective training and for other operating difficulties that could be impacted by training.

b. Observations and Findings

No examples of significant operator errors due to ineffective training were noted.

Previous NRC inspection reports had noted some inconsistencies or deficiencies with operator performance. Examples were crew differences in the conduct of load changes while dealing with individual rod position indication drift problems vs axial flux difference technical specifications; and procedure use to fill and vent of a portion of the chemical and volume control system after maintenance. The inspectors considered these inconsistencies resulted from a lack of clear operational guidance rather than from deficiencies in training.

c. Conclusions

No significant operational errors or operating difficulties were identified which could be attributed to ineffective training.

O5.3 Examination Quality

a. Inspection Scope (71001)

The examination scenario bank was reviewed against the criteria of the examination standards (NUREG-1021) for completeness of coverage of the emergency operating procedures (EOPs), and for completeness of coverage of individual plant examination (IPE) events contributing a significant fraction of core damage frequency (CDF).

Two cycles of the most recent and prior biennial written examination and the current job performance measure examination were reviewed against NUREG-1021 criteria and also for the inclusion of selected EOP related tasks.

b. Observations and Findings

Simulator Evaluation Scenarios (SES)

There were 27 scenarios in the SES bank, 25 of which were validated for use with the current simulator load. Nine individual scenarios were reviewed; three of these were the set being administered to the crew during this inspection, the others were exam and retake scenarios administered to crews that required remediation during the current and prior annual operating tests. All individual scenarios met the quantitative criteria of the examination standards, were challenging and had appropriate evaluation tools.

The inspector reviewed the examination scenario bank for completeness of coverage of the EOPs and major functional recovery and contingency procedures. All were exercised with the exception of the functional recovery series that direct action to respond to inadequate core cooling. The facility stated that this was because the simulator could not correctly model such events until a recent upgrade. The inspector verified that a training scenario had now been developed for these procedures.

The inspector also reviewed the bank for coverage of CDF significant event sequences. One category of event, internal flooding, did not appear to have sufficient emphasis. This category of events were piping breaks that either flooded or sprayed switchgear leading to station blackout (SBO), and contributed approximately 15% of CDF, with other SBO events contributing another 11%. One of three SBO scenarios in the bank incorporated one of the identified internal flooding sequences. There is no requirement to distribute exam scenarios in accordance with CDF and there are other factors to consider in designing examinations. However, the current distribution appeared somewhat unbalanced since eight scenarios incorporate steam generator tube ruptures, with a 5.5% CDF contribution. The facility representatives acknowledged this observation.

Job Performance Measures (JPMs)

The inspectors reviewed the six JPMs that were administered during the inspection week. The individual JPMs and the set were of an appropriate difficulty level, involved risk significant systems, and met the criteria of the examination standards. One in-plant JPM was found to have an inadequate cue/task standard for a critical step. The inadequate cue/task standard was JPM 11, Locally Start 32 Aux Boiler Feed Pump. One critical step in this task is to isolate and bleed the air supply for the turbine speed controller HC-1118; the vent line is capped. The JPM does not mention removal of this cap or discuss appropriate cuing if the student does not indicate cap removal.

The inspectors evaluated the JPM bank for EOP actions related to city water backup cooling. The facility provided JPMs for city water backup to charging pumps and city water backup to the residual heat removal (RHR) pumps. There was no similar JPM developed to locally align city water as a backup to the condensate storage tank makeup/ auxiliary feedwater suction source and this initially appeared to be an oversight. However, the facility stated that this alignment would be a maintenance task, not a task for an operator, and would be performed by shift maintenance contingency personnel in an emergency upon operations request.

Written Examinations

This facility administers a two part written examination consisting of the part "A" static simulator and the part "B" classroom sections. The inspector reviewed two weeks of the most recent biennial written examination and the original and retake examinations administered to two individuals who required remediation during the prior biennial written. The questions were of generally good quality at the analysis or comprehension level.

A problem potentially effecting examination integrity was noted in that procedure TNG-DD-3.8, Revision 5 "Preparation, Administration, Grading, and Control of Examinations" allows as little as a 20% variation in exams given to subsequent classes over several weeks. One hundred percent variation (no overlap) was noted in the biennial written examinations reviewed. The facility stated that the procedure number was a minimum and their actual goal had been the one hundred percent variation (zero overlap) observed.

c. Conclusions

Requalification examinations were well prepared, met the examination standards criteria, challenged the operators, and were appropriate evaluation tools.

O5.4 Examination Administration and Facility Evaluation

a. Inspection Scope (71001)

The inspectors observed the annual operating test, critiquing, and grading of one operating crew with an additional staff senior reactor operator (SRO). The examination consisted of three simulator scenarios and six JPMs (administered as sets of five). Completed JPMs and simulator grading sheets were reviewed.

b. Observations and Findings

Crew Performance

The crew and all individuals passed their examinations. Two individuals each failed JPM number 34, start of a static inverter. Overall crew performance was good. In two prior requalification inspections, personnel in the control room supervisor (CRS) position errored and required assistance from other crew senior reactor operators (SROs) for correction; no similar difficulties were observed this time. Some performance and knowledge deficiencies were observed; all were noted and recorded by the facility evaluators.

Facility Evaluation

The facility post-scenario evaluations were thorough, critical, and comprehensive. There was no hesitation to criticize performance or acknowledge deficiencies. Appropriate follow-up questions were asked to evaluate areas not observed during a given scenario, such as technical specification entry, or to clarify performance weaknesses, such as underestimating reactor coolant system (RCS) leakrate. No additional performance deficiencies were observed by the inspectors which were not brought out in the post scenario evaluation and appropriately documented. The inspectors considered the thoroughness and detail of post scenario critiques to be a program strength.

JPM grading was appropriate. Follow-up questions were asked where necessary concerning venting of a valve for starting an auxiliary boiler feed pump. The evaluators were professional and no instances of improper cuing were observed.

c. Conclusions

Although there were some performance errors, the crew performed well overall in all three examination scenarios. The facility evaluators identified all performance deficiencies from both the JPMs and the scenarios. Post scenario evaluations were critical and comprehensive and were considered a program strength.

O5.5 Operator Feedback

a. Inspector Scope (71001)

The inspector reviewed lesson plans and feedback mechanisms to verify that the requalification program was appropriately updated.

b. Observations and Findings

The inspector reviewed lesson plans and simulator training guides addressing plant licensee event reports (LERs) and industry events and found them to be of adequate quality. A facility initiative for some industry event lessons involved splitting the class and having the separate groups present events and develop hypothetical exam questions about them.

Other feedback mechanisms included post cycle summaries of performance, student comments solicited at the end of each cycle, and exam contention forms. The inspector verified through spot checks and operator interviews that these items or comments are evaluated and addressed.

