U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.	50-286
License No.	DPR-64
Report No.	98-01
Licensee:	New York Power Authority
Facility:	Indian Point 3 Nuclear Power Plant
Location:	P.O. Box 215 Buchanan, New York 10511
Dates:	February 10, 1998 to March 23, 1998
Inspectors:	David Lew, Senior Resident Inspector Laura Dudes, Resident Inspector Jack McFadden, Radiation Specialist (2/23 - 2/27) Ed King, Security Specialist (2/17 - 2/20)
Approved by:	John Rogge, Chief Projects Branch 2 Division of Reactor Projects

EXECUTIVE SUMMARY

Indian Point 3 Nuclear Power Plant
NRC Inspection Report No. 50-286/98001

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

Operations: The licensee appropriately identified and initiated corrective actions in response to three human performance errors. Two of these errors involved the inadequate implementation of the protective tagging procedure, and the third involved the failure to follow a surveillance test procedure. The licensee identified and corrected failures to follow procedure were three examples of a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy. **(NCV 98001-01)** (Section O1.1)

The overall trend in the human performance error rate was flat since the refueling outage and was near the licensee's goal of 0.8 errors per ten thousand man hours worked. However, the error rates associated with procedure revisions and work control were consistently higher than in other areas. The operations department's initiatives to reduce human performance error rates in these areas were appropriate; however, the effectiveness of corrective actions remain to be determined. (Section O1.1)

The operators and instrument & control technicians responded conservatively and appropriately to a misaligned control rod. Although the control rod was realigned before the power reduction was completed, the licensee conservatively decided to continue the power reduction to 83%, and to reset the high flux power trips to 91%. The licensee performed additional checks of the control rod and consulted with the equipment vendor to ensure no control rod operability issues existed. However, the licensee was not able to determine the cause for the misalignment during control rod exercising. (Section O1.2)

The revision of procedures from changes during the refueling outage was inadequate. The licensee review of the extent of condition to a previous violation on this issue was not sufficiently broad. As a result, two additional examples were identified during this inspection period. The NRC identified one example associated with the speed setting of the 31 emergency diesel governor. The licensee identified the other example concerning a surveillance test on service water valves, when several valves were found to be mispositioned. The two examples of inadequate procedures are a violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings." **(VIO 98001-02)** (Section O3.1)

Operator performance with regard to maintaining plant power within the administrative limits set by operations management was weak. The operations shift did not take actions to notify management or reduce power when a calculated heat balance indicated that power was above administrative limits. Also, opportunities were missed to identify the lack of operator actions to the 2:00 a.m. heat balance result. Subsequent to a concern being raised in this matter by the NRC, the licensee appropriately reviewed the issue and verified that the licensed power limit was not violated. (Section O4.1)

Maintenance: The work activity associated with the replacement of lagging on the chemical and volume control system was weak, because the extent and duration of the work was not well communicated between the work group and operations. Although the work was adequately control through the involvement of the system engineer, the operations shift was unaware of ongoing work which had the potential to impact a technical specification required flow path. The lack of clarity in the work control procedures contributed to the weak communication between the work group and operations. (Section M1.2)

The licensee's response to the wrong impeller being procured for the 34 auxiliary component cooling water pump was thorough and the corrective actions were appropriate. Maintenance personnel made an excellent identification in the field which prevented the wrong impeller from being installed in the auxiliary component cooling water pump. Also, maintenance personnel responded well to several challenges encountered while performing this work, including the difficult removal and replacement of the pump motor due to the physical location of the pump and an unclear procedural statement for terminating the motor electrical leads. (Section M1.3)

The licensee's corrective actions in response to the failure of the 31 fan cooler unit motor breaker to close in August 1997 were inadequate. Several opportunities were missed to identify and correct a condition that contributed to the second failure of the breaker to close in March 1998. The licensee's failure to identify, correct and prevent repetition of this condition adverse to quality is a violation of NRC requirements. **(VIO 98001-03)** (Section M1.5)

The licensee was appropriately managing the corrective maintenance backlog. The licensee reduced the non-outage corrective maintenance backlog by about 30% since the beginning of the operating cycle. The goal of 250 non-outage corrective maintenance items by the end of the year was appropriate and challenging. Although some minor discrepancies were identified, the overall deficiency and equipment problem identification by the licensee were good. (Section M2.1)

Engineering: System engineering and operations personnel responded well to the failure of the leading edge flow meters. The adjustment of the nuclear instruments and determination of heat balance were conducted in a manner that was conservative and that assured licensed limits were not exceeded. Appropriate directions were provided to the operators. Revision of the system operating procedure for adjustment of nuclear instruments was timely and supported plant operations. (Section E1.1)

The temporary modification process was effective in ensuring that plant configuration control was maintained. Five temporary modifications were reviewed and found to appropriately reflect field conditions. Procedures and drawings affected by the temporary modification were appropriately revised or developed. Based on this review, a failure to implement a temporary modification change notification as documented in NRC inspection report 50-286/97009, was considered minor and is a non-cited violation **(NCV 98001-05)**. However, this deficiency did not detract from the overall effectiveness of the temporary modification process to control plant configuration. (Section E1.2)

The licensee performed a thorough review for the auxiliary steam driven feed pump steam isolation valve's failure to open following testing. Although this valve is always in its open safety position and does not have a safety function to stroke open, the maintenance engineer performed an extensive review of this issue. The diagnostic testing of this valve provided sound technical information on which to base decisions for future modifications to enhance performance. Additionally, developing baseline data using a temporary pressure regulator allowed for a high quality solution that is most suited for the valve type. (Section E2.1)

