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EXECUTIVE SUMMARY

Indian Point 3 Nuclear Power Plant
NRC Inspection Report No. 50-286/96-80

This inspection included a review of New York Power Authority's implementation of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." The report covers a 1-week onsite inspection by regional and NRR inspectors and an NRC contractor.

<u>Maintenance</u>

- Generally, NYPA correctly identified the systems, structures and components (SSCs) that were required to be within the scope of the maintenance rule. However, not including the turbine building and the power conversion equipment building within the scope of the rule is a violation of 10 CFR 50.65(b)(2).

- Initial screening by system engineers assured good knowledge and ownership of the systems, structures, and components (SSCs) in the program.

- Overall, the expert panel was functioning very well and use of the panel beyond that described in NUMARC 93-01 was considered a very good initiative. Better documentation of the panel's actions and a common understanding of the basis for plant-level performance criteria would improve the program.

- The approach for establishing risk importance from the PRA was generally acceptable. There were some weaknesses noted in the treatment of initiating events and SSCs not addressed by the PRA importance measures.

- An effective process has been developed and implemented to assess risk when taking equipment out of service. The team noted that the recently revised procedure for on-line maintenance risk assessments was missing some risk significant components.

- Where unavailability performance criteria was specified, it was found to be acceptable. However, a number of SSCs which should have had unavailability performance criteria did not have it specified. NYPA's use of MPFFs for reliability performance criteria for risk significant systems was not related to safety as required by the rule. Also, the team found that the plant-level performance criteria of unplanned automatic scrams would not capture all plant trips that have maintenance performance significance. These inadequacies in performance criteria for SSCs was cited as a violation of 10 CFR 50.65.

- Operators' knowledge was consistent with their responsibilities for implementation of the maintenance rule.

- The team concluded that the self assessment, dated November 26, 1996, was an effective tool and a crucial part of the overall implementation of the maintenance rule. While NYPA had responded to all the issues identified in the self assessment and had completed corrective actions for a number of them, some important actions remained to be completed. Selected activities will be reviewed by NRC at a future date to ensure corrective actions are effectively implemented.

- System engineers were knowledgeable of their assigned systems and demonstrated sufficient knowledge to effectively implement their responsibilities under the maintenance rule. They were effectively monitoring their systems in spite of the weaknesses in the performance criteria.

Report Details

Introduction

The primary focus of this inspection was to verify that NYPA had implemented a maintenance monitoring program which satisfied the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" (the maintenance rule). The inspection team of six inspectors included regional and headquarters inspectors and one NRC contractor. Assistance and support were provided by one member of the Quality Assurance and Maintenance Branch, NRR.

II. Maintenance

M1 Conduct of Maintenance (62706)

M1.1 SSCs Included Within the Scope of the Rule (62706)

a. Inspection Scope

The team reviewed the scoping documentation to determine if the appropriate SSCs were included within the maintenance rule program in accordance with 10 CFR 50.65(b). The team used NRC Inspection Procedure (IP) 62706, NUMARC 93-01, and Regulatory Guide 1.160 as references.

b. Observations and Findings

At Indian Point 3, administrative procedure (AP)-62, "Maintenance Rule," provides the listing of those SSCs which are in the scope of the rule and their safety (risk) significance. New York Power Authority (NYPA) reviewed 227 SSCs for inclusion in the maintenance rule program. NYPA developed engineering standard (ES)-8, "Maintenance Rule Scope Determination," to define the process for evaluating SSCs, maintaining the status of SSCs in the program, and maintaining the justification for scoping decisions. Of the SSCs reviewed, 118 were determined to be in scope and 29 were risk significant.

The responsible system engineer had performed the initial screen for SSC scoping decisions. The team noted that the screening criteria used by NYPA was consistent with NUMARC 93-01 guidance. These scoping decisions were then reviewed and approved by the expert panel.

The team reviewed several SSCs excluded from the program and generally noted that the scoping decisions were correct. Nonetheless, the team identified two structures, the turbine building and the power conversion equipment building, that should have been included in the scope. Failure of these structures could cause a plant trip. NYPA had included in the scope of the maintenance rule those structures that were safety-related or whose failure could prevent safety-related equipment from performing its safety-related function. Structures enclosing SSCs that are important to safety and whose failure could cause a transient or plant trip must be included in the scope of the rule also. This is a violation of 10 CFR 50.65(b)(iii) (VIO 50-286/96-80-01). The team noted that NYPA was considering the turbine building scoping question at the time of the inspection.

The team noted that system boundaries were not well defined for a number of systems. This issue had been identified by NYPA in their self assessment and actions were being taken to correct the problem.

In addition to the review of SSCs, several components were examined from a PRA (probabilistic risk assessment) perspective to determine if they were included within the scope. The PRA has several operator actions that implicitly or explicitly credit the successful operation of hardware. The team reviewed the following operator actions: alignment of city water to the auxiliary feedwater (AFW) pump suction, the provision of alternative AFW pump room ventilation, and the alignment of the primary water system to refill the refueling water storage tank (RWST). The team confirmed that the necessary components to support these operator actions were included in the maintenance rule program.

Modification control manual (MCM)-19, "Modification Turnover and Closeout," contains instructions to ensure that the responsible engineer considers maintenance rule impacts. The team reviewed this procedure and determined that means existed to assure that SSCs in the rule would be updated to reflect subsequent changes to the plant.

c. Conclusions

The team concluded that the NYPA review of SSCs for inclusion in the maintenance rule was effective. Initial screening by system engineering assured good knowledge and ownership of the program. A violation was noted in that two structures were inappropriately excluded from the scope of the program.

M1.2 Safety (Risk) Determination, Risk Ranking, and Expert Panel (62706)

a. Inspection Scope

Paragraph (a)(1) of the maintenance rule requires that SSC performance goals be established, commensurate with the safety significance of each SSC. Additionally, implementation of the maintenance rule using the guidance contained in NUMARC 93-01 requires that safety be taken into account in setting performance criteria and monitoring under paragraph (a)(2) of the maintenance rule. This safety consideration would be used to determine if the SSC should be monitored at the system, train, or plant level. The team reviewed the methods and calculations that NYPA had established for making these safety determinations. The team also reviewed the safety determinations that were made for the specific SSCs reviewed during this inspection, the expert panel's process, and the information available which documented the decisions made by the expert panel.

b. <u>Observations and Findings on Risk Determinations, Risk Ranking, and Expert Panel</u>

Except for certain aspects of the risk ranking process, the team found the expert panel was performing its risk ranking function as described in NUMARC 93-01. The team noted that NYPA had established additional responsibilities for the expert panel. These included reviewing and approving scoping decisions, goals, and performance criteria, and reviewing performance assessments. The NYPA procedure did not provide detailed guidance on how the expert panel was to fulfill its responsibilities.