The inspector reviewed the facility resolution of a NRC identified problem regarding operators having difficulty determining loads lost in response to loss of a 480V bus. The facility had developed a new procedure off normal operating procedure (ONOP)-EL-7, Rev. 0, "Loss of a 480V Bus - Above Cold Shutdown," and a simulator training guide for this event. All crews had been trained on this procedure by October 1998. Prior to the development of this procedure, the training expectation was that the crew would refer to check-off lists to determine loads affected by this event. The new procedure lists major bus loads and motor control centers (MCCs), but does not list MCC loads. Neither the procedure or lesson plan specifically mention the check-off lists. The licensee representatives acknowledged the inspectors' finding.

c. Conclusions

The facility utilized effective methods for obtaining trainee feedback and for evaluating these comments, as well as plant and industry events, for revision of the training curriculum.

O5.6 Remedial Training, Attendance, and Makeup Training

a. Inspection Scope (71001)

Examination results summaries for the current and prior biennial written and annual operating tests were reviewed for examination failures. Attendance was reviewed for the most recent three training cycles.

b. Observations and Findings

The inspector reviewed two examples of biennial written examination failures from the 1996 exam, five examples of simulator examination failures from 1997 (two crews, three individuals), and two examples of simulator examination failures from 1998 (one crew, one individual). In one case, two SROs in one crew did not complete a critical task to shutdown a turbine auxiliary feed pump during a ruptured steam generator, despite recommendation from the reactor operators (ROs). This was the only critical task failure. The other failures were competency failures and reflect continuing facility efforts to improve personnel performance. Appropriate remediation plans had been prepared in accordance with facility directives and reexaminations passed after remedial training.

Attendance for the last three training cycles was reviewed. No instances of missed or excessive delays in makeup training were found for shift operators. Staff personnel missed more individual days of training and took longer to make it up, particularly during a three week shift upgrade training program administered this past summer. The inspector reviewed in detail the cases of two individuals who had missed the most training during their initial attendance weeks and verified that all training had been made up by the end of the upgrade program.

c. Conclusions

Remediation and re-examination practices were appropriate. The facility monitored attendance and ensured missed training was made up.

O8 Miscellaneous Issues

O8.1 Procedure Quality

As a result of the inspectors' review of the Licensed Operator Requalification program, the inspectors observed implementation and related adequacy of facility procedures. No problems were identified.

O8.2 (Closed) Violation 50-286/98-02-01: Failure to have written procedures approved prior to fill and vent evolutions within the charging system. New York Power Authority concluded that the apparent cause on this violation was personnel error as documented in IPN-98-083 on July 23, 1998. Corrective actions included implementing a shift order clarifying management expectations regarding filling and venting of safety-systems using the guidance in administrative procedure (AP)-10.1, "Protective Tagging." Further, a generic guidance form was implemented providing aspects to consider during restoration of a system that had been drained. NYPA demonstrated acceptable performance in this regard when the generic guidance was developed and implemented successfully for the fill and vent of the charging system on December 30, 1998 (See report detail M 2.3). This item is closed.

II. MAINTENANCE

M1 Conduct of Maintenance

M1.1 Maintenance and Surveillance General Comments (62707/61726)

a. Inspection Scope (62707)

The inspectors reviewed selected maintenance work activities and supporting work documentation as well as surveillance test procedures. Activities were selected based on the systems, structures, or components being contained within the scope of the maintenance rule.

b.1 Maintenance Observations and Findings

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

- WR 98-05381-00, "33 Auxiliary Boiler Feedpump Packing Replacement,"
- WR 98-05323, "Safety Injection Discharge Valve MOV-850C Repair,"
- WR 98-00667-01,"33 Safety Injection Pump oil reservoir piping replacement,"
- WR 98-05605, "Repair of Chemical and Volume Control system drain valve (CH-148)"
- WR 98-04221-00, "Repack Component Cooling Water Discharge Valve AC-8024 to 31 Safety Injection Pump Cooler"

c.1 Maintenance Conclusions

The inspectors observed that the work performed to selected work requests (WRs) were conducted satisfactorily and in accordance with applicable maintenance and administrative procedures. The inspectors also confirmed that the equipment was within the scope of the maintenance rule and that the licensee was appropriately monitoring equipment performance.

b.2 Surveillance Observations and Findings

The inspectors observed all or portions of the following surveillances:

- 3PT-120C, "Motor driven auxiliary feed water pump test,"
- 3PT-Q101, "Valve 1310A,B and 1139 valve functional,"
- 3PT-Q116, "SI pump functional test,"
- 3PT-M79A, "32 Emergency Diesel Generator Functional Test"
- ENG-627, "IVSW Station 2 Leak Test"

During observation of 3PT-M79A, the emergency diesel generator output breaker tripped on overcurrent on phase "C" during the loading sequence. The inspector observed appropriate response by the nuclear plant operators involved with the

surveillance by adhering to annunciator response procedure (ARP)-19, "Panel Local - Diesel Generators", and quickly notifying the control room of the deficient condition. Deviation event report (DER) 98-02532 was prepared to document the surveillance failure. Timely operator action to isolate the emergency diesel generators occurred. Investigation into the cause of the overcurrent condition revealed a premature failure of the potential fuse in the protective circuit for the breaker. An outstanding work request existed for the 32 emergency diesel to replace the fuses due to a previous failure. The inspectors concluded that the planned corrective actions were timely even though they did not prevent the surveillance failure. Specifically, the action to replace the potential fuses were scheduled on the next planned outage for the 32 emergency diesel generator. The remaining two diesel generator potential fuses had been previously replaced.

c.2 Surveillance Conclusions

Surveillances were conducted appropriately and in accordance with procedural and administrative requirements. As applicable, good coordination and communication with the control room was observed during performance of the surveillance. The test instrumentation was within calibration, and the acceptance criteria was achieved.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Spent Fuel Assembly Reconstitution

a. Inspection Scope (62707)

The inspector observed the activities associated with removing several damaged fuel pins from their assemblies in the spent fuel pool.

b. Observations and Findings

During the week of November 12, 1998, the inspector observed the activities conducted in the spent fuel pool to identify and remove five failed fuel rodlets from their respective fuel assemblies. The fuel reconstitution effort was part of a root cause investigation for the failure of the fuel rodlet during the previous cycle. The vendor plans to use the data gathered during the reconstitution to perform further research as to the nature of the fuel failures. The inspector observed good vendor oversight by the reactor engineers who maintained a constant presence during the activity. The work performed by the vendor was well controlled with individuals held accountable for all stages of the job including foreign material exclusion controls, equipment manipulation, crane operation and maintaining a video record of the work.

