

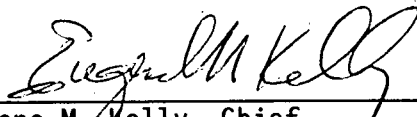
U. S. NUCLEAR REGULATORY COMMISSION
REGION I

DOCKET/REPORT NO: 50-286/95-14
LICENSEE: New York Power Authority
FACILITY: Indian Point 3 Nuclear Power Plant
LOCATION: Buchanan, New York
DATES: September 18-October 6, 1995
INSPECTORS: George W. Morris, Reactor Engineer


Fred L. Bower, III, Reactor Engineer
Systems Engineering Branch
Division of Reactor Safety

10/27/95
Date

APPROVED BY:


Eugene M. Kelly, Chief
Systems Engineering Branch
Division of Reactor Safety

11/13/95
Date

Results: The NRC assessment is summarized in the following executive summary.

**EXECUTIVE SUMMARY
INDIAN POINT 3
NRC ENGINEERING INSPECTION 50-286/95-14**

Undue focus on emergent plant issues appears to be distracting from progress on needed long-term improvement issues such as workload prioritization, setpoints, post-modification testing process improvements and configuration management. The development of the Engineering Assurance Program and management's request of a Quality Assurance (QA) audit of the implementation of the safety evaluation process reflected effective management oversight, but continued weaknesses in the areas of setpoint and configuration control are examples where management oversight has been ineffective.

Implementation plans to develop a setpoint control program have not been successful, and weaknesses in the implementation of the program continue to be identified. The licensee's own QA concluded that the setpoint control program was fragmented and that many problems that have existed since 1992 persist. Programmatic weaknesses have been found in the areas of: (1) program ownership, (2) inconsistent use of event reporting and ACTS systems to identify and resolve setpoint problems, (3) a setpoint database is not available to "end-users" and is generally considered to be uncontrolled, and (4) some setpoint program controls are confusing, cumbersome, and difficult to use.

Design changes and safety evaluations were generally adequate in scope and detail, but problems related to design control, post-modification testing, and controlled document updating were noted. The findings in the areas of post-modification testing and controlled document updating are of particular concern because they indicate that corrective actions to findings identified by self-assessments and previous NRC inspections have not been implemented.

Weaknesses in NYPA's independent review processes were evident in the observation of errors in calculational acceptance criteria, references, methodology, and assumptions. Good progress has been made to document the design basis, however, validating and maintaining the design bases documents (DBDs) remain as a significant challenge, and NYPA has not met their goal for biennial revision of the DBDs. The control of vendor-produced engineering work products and the review of operational experience information were adequate. The Engineering Assurance (EA) Program is a positive initiative that includes many promising initiatives that nonetheless have not been fully implemented.

TABLE OF CONTENTS

1.0	INSPECTION SCOPE	1
2.0	DESIGN ENGINEERING ORGANIZATIONS (37550)	1
2.1	Organization and Staffing	1
2.2	Review of System Engineering	2
2.3	System Walkdown Accompaniments	3
2.4	System Engineer Qualification and Training	4
2.5	Engineering Workload	5
2.6	Modification and Engineering Work Prioritization	5
2.7	Support to Plant Operations	6
3.0	REVIEW OF RECENT ENGINEERING WORK PRODUCTS	6
3.1	Type 1 Design Changes	7
3.2	Calculations	10
3.3	Nuclear Safety Evaluations (NSEs)	10
4.0	SETPOINTS	11
4.1	Setpoint Changes	11
4.2	Setpoint Program Assessments	13
5.0	DESIGN BASIS DOCUMENTS	14
6.0	REVIEW OF CONTRACTOR DEVELOPED ENGINEERING PRODUCTS	16
7.0	MANAGEMENT OVERSIGHT AND SELF-ASSESSMENT	17
7.1	Engineering Assurance	17
7.2	Review of Operational Experience	18
8.0	ENTRANCE/EXIT MEETINGS	19

DETAILS

1.0 INSPECTION SCOPE

The objective of this inspection was to continue an NRC evaluation of the effectiveness of the engineering and technical organizations at the New York Power Authority's (NYPA) Indian Point 3 Nuclear Power Plant (IP3) using NRC Inspection Procedure 37550, "Engineering." This evaluation included selected reviews of various engineering activities, plant modifications, technical work assignments and assessment documents, and discussing these reviews with NYPA personnel.

2.0 DESIGN ENGINEERING ORGANIZATIONS (37550)

The inspectors assessed the effectiveness of the engineering departments (Design Engineering and System Engineering) at the site through reviews of organizational structure and staffing changes, system engineering, qualifications and training, engineering workload, work prioritization, support to plant operations, system walkdown accompaniments, and observance of the day-to-day workings and communications among the engineering groups. The inspectors also interviewed engineering personnel at all levels of responsibility.

2.1 Organization and Staffing

In October 1993, NYPA conducted an evaluation of the Nuclear Engineering Department's performance. The evaluation concluded that engineering support to the FitzPatrick and Indian Point 3 plants would be improved by relocating most corporate engineering personnel, functions, and the design authority to the sites. This recommendation was integrated into NYPA's business plan with implementation expected to take two to three years. As of this inspection, the relocation and subsequent reorganization to a decentralized engineering organization was fully implemented. An additional reorganization was accomplished in August 1995, when the system engineers were reassigned to Design Engineering (DE) from Technical Services (TS) within the Operations Department.

The IP3 DE organization consists of four departments that provide engineering support to the plant. Under the Director of DE, one manager exists for each of the two major engineering disciplines (mechanical/civil structural and electrical/I&C), and managers exist for both the engineering support and system engineering departments. The DE organization currently includes approximately 106 supervisors, engineers and skilled trade individuals in the on-site engineering organization. This includes 34 personnel that are assigned to the system engineering group. Additionally, the corporate office in White Plains has a staff of approximately 26 technical personnel that provide support to both NYPA plants in program areas such as chemistry, welding, metallurgy, fire protection, and Appendix R.

2.2 Review of System Engineering

The administrative controls for the system engineering (SE) department in DE are provided by procedure TSP-50, "System Engineering Program". This procedure contained generic guidance for system engineer responsibilities, qualification and training. Guidance for performing system engineering responsibilities such as system walkdowns, system status reports, system reference books, modifications assistance and delineation of the expected level of general system knowledge is also included in the TSP-50.