Documentation of expert panel decisions was contained in meeting minutes. Typically, the basis for taking action was documented, but the basis for not taking action was not documented.

The team interviewed the expert panel as a group. The panel had an acceptable variety of experience and knowledge, and demonstrated a knowledge of the requirements of the maintenance rule. The expert panel members differed in their interpretation of how to apply the plant level performance criteria to plant trips and unplanned capability loss factor. If the expert panel could not apply plant-level performance criteria consistently, it is unlikely that others could consistently apply the criteria either.

The maintenance rule requires that a determination be made of the safety (risk) significance of each SSC in scope. A plant-specific PRA was used to rank SSCs with regard to risk significance. NYPA submitted the Indian Point 3 Nuclear Power Plant Individual Plant Examination (IPE) for internal events on June 30, 1994, in response to Generic Letter 88-20. The IPE (hereafter called the PRA) includes level 1 (internal events core damage frequency analysis) and level 2 (containment performance analysis) sections.

The team reviewed the adequacy of the PRA truncation limits used during the risk ranking process. Truncation limits are imposed on PRA models to limit the size and complexity of the PRA results to a manageable level. NYPA used a truncation limit of 1E-9 when quantifying the PRA model. This was about four orders of magnitude less than the estimated internal core damage frequency of 4.4E-5 events per year. The team considered this truncation limit to be reasonable.

The IP 3 PRA used generic data in conjunction with some plant-specific information for initiating events, component failures, and unavailability. A Bayesian process was used to aggregate generic and plant-specific data. NYPA planned to update the PRA every 2 years to reflect plant modifications, procedural changes and new plant data.

The risk significance determination process was the responsibility of the expert panel. NYPA engineering standard ES-9, "Risk Significance Determination," specified that the expert panel to consider: all SSCs in the scope of the rule, the listing of systems and events and their risk measures; shutdown functions and systems; and SSCs that prevent containment failure or bypass. NYPA used the guidance in NUMARC 93-01 for risk reduction worth (RRW), risk achievement worth (RAW) and a more conservative criterion (95%) for core damage frequency (CDF). The expert panel used this information to develop a list of risk significant systems. The expert panel worked to reach a consensus on the final determination of risk significance. All of the systems that satisfied any of the risk-ranking criteria were retained as risk significant. The panel added the control building HVAC, the reactor water level indication, main feedwater, 138 KV and 13.8 KV systems to the list of risk significant SSCs. The team noted, and NYPA personnel concurred, that the documentation of the panel's deliberations were weak, especially for those SSCs that were not deemed potentially risk significant. The expert panel concluded that there were 29 risk significant SSCs.

The team reviewed several SSCs considered to be non-risk significant by the panel. The sample included steam generator blowdown, Appendix R, "Emergency Diesel Generator," and the condensate systems. These systems were modeled in the level 1 PRA. The condensate system was also considered by NYPA from an initiator perspective, but was discarded on the basis of plant operating history. The team agreed with the panel's risk significant determinations. The team also reviewed systems that were not modeled in the level 1 PRA. These systems included; containment vent, hydrogen recombiner, reactor coolant, electric trace heat and containment isolation. Based upon the sequences that comprised the large early release frequency, the team agreed with the panel's assessment for containment vent and the hydrogen recombiner systems. However, weaknesses were noted in the assessments for reactor coolant, heat tracing and the containment isolation systems.

For purposes of the maintenance rule, the reactor coolant system does not have an active safety function. The high passive reliability, as evidenced by the low loss of coolant accident (LOCA) initiator frequency, was the basis of the non-risk significant determination. However, high reliability is not a necessary and sufficient condition for classifying a system as non-risk significant. Another consideration is the increase in risk that would be experienced if system performance were to degrade. The team noted that initiators were generally excluded from the risk ranking process. If initiators that have maintenance contributions were included, it is likely that the reactor coolant system would be considered risk significant.

The team also noted a weakness in the panel's review of SSCs that were not modeled in the level 1 PRA. In their minutes of meeting dated October 2, 1995, the expert panel stated that the heat tracing systems did not contribute to transients and had no significant impact on CDF. The trace heating systems were not modeled in the PRA. They were assumed to be available. As a consequence, the trace heating systems did not appear during the risk ranking process.

Similarly, the importance of the source term mitigation function of the containment isolation system would not be identified in a risk ranking process based on core damage frequency. However, the team noted that NYPA recently revised its assessment of the containment isolation function to be risk significant as documented in AP-62 Revision 1, dated December 11, 1996.

One of the roles of the panel is to compensate for the limitations of the PRA. The expert panel did not appear to recognize the modeling limitations and the boundaries of the level 1 PRA when these determinations were initially made.

c. Conclusions on Risk Determinations, Risk Ranking and Expert Panel

The team concluded that overall the expert panel was functioning very well. The decision to expand the role of the panel beyond that described in NUMARC 93-01 was a very good initiative. Improved documentation and a common understanding of the bases for plant level criteria would improve the program.

The team noted some weaknesses in the treatment of initiating events and for SSCs not addressed by the PRA importance measures. The expert panel did not adequately consider the limitations and boundaries of the level 1 PRA in their risk significant determination of some SSCs.

The team concluded that the approach to establishing risk importance from the level 1 PRA was generally acceptable. NYPA used a more conservative criteria for cutset CDF contribution than was given in NUMARC 93-01. All three of the NUMARC 93-01 PRA importance measures were used during the risk determination and ranking processes.

M1.3 (a)(3) Periodic Evaluations (62706)

a. Inspection Scope

Section (a)(3) of the maintenance rule requires that in evaluating performance and condition monitoring activities (and associated goals and preventive maintenance activities) industry-wide operating experience be taken into account, where practical. This evaluation is to be performed at least once during each refueling cycle, with no more than 24 months between evaluations. The team reviewed quarterly reports prepared in 1996 and discussed the reports with the maintenance rule coordinator and system engineers.

b. Observations and Findings

Procedure AP-62 specified that industry operating experience be taken into account and was consistent with NUMARC 93-01. Even though not required by the rule, NYPA has conducted formal maintenance rule evaluations on a quarterly basis. At the time of this inspection, no refueling cycle periodic evaluation had been completed, therefore, no review of the implementation of this aspect of the rule could be made. As noted below in M1.4, some issues in this area remain to be resolved. The forthcoming refueling cycle assessment will be reviewed to ensure the evaluations are properly performed and is identified as an inspection follow-up item (IFI 50-286/96-80-02).

c. Conclusions

The procedures for performing the periodic evaluations appeared to meet the requirements of the maintenance rule and were consistent with the guidance in NUMARC 93-01. The periodic evaluation will be reviewed to ensure it is properly performed and was identified as an inspection follow-up item.