During the restoration of the final fuel assembly, a lock tube, which is installed with the top nozzle of the fuel assembly, was inadvertently dropped into the pool. A camera inspection of the pool area near the fuel assembly was conducted, but the

lock tube was not found. The camera inspection did however identify other items present in the pool such as a rag and what appeared to be two rolls of duct tape. The licensee initiated deviation event report (DER) 98-02247 to resolve the potential safety impact of having foreign materials in the spent fuel pool. The items identified during the camera inspection were not attributed to the current activity in the pool area. The licensee surmised that those items are residuals from refueling outage 9 (RO9) in August 1997. The DER was closed based on an evaluation by reactor engineering which provides assurance that the identified foreign material will not adversely impact the pool or its contents and an open item to assure that the items will be removed during fuel receipt inspection for RFO 10. The inspector reviewed the licensee's response to the DER and determined that the response was adequate and the actions planned for refueling outage 10 are appropriate.

c. Conclusions

Good support from system engineering, operations and the health physics organization occurred during fuel reconstitution efforts in the spent fuel pool. The actions planned in response to the discovery of foreign material in the spent fuel pool were appropriate.

M2.2 Replacement of 33 Auxiliary Boiler Feedwater Pump Packing

a. Inspection Scope (62707)

The inspector observed the replacement of the pump packing, reviewed the pumps work history and prior packing replacements or adjustments.

b. Observations and Findings

On November 29, 1998, while running the quarterly surveillance test on the 33 auxiliary boiler feed water pump (ABFP), the nuclear plant operator noted that the inboard and outboard bearings were above normal temperature. During the test, the room filled with smoke which was attributed to the excessive friction between the packing and the pump shaft.

On November 30, 1998, the licensee replaced the packing on the ABFP. The inspector discussed the previous work packages with the pump maintenance engineer and learned that the guidance to overhaul the ABFPs as prescribed in PMP-024-BFD, "Inspection and/or Repair of motor driven auxiliary boiler feed pumps #31 and #33," was not updated to reflect vendor specific recommendations regarding the installation of this type of packing material. Procedure PMP-025-BFD, "Motor driven auxiliary boiler feed pump bearing replacement," had been updated to reflect that while the generic pump picture included in many of the maintenance procedures depicts eight rings of packing, the actual number of rings should be adjusted until the gland follower is properly engaged in the stuffing box to maintain a minimum of 0.06 inch engagement. In addition, the final torque adjustment to the gland follower nuts should be made when the pump is in service to ensure the proper water flow.

The procedure used to install packing for this pump was adequate and there appeared to be no correlation between the procedural discrepancies and the pump packing failure. However, the inspector noted a weakness in that two maintenance procedures with the same task have different guidance, and further the vendor recommendations for packing replacement were not implemented.

No apparent cause to the packing failure was identified and the maintenance investigation of the failure was closed. The ABFP is tested on a quarterly basis to assure operability when called upon to perform its safety function.

The inspector observed good implementation of the STAR program while watching the maintenance and noted that the adjustments to the gland follower bolts during the retest were appropriate to the circumstance.

c. Conclusions

Maintenance personnel performed well during implementation of an emergent work package for the 33 auxiliary boiler feedwater pump. Inconsistent maintenance guidance for packing replacement existed and recent vendor information was not implemented for packing replacement. However, none of the above performance issues contributed to the failure of the packing. The cause of the failed pump packing could not be determined.

M2.3 Failure of a Drain Valve in the Chemical and Volume Control System (CVCS), CH-148

a. Inspection Scope (62707)

The inspector observed portion of the repair of the leaking socket weld which connects a drain valve to the main CVCS charging line. In addition, the inspector reviewed the corrective action plan developed in April 1998 to address the numerous weld failures in the CVCS.

b. Observations and Findings

On December 29, 1998, the licensee identified that the socket weld that attaches CH-148, a drain valve, to the main charging header had failed for the second time this year. The licensee performed a walkdown of the area prior to repairing the weld and noted that a metal shim which was supposed to have been installed between the welded component and the U-bolt plate had fallen to the floor. This was an apparent contributor to the accelerated vibration failure of this weld. An extent of condition walkdown performed by maintenance engineers identified one additional U-bolt support that did not have the required shim plate between the piping and the U-bolt support plate. The missing shim plates were documented in the licensee's DER system.

Overall, the implementation of the maintenance package was appropriate and the work was conducted in accordance with station maintenance procedures. Health physics and engineering support throughout the evolution was good.

NRC inspection report 50-286/98002, discussed the first failure of this valve on April 8, 1998, and concluded that the licensee had a comprehensive action plan to address the vibration issues in the CVCS system. The licensee has continued to implement the actions in the original plan; however, the root cause and corrective actions for the vibrations in the system have yet to be determined. The licensee has recognized the delay in resolving this long standing vibration issue as discussed in a recent report outlining common causes for recent plant challenges (Section E2.2).

c. Conclusions

The licensee's response to a second failure of a chemical and volume control system drain valve weld was appropriate. The final resolution to the long standing vibration problem in the chemical and volume control system had not yet been developed. The implementation of the maintenance work package was performed in accordance with station procedures. Health physics and engineering support during the work activity was appropriate.

M3 Maintenance Procedures and Documentation

M3.1 Inoperable Containment Isolation Valves due to Inadequate Leak Testing Procedure

a. Inspection Scope (71707, 37551)

The inspector reviewed the licensee's action in response to the discovery that the containment isolation valve leakage verification tests were inadequate.

b. Observations and Findings

On November 18, 1998, while investigating the failure of the pressurizer liquid space sample containment isolation valve, 956C, the licensee discovered that the surveillance test that verifies the containment isolation valve Appendix J, type C leakage requirements did not specify the appropriate differential pressure requirements in the system to be tested. The 956C valve failure was identified during a routine chemistry sample evolution when it was leaking reactor coolant system water past the valve seat. During the equipment failure evaluation (EFE) for the 956C valve, the licensee discovered that an inadequate maintenance procedure failed to assure that the valve packing loads were not present during the stem travel adjustment. The refurbishment of this valve was completed on August 14, 1997. The licensee noted that part of the post maintenance test for this valve was to perform a leak rate test in accordance with surveillance procedure 3PT-R25. The EFE concluded that the upstream side of this valve wasn't properly vented and

therefore did not provide accurate test results that would have identified the inoperable valve.