TSP-50 indicates that System References Notebooks should be maintained for each system by the assigned system engineer. TSP-50, Section 6.2.8, describes the guidance for maintaining a system notebook. These living references contain information on the system's design and licensing basis, operation and maintenance history and procedures, system status, system performance and outage information. The inspectors reviewed selected system reference notebooks and found an inconsistent approach among different system engineers. It appeared that some of the notebooks had been assembled by previous personnel using a different format than that currently specified by TSP-50. During interviews of system engineers, the inspectors found the present system engineers were aware of the need for a reference notebook, but some system engineers were not aware of the procedure describing the required contents. In response to this observation, the SE manager directed all SE supervisors to review and approve the updated notebooks prior to the end of 1995.

TSP-50 delineates expectation for the development of System Status Reports on selected safety systems. Monthly and quarterly reports are expected on 71 sub-systems of 26 systems. The inspectors reviewed the subject matter of those selected sub-systems and noted that some of the engineered safeguards features (ESF) systems were not included. The licensee indicated that the basis for the selection of systems requiring status reports was based on a combination of inputs. Those systems which were generally reliable, were not required to be reported on a monthly report. This included such systems as the nuclear instrumentation and containment building spray.

Trending by many of the system engineers appeared to be limited to collecting data on the number of open problem identifications (PIDs), work requests (WRs) and action commitment tracking system (ACTS) items each month. Although procedure TSP-50 directs the system engineer to evaluate the performance of their assigned systems through monitoring and trending important system parameters, the inspectors could find little evidence that these tasks were being performed in accordance with the intent of the procedure. The system status report did not mention system critical characteristics or provide any reference to the Performance Engineering group in the Operations Department. The inspectors also found no mention of system performance in the monthly reports other than availability and "system health." The diesel system engineer was the one exception found, having produced and reviewed trends of different diesel parameters. In response, the SE manager contacted the site computer services group to provide a direct access capability for trending key system components. In addition, SE supervisors plan to reinforce trending expectations and ensure that the system notebooks are supplemented as appropriate.

Surveillance and maintenance procedures are, in general, referenced in the SE Reference books. Procedure TSP-50 directs the system engineer to perform monthly reviews of surveillance test results. The inspectors observed significant evidence of surveillance test results reviews were present in the diesel generator system engineer's notebook but there was no evidence of surveillance test results reviews in the direct current (dc) system engineer's files.

Design basis document (DBD) validation is not a formal duty of the system engineer at IP3. However, the system engineers are expected to develop and maintain a through working knowledge of the design basis for their assigned systems (TSP-50). The inspectors found one engineer who did not know that a DBD existed that covered his system. Also, formal DBDs have not been prepared for all safety-related systems. The containment spray system and the emergency diesel generators were significant systems not having DBDs. The licensee personnel indicated that no plans exist to add these systems.

The inspectors concluded that the system engineers' implementation of SE department procedure guidance for system status reports, system reference books, and expected level of system knowledge was weak.

2.3 System Walkdown Accompaniments

System walkdowns are required by procedure TSP-50 and defined in procedure TSP-43, "System Engineer Walkdowns". TSP-43 sets a goal of walking down one third of a system each month and permits justification for differing frequencies depending on the system complexity and accessibility. This procedure provides generic guidance for walkdown attributes and a generic inspection report format. The inspectors interviewed selected system engineers and accompanied them on walkdowns of parts of their systems. The inspectors noted that neither the generic guidance provided in procedure TSP-43, nor the specific inspection reports for some of the systems reviewed by the inspectors, addressed system specific attributes or critical characteristics for the subject systems. The quality of the observations by the system engineers were directly related to the system engineers experience with their assigned system. Some of the newly assigned engineers were not aware of the status of PIDs on system components or failed to react to leaking components in their systems. None of the problems observed by the inspectors were major hardware or safety concerns but the system engineers' insensitivity to equipment problems was considered a weakness. The inspectors concluded that IP3 management provided insufficient guidance to the individual system engineer. In response, the licensee initiated a cooperative review of the applicable requirements and committed to ensure that system engineers were qualified for their walkdown duties by the end of 1995.

During the walkdown of the dc electrical system, the inspectors observed that the cable terminal lugs on battery number 34 were bright copper. The inspectors questioned why these terminal lugs were not lead-plated. The inspectors expected to find all electrical hardware connected to lead-acid batteries to be protected from the acidic electrolyte and vapors that escape from the cells during battery charging. Sulfuric acid will attack exposed copper and eventually result in a degraded termination. Although this is not

an immediate safety concern, battery 34 is more susceptible than the larger batteries at IP3 because it is composed of lead-antimony cells. These type cells tend to off-gas more than the lead-calcium cells of batteries 31 and 32.

In response to the inspectors' observations, the system engineer (who was assigned this system one month prior to this inspection) initiated a deviation/event report (DER) and performed a thorough investigation into the matter. The system engineer found that the licensee personnel previously had questioned the original battery jumper cable terminal lug's material condition during a design change (DC) implemented earlier in 1995. DER 95-147 was issued to replace the original lugs, which were lead-plated in accordance with the manufacturer's specifications, because of exposed copper. Because no lead-plated lugs were available in-stock, an action commitment tracking form (ACTS 6416), which referenced DER 95-147, was issued to "install new battery cable terminal lugs." Parallel to this action, a different DER (DER 95-331) was issued when the studs on the battery cable terminal lugs broke off when they were over torqued. It appears that these lugs were also bare copper. DC 95-3-064 was used to replace the broken lugs with those of a different manufacturer without referring to the earlier DER, which identified the concern with the use of exposed copper lugs. The DC did not fully address the change of the lug material specification from lead-plated to pure copper. The ACTS item to replace the defective plated lugs was subsequently closed based on the change-out of the broken lugs without addressing the exposed copper concern expressed in DER 95-147.

The inspectors concluded that this issue was not an immediate safety concern, because of the extended period of time required for the sulfuric acid to attack the exposed copper and cause degraded termination. However, the inspectors concluded that this event demonstrated previous weak performance by engineering and resulted from a combination of weak design control, ineffective corrective action and a breakdown in communication between different work groups. Once the inspectors identified the battery lug material issue, the dc system engineer thoroughly investigated the inspectors' concerns.

2.4 System Engineer Qualification and Training

The system engineer development program is a combination of formal training, self-study, and informal mentoring. The inspectors reviewed the contents of the formal study program and concluded that it was a generic orientation review. Having each system engineer attend the formal initial licensed operator training on their respective systems remains an SE department goal that has not been achieved at this time. No detailed requirements exist for system engineer self-study training. Guidance on the assigned system appears to come from the previous system owner on a question and answer basis as the need arises. Given that the system engineering program at IP3 is relatively new, the inspectors concluded that system engineer training, particularly for the new system engineers, was not sufficiently established to quickly develop high quality system engineers.