Based on the review conducted by the team, it was concluded that NYPA uses industry operating experience in their evaluations.

M1.4 (a)(3) Balancing Reliability and Unavailability (62706)

a. Inspection Scope

Paragraph (a)(3) of the maintenance rule requires that adjustments be made where necessary to assure the objective of preventing failures through the performance of preventive maintenance was appropriately balanced against the objective of minimizing unavailability due to monitoring or preventive maintenance. The team reviewed NYPA's plans to ensure this evaluation was performed as required by the maintenance rule.

b. Observations and Findings

NYPA's use of MPFFs (maintenance preventable functional failures) as a measure of reliability will not allow reliability and unavailability to be balanced when the periodic evaluation is made. This problem has been identified in the NYPA self assessment. This aspect of the rule will be reviewed when the review of the periodic evaluation is made.

c. Conclusions

Although balancing reliability and unavailability was not required at the time of the inspection, the team concluded that the approach taken by NYPA would not be able to balance reliability and unavailability under the current program. The issue of measuring reliability should be resolved and the program adjusted prior to the first periodic assessment. Balancing reliability and unavailability will be reviewed when the first required periodic assessment of the maintenance rule program is reviewed and is part of the above inspector followup item.

M1.5 (a)(3) Plant Safety Assessments Before Taking Equipment Out of Service (62706)

a. Inspection Scope

Paragraph (a)(3) of the maintenance rule states that the total impact on plant safety should be considered before equipment is taken out of service for monitoring or preventive maintenance. The team reviewed NYPA's procedures and discussed the process with appropriate personnel. The team interviewed five licensed senior reactor operators and a work week coordinator to determine if they understood the general requirements of the maintenance rule, and their particular duties and responsibilities for its implementation.

b. Observations and Findings

Procedure SPO-SD-03, Revision 0, "On-line Work Scheduling Process," is used to assess overall plant safety prior to taking plant equipment out of service. Attachment 3 to this procedure listed the maintenance rule risk significant systems and Attachment 4 listed risk significant components. The procedure specifies that only one risk significant system should be out of service at a time. If this condition cannot be met and two or more risk significant components listed in Attachment 4 are unavailable also, then the safety impact of the combination must be reviewed by the nuclear system analysis (NSA) group.

The NSA group was responsible for PRA analyses to support work week planning when two or more Attachment 4 risk significant components are expected to be out of service at the same time, including qualitative and quantitative assessments of the planned or emergent configuration. The qualitative screening includes an evaluation of outage windows, unrecoverable testing, and the importance of multiple component unavailabilities. Quantitive evaluations use the minimal cutset equation or a full sequence quantification. In certain cases, the analysis of a similar configuration is reviewed. NYPA uses a 1E-6 conditional core damage probability to evaluate the acceptability of planned or emergent work configurations.

A PRA-based equipment checklist has been included in Revision 1 to SPO-SD-03 to compare actual equipment configuration with the work schedule on a daily basis. In addition, NYPA was developing computer software to improve the work scheduling and risk assessment processes for both on-line and outage conditions.

The team observed the implementation of this planning and risk assessment process for an upcoming work week. The process was well implemented and scheduled equipment outages were adjusted to minimize risk to plant safety. The team also reviewed work activities for several previously completed work weeks to determine how emergent work was assessed for impact on overall plant safety. The team noted that emergent work was handled effectively, and work was frequently rescheduled to subsequent weeks to avoid undesirable equipment outage combinations.

The team compared the risk significant systems listed in Attachment 3 of procedure SPO-SD-03 to the information in procedure AP-62. Two systems: vapor containment building ventilation and containment isolation were not included in Attachment 3. Vapor containment building ventilation was missing from SPO-SD-03 due to an oversight when the procedure was initially prepared. The containment isolation system had been reclassified as risk significant when the self assessment in November 1996 determined that 15 containment isolation valves were inappropriately classified as non-risk significant. However, actions were not taken to ensure that the procedures were updated accurately. SPO-SD-03, Revision 1, dated December 6, 1996, did not include the containment isolation system as risk significant and did not include 10 of the 15 containment isolation valves. Further, adequate compensatory measures were not taken to ensure that work control personnel were aware of the additional risk significant components when assessing the work week schedule. When identified by the team, these oversights were documented in a NYPA deviation/event report (DER) to initiate corrective actions.

The team noted that procedure SPO-SD-03 did not explicitly address assessing the unavailability of non-risk significant systems. The unavailability of multiple non-risk significant systems could result in an unrecognized risk significant plant configuration. Although not proceduralized, non-risk significant system interaction was being considered based on operator knowledge and training of the work week risk assessors.

The team reviewed the process used to manage risk during plant shutdowns. The process as described in AP-9.2, "Outage Risk Assessment," provided good guidance for minimizing risk.

The personnel interviewed were knowledgeable of the work scheduling risk assessment requirements of NYPA procedure SPO-SD-03, "On-line Work Scheduling Process." They were aware of the need to have the work schedule assessed for risk. The shift manager was aware of his responsibility for using the process for emergent work to evaluate the effect on overall plant safety when work control personnel were unavailable.

The team found that all operations personnel interviewed had a basic understanding of the maintenance rule and their responsibilities in implementing it. Their role, as they saw it, was to minimize equipment unavailability while supporting the maintenance work schedule. This was accomplished by the timely removal and restoration of equipment in support of maintenance and surveillance activities.

c. <u>Conclusions</u>

An effective process has been developed and implemented to assess risk when taking equipment out of service. A problem was noted in ensuring that the risk assessment procedure remained up to date. Although the integrated assessment of non-risk significant components was not proceduralized, personnel knowledge and training helped ensure that risk associated with these components was factored into the work week schedule.

Personnel interviewed demonstrated a good general understanding of the maintenance rule and were aware of their responsibilities for effective implementation of the maintenance rule.