NYPA review of 3PT-R025, "Isolation Valve Seal Water Test," revealed that the 10 CFR Appendix J, type B and C leakage procedure never instructed the test performers to verify the system piping upstream and downstream of the valve to be tested was depressurized or direct an increase in test pressure to compensate for pressure upstream or downstream of the isolation valve. Technical specification 4.4.E.2, containment isolation valves, requires verification that the leakage rate of water from the Isolation Valve Seal Water System is less than or equal to 14,700 cc/hr when pressurized to greater than or equal to 1.1Pa, in accordance with the containment leakage rate testing program. Since the test did not establish the upstream and downstream pressure conditions for the test, the licensee could not verify that a value of 1.1 Pa was input for the leakage test and therefore could not verify that the technical specifications had been met. The licensee took immediate action to place the plant in a cold shutdown condition and began an extensive investigation into the 10 CFR Appendix J leakage test program. This failure to have adequate surveillance procedures appropriate to the circumstances is a violation of 10 CFR Appendix B, Criterion V. However, because this issue was identified by the licensee during an EFE for the 956C valve, and adequate corrective actions were promptly taken upon discovery, this violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy. **(NCV 50-286/98009-01)**

As part of the extent of condition review, the licensee also identified other procedures that verify containment integrity to be technically inadequate. Three issues were identified which could potentially impact the accuracy of the Appendix J test method. Two of the issues pertained to not accounting for pressure due to either the location of the test rig or a column of water that may be present during the performance of the test. The third issue was the test method for some valves required a gas test; however, the systems were never fully drained and therefore the actual test performed included water across the valve seat with a gas used to pressurize the system. This last issue required the licensee to obtain an emergency technical specification change due to the hardships associated with performing the TS required test in the current plant configuration.

The licensee identified a total of ninety-five valves to be tested during the forced outage. Of those, eighty-two valves had to be tested to verify the appropriate system test pressure across the valve disks. Two containment isolation valves failed, the first being the pressurizer liquid sample space valve (956C) which led to the discovery of the inadequate containment valve testing issue. The second valve was the component cooling water to the reactor coolant pump seals isolation valve (AC-MOV-797). On November 27, 1998, while performing extent of condition testing, the licensee identified that AC-MOV-797 grossly exceeded the leakage criteria in the procedure. The licensee repaired the valve and re-tested the leakage capability satisfactorily; however, they were unable to quantify the "as found" leakage of the valve due to the initial excessive leakage.

The inspector reviewed the licensee's safety and risk assessments of the failed valves. Both the 956C and the AC-MOV-797 valves have in series, redundant valves in the system piping which would have performed the containment isolation function. In the case of a single failure of the redundant valve for 956C, the IVSW system would have provided automatic seal water to mitigate any potential release from this path. For the worst case single failure concurrent with a loss of offsite power, the piping configuration of the CCW system along with check valve AC-770 would restrict the postulated containment atmospheric path. The licensee concluded that for a single failure of either 965C or AC-MOV-797, the IVSW would be within its twenty-four hour design capability based on the current total measured leakage of all other IVSW fed valves and the IVSW flow rates assumed for the failed valves and their associated redundant valves.

In addition to the detailed extent of condition reviews performed on the specific containment isolation leakage surveillances, the entire population of 684 active surveillance tests were sampled and reviewed. The scope of the review was to determine if the tests had the appropriate technical review and if any additional engineering expertise was needed to assure the appropriate test conditions were being satisfied. No additional tests deficiencies were identified as part of this review.

The inadequacy of this procedure to properly verify test pressure was first identified by a system engineer in August 1997. Deviation event report (DER) 97-2106 was initiated on August 19, 1997, documenting the inadequate test pressures in the leakage procedure 3PT-R25. The immediate actions to this DER were to retest the specific valves called out in the DER in the chemical volume control system. The DER has remained open since August 1997 pending completion of a review of past operability pertaining to this surveillance. The inspector noted that the due date for this action commitment tracking system (ACTS) was extended several times by the Operations department. The inspector concluded that the actions taken to resolve this condition adverse to quality were inadequate. In addition, the licensee has had several violations associated with inadequate corrective actions as documented in the following NRC inspection reports (IR): 50-286/98005, 50-286/97081, 50-286/97010, 50-286/97006, 50-286/97-080, and 50-286/97003. This failure to promptly correct a deficiency adverse to quality is a violation of 10 CFR 50, Appendix B, Criterion XVI **(VIO 50-286/98009-02)**.

The inspector concluded that the actions taken by the licensee once the problem was clearly identified were appropriate. However, these test procedures were performed and reviewed many times in the past without strong engineering oversight. Also, NRC inspection report 50-286/97009 discussed a single instance where the licensee did not address plant conditions which may affect the validity of previously performed leak tests. This report specifically discussed a nuclear safety evaluation which was developed to support corrective maintenance of containment isolation valve NNE-AOV-863. In addition, the failure to verify system conditions prior to test implementation to ensure 1.1Pa per the TSs was identified while the licensee was still shutdown during refueling outage nine; thus it would have been

reasonable to expect this issue to have been identified and corrected prior to exiting the outage.

c. Conclusions

The licensee's performance regarding the November 18, 1998, identification, corrective actions and extent of condition review of the inadequate containment isolation leakage surveillance tests were good. However, there was an earlier opportunity to identify and correct this deficiency during the last refueling outage. The corrective actions with respect to the initial identification of this issue in August 1997 were poor. This is considered a violation of 10 CFR 50, Appendix B, Criterion XVI **(VIO 50-286/98009-02)**.

M8 Miscellaneous Maintenance Issues (92903)

M8.1 (Closed) Violation 98-001-03: Two examples whereas significant conditions adverse to quality were either not promptly identified and corrected, or the cause of the condition was not determined and actions not taken to preclude repetition. The first example was untimely actions to promptly identify and correct a potential for common cause carbon dioxide suppression system failure that would isolate building ventilation to the three emergency diesel generators. The second example was failure to determine the cause of a fan cooler unit breaker to close and failure to take corrective actions to preclude repetition of the failure.

The inspector confirmed that NYPA had installed plant modification 97-3-0400 to correct the common mode vulnerability from a seismic event for both the switchgear and cable spreading room areas. Modification 97-3-424 for the emergency diesel generator carbon dioxide suppression system was approved in October 1998. At the time of the inspection, NYPA was planning to implement this modification in early 1999. During the interim, NYPA implemented a temporary modification to disable the suppression system and allow for manual initiation. The inspector confirmed that recent fire drills have exercised the verification of manual operator actions to initiate the suppression system. Further, the inspector confirmed that applicable annunciator response procedures had been revised to provide guidance on how to proceed following interlock operation without a fire. Notwithstanding, the suppression system is considered inoperable with the installation of the temporary modification, and the inspector verified that the compensatory actions were met as required in operations specification (OS) 3.5.7.A.