2.5 Engineering Workload

The workload of the system engineers varies widely from group to group and system engineer to engineer. There are 47 systems that are sub-divided into 225 sub-systems. These subsystems are divided among 24 system engineers. Within each SE group, the workload appeared equally divided among the engineers with the major systems assigned to each group spread over the group. The backlog of work items in SE was compared to the TS backlog reported during the Restart Assessment Team Inspection (RATI), NRC Report 95-80. For example, the number of open ACTS items (approximately 310) assigned to SE is approximately the same workload that was reported for TS during the RATI. SE also has a backlog of approximately 500 WRs that were assigned to the 12-week rolling schedule or during future outages. This is an increase compared to 400 WRs that were reported in the TS backlog during the RATI. The inspectors noted that the RATI verified that the engineering backlog was adequately screened for restart. The backlog was not reviewed during this inspection. The inspectors expressed concern that the backlog had steadily increased since the RATI. NYPA personnel indicated that their planned prioritization procedure (Section 2.6) should aid in addressing this issue.

The inspectors discussed the DE workload with engineering management and reviewed the current performance indicators. The outstanding workload (for DE excluding SE) included approximately 3700 drawing updates, approximately 785 open WRs, and approximately 1532 ACTS items. Comparison to the backlogs reported during RATI of approximately 5000 drawing updates, 650 open WRs, and 240 ACTS items indicates that the drawing updates are trending downward whereas the open work requests and ACTS items are on an upward trend. This is a change from the RATI conclusion that showed a relatively constant or downward trend for these items in early 1995. The inspectors also reviewed a graphical representation of the ACTS workload with engineering management and noted two very large peaks in the workload. These peaks were in December 1995 (400 items) and March 1996 (over 1000 items). The inspectors expressed concern because it appeared that these ACTS items represented a new large, unexpected and unplanned increase in the engineering workload. As a result of these discussions, the engineering managers recognized that these ACTS items may not be able to be completed on schedule, and recognized that prioritization and workload leveling would be required.

2.6 Modification and Engineering Work Prioritization

Design Change Requests (Engineering Work Requests) are processed through the SE department. The system engineers make the initial evaluation and determine if the work should be assigned to the DE group as the lead or responsible engineering organization. On occasion, modification teams have been formed on an informal basis. For example, the 480 Volt system upgrade that was installed during the RS94 outage involved a modification team that consisted of representatives from electrical and mechanical engineering, operations, and maintenance. NYPA personnel indicated that the use of modification teams may be continued; however, at the time of this inspection, no modification teams had been established for work proposed for the 1996 refueling outage.

For the upcoming refueling outage (RO)-9 scheduled for the fall of 1996, the backlog of potential modifications has been reviewed and a list of 20 have been reviewed and approved by a plant prioritization committee. Using the Executive Vice President of Nuclear Generation's prioritization method, these modifications were determined to be either "crucial" [required within a specific time limit or unacceptable consequences ensue] or "urgent" [required or unacceptable consequences ensue, but timing is flexible].

The remainder of the engineering work requests have been prioritized using the plant work request prioritization process. Items assigned a priority of "6" [threatens redundancy of vital components or instrumentation important to plant operation] or higher are being worked to support plant operation. Items with a priority of "7" [preventive or corrective maintenance on safety class equipment, creates additional cost, or contained contaminated leaks] or lower are not currently being worked because engineering resources are being focused on addressing the priority "6" and higher items.

During the RATI, the NRC noted that NYPA was developing a engineering work cost/benefit prioritization process for use at IP3 and had prepared a draft procedure ADM-SD-16, "Engineering Work Ranking System". Engineering management expected that this work prioritization methodology would eliminate backlogged items that have low (or no) nuclear and personnel safety benefit and are not economically effective. However, at the time of this inspection the planned engineering work cost/benefit prioritization process remained under development. The inspectors noted that, without this procedure, DE has no established method for prioritizing the increasing workload and the backlog of priority "6" work that DE is attempting to work to support the plant.

2.7 Support to Plant Operations

At the start of this inspection, the engineering departments at IP3 were involved in two major problems. The inspectors observed DE and SE worked well together to identify and resolve operating problems associated with the generator hydrogen cooler and the weld channel pressurization system leaks. However, based on the inspectors observations during this period -- that included intensive activities resulting from an ongoing forced shutdown to repair the weld channel pressurization system -- it appeared that Engineering was reacting to emergent plant issues, and this appears to be distracting from progress on long-term issues such as workload prioritization, setpoints, post-modification testing and configuration management.

3.0 REVIEW OF RECENT ENGINEERING WORK PRODUCTS

The inspectors reviewed several types of engineering work products including Type 1 Design Changes, calculations, and safety evaluations to assess the effectiveness engineering in resolving technical issues. An effort was made to select a sample of safety significant work performed in the six months preceding the inspection or work related to ongoing emergent work such as repairs to the weld channel pressurization system.

3.1 Type 1 Design Changes

According to the Modification Control Manual (MCM)-14, "Type 1 Design Change", a Type 1 Change is a change to a plant system structure or component that does not change the overall design function, operation, critical characteristics; reduce the level of quality or reliability; or change the Final Safety Analysis Report (FSAR) or Technical Specification. Type 1 Changes do not require a detailed 50.59 analysis. Type 1 Changes can consist of either equivalent changes or design changes. The inspectors reviewed examples of Type 1 Changes to verify that the changes were conducted within the limits specified by the MCM and to confirm that the DCs did not adversely affect safety-related systems. The results of these reviews are described in the sections below:

Weld Channel Pressurization System Modifications

Four modifications to the Weld Channel and Containment Penetration Pressurization System (WCCPPS) were reviewed. With the following exception, the inspectors noted that the DCs were generally adequate in scope and detail. The retest requirements for each of these modifications included: (1) visual and liquid penetrant nondestructive examination; (2) pneumatic pressure test of leak tightness of the welds; (3) inservice leak testing of disturbed mechanical joints; and (4) 10 CFR 50, Appendix J, Type B & C testing. Although this testing was performed by some mechanism for each modification, the DC documents were inconsistent in their specification of these test requirements as described below.