M1.6 (a)(1) Goal Setting and Monitoring and (a)(2) Preventive Maintenance (62706)

a. Inspection Scope

The team reviewed program documents in order to evaluate the process established to set goals and monitor under (a)(1) and to verify that the established performance criteria and preventive maintenance were effective under (a)(2) of the maintenance rule. The team also discussed the program with appropriate plant personnel. The team performed detailed programmatic reviews of maintenance rule implementation for the following SSCs:

(a)(1) SSCs

- Auxiliary Feedwater (AFW) System
- Containment Isolation System
- Containment Spray (CS)
- Emergency Diesel Generators (EDG)
- Appendix "R" EDG
- Weld Channel and Containment Penetration Pressurization (WCCPP)
- Service Water System (SWS)
- Vapor Containment (VC) Hydrogen Analyzer
- Chemical and Volume Control System (CVCS)
- Instrument Air

(a)(2) SSCs

- Reactor Protection and Controls (General)
- Reactor Trip Relays
- Engineered Safeguards Initiation Logic
- Structures
- Spent Fuel Pool Cooling (SFPC) System
- Component Cooling Water
- 13.8 KV, 138 KV, 6.9 KV and 480 V Electrical Distribution systems

The team reviewed each of these systems to verify that goals or performance criteria were established in accordance with safety, that industry-wide operating experience was taken into consideration where practical, that appropriate monitoring and trending were being performed, and that corrective actions were taken when an SSC failed to meet its goal or performance criteria or experienced an MPFF. The team also reviewed goals and performance criteria for SSCs not listed above.

Observations and Findings for Safety Considerations in Setting Goals and Performance Criteria

The maintenance rule was implemented by NYPA using NUMARC 93-01. This guidance required that safety (risk) be taken into consideration when establishing goals under (a)(1) or performance criteria under (a)(2) for risk significant SSCs.

NYPA procedure AP-62, section 4.3.2 specifies that performance criteria for risk significant and standby SSCs be based on unavailability and reliability consistent with the PRA. Also, section 4.5.4 of the procedure specifies that safety and the use of PRA values for unavailability and reliability shall be considered when establishing goals. The team noted that the unavailability performance criteria and goals were generally less conservative than the values used in the PRA. NYPA performed a sensitivity study to assess the safety impact of the unavailability performance criteria and goals. The CDF increased approximately 17% to 5.16E-5 per year. Based on this small increase in CDF, the team concluded that the unavailability performance criteria and goals were acceptable.

The team identified several examples of risk significant SSCs that did not have unavailability performance criteria established. These SSCs included:

- Reactor Protection and Controls (General)
- Reactor Trip Relays
- Engineered Safeguards Initiation Logics
- 120 VAC
- 13.8 KV
- 138 KV
- 480 V
- 6.9 KV

Failure to establish acceptable unavailability performance criteria is a violation of the rule.

Reliability performance criteria and goals were based upon the number of MPFFs per 24-month cycle. The number of MPFFs allowed per system/train was defined in ES-10, Revision 0, "Guidelines for Developing Maintenance Rule Basis Documents." The NYPA guidance did not consider safety when establishing the number of MPFFs to use as a reliability measure. This is a violation of the rule. NYPA had identified in its self assessment that the reliability performance criteria were not acceptable and lacked a basis.

Non-risk significant SSCs that are normally operating may be monitored at the plant level if the plant level performance criteria adequately monitors the effectiveness of maintenance on these systems. IP-3 had a plant level criterion for unplanned automatic scrams, and used an industry performance indicator definition of unplanned automatic scrams to determine which scrams are counted by this performance criterion. This definition excluded manual scrams. Although several members of the expert panel believed that anticipatory manual scrams would be monitored under this plant level criteria, such scrams had not been counted. Where a manual scram occurred as a result of an MPFF, monitoring these scrams would provide useful information on maintenance effectiveness of the SSCs being monitored. The team determined that the existing plant level performance criterion of automatic scrams would not monitor the effectiveness of maintenance. This is a violation of the rule.

Conclusions for Goal Setting and Performance Criteria

A violation of the maintenance rule relating to establishing performance criteria and goals was identified by the team. This violation included three parts:

(1) Unavailability performance criteria were not established for all risk significant and standby SSCs;
(2) Reliability performance criteria were not commensurate with safety;
(3) The plant level performance criteria would not adequately monitor the effectiveness of maintenance for SSCs that are monitored at the plant level.

(VIO 50-286/96-80-03). NYPA had identified the second part of this violation in their self assessment.

Where NYPA had established an unavailability performance criteria for an SSC, the team concluded that the performance criteria were satisfactory.

Detailed Review of (a) (1) SSCs

The team reviewed the implementation of the maintenance rule to individual (a)(1) SSCs as follows:

Chemical and Volume Control System (CVCS)

The team interviewed the system engineer, walked down portions of the system, and reviewed the basis document and action plan for the system. The CVCS system is in scope of the rule because it is safety-related. Portions of the system associated with the letdown demineralizers are not safety-related and not in scope. The system is risk significant and has four maintenance rule functions:

F2- provide cooling water to the reactor coolant pump seal package via the seal injection lines.

F4- provide boron for reactivitity control

F7- provide an independent means for reactor shutdown

F9- maintain reactor coolant inventory through charging and letdown

The reliability goal for functions F2 and F4 was 2 MPFFs per cycle. Functions F7 and F9 were monitored using the goals for function F4. As noted in the previous section of this report, these goals were not commensurate with safety.

NYPA established an unavailability goal for each charging pump and each boric acid transfer pump. These goals were satisfactory.

The CVCS was in (a)(1) as a result of 4 MPFFs that occurred for function 4. Effective corrective actions were taken for each failure. In response to a solenoid-operated valve (SOV) failure, NYPA is formulating a preventive maintenance program covering all solenoid-operated valves.

The team identified an MPFF that had not been characterized as such by NYPA. As described in DER 95-1526, failure of an internal valve in the 33 charging pump caused a functional failure (FF) of the pump. This type of failure had been observed previously. The FF was not characterized as an MPFF because the pump design made it difficult to determine if the valve seat had been installed correctly. Only after extended run time would the incorrect valve seat installation become apparent. The vendor was contacted and provided additional guidance on seat replacement. The system engineer was trending pump vibration and flow in an effort to identify when the valve seat was beginning to back out of its bore. NYPA identified in its self assessment that past FFs need to be reevaluated to ensure that all MPFFs had been identified. Since the system is in (a)(1) and extensive corrective actions, and monitoring and trending are being performed to address this failure, the miscategorization is of little consequence. Also, the four MPFFs identified by the system engineer that placed the system in (a)(1) were conservative and indicate that the system engineer was aggressive in identifying and correcting problems with his system.