Inadequate modifications in 1980 resulted in the potential adverse impact of the carbon dioxide (CO_2) control systems on the emergency diesel room ventilation systems. Although this inadequacy was an old design issue, the licensee failed to identify and correct this significant condition adverse to quality in 1995 when the concern regarding the CO_2 control system was raised. When this issue was identified again in 1997, the licensee conducted a thorough extent of condition review with regard to potential fire protection and ventilation system vulnerabilities. However, the licensee did not thoroughly review the reasons for the failure to identify and correct the deficiency in 1995. The failure to take adequate corrective actions in 1995 is a violation of 10 CFR Part 50, Appendix B, Criterion XVI. **(VIO 98001-04)** (Section E7.1)

Plant Support: Control of external and internal occupational exposures was implemented effectively. Overall, control of radioactive materials and contamination was normally effective. Deficiencies were being identified and appropriately addressed. Performance in ALARA continued to be aggressive. Program changes to improve effectiveness and a challenging annual person-rem goal for 1998 were good initiatives. The quality assurance audits, appraisals, and self-assessment efforts were generally frequent and thorough. The evaluations and corrective actions for findings were usually detailed and effective (Sections R1-R7).

The licensee was maintaining an effective program and management was appropriately administrating the security program. Alarm station operators were knowledgeable of their duties and responsibilities, and communications requirements were being performed in accordance with the NRC-approved physical security plan (the Plan). Assessment aids had good picture quality and excellent zone overlap and detection aids were functional, effective and met regulatory requirements. The access authorization program was being implemented in accordance with regulatory requirements. Personnel and packages were being properly searched prior to granting PA access. (Sections S1-S6)

Effective controls were in place, which included a departmental self-assessment program, for identifying, resolving, and preventing programmatic problems and security training was being performed in accordance with the NRC-approved training and qualification (T&Q) plan. (Section S7)

The licensee fitness-for-duty (FFD) audit was thorough and in-depth; however, the audit of the access authorization program was limited in scope and depth which resulted in a violation of NRC requirements. **(VIO 98001-05)** (Section S7)

TABLE OF CONTENTS

Table of Contents (cont'd)

ATTACHMENTS

Report Details

Summary of Plant Status

Indian Point Unit 3 began this inspection period at full power. On March 13, the licensee reduced power to approximately 89 percent in preparation for control rod exercise testing. During the test, the licensee reduced power to 83 percent in response to a misaligned control rod. The licensee returned the unit to full power on March 15 and remained at full power for the duration of the inspection period.

I. OPERATIONS

O1 Conduct of Operations

O1.1 Human Performance Error Evaluations (NCV 98001-01)

a. Inspection Scope (71707)

The inspectors observed the licensee's evaluations, corrective actions and resolutions to three human performance errors identified in the operations department during this inspection period. Additionally, the inspectors and operations management discussed human performance error trends and planned improvements.

b. Observations and Findings

The licensee identified several operator performance issues this inspection period which met the criteria to be addressed as human performance errors (HPEs). Two issues were related to the protective tagging process, and a third was related to a surveillance test that resulted in an inadvertent injection of water into the steam generators.

On February 20, 1998, while performing 3PT-M20A,"Motor Driven Auxiliary Boiler Feedwater Surveillance and IST," a nuclear plant operator (NPO) failed to close two normally locked open valves in order to isolate the steam generators during the testing of the auxiliary feedwater pumps. The reactor operator in the control room noted the slight increase in steam generator level when another valve in the series with the left open valve was stroke tested. The test was immediately stopped and the licensee began an investigation.

The inspector attended the performance enhancement review committee (PERC) meeting held to assess the performance of the personnel involved in the error, to develop ideas to prevent reoccurrence and to provide lessons learned from the event. The PERC determined that contributors to this human performance error were inconsistency in format for valve lineups and the lack of a second verification.

On March 2, 1998, in preparation to perform work on a pressure indicator linked to the fire protection deluge system for the station auxiliary transformer, a protective tag out (PTO) to isolate the deluge valve was found to have the wrong valve

number. A nuclear plant operator identified the inadequacy while hanging the tag in the field. This tag was an additional isolation requested by the instrument and controls (I&C) department after the initial tagout was developed by the work control center. Although I&C had been consulted on the initial tagout, I&C subsequently requested this additional isolation as enhanced protection.

The inspector determined that the major contributor to the inadequate development of the additional tagout was the lack of an independent review. Contrary to administrative procedure AP-10.1, "Protective Tagging," a licensed senior reactor operator (SRO) prepared the additional tag as well as signed off as the reviewer. The SRO's performance of both the preparation and review reduced the assurance that tagout was properly developed due to the lack of an independent review and a walkdown of the tagout. Other contributors included the SRO's perceived pressure to meet the work schedule, weak coordination within I&C on the tagging boundary and a fire protection drawing that was not well human factored.

The inspector attended the PERC meeting for this event and observed that several people involved in this event were not in attendance. For example, the NPO who discovered the error when out in the field hanging the tag and the I&C technicians who requested the additional protection were not in attendance during the PERC. The inspector noted that although the PERC summary document seemed to capture the key issue regarding the loss of independent review, the meeting itself focused on other issues that might have posed challenges to the operations personnel but were not necessarily the more significant contributors.

On February 25, while applying a PTO for the 32 circulating water pump load commutated inverter (LCI) drive, the 31 circulating water pump isolation transformer cooling fan feed switch, PCE-A2-ckt-1, was found de-energized per PTO 98-0105. Upon a review of the PTO database, it was determined that this PTO was terminated on February 10 and that this circuit was missed when the PTO was being removed.

The inspector reviewed the PTO application and removal documentation. It appears that the field support supervisor (FSS) who wrote the PTO needed to remove a tag from the original PTO, but did so by hand instead of changing the documentation in the computer system. When the PTO was to be removed, a different FSS obtained a copy of the PTO from the computer database and was misled as to which tags were actually hung in the field. Failure to remove a tag for a cleared protective tagout is contrary to the requirements of administrative procedure AP-10.1, "Protective Tagging."