The inspector confirmed that NYPA effectiveness reviews to date indicate that breaker failures have appropriately been documented in deviation event reports. The inspector confirmed the formation of a breaker working group to respond to safety-related breaker failures. Notwithstanding, a failure of a reactor protection system output breaker to close in September 1998 indicated a desire by the maintenance organization to perform troubleshooting without involvement of the breaker working group. The inspector considered this an isolated instance, due to observations in inspection report 50-286/98-02 on the 31 CCW breaker failure and the fact that a

majority of the DERs prepared since this violation involve breaker deficiencies during the performance of preventative maintenance and vendor work to overhaul breakers. Additional inspection of safety-related breaker maintenance is documented in report detail E8.2. This item is considered closed.

III. ENGINEERING

E2 Engineering Support of Facilities and Equipment

E2.1 Review of Operability Determination for Containment Spray Flow Deficiencies

a. Inspection Scope (37551)

The inspector reviewed the quality and the technical adequacy of the licensee's operability determination when it was identified that the sodium hydroxide eductor flow in the system was not accounted for in the design basis flow analysis.

b. Observations and Findings

The inspector reviewed operability determination 98-0045, documented on December 14, 1998, provided a technical basis for current operability of the containment spray system in light of recent system engineer findings that the sodium hydroxide (NaOH) eductor flow was not accounted for in the design basis analysis. The FSAR lists variable containment spray flows versus containment back pressures which were used in peak containment pressure calculations to support the containment integrity analysis. The flow rate for proper eductor operation is 112 gallons per minute (gpm) or greater which assures a differential pressure to develop a suction path from the NaOH tank. This flow rate was not accounted for in the design basis analysis calculations for peak containment pressure.

The accident analysis assumes an upper bound on the temperature of the refueling water storage tank (RWST), the suction source for the containment spray pumps, to assure adequate flow from the containment spray pumps under maximum assumed containment pressures. A preliminary evaluation by the vendor conservatively input a RWST temperature of 80° F to account for any additional pressure increases due to the lower flow rates. The resulting containment pressures from this analysis were well within the design basis limits. The licensee based current operability on the fact that the RWST temperature is well below the upper limit defined in the accident analysis as 110° F, due to the seasonal temperatures; however, a final resolution from the nuclear steam supply system vendor will provide additional margin in the safety analysis with respect to design basis flow requirements and RWST temperatures.

The inspector reviewed the licensee's operability determination and the technical assumptions in re-calculating the containment pressures at the lower RWST temperatures. The inspector concluded that the assumptions were appropriate for interim operability and that in all likelihood the margin available in the accident

analysis coupled with an upper bound temperature of 110° F provided sufficient basis for any previous operability concerns. Additionally, the discovery of this discrepancy in the FSAR was a good identification by the licensee. Final resolution of this issue prior to a significant increase in the ambient temperature is currently being finalized and will be incorporated into the design basis analysis upon completion.

c. Conclusions

The operability determination for a discrepancy between the FSAR containment accident analysis and the current plant configuration was thorough and appropriate to the circumstance. The supporting technical documentation satisfied the licensee's operability criteria for the interim; and the long term resolution of this discrepancy is currently under development.

E2.2 Plant Challenges

a. Inspection Scope (37550)

The scope of the inspection was a review of NYPA's recent integrated assessment of equipment failures which challenged both operators and the plant. This assessment was acknowledged in inspection report 50-286/98-03 on July 21, 1998.

b. Observations and Findings

The licensee established a team composed on individuals from the performance department, system engineering, planning and scheduling, operations, and Operations Review Group (ORG) to perform a "common cause" analysis of fifteen events that were considered plant challenges. The team defined a plant challenge as either an unplanned limiting condition for operation, or a load reduction, or resulting in excessive maintenance rule (10 CFR 50.65) unavailability and/or creation of an operator work-around.

The licensee's team concluded four "common" inappropriate actions occurred during these fifteen plant challenges. The inappropriate actions included:

- failure to initiate, or complete in a timely manner, any long term plan or corrective action;
- Continued repairs to equipment which was obsolete;
- Failure to accurately determine the root causes of a problem; and,
- Failure to perform durable repairs

Inspector review of the specific plant challenges concluded a significant majority were previously documented in past inspection reports. At the end of the inspection period, the licensee developed an action plan (IDSE-APL-98-022) to initiate efforts to improve root cause determinations, prioritize and implement action

plans, reassess the "rework" program, and optimize the preventive maintenance program.

The inspector concluded that this assessment was a critical and complete review of the corrective action program by implementing "common-cause" techniques. The action plan development was complete, although its effectiveness has not yet been proven due to its recent development.

c. Conclusions

The licensee performed a critical review of the corrective action program by performing a "common-cause" analysis of numerous plant challenges that occurred in mid-1998. The effectiveness of corrective action program enhancements developed as a result of this assessment has not been evaluated.

E8 Miscellaneous Engineering Issues

E8.1 (Closed) VIO 50-286/97-81-01: Inadequate Control of Activities in the Switchgear Room

During inspection 50-286/97-81, the NRC event response team reviewed the events of December 18, 1997, in which the 32 residual heat removal (RHR) pump motor breaker failed to open. The inspection report documented that the licensee's initial reviews failed to address activities in the switchgear room specifically with respect to the adequacy of control. The scope of the licensee's review had not covered the adequacy of personnel actions in the switchgear room. The NRC team determined that the inadequate review of the infrequent actions in the switchgear room, which damaged safety-related equipment, was a condition affecting quality which needed review for identification and for corrective action. The licensee's lack of review of switchgear room actions was cited as a violation of 10 CFR 50, Appendix B, Criterion XVI.

In their response to the violation (NYPA Letter IPN-98-047), the licensee acknowledged that the violation was caused by a combination of inadequate written instructions and poor work practices. The inspectors confirmed that Standing Order 95-07, Operations Procedure Usage, had been incorporated into procedure AP-21, Conduct of Operations, Revision 42, to require that a Deviation Event Report (DER) be initiated for actions under that order. In addition, Procedure AP-8.2, Deviation and Event Analysis, Event Recollection form, Revision A, had also been enhanced to question if operator actions were taken outside established procedures. The licensee's actions adequately addressed this concern. This item is closed.

E8.2 (Closed) URI 50-286/97-81-02: Onsite Troubleshooting and Test Results

a. Scope of Inspection (92903)

The inspectors reviewed the licensee's root cause evaluation report, the vendors failure report, the licensee's and vendor's maintenance procedures, procurement documents and related quality assurance procedures to assess the licensee's evaluation and corrective actions to the breaker failure event.

b. Observations and Findings

Inspection report 50-286/97-81 documented that 480 Volt breaker A1033 failed to open on demand on December 18, 1997. Following repeated failed attempts by the licensee to open the breaker, the licensee declared the associated diesel generator inoperable. The breaker subsequently opened on its own. Following the event, the licensee immediately replaced and quarantined the breaker and assembled a root cause evaluation team.