- DC 95-3-276-VC Modifications to Containment Piping Penetrations W-W and Z-Z

This modification was developed to facilitate the removal of water that was identified in two spare piping penetrations. NYPA concluded that removal and rewelding of the existing butt-welded caps was not practical due to space constraints. This DC drilled a hole in the pipe cap, drained the penetration, and plugged the drilled hole with a welded pipe coupling and cap of the same material. The post-modification test requirements specified by this DC was only one of the four required (a pneumatic pressure test of the welds). From a walkdown of the DC while in progress, the inspectors concluded that the plug installation was being performed in accordance with the DC.

- DC 95-3-277-VC Replacement Nipple for Penetrations W-W and Z-Z

This modification was developed to justify a substitute material for eight replacement pipe nipples and caps in two spare containment penetrations because the original material is no longer manufactured. The chemical composition of the replacement material was nearly identical to the original material, and the physical properties were identical at the design temperature. The post-modification test requirements specified by this DC was only one of the four required (a pneumatic pressure test of the welds). The inspectors walked down the DC while work was in progress. The inspectors concluded that the DC adequately justified the material substitution.

- DC 95-3-279-VC Weld Channel and Containment Penetration Pressurization System Supply Connection to Line #474 in Pipe Penetration RR

This modification was developed to restore the WCCPPS gas supply to a previously abandoned portion of the WCCPPS related to line #474 and penetration RR. The post-modification test requirements specified by this DC included only two of the four required (a pneumatic pressure test and visual and liquid penetrant nondestructive examination).

- DC 95-3-289-VC Installation of Drain Connection for Piping Penetration O₁-O₁

This modification was developed to facilitate the removal of water that was identified in a spare piping penetration. NYPA concluded that the most effective way to drain this penetration was to install a socket welded drain connection in the bottom of the 22-inch pipe that forms the penetration. The post-modification test requirements specified by this DC included only two of the four required (a pneumatic pressure test of the welds and an inservice leak test of the disturbed mechanical joints).

For the DCs reviewed, the inspectors noted that the test specifications were not consistent with the guidance in the controlling procedures MCM-14 and MCM-11, "Preparation, Review, and Approval of Modification Test Requirements" and the responsible engineers for the modifications did not consistently identify the required post-modification acceptance test specifications (MATS). The inspectors noted that similar concerns regarding MATS had been previously raised in unresolved item (URI) 94-26-02 and this unresolved item was closed based on the corrective actions planned by NYPA. One of these corrective actions to address URI 94-26-02 was for Engineering Assurance (EA) to monitor the quality of post-modification testing. The most recent monitoring report dated June 15, 1995, identified that further improvement was required. Specifically, the EA report identified that Type 1 changes must specify all required tests. The inspectors found documentation that engineering took action to respond to the EA recommendation. Other corrective actions for URI 94-26-02 including the development of testing specifications and a related training program were not completed by the initially assigned due date. The due date for these corrective actions have been extended in the ACTS.

The inspectors noted that in these instances, the inconsistent specification of test requirements was of low safety significance because all the required testing was performed by some mechanism for each modification. The inspectors concluded that the recurrence of weaknesses related to MATS, and NYPA's failure to complete its corrective actions constituted a weakness in management's efforts to implement effective corrective actions in an identified area of weakness. After the inspectors raised concerns related to the adequacy of specified test requirements, NYPA initiated a DER 95-2304 to investigate the issue and identify corrective actions.

Additional Type 1 Modifications

Three additional DCs were reviewed, and except as noted below, were found to be adequate in scope and detail.

- DC 95-3-288-VC Reconnection of WCCPPS to Penetrations O-0 and O₁-O₁

This modification was developed to restore WCCPPS gas supply to weld channel sections for penetrations O-0 and O₁-O₁. The restoration was accomplished using tubing and mechanical fittings. The post-modification test requirements specified by this DC included a pneumatic pressure test of the new joints, an inservice leak test of the mechanical joints disturbed during pressure testing, and Type B and C leak rate testing. These specified retest requirements were considered appropriate.

- DC 95-3-218-CVCS Replacement of Charging Pump Discharge Check Valves

After an inspection of valve CH-401 revealed cracking of the seat, possibly due to an improper manufacturing procedure, this modification was developed to replace all of the charging pump discharge check valves. The existing spring loaded lift check valves with a welded seat ring insert were replaced with spring loaded lift check valves with an integral stellite seat. The replacement valves' lower service ratings exceeded the design requirements for the valves. The inspectors noted that a large number (7) of engineering change notices (ECNs) were required to accomplish this relatively simple modification. Some of the ECNs addressed multiple problems. Five of the seven ECNs were related to constructability and were required to complete the installation of this DC. The remaining ECNs were related to testing issues that were not anticipated prior to issuing the DC.

- DC 95-03-203-RCS Reactor Vessel Flange "O" Ring Replacement

The reactor vessel flange "O"-rings required replacement, and this modification evaluated and specified the replacement of the original style O-rings, designed and fabricated by Combustion Engineering, with a new Helicoflex Company design recommended by Westinghouse. The new design has a larger cross-sectional diameter to improve the sealing margin. During the review of the DC and its closeout, the inspectors noted that the Final Safety Analysis Report (FSAR) contained a drawing (Figure 4.2-3) reflecting the diameter of the O-rings and this drawing was not identified as requiring change due to this DC. The inspectors noted that examples of ineffectiveness of the modification turnover and closeout process to identify all effected documents previously had been identified as an engineering weakness by the RATI (NRC IR 95-80). During the RATI, a DER was issued to perform an "extent of condition" review and to identify corrective actions.

Conclusions

For the DCs reviewed, the DC packages were satisfactorily organized and the safety evaluation screens were satisfactorily completed. In general and except as noted, the inspectors concluded that the technical bases and associated documentation for the DCs were adequate, and the DCs were adequate

to ensure that plant safety margins were not reduced. However, the inspectors identified that for four DCs reviewed, the responsible engineers for the modifications did not develop test specifications that were consistent with the guidance in the controlling procedures, and the closeout process for a fifth DC did not identify all the affected documents. Although no immediate safety concern exists because adequate testing was performed by some means, these examples are of concern because previously identified corrective actions have not been fully implemented or effective.

3.2 Calculations

The inspectors reviewed selected engineering work products that were produced to assist operations. This review included three calculations produced by the Electrical Design Engineering group: (1) dc voltage drop with abnormal battery line-up, (2) dc short circuit current at a sub power panel, and (3) diesel generator kW meter loop accuracy. The inspectors concluded that the calculations produced acceptable results, but contained minor errors in acceptance criteria, references, methodology, and assumptions that should have been questioned during the formal calculation review process. The inspectors therefore concluded that the review and checking process was weak. In acknowledging the inspectors concern with the apparent lack of rigor in the review process, the licensee's engineering group manager indicated that they would emphasize the duties of independent reviewers in a department "tailgate" meeting.