The system engineer's knowledge of the system, its maintenance history, the maintenance rule and NYPA's program to implement the rule were excellent. The system engineer was very active in monitoring the effectiveness of maintenance on the CVCS.

The team concluded that NYPA had properly determined that CVCS was in scope and risk significant. The system was appropriately categorized as (a)(1), with goals established, corrective actions taken, and monitoring and trending of performance being done. With the exception of the reliability goals, all actions were acceptable. The broad-based solenoid-operated valve preventive maintenance program that was being established in response to the CVCS solenoid failure was considered a strength. The system engineer's knowledge and actions were also considered a strength.

Containment Spray (CS) System

CS is a safety-related, risk significant, standby system. The performance criteria established for the system is an unavailability of no more than 1.5% per cycle and a reliability of 2 or less MPFFs per cycle with no repeatable MPFFs. The system is (a)(1) based on a solenoid-operated valve SI-SOV-867B failure (repeat MPFF). For the CS system to be placed in (a)(2), the system must not incur any new repeat MPFFs within two successive surveillance periods.

The team noted that it took over 3 three months to declare the system (a)(1) following the occurrence of the repeat MPFF. The problem of timeliness to take action was identified in the self assessment, however, the self assessment did not review the containment spray system. The team reviewed procedure TSP057, "Maintenance Preventable Functional Failure Determination," dated December 3, 1996, and determined that the procedure should help ensure appropriate and timely evaluation of MPFFs in the future.

The team reviewed the action plan for the CS system which described the corrective actions and the plans to restore the system to (a)(2) status. The action plan was determined to be adequate. As noted previously, NYPA is establishing a special preventive maintenance program to address the solenoid-operated valves.

The system engineer was knowledgeable of the system and of the maintenance rule requirements. He monitored his system by daily reviews of the deviation/event reports (DERs) and plant-identified deficiencies (PIDs) written against the system. He also reviewed surveillance tests and reliability engineering tests (e.g., vibration testing on CS pumps). He did not consider control room annunciators to be within the scope of his system boundary. NYPA guidelines on system boundary definition issued on December 6, 1996, describe the annunciators as part of the system. The system engineer reviewed industry experience for his system. The team noted that there was one outstanding action tracking system (ACTS) item to consider relocating the chemical addition tank in response to NUREG 1465, "Accident Source Terms for Light Water Nuclear Power Plants," issued February 1995.

In August 1996, the CS system was one of four systems reviewed by NYPA to ensure consistency between the updated final safety analysis report (UFSAR), procedures and actual plant configuration. One apparent conflict was identified between the UFSAR and the emergency operating procedures (EOPs). This involved the directions to operators for sodium hydroxide (NAOH) addition. NYPA has taken action to revise the UFSAR to be consistent with the procedures. Ten minor consistency statements were also identified in the UFSAR. The team evaluated these issues and concluded that NYPA was taking appropriate actions.

The team reviewed the last three maintenance rule quarterly reports and concluded that the reports provided a good evaluation of the CS system. The team also reviewed DERs for the last 2 years, open ACTS items, and the backlog of open work requests and concluded that the backlog was reasonable (8 open corrective maintenance work requests) and no concerns were identified. The team walked down the system and noted the system appeared to be well maintained with only a few equipment deficiency tags present.

The team concluded that NYPA's actions on the CS system had appropriately addressed maintenance rule requirements except for the use of 2 MPFFs for reliability performance criteria. The timeliness of declaring the system (a)(1) was a concern. The team also concluded that NYPA should ensure that all system engineers have the guidance on system boundaries which provides clarification on control room annunciators associated with specific systems.

Emergency Diesel Generators (EDGs) and Appendix "R" EDG

The EDGs are a safety-related, risk significant, standby system. The performance criteria established for this system included an availability of at least 97.5% per cycle for each EDG and no more than two MPFFs per cycle for each EDG with no repeat MPFFs. None of the three EDGs met the availability criteria and the system was placed in (a)(1). Failures associated with the EDG ventilation system temperature controllers caused the excessive unavailability. For the EDGs to be placed in (a)(2) there can be no new repeat MPFFs of the EDG ventilation system temperature controllers and the availability must meet the established criterion for each EDG for two successive surveillance periods. The use of two MPFFs for reliability performance criterion has been discussed previously.

The Appendix "R" EDG is a non-safety related, non-risk significant, standby system. The performance criteria established for this system included an availability of at least 95% and no more than two MPFFs per cycle with no repeat MPFFs. The system was placed in (a)(1) because it did not meet the availability performance criterion. To be placed in (a)(2), the system must meet the availability criterion of 95% for two successive surveillance periods.

The team reviewed 11 FFs associated with the EDGs and Appendix "R" EDG. Four of these FFs were MPFFs including two for the 31 EDG, one for the 32 EDG and one for the Appendix "R" EDG. The team concluded that the root cause or apparent cause investigations by NYPA were good. The availabilities for the EDGs including the Appendix "R" EDG have improved since the beginning of 1996, but have not met the performance criteria. The EDG system action plan was issued on October 29, 1996, and included a number of actions to improve performance including modifications. The team review of the action plans, improvement plan, basis documents, quarterly reports, monitoring and trending activities and corrective actions concluded that the NYPA actions were appropriate. The backlog of open corrective maintenance work requests was 20 for the EDGs and 7 for the Appendix "R" EDG.

The system engineer was knowledgeable of his system and his maintenance rule responsibilities. He monitored the system by conducting daily reviews of DERs, PIDs, surveillance tests, and trending reliability engineering test results. He indicated that he frequently walked down the systems. The team walked down the systems and noted that the material condition was satisfactory. A few oil leaks of a minor nature were observed.

The team concluded that the EDGs and Appendix "R" EDG systems were appropriately managed under the rule. The planned corrective actions should help to improve performance. Close monitoring and management oversight is required to ensure that improvements are implemented and performance criteria are met.

Containment Isolation System

Containment isolation is a safety-related, risk significant (valves that are 2 inches or larger) standby system. The performance criteria established for the system is no more than three MPFFs per cycle with no repeat MPFFs. The system was placed in (a)(1) based upon 10 MPFFs. To be placed into (a)(2), the system must not incur any new repeat MPFFs for a period of 6 months. The containment isolation system was initially classified as non-risk significant and did not have performance criterion for availability. Fifteen out of 150 isolation valves were recently classified as risk significant and NYPA is in the process of establishing availability performance criterion for these valves.