In the above examples, the failures to follow administrative procedure AP-10.1, "Protective Tagging," and surveillance procedure, 3PT-M20A, "Auxiliary Boiler Feed Pump Surveillance," were identified by the licensee. Upon identification of these errors, the activities were stopped and deviation event reports were written to follow up on these human performance errors. A performance enhancement review committee (PERC) meeting was held to provide a more thorough investigation of the event. These licensee identified and corrected violations

are being treated as three examples of a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy. **(NCV 98001-01)**

The inspectors met with senior operations managers to discuss the trending of human performance errors since September 1997. The inspectors considered that the trend in the error rate was flat since the refueling outage and was near the licensee's goal of 0.8 errors per ten thousand man hours worked. However, the error rates associated with procedure revisions and work control were consistently higher than in other areas. This observation was consistent with the NRC's identification of procedure deficiencies in section O3.1 of this report, as well as previous inspection reports, and with the tagging issues described above.

Operations management indicated that several actions were being taken to address human performance errors, particularly in the areas of procedural revisions and work control. In October 1997, NYPA conducted a assessment of operations performance and procedures. The team identified several recommendations for improvement, which were accepted and being implemented by the operations department. In addition, an on-going multi-discipline group was established to examine human performance. The inspector reviewed these actions and considered that the operations department's initiatives to reduce human performance error rates were appropriate. However, the effectiveness of corrective actions remain to be determined.

c. Conclusions

The licensee appropriately identified and initiated corrective actions in response to three human performance errors. Two of these errors involved the inadequate implementation of the protective tagging procedure, and the third involved the failure to follow a surveillance test procedure. The licensee identified and corrected failures to follow procedure were three examples of a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy. **(NCV 98001-01)**

The overall trend in the human performance error rate was flat since the refueling outage and was near the licensee's goal of 0.8 errors per ten thousand man hours worked. However, the error rates associated with procedure revisions and work control were consistently higher than in other areas. The operations department's initiatives to reduce human performance error rates in these areas were appropriate; however, the effectiveness of corrective actions remain to be determined.

O1.2 Control Rod Misalignment

a. Inspection Scope (71707, 37551)

On March 13, 1998, during control rod exercising, control rod B-6 became misaligned. The individual rod position indication showed the control rod at 203 steps while the group position indication was 216 steps. The inspector reviewed the licensee's response to the misalignment.

b. Observations and Findings

The operators and instrument & controls (I&C) technicians took appropriate and conservative actions in response to misaligned control rod B-6. Procedure ONOP-RC-1, "Dropped or Misaligned Rod(s)," was entered and the control rod was realigned about three hours later. Although the control rod was realigned before the power reduction was completed, the licensee conservatively decided to continue the power reduction to 83%, and to reset the high flux power trips to 91%. The licensee elected to remain at the reduced power level for several hours to attain equilibrium conditions before determining core peaking factors. Based on interviews with the licensee's staff, the I&C technicians thoroughly walked down the procedure for resetting the high flux trip setpoints before use.

The licensee took several actions to ensure that the control rod was properly aligned and functioning. These actions included exercising of the control rod and additional verifications of control rod alignment. The licensee consulted with the vendor of the control rod system regarding control rod operability and possible actions to determine the cause of the misalignment. These actions were completed before returning the plant to full power on March 15, 1998.

The licensee determined that control rod B-6 inserted into the core more than expected during rod exercising. The I&C department conducted troubleshooting of the misaligned rod, which included checks of fuses, current diodes and resistance of the moveable gripper coils. These checks did not provide any information which accounted for the misalignment. In December 1997, control rod F2 dropped during a plant shutdown. Control rod F2 was located in the same control bank as control rod B-6, but in a different group. The I&C manager indicated that an action plan was being developed that would include the installation of monitoring instrumentation.

c. Conclusions

The operators and instrument & control technicians responded conservatively and appropriately to a misaligned control rod. Although the control rod was realigned before the power reduction was completed, the licensee conservatively decided to continue the power reduction to 83%, and to reset the high flux power trips to 91%. The licensee performed additional checks of the control rod and consulted with the equipment vendor to ensure no control rod operability issues existed. However, the licensee was not able to determine the cause for the misalignment during control rod exercising.

O3 Operations Procedures and Documentation

O3.1 Procedural Deficiencies (Closed VIO 97007-01) (VIO 98001-02)

a. Inspection Scope (71707)

The inspector reviewed two procedural deficiencies identified during this inspection period. Also, the licensee's response and corrective actions to a previous NRC violation concerning procedural deficiencies were reviewed.

b. Observations and Findings

On March 8, 1998, in preparation to perform surveillance test 3PT-Q77, revision 3, "Containment Fan Cooler Units Manual Isolation Valves," the nuclear plant operators identified that the positions for the fan cooler motor service water outlet valves were in the incorrect position. Checkoff list COL-RW-2, "Service Water System," required the valves to be in the throttled position; however, the valves were found to be in the open position. The licensee initiated deviation event report (DER) 98-0365 to document this discrepancy. The cause of the mispositioned valves was the performance of procedure 3PT-Q77 in December 1997. Although checkoff list COL-RW-2 was revised, procedure 3PT-Q77 was not updated to reflect ENG-281, "Service Water System Flow Balance Test" which was conducted during the last refueling outage and changed the valve position from open to throttled. The inspector considered that the procedure revision process was not effective in ensuring that procedure 3PT-Q77 was revised when the position of the valves was changed by ENG 281.