3.3 Nuclear Safety Evaluations (NSEs)

Review of NSEs

The following safety evaluations were reviewed to assess the quality of the engineering and to determine whether they contained sufficient technical detail to support the conclusions that unreviewed safety questions did not exist:

- 95-3-223 "Evaluation of Double Check Valve Failures on the LHSI Lines"
- 95-3-153 "Evaluation of Temporary City Water Supply to Charging Pumps and Boric Acid Transfer Pumps"
- SECL-95-3-076 "Reactor Vessel O-Ring Replacement"

These NSEs were adequate in scope and technical detail and contained reasonable conclusions. Each safety evaluation documented an adequate basis for determining that an unreviewed safety question was not involved.

Quality Assurance Audit of Safety Evaluation Implementation

NYPAs Modification Control Manual (MCM)-4, "Nuclear Safety and Environmental Impact Screens and Nuclear Safety Evaluations" was significantly revised in October 1994. The implementation plan for the revision included an action item to audit the revised 10 CFR 50.59 process and to determine whether the process was consistent, screenings were properly performed, training was

adequate and whether the procedure was followed. Quality Assurance Audit Report A95-05, "MCM-4 Safety Evaluation Implementation," dated May 3, 1995, concluded that the 10CFR50.59 process was being uniformly applied and properly executed, and that the training program was satisfactory. The audit also concluded that MCM-4 was being followed with one significant exception taken concerning NYPA's implementation of procedure guidance concerning qualification and approval of individuals performing safety reviews. Examples of these exceptions were documented in several DERs. The inspectors verified that corrective actions had been identified, reviewed and accepted by Quality Assurance, and that the audit had been closed. For the safety evaluations and safety screens reviewed during this inspection, the inspectors verified that the personnel involved were approved as safety evaluation preparers, reviewers and/or approvers as appropriate. The inspectors concluded that this was an example of effective management oversight of an engineering function.

4.0 SETPOINTS

4.1 Setpoint Changes

During the review of recent engineering work products (report section 3.3), NSE 95-3-185, "WCCPP PI-1201S - 1204S Setpoint Change Evaluation" was also reviewed. The inspectors identified that although NSE 95-3-185 was drafted to support setpoint change request (SCR) IP3-94-0021, the NSE was never completed and approved. The NSE was drafted because the proposed change altered setpoints of the actuating pressure for the WCCPPS back-up N₂ supply solenoid operated valves, which are shown on a critical control room drawing that is included as Figure 6.6-1 in the FSAR. The SCR stated that an NSE was not required because the facility as described in the FSAR was not being changed since only the FSAR figure and not the FSAR text described the WCCPPS setpoints proposed for change. Further, the SCR noted that a request for document change (RDC) was going to remove the setpoints from the FSAR figure. The inspector found that this RDC was rejected in January 1995 and the SCR was subsequently approved without an approved NSE in March 1995. The inspectors considered the approval of the SCR without an approved NSE, to review for potential unreviewed safety questions associated with changes to the FSAR including the figures, inappropriate. Discussions with engineering management indicated that although NYPA had previously questioned the significance of the FSAR figures, currently NYPA engineering policy recognizes that the FSAR figures do, in part, describe the IP3 facility. DER 95-2168 was issued during this inspection to review this issue.

As previously described, the original RDC to change FSAR figure for the WCCPPS was disapproved in January 1995. In July 1995, RDC 100122124 was generated and favorably evaluated for removing all of the WCCPPS setpoints from the FSAR figure and control room critical drawing. As of September 22, 1995, the inspectors found that the controlled copy of this "critical" drawing in the Technical Support Center had not been red-lined to reflect the planned change. Investigation by NYPA personnel indicated that the control room's "critical" copy had been red-lined on September 20, 1995; however, the RDC had not been approved by DE. The inspectors questioned the timeliness of the red-lining

and updating of controlled copies of "critical" drawings and noted that a similar weakness was raised by the RATI. Licensee personnel took positive action and initiated DER 95-2230 during this inspection to investigate this issue.

Review of SCR IP3-94-0021 indicated that this setpoint increase to 45 psig was required to ensure that the WCCPPS pressure did not drop below the Technical Specification minimum value of 43 psig. The TS minimum value was increased based on an increase in the ultimate heat sink temperature and the related increase in the peak accident pressure. Many of the WCCPPS setpoint were raised by Minor Modification (MMP)-90-3-169 MULT, "Setpoint Changes for IVSWS Tank". However, the setpoints in SCR IP3-94-0021 were not recognized as needing to be changed. Further, the MMP did not recognize that the FSAR (Figure 6.6-1) would be changed by this modification. A 10 CFR 50.59 evaluation was not done to evaluate these setpoint changes. DER 95-2228 was initiated during this inspection to investigate this issue.

The inspectors review of SCR IP3-94-0021 also noted that the SCR was generally appropriate in scope and detail. The inspectors noted that surveillance procedure 3PT-R136, "WCCPPS Backup N₂ Supply" was not listed as requiring revision. The inspectors review of 3PT-R136 indicated that the setpoints were included in section 2.7 of the procedure and had not been revised. The inspector noted that examples of the ineffectiveness of the setpoint change process to identify all affected documents previously had been identified as an engineering weakness by the RATI. One of the short term corrective actions to address the concerns raised by the RATI was to re-review all of the setpoint changes performed between the fall of 1993 and restart (prior to the appropriate mode change) to identify any errors, including documents that were not appropriately identified for update. Licensee review of the current WCCPPS setpoint issue identified that not all pertinent and related procedures had been listed in the setpoint change resulting in DER 95-2169 being initiated during this inspection to review the issue. The DER also raised a generic concern regarding the consistency between cross-referenced procedures.

During the review of this SCR, the related DBD that includes the WCCPPS was reviewed. A design document open item (DDOI) that was generated as part of the DBD development process identified conflicts between the WCCPPS setpoints and FSAR Figure 6.6-1. The DDOI recommended correcting the FSAR or removing the setpoints from the drawing. The inspector found that the DDOI was closed without performing either recommended corrective action.