The team reviewed the action plan which provided corrective actions for the 10 MPFFs and conditions necessary to place the system in (a)(2). Prior to the inspection, the system engineer identified five new MPFFs as part of the action to reevaluate DERs for MPFFs. The action plan and basis document will be revised to reflect this new information. The team's review of the present action plan and corrective actions concluded that the actions were appropriate. The system engineer noted that 28 isolation valves that were assigned to a preventive maintenance (PM) program did not have a specified PM frequency or test procedure. In addition, the system engineer noted that three isolation valves were not yet included in any PM program. NYPA has taken action to ensure that all containment isolation valves are in a PM program.

In the quarterly report issued October 18, 1996, the system engineer described the system condition as poor. The system's "Z" number, a statistical index of failures, was about three times higher than the industry average. Several modifications are planned for the next refueling outage to improve the reliability of the containment isolation function. One modification involves replacing the limit switches on a number of valves with a new design and a second modification will install stiffer springs on about 12 air-operated valves to improve their response times.

Based upon the in-service test program results, none of the containment isolation valves were in the alert range at the time of the inspection. However, WD-AOV-1786, the RCDT discharge to waste gas, was measured at 9 seconds and was approaching the alert limit of 10 seconds closing time. NYPA had conducted a design basis review for a large break loss of coolant accident and determined a maximum closing time of 24 seconds was supportable. NYPA was in the process of evaluating a proposal to raise the limit based on the design basis review.

Based upon the team's review, it was concluded that the containment isolation system was appropriately managed under the maintenance rule. Close monitoring and management oversight is required to ensure improvements are implemented and desired performance is achieved. Actions to establish availability performance criteria and include all isolation valves in a PM program must be completed.

Weld Channel and Containment Penetration Pressurization (WCCPP) System

WCCPP is a safety-related, non-risk significant, normally operating system. The purpose of the system is to provide pressurized gas to all containment penetrations and between selected isolation valves such that in the event of a loss of coolant accident (LOCA), there would be no leakage paths from containment to the atmosphere. By maintaining the WCCPP system above peak accident pressure, any leakage would be into containment. The performance criterion established for the system was no more than three MPFFs per cycle with no repeat MPFFs. The system is in (a)(1) because of repeat MPFFs associated with pressure regulators. The system experienced repeat MPFFs in the third quarter of 1996. To be placed in (a)(2), the system must meet its performance criterion.

The system condition was described as poor in the quarterly report, dated October 4, 1996. Internal debris which becomes lodged in components has caused problems in the past. Modifications including replacement of carbon steel piping with stainless steel, and replacement for selected valves and installation of filters are planned for the next refueling outage. At Indian Point 2, the system reliability improved significantly after these modifications were made.

The team reviewed the WCCPP system action plan that provided corrective actions for the MPFFs and the conditions needed to restore the system to (a)(2) status. The NYPA actions were determined to be appropriate. The corrective maintenance backlog (eight open corrective maintenance work requests) was reviewed and determined to be reasonable.

The system engineer was knowledgeable of the system and her responsibilities under the maintenance rule. She monitored the system by daily reviews of the DERs and PIDs and checking system leakage from control room instrumentation.

The team concluded that the WCCPP system was appropriately managed under the maintenance rule. Close monitoring and management oversight is required to ensure improvements are implemented and performance criteria are met.

VC Hydrogen Analyzer

VC hydrogen analyzer is a non-safety related, non-risk significant standby system. The performance criterion established for the system is no more than two MPFFs per cycle with no repeat MPFFs. The system was placed in (a)(1), based on repeat MPFFs. To be placed in (a)(2), the system must not incur any MPFFs for 6 months.

Many of the past problems were associated with finding the system out of calibration when the monthly surveillance test was conducted. NYPA determined that the problem was related to procedural deficiencies and revised the procedures (3PT-M68 A & B). The revised procedure has the operator recalibrate the equipment prior to use. The team reviewed the NYPA's bases for the procedure change, the emergency operating procedures, and the UFSAR. The team concluded that the change would not adversely affect the LOCA response since hydrogen buildup is gradual (25 days to reach 4% by volume). In addition, manual hydrogen sampling could be accomplished in lieu of using the hydrogen analyzer to determine the need for the hydrogen recombiner. The team reviewed the VC Hydrogen Analyzer action plan and determined it was appropriate. No concerns were identified with this system regarding the maintenance rule.

Auxiliary Feedwater (AFW) System

The performance criteria for AFW was an unavailability of 0.5% per cycle for each pump, two MPFFs per cycle for the system with no repeat MPFFs. The system was placed in (a)(1) because the unavailability performance criterion was exceeded for the 33 AFW pump. At the end of the first quarter of 1996, the 33 AFW pump unavailability was 0.85% due to a pump motor failure. The action plan dated September 10, 1996, which identified the performance goals and corrective actions for returning the system to (a)(2) status, was reviewed by the team and found to be appropriate. One of the corrective actions was to evaluate whether the unavailability performance criterion could be increased. The 0.5% limit had been set by the NSA group and a review of industry experience for AFW pump unavailability indicated an average of 2.5%. Engineering review determined that planned surveillance testing on the system alone would result in exceeding the 0.5% limit. The NSA group evaluated the change in CDF based on an assumed AFW system unavailability of 2% per cycle and concluded the increase in CDF was acceptable. The expert panel reviewed and approved the 2% per cycle criteria on October 17, 1996. The team found NYPA's actions acceptable.

The team reviewed the actions taken for AFW functional failures (FFs). For the current cycle there were two FFs, one of which was a MPFF. DER 96-497 documented a low flow during a full flow test on the 31 AFW pump, which was classified as an FF. DER 96-732 described increasing vibrations on the 33 AFW pump motor, which resulted in the pump being declared inoperable. This FF was classified as a MPFF. The motor was replaced and disassembled. Inspection revealed a rag lodged in one of the motor intakes. This rag caused a reduction in air cooling flow and resulted in uneven cooling and increased vibrations. Corrective actions included inspecting the other motors. NYPA is evaluating the need to install screens on the motor intakes. The team found the corrective actions appropriate.

Based upon observations made during a system walkdown, the system appeared to be well maintained and in good condition. All deficiencies noted had been previously identified by NYPA.