The licensee's initial findings indicated a number of potential contributing causes for the breaker misoperation. First, the licensee discovered that if the pole shaft reset spring was removed (not a normal condition), the breaker mechanism may not overcome frictional forces resisting tripping. Second, the failed breaker's pole levers and insulating links locked for unexplainable reasons. These conditions were discovered by the licensee and the original-equipment-manufacturer (OEM) vendor's engineer during initial, onsite troubleshooting/failure analysis activities. Also discovered was a lack of lubrication in the insulating link joints which was also believed by the licensee and vendor's representative to be a contributor to locking up the main contact linkage.

To the extent possible without breaker disassembly, the licensee examined the various mechanical joints on the breaker for evidence of excessive friction and proper lubrication. Some of the breaker surfaces, that were originally lubricated at the factory, had no lubricant remaining. It was also noted by the licensee and the OEM vendor's representative that the high pressure grease was missing in the notches in the rear edges of the mechanism side sheets that support the center of the pole shaft and in which the pole shaft rotates. According to the vendor's representative, the removal of the lubricants would lead to excessive friction, which could be a contributor to the failure of breaker A1033 to open. The licensee had identified that the failed breaker, and other 480 Volt breakers had been overhauled at a third party electrical maintenance vendor. At the time of the 50-286/97-81 inspection, the licensee had not determined the exact cause of the failure and was making arrangements to have the breaker shipped to the manufacturer's facilities for further evaluation.

The licensee issued root cause evaluation report, IP3-RPT-EL-02697, on February 22, 1998. The evaluation included a review of the maintenance history on 480 Volt breakers similar to the A1033 breaker, both on-site and at various vendor

facilities. The evaluation also included the findings of the manufacturer's failure investigation of the A1033 breaker at their facility in Pennsylvania. The report identified the prime contributing factor to be a lack of proper lubrication at key pivot points in the breaker mechanism. The root cause was attributed to the 1994 overhaul of this breaker and the overhaul service provider's lack of knowledge of the lubricant and its critical function for breaker operation. Part of the corrective actions from the root cause team's evaluation report consisted of returning those questionable breakers to the OEM for factory servicing and overhaul. The inspectors considered the corrective actions reviewed and the licensee's evaluation report comprehensive and adequate to deter a repeat problem in this area. This item is closed.

In 1993, the licensee contracted with a third party electrical maintenance company to perform overhauls on safety-related 480 Volt breakers. The inspectors review of the licensee's root cause evaluation report and interviews with licensee personnel found that the licensee had prepared the overhaul service purchase order with specific requirements to include total lubrication of all friction surfaces. The purchase order also included a requirement for the vendor to certify that the refurbishment was performed to the OEM technical requirements manual. The purchase order failed to identify the specific technical requirements manual. The vendors procedure PDT-OP-04, Revision 3, dated June 14, 1993, referenced the OEM's Instructions for Low Voltage Power Circuit Breakers, Types DS and DSL without a document number. However, neither the licensee nor the vendor was aware that the OEM non-proprietary maintenance instructions failed to include steps that the OEM considered factory service or proprietary, and therefore had insufficient basis that measures were established to assure that the services provided by the overhaul vendor conformed to the requirements on the procurement documents. The A1033 breaker refurbishment was begun on October 4, 1993 and completed on May 25, 1994.

During the same time that the refurbishment work was being performed at the service vendor's facility, the OEM vendor issued technical bulletin NSD-TB-93-05-R0, dated January 10, 1998, warning utilities that the use of unauthorized third party switchgear maintenance manuals may compromise the operation of safety-related circuit breakers. The technical bulletin was accompanied by a controlled copy of the OEM's Maintenance Program Manual (MPM-DS Breakers) which was accepted by the licensee on February 24, 1994. Section 9 of that manual provided guidance for normal field lubrication and indicated that breakers found with missing Poxylube should be returned to the factory for refurbishment. The licensee failed, at that time, to revise their contract with the service vendor to incorporate the recommendations of the technical bulletin and maintenance program manual. This was a finding of the licensee's root cause evaluation into the December 1997 breaker failure event. One of the corrective actions from that event was to have the OEM factory service organization perform future refurbishment on the DS breakers. The inspectors confirmed that purchase order C 98-16023 had been issued to the OEM for this work and verified that work was being performed at the OEM facility in accordance with that purchase order.

10 CFR 50, Appendix B, Criterion VII, Control of Purchased Materials and Services, requires that measures be established to assure that purchased material, equipment and services conform to the procurement documents. These measures shall include provisions, as appropriate, for source selection and evaluation, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery. The licensee's failure to revise their contract with the service vendor to incorporate the recommendations of the technical bulletin and maintenance program manual to ensure the contracted services conform to the requirements of the procurement documents was a violation of 10 CFR 50, Appendix B, Criterion VII. However, in accordance with Section VII.B.1 of the Enforcement Manual, this licensee identified and corrected deficiency was not cited. **(NCV 50-286/98-009-03)**

The inspectors confirmed that the licensee had revised their maintenance procedure, BKR-004-ELC to incorporate the OEM vendors guidance, had hired an experienced maintenance engineer for breaker maintenance, had returned to the original OEM vendor for contracted breaker maintenance and overhaul services and included 100% source inspection for this work. The inspectors were satisfied that the licensee's corrective actions would eliminate the problems in the control of vendor services they had found with the work performed by their previous breaker overhaul vendor.

c. Conclusions

The licensee's root cause evaluation of the December 1997 breaker failure event was comprehensive. The licensee's corrective actions were extensive, thorough and completed in a reasonable time. The corrective actions taken as a result of the licensee's evaluation of the December 1997 event adequately preclude a repeat occurrence with their present breaker overhaul vendor. The licensee's failure to adequately control the work performed by their original breaker maintenance service vendor was a violation of 10 CFR 50, Appendix B, Criterion VII, but was not cited in accordance with Section VII.B.1 of the NRC enforcement manual.

E8.3 (Closed) Licensee Event Report 50-286/98-004: Control Room Ventilation System and Component Leakage Design Bases not met due to Deficiencies in Input to Surveillance

This LER details an event discussed in NRC Inspection Report 50-286/ 98-81, which involved two violations of NRC requirements. These violations, 98-81-02 and 98-81-03, were reviewed in detail and closed in NRC Inspection Report 50-286/98-07. While NYPA was cited in violation 98-81-03 for failing to submit this LER, NYPA disagreed with the issuance of this citation but later submitted this LER voluntarily. On November 25, 1998, NYPA reinforced disagreement with the failure to report violation. This item will be addressed under separate correspondence. Notwithstanding, LER 98-004 is closed based on inoffice review.