A related setpoint change (SCR IP3-94-0013) for the WCCPPS air receiver low pressure alarm was also reviewed. The SCR noted that quarterly calibrations would be required until the calculational assumptions concerning instrument drift could be validated. The inspectors' inquiries determined that the calibration program had established a 180-day frequency for the calibration of these instruments. Further, the last scheduled calibration was missed even when the 25% grace period was considered. This issue was documented in DER 2178. Licensee personnel reported the immediate corrective action to calibrate the switches found that all the switches within tolerance.

Based on the examples above, the inspectors concluded that there are continuing weaknesses with the implementation of the setpoint change program. In particular, concerns previously identified by the RATI related to the ineffectiveness of the setpoint change process to identify all documents affected by a setpoint change have persisted. The inspectors concluded that the recurrence of weaknesses related to the identification of documents affected by procedure changes, and NYPA's failure to complete its corrective actions a weakness in management's efforts to implement effective corrective actions in an identified area of weakness.

4.2 Setpoint Program Assessments

To review NYPA's effectiveness in assessing and correcting weaknesses with the setpoint control and setpoint change processes at IP3, the inspectors reviewed Quality Assurance (QA) surveillance 5-75, "Setpoint Control", dated August 17, 1995. The stated purpose of the surveillance was to assess the present condition of the setpoint control program at IP3, and the effectiveness of corrective actions taken to address three previous QA assessments and the NRC RATI. The surveillance reviewed: (1) the setpoint control program implementation plan; (2) corrective actions; (3) setpoint implementation; and (4) procedure adequacy. The surveillance concluded that various implementation plans that represent attempts taken by NYPA to develop a setpoint control program had not been successful. Ownership for the implementation plan was lacking and no effort was being made to compile or control the remaining setpoints used at IP3. Additional programmatic weaknesses that were identified included: (1) the event reporting and commitment tracking systems are not consistently used to identify setpoint problems; (2) the setpoint database is not available to end users and engineers consider the current setpoint control mechanism (drawings, procedure, and other technical documents) uncontrolled and sometimes invalid; and (3) confusing, cumbersome, and difficult to use procedures. In summary, QA concluded that the setpoint control program was fragmented and that many problems that have existed since 1992 persist. QA also noted that plant personnel, QA and the NRC continue to identify problems with the setpoint control program. QA initiated DER 1849 to escalate its finding to the Vice President of Nuclear Engineering.

The inspectors discussed this surveillance with DE supervisory and management personnel. The personnel recognized and accepted the QA findings and noted that some corrective actions were ongoing and others were under development. The licensee personnel indicated that the Electrical and I&C Department within DE had assumed ownership for setpoints. These engineering personnel indicated that a response to the QA surveillance and a long-term corrective action plan were under development but may take until the end of 1995 to fully develop.

The inspectors concluded that QA had been persistent and effective in identifying weaknesses with the setpoint control and change programs. However, NYPA's corrective actions have been ineffective and untimely.

5.0 DESIGN BASIS DOCUMENTS

The DBD program was a NYPA initiative to consolidate the design basis for selected safety systems. This initiative was reviewed to assess its effectiveness and verify whether the program conforms to its established program guidance and administrative controls.

The DBD program was developed through the Engineering Programs Department in the White Plains Office (WPO) and was recently transferred to the IP3 site. Except for the residual heat removal (RHR) system DBD which is being revised, and the Fire Protection System, which is still in development, the final DBD turnover to DE was accomplished on September 28, 1995. The turnover package for each DBD consisted of the existing DBD with all Pending Change Notices (PCNs), a sort of all active DDOIs, a sort of all deferred DDOIs, a listing of all closed DDOIs and a listing of numbered engineering documents (i.e., modifications, evaluations, and material substitutions) that had been entered into the (ROME) data base since the effective date listed in the last issue of the DBD. The last complete status report for the DBD program was dated June 22, 1995, and included a breakdown of each system's DDOIs and pending engineering documents at that time.

The inspectors interviewed the DBD Programs manager from the WPO, the Engineering Support engineer at IP3, and the new DBD owners at IP3. Five DBDs had been assigned to electrical DE group and fifteen DBDs had been assigned to the mechanical DE group. The RHR DBD is planned for assignment to the mechanical DE group when the next revision is issued later this year. Because the mechanical DE group received the majority of the DBDs, this group has the responsibility for resolving and closing out the majority of the 800-900 outstanding DDOIs and associated ACTS items. The mechanical DE manager believes that the mechanical DE group is currently overloaded by the DBDs and that a plan must be developed to resolve the outstanding DDOIs.

NYPA Configuration Management Manual (CMM) procedure CMM 2.1, Revision 3, dated August 18, 1995, "Preparing and Revising Design Basis Documents and the Fire Protection Manual," provides the administrative controls for the DBD program. This procedure establishes a goal that the DBDs be maintained up to date by revising them at least biennially or sooner, when a sufficient number of PCNs are issued. "Sufficient number" was not defined in the procedure. The inspectors observed that 15 of 21 issued DBDs are over two years old. Four of these DBDs, including the RHR system, are over four years old.

Procedure CMM 2.2, Revision 0, dated May 11, 1992, "Design Document Open Item Identification, Control and Resolution," is the controlling document for resolution of missing or discrepant information. The inspectors sampled one electrical and one mechanical DBD to assess the turnover process and the process for maintaining the DBDs up to date.

The inspectors found that the Rod Control System DBD, issued November 30, 1992, identified a limit on the permissible inductance of the rod control power supply motor-generator circuit. The DBD section on related calculations did not contain any reference to a calculation that would describe how that limit was incorporated into the IP3 design. In response, the licensee contacted Westinghouse for clarification and initiated a PCN to clarify the DBD-identified limit.

The Auxiliary Feedwater (AFW) System DBD was revised on January 24, 1995, with information available as of the "effective date" of July 1994. The inspectors observed that the August 22, 1995, AFW DBD turnover package indicated that four PCNs had been issued against this DBD. The inspectors observed that, in fact, a fifth PCN had been issued on May 19, 1995, and attached to the controlled copy of the DBD. The PCN process is a two stage process. Part I of the PCN is issued to the holders of controlled copies of the DBDs. Part II remains with Document Control until the DBD is revised. The modification closeout process instructs that any change that affects the system DBD must result in a PCN in order to sign off the Modification Closeout Form (MCF). However the inspectors observed that the MCF permits an ACTS item to be issued for a future evaluation of a PCN in place of actually issuing a PCN.