Service Water System

The service water system is a safety-related, risk significant system with four functions covered under the maintenance rule. These functions are to:

- provide cooling water to safety-related components
- provide cooling water to non-safety related components required to mitigate accidents

- provide cooling water to non-safety related components used in emergency operating procedures
- provide seal and lubricating water to main circulating water pumps.

The system is in (a)(1) because of the performance of the zurn strainer automatic blowdown valves. Goals have been established for reliability and unavailability. The PRA was used in setting the unavailability criteria, however, the use of two MPFFs per cycle as a reliability performance criteria with no adequate bases has been identified as a violation and is also under review by NYPA. Goals have also been established that address the specific problems identified. Performance related to these goals is monitored and trended. The third quarter performance report dated November 23, 1996, noted that service water pump 34 was projected to exceed its unavailability performance criteria of 2.1%. The system engineer recently defined the system boundaries which appear reasonable and adequate.

There are a large number of outstanding equipment deficiencies for the service water system. These deficiencies go back to 1992. The system engineer noted that an integrated action plan for the service water system was under review, which addresses many longstanding problems with the system integrity and performance.

Based upon document reviews, discussions with the system engineer, and plant walkdowns, the team found the system engineer was knowledgeable of his system and the maintenance rule requirements. Programs have been established to address the problems with the system. All of these programs and modifications have not been implemented at this time, therefore, their effectiveness cannot be verified. However, it appears that NYPA is providing adequate resources to implement effective corrective actions.

Instrument Air

The team reviewed the instrument air system basis document, conducted discussions with the system engineer and walked the system down. The system was placed in (a)(1) because the unavailability performance criterion for the 32 instrument air compressor was exceeded. The performance criterion was 5% and the actual unavailability was 11.5%. The system was just recently placed into (a)(1) and the action plan which prescribes corrective actions and goals had not been completed. Adequate reliability performance criteria had not been established. This was identified as part of the violation on performance criteria. The system engineer was knowledgeable of the system and maintenance rule requirements.

Detailed Review of (a)(2) SSCs

The team reviewed the implementation of the maintenance rule to individual (a)(2) SSCs as follows:

Reactor Protection & Controls (General), Reactor Trip Relays, and Engineered Safeguards Initiation Logic Systems

The team interviewed the system engineer and reviewed the basis documents for these three systems. These systems were in scope because they are safety-related. The reactor protection and controls system had five in-scope functions. The other two systems had one in-scope function each. All of these functions were classified as normally operating functions. All three systems were risk significant and had a system/train level specific performance criteria established.

All three systems had a reliability performance criterion of two MPFFs per cycle of 24 months. None of the systems had unavailability as a performance criterion, although the system engineer indicated that an unavailability criterion was being developed. The inadequate reliability performance criteria and the lack of unavailability performance criteria was previously discussed in this report as a violation of the maintenance rule.

The system engineer had reviewed the past performance of these systems and determined that they had not exceeded their performance criteria and were, therefore, in (a)(2). The system engineer was in the process of reevaluating past performance to determine if MPFFs had occurred consistent with the action item in the NYPA self assessment.

The system engineer was knowledgeable of the systems, their performance, and the requirements of the maintenance rule. The team concluded that NYPA had properly determined that these systems were in scope of the rule, were risk significant, and should be monitored with system/train level performance criteria.

Structures

The team interviewed the design engineers and reviewed the basis document and procedure for monitoring the condition of structures. The procedure provided guidance on responsibilities, personnel qualifications, and conditions to be monitored for each structural element (structural steel, reinforced concrete, etc.), degradation mechanisms, inspection checklists, and the list of structures in the scope of the maintenance rule.

NYPA performed baseline condition inspections on all accessible structures and documented the results in IP3-RPT-STR-02132, "Maintenance Rule Structural Baseline Report." All structures were determined to be acceptable or acceptable with deficiencies. All structures were categorized as (a)(2) structures. The report identified structural deficiencies and corrective actions, including the need for repair and/or increased surveillance frequency.

NYPA categorized structures as either acceptable, acceptable with deficiencies, or unacceptable. Structures determined to be unacceptable would be considered for placement in (a)(1). NYPA defined an unacceptable structure as a structure that was damaged or degraded such that it was not capable of performing its structural function. The design engineers responsible for implementing the monitoring program stated that a structure would be placed in (a)(1) prior to becoming unacceptable, however, the procedure did not reflect this practice. The team determined that the NYPA approach, as described in procedure SED-AD-22, Revision 1, "Condition Monitoring of Maintenance Rule Structures," would not meet the requirements of the rule. Only those structures for which effective maintenance has been demonstrated can be placed in (a)(2). Structures that have significant degradation that, if uncorrected, could lead to an unacceptable condition do not meet the requirements for being in (a)(2). Lack of industry guidance on monitoring structures has been identified as a generic concern. This issue will be reviewed after industry guidance is provided to NYPA (IFI 50-286/96-80-04)

The team concluded that, except for the procedural process for placing structures in (a)(1), the NYPA program for monitoring the condition of structures was acceptable.

Spent Fuel Pool Cooling System

The unavailability performance criteria established for the spent fuel pool cooling system was 5% per cycle for each pump. The reliability performance criteria for the system was 3 MPFFs, which the team considered unacceptable and part of the earlier violation on performance criteria. The MPFF criteria was not validated against the PRA assumptions. The system engineer indicated that the performance criteria was based upon industry data.

The team reviewed the performance history for the system. One MPFF was noted in DER 95-409. This DER described the discovery of discolored lube oil during investigation of the 32 spent fuel pool cooling pump. NYPA evaluation determined that the discolored oil was caused by the radial bearing housing being out of round due to pump/motor misalignment. A piping misalignment was the cause of the problem. The piping was realigned and the bearing assembly replaced. The team found the corrective actions appropriate.

Based upon observations made during a system walkdown, the system appeared to be adequately maintained and in good condition. All deficiencies noted had been previously identified by NYPA.

138 KV, 13.8 KV, 6.9 KV, and 480 VAC Electrical Distribution systems

These systems were all classified as risk significant. The only performance criteria established was MPFFs. The basis documents indicated that unavailability performance criteria was impractical. The team found the performance criteria unacceptable. After discussions with the system engineer, he indicated that unavailability performance criteria would be developed.

Except for the inadequate performance criteria, the team found that NYPA had properly incorporated these systems into the maintenance rule program and the systems were being effectively maintained. The system engineers were found to be knowledgeable of their systems and the general requirements of the maintenance rule.