On March 9, 1998, the inspector identified a discrepancy associated with the 31 emergency diesel generator (EDG) governor speed setting. The checkoff list COL-EL-5, revision 21, "Emergency Diesels," indicated a speed setting of 1146 for the 31 EDG. However, the 31 EDG governor speed setting was set at 1884. The licensee indicated that a new governor was installed in the 31 EDG during the refueling outage, and, as a result, the speed setting was changed. The nuclear plant operator's log OPT-16, revision 34, "Conventional Hot Log Sheet," was revised to reflect this change; however, checkoff list COL EL-5 was not changed. The licensee initiated DER 98-0372 to document and correct this deficiency. In discussions with the system engineer, the system engineer indicated that the affect on the checkoff list by the change was an oversight.

In NRC inspection 50-286/97007, the NRC identified and cited five examples of procedural deficiencies. One example concerned procedure 3PT-5Y4, "32 Auxiliary Boiler Feed Pump (ABFP) Turbine Overspeed," in which the inspector identified that the procedure was not revised to reflect nuclear safety evaluation 97-3-365-MS, "32 ABFP Turbine Drains," which changed the position of some drain valves. Although checkoff list COL-FW-2, "Auxiliary Feedwater System" was revised, the licensee failed to revise other affected procedures. A second example identified in NRC inspection 50-286/97007 was the lineup of the service water system for operability before checkoff list COL-RW-2 was revised to reflect changes during the

refueling outage. These changes included the failure to revise checkoff list COL-RW-2 to reflect the changes to the fan cooler motor service water outlet valves' position from open to throttled.

The inspector reviewed the licensee's response letter, dated November 4, 1997, to the violation issue with NRC inspection report 50-286/97007. The inspector selected a sample of commitments made in the letter and verified their completion. However, the licensee did not consider a broader review of the extent of condition. Consequently, two additional examples of inadequate procedures resulting from changes made during refueling outage were identified during this inspection. The two examples of inadequate procedures are a violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings." **(VIO 98001-02)** Based on the review of the licensee's response to violation 50-286/97007-01 and the issuance of the violation 50-286/98001-02, violation 50-286/97007-01 is closed.

c. Conclusions

The revision of procedures from changes during the refueling outage was inadequate. The licensee review of the extent of condition to a previous violation on this issue was not sufficiently broad. As a result, two additional examples were identified during this inspection period. The NRC identified one example associated with the speed setting of the 31 emergency diesel governor. The licensee identified the other example concerning a surveillance test on service water valves, when several valves were found to be mispositioned. The two examples of inadequate procedures are a violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings." **(VIO 98001-02)**

O4 Operator Knowledge and Performance

O4.1 Heat Balance Calculations

a. Inspection Scope (71707)

The inspector reviewed the appropriateness of operator actions in response to consecutive heat balances which indicated power above the administrative power limit imposed by operations management.

b. Observations and Findings

On March 9, 1998, the inspector noted that the heat balances for March 6 at 2:00 a.m. and 9:00 a.m. indicated 97.93% and 98.13%, respectively. As described in section E1.1 of this report, an administrative limit was placed on plant power because the leading edge flow meters were out of service. A shift order specified the administrative limit on power calculated by a heat balance using the Barton flow meters to $\leq$97.83%. However, the inspector noted no documented operator actions after the completion of the 2:00 a.m. heat balance to ensure that power would be reduced below 97.83%.

The inspector raised this concern to the licensee. In response, the licensee reviewed the concern and identified another data point in which the heat balance results were higher than 97.83% (i.e., the heat balance calculation performed at 11:00 a.m. on March 6 indicated 97.94% power). However, the licensee concluded that the operators responded appropriately to the heat balance results obtained at 9:00 a.m. and 11:00 a.m. The operators had notified management and taken actions to reduce power. The licensee, however, noted the lack of documentation of these actions, and considered that operator performance should be improved to log these actions.

Regarding operator actions to the 2:00 a.m. heat balance, the licensee determined that the control room operator was aware of the shift order to limit power to 97.83% as indicated by the heat balance. However, the operator assumed that the shift order was superseded by the revision to system operating procedure SOP-RPC-6, "Reactor Thermal Power Calculation." This assumption was incorrect. Also, opportunities were missed to identify the lack of operator actions to the 2:00 a.m. heat balance result. These opportunities include supervisory oversight in the control room, a shift turnover conducted at 7:00 a.m. and the review of previous heat balance results when the 9:00 a.m. heat balance indicated that administrative limit were exceeded.

The licensee reviewed the data collected during this time period and verified that the licensed power limit was not exceeded. Also, before the concern was raised by the inspector, the licensee had revised the shift order to clarify the administrative limits and data collection while the leading edge flow meters were inoperable.

c. Conclusions

Operator performance with regard to maintaining plant power within the administrative limits set by operations management was weak. The operations shift did not take actions to notify management or reduce power when a calculated heat balance indicated that power was above administrative limits. Also, opportunities were missed to identify the lack of operator actions to the 2:00 a.m. heat balance result. Subsequent to a concern being raised in this matter by the NRC, the licensee appropriately reviewed the issue and verified that the licensed power limit was not violated.

O8 Miscellaneous Operations Issues (71707, 92700, 92901)

O8.1 Re-review of Open Unresolved Items

During this inspection period, the resident inspectors reviewed open unresolved items to determine whether the related issues met the criteria of an unresolved item as defined in NRC Inspection Manual Chapter (IMC) 0303, "Inspection Follow Up System." NRC IMC 0303 defines an unresolved item as "a matter about which more information is required to ascertain whether it is an acceptable item, a deviation, a non-conformance, or a violation." Based on this review and with the concurrence of the originating inspectors or responsible branch chiefs, the below

unresolved items were determined to not meet the criteria of an unresolved item. As a result, these items were administratively revised to inspector followup items.