Unlike the formal requirement to update the DBDs for modifications, other engineering documents have an informal, uncontrolled updating process at best. These other documents include such items as NSEs, calculations and reports, and memoranda. The licensee acknowledged that additional guidance in this area may be required. The inspectors surveyed the IP3 database of engineering tasks for the AFW system and found no discrepancies.

The licensee initiated an action plan, NGES-APL-95-008, for IP3 on lessons learned from JAF vendor document review and collection. As part of this review, NYPA identified two calculations related to the AFW DBD that were not in the WPO calculation data base. In addition to those calculations, the inspectors questioned the accuracy and timeliness of the WPO calculation data base with respect to cross referencing to the DBDs. Many of the calculations in the data base did not have references to the DBD. The inspectors also found that one of the calculations referenced in the DBD had been revised in 1993, but the DBD reference to that calculation had not been updated to reflect that latest revision in the data base. Design Control Manual (DCM) procedure DCM-11, "Control, Review Comment and Acceptance of Vendor Comments", Section 6.8, indicates that review of vendor documents should be completed within 15 working days. The inspectors found other calculations associated with the AFW system that were not in the document control data base (8399.337-2-AFW-001, dated March 28, 1995) or had been indexed to the feedwater system instead of the AFW system (6604.164-F-AFW-035 and 6604.003-C-AFW-146, both dated June, 1992.) The licensee acknowledged a lengthy processing time existed past the 15 day goal of the DCM procedure. The licensee also reviewed their data base for the AFW DBD references and brought it up to date with the issued DBD.

NYPA memorandum CM-DBDM-95-048, May 16, 1995, established a method to justify deferral of low priority DDOIs based on the listing of the component on the Appendix R safe shutdown list, the Independent Plant Evaluation (IPE) core damage component list or the Seismic Qualification Users Group (SQUG) list. The inspectors reviewed the deferred DDOIs associated with the AFW DBD. This document had four Priority III and one Priority IV DDOIs. The inspectors initially questioned why any AFW item should be deferred and particularly DDOI AFW-21.2-025, which identified the lack of a calculation to define the relief valve exhaust line back pressure. The inspectors reviewed the deferred DDOIs with the DBD Program Manager, reviewed an assessment of the core damage contribution of failure of the relief valve documented in NYPA memorandum RET-95-363, dated October 9, 1995, and the summary of UE&C Report 8399.337-S-M-016, dated June 5, 1995. The inspectors concluded that all five deferred DDOIs in the AFW system were acceptable.

The inspectors concluded that NYPA efforts to develop DBDs is commendable; however, resolution of the open items identified by this development process and validation of the DBDs are remaining significant tasks. Maintaining the DBDs is another program challenge. An acceptable method has been established for documenting DBD changes resulting from modification, but the process for documenting changes from other types of engineering documents such as NSEs, calculations and reports, and memorandums remains informal. Further, NYPA has not been meeting their biennial timeliness goal for revising and updating DBDs with identified changes. Based on the sample reviewed, no safety concerns were identified with the completed process for deferring low significance DDOIs.

6.0 REVIEW OF CONTRACTOR DEVELOPED ENGINEERING PRODUCTS

Design Control Manual (DCM)-11, "Control, Review, Comment, and Acceptance of Vendor Documents," provides instructions for the administrative control, technical review and acceptance of engineering and design documents originating from outside of NYPA. DCM-11 provides detailed administrative instructions for controlling the document reviews. Four attachments to DCM-11 provide clear guidelines for reviewing: modification packages, vendor drawings, vendor manuals, and other vendor generated information. The following sample of vendor generated documents in the DCM-11 categories of "accepted", "accepted as noted", and "accepted as noted, re-submittal required" were reviewed by the inspectors. When possible, those documents that had been reviewed and commented on by NYPA before final acceptance were also reviewed.

- Raytheon Nuclear Inc. Report 8399.164-S-M-015, "Procedural Guidance for Determining Fan Cooler Unit Heat Transfer Rate"
- Raytheon Nuclear Inc. Report 8399.337-S-M-012, "Design Basis for the Auxiliary Feed Water System AFWP Bearing Water Relief Valve CD-123"
- Raytheon Nuclear Inc. Calculation 8399.337-2-AFW-002, "Maximum Flow for Full Open (AFW) Pressure Control Valve 1213"
- Ebasco Services Inc. Calculation IP3-CALC-HVAC-00859, "Additional 125 VDC Station Battery - HV System"

- Raytheon Nuclear Inc. Report 8399.337-S-M-013, "Design Basis for the Auxiliary Feed Water System AFWP Suction Piping Relief Valves CT-35-1, CT-35-2, & CT-35-3"
- Raytheon Nuclear Inc. Report 8399.337-S-M-014, "Design Basis for the Auxiliary Feed Water System AFWP Bearing Cooling Water Pressure Instrumentation, PCV-1213, Setpoint Tolerances"

Note: Documents Accepted by NYPA

No technical concerns were identified with any of the vendor generated documents accepted by NYPA. All of the vendor generated documents were appropriate in scope and detail for the issue addressed. For those documents where comments were made, the inspectors considered NYPA's comments appropriate and technically valid. The inspectors concluded that the DCM-11 process has been effectively implemented to ensure that satisfactory quality vendor documents were accepted.

7.0 MANAGEMENT OVERSIGHT AND SELF-ASSESSMENT

Although management oversight and direct involvement at all levels in the engineering groups were observed, the effectiveness has been mixed. Development of the EA Program and management's request of a QA audit of the implementation of the safety evaluation process are examples of effective management oversight. Continued weaknesses in the areas of setpoints and configuration control are examples indicating weak management oversight.

7.1 Engineering Assurance

The EA Program for the Nuclear Engineering Division was established in December 1994. An experienced NYPA engineering manager in the WPOs was appointed as the Manager of Engineering Assurance. The EA program charter indicates that the purpose of the EA program is to provide a performance assessment and trending vehicle to track and measure the effectiveness of the engineering process and to institute improvements. Under the direction of the EA program, Engineering Quality Review Teams (EQRTs) were established at both the J. A. FitzPatrick (JAF) and Indian Point 3 sites. The inspectors reviewed the scope, plans, and progress of the EA program to date and concluded that the program is a positive initiative with a number of notable plans including development of nuclear engineering division performance indicators, the Systematic Engineering Self-Assessment Program (SESAP), and development of process improvements intended to reduce number of ECNs.