E8.4 (Closed) Licensee Event Report 50-286/96-006: Two Emergency Diesel Generators were Declared Inoperable in Hot Shutdown Due to a Leaking Oil Header Check Valve; A Condition Outside the Design Basis of the Plant

In response to the failure of the leaking oil header check valves, NYPA replaced the check valves on the affected engines. A failure analysis performed by a NYPA vendor could not identify a specific cause for the check valve leakage, but indicated that the probable cause was fine foreign particles positioned near the seat of the valves. NYPA Design Engineering is currently working on design change 96-3-053 to replace the existing hard seat valves with a viton soft seated valve; to date, one of three EDGs have received the new check valves. Up until now, the hard seat check valves were replaced on an annual basis; given the introduction of soft seat valves and the absence of check valve leakage since this event, NYPA plans to extend the replacement schedule. In addition, since the check valves fail to close after an engine run and could introduce oil into the engine header, resulting in hydraulic locking of the pistons, nuclear plant operators now look for check valve closure following an engine run. Check valve closure is confirmed by ensuring that the oil line downstream of the check valve is cooler than the upstream section of the oil line since the oil upstream of the check valve is pre-heated. The inspector observed NPOs perform this check on December 31, 1998, during performance of 3PT-M79A, "32 Emergency Diesel Generator Functional Test." Based on the corrective actions taken and the absence of a repeat problem with these check valves, this LER is closed.

E8.5 (Closed) Violation 50-286/98005-01: Failure to Promptly Correct a condition adverse to quality. The inspector reviewed the licensee's corrective actions regarding the failure to promptly identify and correct the inadvertent, spurious closure of the reactor coolant pump thermal barrier heat exchanger component cooling water return valve. The immediate corrective actions included identifying this issue as an operator work around and issuing an engineering problem identification tag in order to develop a long term solution to the spurious closures. Additionally, a flow balance test was conducted to verify the system flow parameters and develop a modification which inhibits the closing feature of the valve for a short duration to avoid spurious closures during system flow transients.

The operations department issued a shift order to emphasize the importance of the shift manager's role in reviewing problem identification tags (PIDs) for potential operator work arounds. In addition, the operations review group established a "Recurring Issues List" to document and track deviation event reports that may need a higher level of attention because of the repetitive nature of identified problems.

The inspector verified the licensee's immediate and long term corrective actions and noted that they were appropriate to the circumstance. Although the final modification to the system has not been completed the actions are being tracked within the licensee's open item tracking system. The inspector concluded that

NYPA's corrective actions for this violation were acceptable and therefore this violation was closed.

E8.6 (Closed) EEI 50-286/98005-02: Failure to evaluate the impact on the Final Safety Analysis Report (FSAR) for operator actions necessary to reestablish reactor coolant pump thermal barrier cooling under certain transients. By letter dated August 19, 1998, the staff informed NYPA that based on the information provided at the enforcement conference on July 24, 1998, no violation of NRC requirements occurred.

E8.7 (Closed) Violation 50-286/98-005-03: Licensee failure to assure that applicable design basis was correctly translated into specifications and drawings for a modification associated with the emergency diesel generator auxiliaries. NYPA responded to the violation on September 18, 1998, and concluded that the cause was failure was a less than thorough documented design inputs for the modification. NYPA documented contributing factors and various opportunities to have identified this condition. The inspector verified the corrective actions taken that included review of the event with design engineers, drawing upgrades, implementation of outage milestones for plant modifications, guidelines for modification verification and cross-checking schematic and wiring diagrams, and the development of guidance for quality reviews of modification packages. This item is closed.

IV. PLANT SUPPORT

F8 Miscellaneous Fire Protection Issues

F8.1 (Closed): Unresolved Item (URI) 50-286/93-24-03: Adequacy of cable insulation ignition temperature. The licensee's evaluation of the fire barrier penetration seals had established the maximum unexposed side temperature of 700°F. However, the licensee had not demonstrated that this established temperature was sufficiently below the self ignition temperature of the electric cables. This URI was subsequently reviewed by the NRC and updated in inspection reports 95-10 and 95-81. This item was not closed because the licensee had not completed an evaluation to demonstrate that the cable ignition temperature was sufficiently higher than 700°F. A public meeting was held in the NRC Region 1 office, on October 15, to discuss the resolution of this issue. The NRC determined that the licensee had not provided sufficient data for the resolution of this URI.

Subsequent to the meeting, the licensee completed an evaluation (IP3-RPT-FP-02862) entitled, "FIRE SEAL EVALUATION - Cable Ignition Temperature of Cables Passing Through Penetration Seals", dated October 22, 1998. In this evaluation, the licensee concluded that the self-ignition temperature of IP3 cables are sufficiently above 700°F, based on the following:

- Polyvinyl chloride (PVC) jacketed cables represented the worst case cable construction with regards to ignition temperature and therefore bounded all the cables at IP3;

- The typical self-ignition temperature for PVC, as indicated in the "Forward" of IEEE standard 634-1978, was 850°F. This temperature was substantially higher than the maximum unexposed side temperature of 700°F.

The inspector conducted an in-office review of the licensee's Fire Seal Evaluation, IP3-RPT-FP-02862, and interviewed the fire protection engineer following the October 15, 1998, public meeting. The inspector found that the licensee's evaluation results had adequately demonstrated that the maximum unexposed side temperature of 700°F was sufficiently below the self ignition temperature of the cables. The inspector determined that no violations of NRC regulations had occurred. This item is closed.

P1 Conduct of Emergency Preparedness Activities

P1.1 NRC Observed Annual Emergency Preparedness Exercise

a. Inspection Scope (82301)

The inspectors reviewed the objectives of the 1998 partial participation emergency preparedness exercise and observed the licensee during the implementation of the exercise scenario.

b. Observations and Findings

The inspectors reviewed the licensee's partial participation emergency preparedness exercise scenario against the guidance in NUREG 0654, "Criteria for preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants." The inspector noted that the appropriate objectives were being exercised during this drill and that the scenario was of sufficient difficulty to challenge the responsible parties who implement the emergency plan.

The inspectors observed the initiation of the emergency exercise scenario in the licensee's simulator facility. The appropriate levels of emergency management were established immediately upon the notification of an unusual event (See section P5 for additional CR observations).