- Item 94026-03 was opened to follow the licensee's actions with respect to additional sampling and verification of NRC commitments.
- Item 96008-03 was opened to follow the licensee's resolution of the potential for water hammer and inadequate flows in the fan cooler units.
- Item 96008-05 was opened to follow the licensee's resolution of a discrepancy between the design basis documents and technical specifications.
- Item 96012-04 was opened to follow an issue associated with the lack of periodic testing of emergency diesel building ventilation flows.
- Item 97010-04 was opened to follow an issue associated with overcurrent trip microswitch tolerances.
- Item 97080-05 was opened to follow flow instruments uncertainty effect on engineering test ENG 366, "Component Cooling Water Flow Balance."
- Item 97080-06 was opened to follow an issue associated with the air receiver capacity for the emergency diesel room ventilation.
- Item 97080-07 was opened to follow an issue associated with the cleaning and inspecting of the component cooling water heat exchangers.

O8.2 (Closed) Inspection Followup Item 94026-03: This inspector followup item concerned the verification of a selective sampling of NRC commitments. NRC inspection report 50-286/94026 reviewed the licensee's improvement initiatives in the area of NRC commitment tracking and implementation. During NRC inspection 50-286/94026, the inspector considered the licensee's actions for resolving the programmatic issue of commitment tracking to be acceptable. These actions included the establishment of the action commitment tracking system and the development of new procedures and processes for tracking commitments. The licensee conducted a sampling of 729 of 6600 past commitments (11%) and identified no safety significant issues. However, an open item was initiated because the inspector considered that the licensee needed to conduct additional sampling of the implementation of commitments.

During this inspection, the inspector conducted an in-office review of the inspector followup item. The inspector noted that since the item was opened, the licensee submitted responses to the NRC's 10 CFR 50.54(f) letter regarding adequacy and availability of design basis information. In the licensee's letters dated February 7, 1997, and March 10, 1997, the licensee committed to complete a three phase program to address issues associated with departures from the final safety analysis report (FSAR). The first two phases were to be completed within two years. The

first phase was to develop and implement an FSAR verification process. This included applying the process to a "pilot" plant system, conducting a vertical slice assessment of the plant system and comparing the results to identify lessons learned for feedback to the FSAR verification process. The second phase involved applying the process developed in the first phase to all safety-related systems. The third phase applies the process developed in the first phase to the remaining portions of the FSAR not covered in the second phase. The licensee committed to complete the third phase within three years. Also, the licensee committed to perform periodic vertical slice assessments after completion of the first and second phases. A minimum of one assessment was planned for completion per operating cycle. The inspector considered that the licensee's response to the NRC's 10 CFR 50.54(f) would result in the additional sampling of safety significant commitments and provide greater assurance that the plant is operating within its licensing basis. The inspector considered this item to be administratively closed.

II. MAINTENANCE

M1 Conduct of Maintenance

M1.1 General Comments (62707)

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

- WR 95-02376-00, Replacement of 34 auxiliary component cooling water pump motor,
- WR 95-04424-92, New motor swapover of 32 emergency diesel room fan 316
- WR 97-03700-00, Replace nitrogen isolation valve to weld channel zone 1
- WR 97-05010-00, Inspection of control building strip heater panel 31
- WR 97-06762-00, Quarterly preventive maintenance inspection of 32 Emergency Diesel Generator

The inspectors observed that the work performed to the above work requests (WR) was conducted satisfactorily and in accordance with applicable maintenance and administrative procedures. The inspector also reviewed significant equipment failures that occurred to determine whether the equipment was within the scope of the maintenance rule, whether the licensee's corrective actions were appropriate and whether the licensee was appropriately monitoring equipment performance.

M1.2 Minor Maintenance Work

a. Inspection Scope (62707)

The inspector reviewed the controls associated with the replacement of lagging on the chemical and volume control system.

b. Observations and Findings

On February 11, 1998, the inspector observed maintenance workers replacing the lagging on the chemical and volume control system. The inspector noted that the lagging on piping located in the vicinity the boric acid blender was removed and inquired into the controls in place to prevent the potential precipitation of boric acid within the piping. When the inspector questioned the operations shift concerning the removal of the lagging, the operations shift indicated that they were unaware of the activity.

The licensee initiated deviation event report (DER) 98-0236 to document the deficiency in which operations was not informed of a work activity. The licensee's review indicated that the work had been authorized several days before under a monthly minor maintenance work request (WR 98-00002-01). A shift manager had authorized the work on February 6, 1998. However, operations believed the work was to be short in duration. The maintenance workers had expected the work to be completed over several days.

The licensee indicated that the minor maintenance process was not clear regarding applying the minor maintenance work process to Category I and M equipment and to work which would exceed one shift. Category I and M equipment are equipment for which the quality assurance program must be applied and whose systems are listed in the final safety analysis report. The licensee initiated a shift order to limit work on Category I and M equipment to one shift. This interim action was taken until the licensee could fully address the appropriate manner by which minor maintenance activities should be handled. Based on discussions with the work control supervisor, the concerns which still need addressing included the appropriateness of working Category I and M equipment under minor maintenance, the appropriate level of operations review and the need for scheduling certain minor maintenance activities.

The inspector reviewed the minor maintenance work control procedures and considered the procedures to be unclear with regard to the duration of work on Category I and M. This lack of clarity contributed to the weak communications between the work group and operations regarding the extent and duration of work which had the potential to impact a technical specification required flow path.

However, the work did not result in the inoperability of the boration flow path. The system engineer had been initially involved in the work activity and had provided guidance to the workers to remove and replace small sections of lagging at a time. Based on the discussions with the worker's foreman, he indicated that the workers had been appropriately briefed. No violations were identified.

c. Conclusions

The work activity associated with the replacement of lagging on the chemical and volume control system was weak, because the extent and duration of the work was not well communicated between the work group and operations. Although the

work was adequately control through the involvement of the system engineer, the operations shift was unaware of ongoing work which had the potential to impact a technical specification required flow path. The lack of clarity in the work control procedures contributed to the weak communication between the work group and operations.