The EA Manager has been working to establish clear and simple indicators that will allow nuclear engineering managers to trend performance against stated goals. Nuclear engineering intends to use these performance indicators to identify the need for corrective actions and to pursue continuous performance improvement. The EA Manager identified the planned performance indicators (PIs) and plans for PI implementation and use in a memo to the Director of the Nuclear Engineering Division, dated October 4, 1995. The inspectors reviewed this memo and concluded that NYPA has developed some potentially good performance indicators that would allow trending of not only the existing

backlogs and quantity of work completed, but may also provide an indication of the quality of engineering performed. However, since these indicators have not been fully implemented, their effectiveness could not be assessed at this time.

One established performance indicating process is the SESAP. The SESAP formally grades and trends available information from organizations outside engineering such as the NRC, Quality Assurance, Independent Safety Evaluation Group, and the Safety Review Group to identify strengths and weaknesses in the performance of engineering and technical support. The first SESAP reviewed eight assessment documents from May through July 1995. Overall, the report concluded that there was a decline in strengths and an increase in weaknesses. The inspectors discussed the report and the process with the EA manager. The EA manager indicated that insufficient data has been compiled to identify significant trends in specific areas of strengths and weaknesses. However, management has directed the initiation of an ACTS item for each weakness identified by the SESAP report. These ACTS items are tracking mechanisms to ensure that corrective actions are developed to address each identified weakness. The inspectors noted that these ACTS items were developed during this inspection period and therefore the process has not been implemented to the extent that its effectiveness can be assessed.

An engineering quality review team (EQRT) action item included the review and evaluation of ECN data and the development of process improvements. NYPA's reviewed the number of ECNs (13) for modifications installed in the 1990 and 1992 outages was compared to the number of ECNs (3.6) on modifications installed during the 1993/1995 outage. The EQRT concluded that the majority of ECNs can be attributed to three causes: (1) inadequate walkdowns; (2) material changes; and (3) detailed and restricting design specifications and requirements which limit installation flexibility and latitude. An EA manager's memo, dated September 14, 1995, identifies planned process improvements to address these findings. The inspectors concluded that NYPA has taken appropriate steps to identify, evaluate an area of concern (the number of ECNs per modification) and has taken action to develop corrective actions. However, since these corrective actions have not been fully implemented, their effectiveness could not be assessed at this time.

The inspectors concluded that the EA program is a notable initiative that has the potential to contribute to continued improvement. The results of the EA Program have not been fully implemented and therefore could not be fully assessed.

7.2 Review of Operational Experience

To review NYPA's effectiveness in reviewing and responding to NRC Information Notices (INs), the inspectors selected one response package for detailed review.

IN 95-34, "Air Actuator and Supply Air Regulator Problems in Copes-Vulcan PORVs," dated August 25, 1995

IN 95-34 was issue on August 25, 1995, to alert all power reactor licensees to the problems caused by actuator degradation in Copes-Vulcan pressurizer power-operated relief valves (PORVs). Specifically, the IN related one plant's experience where both PORVs failed to fully open on demand due to: (1) actuator air leaks from diaphragm failure; (2) actuator air leaks from loose bolting; and (3) valve stroke malfunctions from improper gas pressure regulation.

The inspectors' initial inquiry indicated that although the Model D-100 valves referred to in the IN were installed at IP3, both SE and maintenance personnel were unaware of the IN. The inspectors also noted that both PORVs at IP3 were being worked during the ongoing forced outage. The inspectors then discussed the IN with both maintenance and SE personnel. Preliminary review indicated that some of the problems identified in the IN including diaphragm failures and actuator torquing problems had already been experienced at IP3 and had been addressed in revisions to the appropriate maintenance procedures. Some of the problems with moisture in the associated air system were not applicable to IP3 because N₂ is used as the motive force to actuate the PORVs. Both the maintenance and SE personnel indicated that further evaluation of the IN was ongoing.

Additional review by the inspectors determined that the Operations Review Group (ORG) and the Plant Leadership Team (PLT) had reviewed the IN on September 8, 1995, and determined that it should be assigned to Maintenance for further review and evaluation. The ORG determined that no DER was required and that because the IN was of a low priority an ACTS item would be issued to ensure that the evaluation was completed. The IN was assigned based on consideration that the PORVs had been extensively reviewed and evaluated prior to restarting from the previous extended shutdown. Approximately a month after the initial review, ACTS item 13165 was generated on October 10, 1995, as part of the September monthly self-assessment, to task Maintenance with the IN review.

The RATI (NRC IR 95-80) concluded that the timeliness of ORG screening of new issues and the initial evaluation by the assigned plant staff had improved significantly. Ongoing reviews appear to be keeping pace with new operating experience reports that are received. Based on the review of this one IN, the inspectors concluded that timeliness of IN reviews could be improved. Specifically, the inspectors were concerned that both the maintenance and system engineering personnel were not tasked in a timely manner to review the PORV IN prior to these valves being worked for seat leakage during the forced outage that was ongoing during this inspection.

8.0 ENTRANCE/EXIT MEETINGS

The scope and purpose of the inspection were discussed an entrance meeting conducted on September 18 1995. During the course of the inspection, the findings were discussed periodically with managers, supervisors and other licensee representatives. On September 22, 1995, a briefing was conducted

with NYPA engineering management personnel. An exit was conducted on October 6, 1995, at which time the preliminary findings of this inspection were summarized and the conclusions were presented. The licensee acknowledged the preliminary findings and conclusions, with no exceptions taken. Further, the bases for the conclusions did not involve proprietary information. The following principals were contacted during the inspection or attended the exit meeting held at the IP3 site on October 6, 1995:

New York Power Authority

W. Cahill, Jr.	Executive Vice President and Chief Nuclear Officer
J. Comiotes	General Manager - Support Services
J. DeRoy	General Manager, Maintenance
T. Dougherty	Nuclear Engineering
E. Glasbergen	Indian Point 3 Consultant
J. Gullick	NYPA Design Engineering
L. Hill	Site Executive Officer
W. Josiger	Vice President, Nuclear Engineering Projects
J. Kaucher	Director, Design Engineering
T. Klein	Electrical and I&C Engineering Manager
J. Lafferty	Systems Engineering Manager
M. Licitra	Support Engineering Manager
B. Liseno	NYPA, Systems Engineering
G. Mavrikis	WPO/EA
R. Penny	WPO Programs
K. Peters	Indian Point 3 Licensing Manager
T. Vitale	Maintenance Engineering Supervisor
J. Vozzella	Indian Point 3 GM Site Planning and Outages

U. S. Nuclear Regulatory Commission

D. Lew	USNRC, Region I
--------	-----------------