The inspectors moved to the emergency operations facility (EOF) for the remainder of the drill. Overall the drill activities were implemented in accordance with the licensee's procedures and adhering to the NRC guidance for emergency drills. The inspectors noted that the EOF was appropriately staffed in a timely manner and a second shift roster was developed prior to the release of non essential personnel. The briefings were thorough and the escalation of the emergency action levels was in accordance with the licensee's guidelines. Minor simulator glitches impacted the final declaration transitioning from a site area emergency to a general emergency; however, emergency preparedness drill facilitators took control to keep the exercise focused on drill objectives. The inspector noted a few minor deficiencies during the drill such as a high level of activity during the emergency directors briefs, but most

items were identified by the licensee's own self assessment immediately following the drill. Additionally, the inspector observed the more detailed critique by the drill facilitators the following day which provided suggestions for program enhancements.

c. Conclusions

Overall, the conduct of the emergency preparedness drill was good and the self assessment was thorough in identifying discrepancies and providing for program enhancements. The licensee's partial participation emergency exercise drill was developed and implemented in accordance with NYPA's emergency response procedures and the NRC guidelines for emergency preparedness.

P5 Staff Training and Qualification in Emergency Planning

b. Inspection Scope (71001)

The inspector observed an emergency preparedness exercise in which an operations crew participated on the simulator. The crew observed was the same crew receiving their annual operating test during this inspection.

b. Observations and Findings

Crew performance during the emergency planning exercise scenario was done well overall. This scenario was a loss of coolant accident and loss of internal recirculation with a leak in the RHR system as a release path. Two oversights in crew performance were observed by the inspector:

- When attempting to recover 5A vital 480V bus in order to restore internal recirculation, crew discussion indicated uncertainty regarding whether their inability to recover the bus was due to a fault or due to something they had overlooked. No crew member acted to consult with any references such as the ONOP or SOP for possible guidance in resolving this difficulty.

- The preferred mode for cold leg recirculation is via the internal recirculation pumps located inside containment, with external recirculation via the RHR pumps as a backup. In the exercise, the plant was on external RHR recirculation due to loss of the internal recirculation pumps with an RHR leak as the release path. Once the 5A bus was restored, the crew desired to restore internal recirculation to isolate the leak. The facility did not have a procedure for switching from the backup RHR recirculation mode to the preferred internal mode. The crew devised a method to accomplish this evolution, but began component manipulations without consulting with the technical support center (TAC).

c. Conclusions

Although there were some operator performance oversights, the crew performed well overall in the emergency preparedness exercise scenario.

V. MANAGEMENT MEETINGS

X1 Exit Meeting Summary

The resident inspectors presented the inspection results to members of the licensee's management at the conclusion of the inspection on January 8, 1999. 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.

ATTACHMENT 1

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Barrett, Site Executive Officer
D. Quin, General Manager, Support Services
J. Comiotes, GM-Operations
J. Russell, General Manager-Maintenance
E. Armando, Operations Manager
M. Leonard, Security Manager, Corporate
A. Grubert, Inspector General's Office
J. Odendahl, Security Manager
T. Vitale, Manager, Maintenance
K. Peters, Manager, Licensing
K. Hayes, Security Shift Supervisor
T. Barry, Security Shift Supervisor
E. Danko, Licensing
L. Lubrano, Maintenance Engineering
M Troy, Procurement Engineering
A. Vai, Design Engineering
D.Spoerry, Training Manager
K. Peters, Licensing Manager
B. Sullivan, Assistant Operations Manager
R. Christman, Supervisor - Operations Training
F. Wilson, Requalification Program Coordinator
A. Ettlinger, Manager Fire Protection
S. Wilkie, Fire Protection Engineer

INSPECTION PROCEDURES USED

IP 37550	Engineering
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71001:	Licensed Operator Requalification Training and Evaluation
IP 71750:	Plant Support Activities
IP 90712:	In-office Report Review
IP 92700:	Event Reports
IP 92901	Followup - Operations
IP 82301:	Evaluation of Emergency Exercises for Power Reactors
IP 92904:	Followup - Plant Support
IP 92902	Followup - Maintenance

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

NCV 98009-01	Failure to have an adequate surveillance procedure
VIO 98009-02	Failure to promptly correct a deficiency adverse to quality
NCV 98009-03	Failure to revise contract with service vendor to incorporate recommendation of the technical bulletin

Closed

NCV 98009-01	Failure to have an adequate surveillance procedure
URI 93-024-03	Adequacy of cable insulation ignition temperature
VIO 98005-01	failure to promptly correct a deficiency adverse to quality is an apparent violation of 10 CFR 50, Appendix B, Criterion XVI
EEI 98005-02	Failure to evaluate the impact on the FSAR for operator actions necessary to reestablish RCP thermal barrier cooling under certain transients
VIO 98002-01	Failure to have written procedures approved prior to implementation to fill and vent portions of the charging system
VIO 98001-03	Adverse conditions to quality were either not promptly identified or corrected, or the cause of the condition was not determined and actions not taken to preclude repetition
VIO 97081-01	Inadequate control of activities in the switchgear room
URI 97081-02	Onsite troubleshooting and test results
NCV 98009-03	Failure to revise contract with service vendor to incorporate recommendation of the technical bulletin
LER 98-004	Control room ventilation system and component leakage design bases not met due to deficiencies in a surveillance
LER 96-006	Two emergency diesel generators inoperable in hot shutdown due to leaking oil header check valves
VIO 98005-03	Failure to assure applicable design basis was correctly translated into specifications and drawings for modification with emergency diesel generator auxiliaries

LIST OF ACRONYMS USED

ABFP	auxiliary boiler feed pump
ACTS	Action Commitment Tracking System
ARP	Annunciator Response Procedure
CCW	component cooling water
CDF	core damage frequency
CR	control room
CRS	Control Room Supervisor
CVCS	chemical and volume control system
DER	Deviation Event Report
EAL	emergency action level
ED	emergency director
EDG	emergency diesel generator
EFE	equipment failure evaluation
EOF	emergency operations facility
EOP	Emergency Operating Procedure
FME	foreign material exclusion
FSAR	Final Safety Analysis Report
gpm	gallons per minute
IPE	individual plant examination
IST	inservice testing
IVSW	isolation valve seal water
JPM	Job Performance Measures
LER	Licensee Event Report
MCC	Motor Control Center
MPM	Maintenance Program Manual
MSIV	main steam isolation valve
NCV	non-cited violation
NPO	Nuclear Plant Operator
OEM	original equipment manufacturer
ONOP	off normal operating procedure
ORG	Operations Review Group
PID	Problem Identification Description
RCD	reactor coolant drain
RCS	reactor coolant system
RHR	residual heat removal
RO	reactor operator
RO	refueling outage
RWST	refueling water storage tank
SBO	station blackout
SES	simulator evaluation scenarios
SRO	Senior Reactor Operator
TS	Technical Specification
TSC	Technical Support Center

URI	Unresolved Item
VIO	Violation
WR	Work Request