M7 Quality Assurance (QA) in Maintenance Activities (62706)

M7.1 Self-Assessments of the Maintenance Rule Program

a. Inspection Scope

The team reviewed five assessments made of the IP 3 maintenance rule program. These assessments were:

- NEI Maintenance Rule Assist Visit to IP 3, dated 12/18/95
- Maintenance Rule Information Sharing Committee (MRISC) Assessment for IP 3, dated 4/10/96
- NEI Maintenance Rule Assist Visit to IP 3, dated 7/26/96
- Surveillance Report 6-67, Verification of Maintenance Rule Implementation, dated 8/7/96
- Self Assessment of Maintenance Rule Implementation 10/15 to 11/5/96, dated 11/26/96

b. Observations and Findings

Prior to the NRC inspection, NYPA conducted a comprehensive self assessment and reported the results on November 26, 1996. The assessment was made to determine the extent that IP 3 complied with 10 CFR 50.65 and the NRC interpretations of the rule as established in recent NRC maintenance rule inspection reports. Many of the issues identified in the self assessment were not resolved at the time of this inspection, but were issues that the team had concerns about. Rather than repeat these issues and make them separate from the IP 3 assessment, the team determined that an inspector followup item to review NYPA's actions after they are completed would be the most effective approach. These issues are identified in the report "Self-Assessment of Maintenance Rule Implementation October 15 to November 5, 1996," and Revision 2 of the action plan, dated December 16, 1996. (IFI 50-286/96-80-05)

c. Conclusions

The team concluded that the self assessment dated November 26, 1996, was a strength and a crucial part of the overall adequate implementation of the maintenance rule. While NYPA had responded to all the issues and completed corrective actions for a number of them, some important actions remained to be completed. Selected activities will be reviewed to ensure corrective actions for the issues are effectively implemented. This is an inspector followup item.

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.3 Review of Updated Final Safety Analysis Report (UFSAR) Commitments

A recent discovery of a licensee operating their facility in a manner contrary to the UFSAR description highlighted the need for a special focussed review that compares plant practices, procedures, and parameters to the UFSAR descriptions. While performing the inspections discussed in this report, the team reviewed selected portions of the UFSAR. The team verified that the UFSAR was consistent with the observed plant practices, procedures and parameters.

E4 Engineering Staff Knowledge and Performance (62706)

E4.1 Engineers' Knowledge of the Maintenance Rule

a. Inspection Scope (62706)

The team interviewed system engineers to assess their understanding of the maintenance rule and their associated responsibilities.

b. Observations and Findings

All of the system engineers interviewed were knowledgeable of the rule and their role in support of its implementation. The system engineers displayed strong ownership of the maintenance rule program as it pertained to their system. Several weaknesses were noted by the team that had been previously identified by NYPA. The team found that the knowledge and performance of the system engineers were, in some cases, compensating for these program weaknesses. Some examples include:

- System boundaries for systems in the scope of the rule were not well defined and documented. NYPA was in the process of revising station procedures to require documentation of system boundaries. Also guidelines had recently been issued to help define system boundaries. Most of the system engineers interviewed had a good understanding of the boundaries for their systems.

- Structural engineers planned to place structures in (a)(1) before loss of the function inspite of the wording in the procedure.

- Program procedures require data collection and review quarterly. All system engineers were reviewing and collecting data on a more frequent basis. In addition, parameters other than performance criteria, were frequently monitored to assess trends and system condition.

c. Conclusions

System engineers displayed a strong ownership of their systems and good knowledge of the maintenance rule. The system engineers were effectively monitoring their systems in spite of the problems identified with the performance criteria.

V. Management Meetings

X1 Exit Meeting Summary

The team discussed the progress of the inspection with representatives of NYPA on a daily basis and presented the inspection results to members of NYPA management at the conclusion of the inspection on December 13, 1996. NYPA acknowledged the findings presented.

The team asked NYPA whether any material examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

New York Power Authority

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M. Leviton, Manager, Operations Support
J. Perrotta, Manager, Operations Review Group
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LIST OF INSPECTION PROCEDURES USED

IP 62706 Maintenance Rule

LIST OF ITEMS OPENED

1. VIO 50-286/96-80-01, failure to include the turbine building and the power conversion equipment building in the scope of the maintenance rule program.

2. IFI 50-286/96-80-02, review the approach taken to balance reliability and unavailability and the periodic evaluation when performed.

3. VIO 50-286/96-80-03, failure to establish adequate performance criteria and goals for risk significant and standby SSCs and plant level criteria for non-risk significant SSCs.

4. IFI 50-286/96-80-04, review adequacy of procedural requirements for placing structures in (a)(1).

5. IFI 50-286/96-80-05, review the corrective actions taken as a result of the NYPA self assessment dated November 26, 1996.

LIST OF ACRONYMS USED

ACTS	Action Tracking System
AFW	Auxiliary Feedwater
AOV	Air-Operated Valve
CCW	Component Cooling Water
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CI	Containment Isolation
CS	Containment Spray
CVCS	Chemical and Volume Control System
CW	Circulating Water
DER	Deviation/Event Report
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedure
ESF	Engineered Safety Feature
FF	Functional Failure
IA	Instrument Air
IFI	Inspection Followup Item
INPO	Institute of Nuclear Power Operations
IP	Inspection Procedure
IPE	Individual Plant Evaluation
IPEEE	Individual Plant External Events Evaluation
KV	Kilovolts
LCO	Limiting Condition for Operation
LOCA	Loss of Coolant Accident
MOV	Motor-Operated Valve
MPFF	Maintenance Preventable Functional Failure
MRC	Maintenance Rule Coordinator
NEI	Nuclear Energy Institute
NYPA	New York Power Authority
NRC	United States Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
NUMARC	Nuclear Management and Resources Council
PM	Preventive Maintenance
PID	Plant Identified Deficiencies
PRA	Probabilistic Risk Assessment
QA	Quality Assurance
RAW	Risk Achievement Worth
RCDT	Reactor Coolant Drain Tank
RCS	Reactor Coolant System
RWST	Reactor Water Storage Tank
RG	NRC Regulatory Guide
RRW	Risk Reduction Worth
SFPC	Spent Fuel Pool Cooling
SOV	Solenoid-Operated Valve
SSC	Structures, Systems, and Components

SW	Service Water
UFSAR	Updated Final Safety Analysis Report
UNR	Unresolved Item
VC	Vapor Containment
VIO	Violation
WCCPP	Weld Channel and Containment Penetration Pressurization