M1.3 34 Auxiliary Component Cooling Water Pump Maintenance

a. Inspection Scope (62707)

The inspector observed the implementation of work request 95-02376-00, "Replacement of No. 34 auxiliary component cooling water pump motor." Also, the inspector reviewed the licensee's resolution to inadequate procurement and verification of replacement parts for the pump impeller.

b. Observations and Findings

On March 2, the inspector observed the IP3 maintenance workers remove the motor from the 34 auxiliary component cooling water pump. The work package also included directions to replace the pump impeller. The inspector observed that the maintenance workers followed the procedure for removing the individual components of the pump and appropriately followed all ancillary procedures including foreign material exclusion, radiation work permits and work area cleanliness directives. The maintenance workers encountered several challenges while performing this job and took appropriate actions to resolve each discrepancy identified as they progressed through the work package.

One of the more significant challenges was identified as the workers were preparing to replace the pump impeller. The mechanic noted that the replacement impeller was larger than the original and made of stainless steel instead of carbon steel like the original. The job was put on hold until the appropriate resolution to this issue could be made. The inspector reviewed the work package to verify that the appropriate part number had been designated on the bill of materials for this job. It appears that this pump had been manufactured specifically for this application at a commercial facility during the initial construction of the facility. Later, the manufacturing specification for the pump was sent to the nuclear grade vendor site; however, the special machining requirements for the impeller did not follow. Therefore, the impeller was manufactured to the original casting drawing. The inspector discussed this error with the procurement engineering personnel and determined that a thorough review was performed to identify the root cause of this error. The procurement engineer developed a fully auditable trail as to how the wrong impeller ended up in the field and returned the impellers that remain in the warehouse to be machined to proper specifications. Lastly, the procurement engineers developed a technical evaluation to provide a documented source for the material change to the impeller. In the interim, the old impeller was deemed suitable to be put back into the pump. The inspector concluded that the vendor did not supply the complete information during initial construction which contributed to this error. The licensee performed a thorough review to fully resolve the issue.

Other challenges observed in the field were the method by which the pump motor is removed and reinstalled due to the limited space in the area. The pump area has no provisions for rigging a temporary lifting mechanism to aid in removing and replacing the heavy motor. This places an additional burden on the mechanics but also has the potential to impact the pump performance as the shaft could potentially be damaged when attempting to lift it back into place. Lastly, a temporary procedure change (TPC) had to be initiated when restoring the equipment because the procedure did not specify the appropriate method to terminate the electrical leads for the motor.

c. Conclusions

The licensee's response to the wrong impeller being procured for the 34 auxiliary component cooling water pump was thorough and the corrective actions were appropriate. Maintenance personnel made an excellent identification in the field which prevented the wrong impeller from being installed in the auxiliary component cooling water pump. Also, maintenance personnel responded well to several challenges encountered while performing this work, including the difficult removal and replacement of the pump motor due to the physical location of the pump and an unclear procedural statement for terminating the motor electrical leads.

M1.4 Surveillance General Comments (61726)

The inspectors observed all or portions of the following surveillances:

- 3PT-M18A, Residual Heat Removal Pump Functional Test
- 3PT-M19, Auxiliary Component Cooling Water Pump Test
- 3PT-M62, 480 Volt Undervoltage/Degraded Grid Protection System Function Test
- 3PT-M79B, 32 Emergency Diesel Generator Functional Test
- 3PT-Q101, Main Steam Valves PCV 1310A, PCV 1310B, & PCV-1139 Stroke Test
- 3PT-R20B, Auxiliary Feed Pump Room Temperature Sensor (TC-1113A, TC-1113S)

The licensee conducted the above surveillances appropriately and in accordance with procedural and administrative requirements. As applicable, good coordination and communication with the control room were observed during performance of the surveillance. Procedures supported the timely completion of the surveillance.

M1.5 31 Fan Cooler Unit Breaker Failure Evaluation (VIO 98001-03)

a. Inspection Scope (62707)

The inspector reviewed the licensee's equipment failure evaluation, extent of condition review and corrective actions in response to the failure of a Westinghouse DS 416 circuit breaker to close.

b. Observations and Findings

On March 6, 1998, during the retest of a flow switch, the 31 fan cooler unit (FCU) motor breaker (A1068) failed to close from the control room. Manual attempts to charge the breaker were unsuccessful. Investigations revealed that the closing spring status indicator was binding on the charging motor shaft. This binding prevented the closing spring from charging.

On August 2, 1997, during refueling outage 9 (RO9), the licensee experienced a similar failure with the same breaker. At that time, a problem identification tag was written and a work request was developed in order to troubleshoot the breaker problem. Several days later, the 31 FCU was started and secured several times in support of refueling operations. Because the FCU motor breaker (A1068) successfully cycled several times, the work request was deleted from the outage work and rescheduled for a later date.

In December 1997, the 32 residual heat removal breaker failed to open on demand which led to a plant shutdown and extended root cause evaluation. At this time many of the licensee's DS 416 breakers were removed from the cubicles to test the trip functions. Although this FCU breaker still had a problem identification tag and a work request outstanding, the licensee did not take the December opportunity to troubleshoot the problem.

After the breaker failed to close in March, the licensee removed the breaker from service in order to perform a more thorough equipment failure evaluation. Additionally, the licensee reviewed the work histories of all breakers currently installed in the facility to determine if they are susceptible to this closing spring indicator binding. The licensee did not consider this breaker issue a challenge to operability because the remaining breakers all have charged closing springs and have safety functions to close once. An action plan outlining plans to repair or replace all breakers that had not undergone refurbishment was developed and will be completed by May 1998.

The inspector reviewed the licensee's actions in response to the breaker failure in August 1997 and noted that no deviation event report was written to document specific actions taken in response to the failure. There was no auditable information as to what type of technical review was performed to provide sufficient information about the cause of the failure. Lastly, in reviewing the licensee's response to the March 1998 breaker failure, the inspector noted that there was no information about how the corrective action process did not capture this in August 1997. This failure to identify and correct conditions adverse to quality is a violation of NRC requirements. This is the second example of inadequate corrective actions as denoted in violation 98001-03.

c. Conclusions

The licensee's corrective actions in response to the failure of the 31 fan cooler unit motor breaker to close in August 1997 were inadequate. Several opportunities

were missed to identify and correct a condition that contributed to the second failure of the breaker to close in March 1998. The licensee's failure to identify, correct and prevent repetition of this condition adverse to quality is a violation of NRC requirements. **(VIO 98001-03)**

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Corrective Maintenance Backlog

a. Inspection Scope (62707)

The inspector reviewed the corrective maintenance backlog trends since the beginning of the current operating cycle. Also, the outstanding work requests for three systems that were classified as A1 systems under the maintenance rule were reviewed.

b. Observations and Findings

The inspector reviewed the licensee's trend data for outage and non-outage corrective maintenance backlog. The inspector reviewed the data from September 6, 1997 through March 16, 1998. The non-outage corrective maintenance backlog had been reduced from about 600 to 420 items. The licensee's goal is to reduce this backlog to 250 by the end of 1998. With respect to more significant maintenance deficiencies (priority 1 through priority 3 work), the backlog was reduced from 140 to 45. However, most of this large decrease was attributed to stricter classification of work as priority 1-3 work. Since the outage, the outage corrective maintenance backlog increased from about 420 to 580 items. However, the inspector considered that the increased outage corrective maintenance backlog was reasonable due to the inability to work many of these items with the plant on-line.

The licensee indicated the stricter classification of category 1-3 work was to reduce unnecessary impact on the scheduling process for equipment deficiencies that were not urgent and the repair time was flexible. This effort allowed the plant staff to be less reactive and more effective in completing work. The licensee also indicated that the goal of 250 non-outage corrective maintenance items was important to allow a greater percentage of preventive and predictive maintenance to be worked during the operating cycle.

The inspector reviewed the number of problem identification descriptions (PIDs) being generated. On average, 43 PIDs are generated each week, of which less than 4 are canceled. The inspector reviewed a sample of canceled PIDs and identified no concerns.

The inspector assessed the appropriateness of PID prioritization and the effectiveness of equipment problem identification for three systems that were classified as A1 systems under the maintenance rule. These systems were the weld channel and containment penetration pressurization, the emergency diesel

generator and the instrument air (IA) systems. The inspector noted some minor discrepancies. For example, an inlet louver air motor for the emergency diesels was leaking and was classified as a priority 4. However, a similar component was leaking and was identified as a priority 3. Other minor deficiencies were noted; however, the inspector considered that the deficiencies did not detract from the overall validity of the licensee's trend data.

c. Conclusions

The licensee was appropriately managing the corrective maintenance backlog. The licensee reduced the non-outage corrective maintenance backlog by about 30% since the beginning of the operating cycle. The goal of 250 non-outage corrective maintenance items by the end of the year was appropriate and challenging. Although some minor discrepancies were identified, the overall deficiency and equipment problem identification by the licensee were good.

III. ENGINEERING

E1 Conduct of Engineering

E1.1 Leading Edge Flow Meter Failure

a. Inspection Scope (37551, 71707)

The inspector reviewed the licensee's response to the failure of the leading edge flow meters (LEFMs).

b. Observations and Findings

On March 4, 1998, the LEFMs, which are used in the performance of secondary heat balances and the calibrations of the power range nuclear instruments, failed. A secondary heat balance using the Barton flow meters indicated reactor power at 97.83%. The nuclear instruments based upon the last heat balance using the LEFM indicated 99.5% power.

System engineering and operations personnel determined that power restrictions should be placed upon the plant until the LEFMs could be repaired. The operators were directed to limit power to below 99.5% power as indicated by the nuclear instruments and to below 97.83% power as determined by the secondary heat balance using the Barton flow meters. The imposition of these limits was based in part on past observations that the results of secondary heat balances using the Barton flow meters were lower than the results using the LEFMs. System engineering personnel indicated that the accuracy of the secondary heat balance using Barton flow meters was about 1.97%, whereas the accuracy of the secondary heat balance using LEFMs was 1.2%. Also, system engineering recognized that the nuclear instrument should not be adjusted lower to read the same power level as the power determined by the heat balance using the Barton

flow meters. Reducing the power indication would be non-conservative, because the margin to a high power reactor trip would be increased.

Operations issued a shift order to provide guidance on the power limitations. In addition, procedure SOP-RPC-6, "Reactor Thermal Power Calculation," was revised on the day of the LEFM failure to provide direction concerning the adjustment of the power range nuclear instrument when using the Barton flow instruments for heat balance determination.

c. Conclusions

System engineering and operations personnel responded well to the failure of the leading edge flow meters. The adjustment of the nuclear instruments and determination of heat balance were conducted in a manner that was conservative and that assured licensed limits were not exceeded. Appropriate directions were provided to the operators. Revision of the system operating procedure for adjustment of nuclear instruments was timely and supported plant operations.

E1.2 Temporary Modifications (Closed URI 97009-02) (NCV 98001-04)

a. Inspection Scope (92903)

The inspector assessed the effectiveness of the licensee's temporary modification process in controlling plant configuration.

b. Observations and Findings

Unresolved item 97009-02 concerned an NRC identified discrepancy associated with the temporary modification of the power supplies to the 314 and 315 emergency diesel room fans. The licensee had altered the temporary modification during the installation of a permanent modification, but did not develop a temporary modification change notice as required by administrative procedure AP-13, "Temporary Modifications." The inspector considered this deficiency to reflect weak configuration control, but left the issue unresolved pending the NRC's determination if a programmatic concern in the implementation of temporary modification change notices existed.

During this inspection period, the inspector walked down five temporary modifications to assess the effectiveness of configuration control. The walkdown consisted of verifying that the field condition reflected the changes described in the temporary modifications. Temporary modification tags were observed to be appropriately attached to equipment in the field. Procedural and drawing changes were sampled to ensure that they supported the temporary modification. No deficiencies were identified during the inspector's review of the implementation of temporary modifications. The temporary modifications reviewed are listed below.

- TM 97-06757-00 concerned supplying purified water to the condensate polisher system.

- TM 97-05212-01 concerned connecting temporary ethanolamine tank to the morpholine injection system.
- TM 97-05176-02 concerned separating control circuit power and channel separation to the 33 auxiliary boiler feed pump.
- TM 93-04087-03 concerned liquid radioactive processing using contractor supplied equipment.
- TM 96-07498-16 concerned monitoring level and control signals for low pressure feedwater heaters.

Based on the review, the inspector considered that the deficiency identified in unresolved item 97009-02 was isolated. The failure to initiate a temporary modification change notice was an NRC identified violation of procedural adherence. However, this violation is considered minor in significance and is a non-cited violation **(NCV 98001-04)**. Unresolved item 97009-02 is closed.

c. Conclusions

The temporary modification process was effective in ensuring that plant configuration control was maintained. Five temporary modifications were reviewed and found to appropriately reflect field conditions. Procedures and drawings affected by the temporary modification were appropriately revised or developed. Based on this review, a failure to implement a temporary modification change notification as documented in NRC inspection report 50-286/97009, was considered minor and is a non-cited violation **(NCV 98001-04)**. However, this deficiency did not detract from the overall effectiveness of the temporary modification process to control plant configuration.

E2 Engineering Support of Facilities and Equipment

E2.1 Resolution of Steam Isolation Valve Failure

a. Inspection Scope (37551, 61762)

The inspector reviewed Deviation Event Report (DER) No. 98-0267, "Steam Supply Valve (1310A) to 32 ABFP will not re-open."

b. Observations and Findings

On February 20, 1998, the licensee was performing a quarterly surveillance test on three main steam air operated valves. Two of these valves, PCV-1310A and PCV-1310B are the steam isolation valves for the 32 auxiliary boiler feedwater pump and the third, PCV-1139 serves as the steam admission for the auxiliary turbine. All three valves were to be stroke timed in the open and close direction per the licensee's inservice testing (IST) program. Normally, valves 1310A and 1310B are open and 1139 is in the closed position. The 1310A was stroked closed and then failed to come off its seat when the operators attempted to stroke it open. Minor maintenance was performed to loosen the valve off of its seat and adjust the valve packing. Additionally, on March 10, the 1310A valve was tested in accordance

with 3PT-R20A, Auxiliary Boiler Feed Pump Room Temperature Sensor," a test used to verify the operability of the auxiliary boiler feedwater pump room temperature sensors. Once again the valve failed to open after it was seated. A review of this valve's past performance revealed that it has experienced this problem several times.

The maintenance engineer performed a thorough review of the failure of valve 1310A to open. It appears that there are several factors that contribute to the valve becoming stuck in its seat. First, the air operated actuator installed on this valve is one size larger than the vendor recommended version, which provides additional seating force. Secondly, the valve originally had an air regulator installed on the actuator to moderate the air force used to seat the valve. In order to facilitate faster closing times, the air regulator was removed via plant modification 85-3-092. The design of the valve is to seat tightly and it appears that the additional air pressure present without an air regulator on the line serves to wedge the valve into its seat too tightly. Corrective actions for this problem include, installing a temporary regulator on the instrument air line of the valves actuator. By adjusting the regulator and then recording the performance of the valve at different air pressures, the maintenance engineer can recommend a suitable permanent modification for the valve. The inspector concluded that the maintenance engineer performed an extensive review of this issue and made technically sound recommendations to address the problem.

c. Conclusions

The licensee performed a thorough review for the auxiliary steam driven feed pump steam isolation valve's failure to open following testing. Although this valve is always in its open safety position and does not have a safety function to stroke open, the maintenance engineer performed an extensive review of this issue. The diagnostic testing of this valve provided sound technical information on which to base decisions for future modifications to enhance performance. Additionally, developing baseline data using a temporary pressure regulator allowed for a high quality solution that is most suited for the valve type.

E7 Quality Assurance in Engineering

E7.1 Emergency Diesel Room Carbon Dioxide Control System (VIO 98001-03)

a. Inspection Scope (92700)

The inspector reviewed licensee event reports (LERs) 97010-00 and 97010-01 documenting a condition in which only one emergency diesel generator was operable while in the cold shutdown condition.

b. Observations and Findings

On June 18, 1997, while removing a carbon dioxide relay box cover, a nuclear plant operator inadvertently dropped the cover on the 32 emergency diesel room CO_2 control panel. The shock from the dropped cover caused the momentary actuation of relay contacts in the control panel. As a result, the 32 emergency diesel room ventilation was lost and several alarms associated with the fire protection system were actuated. No carbon dioxide was discharged into the room.

The 32 emergency diesel generator (EDG) was declared inoperable due to the loss of ventilation. The design room temperature for the EDG is 126°F and is based on the qualification temperature of the switchgear. The loss of the ventilation system would cause the room temperature to exceed design. The combustion air for the diesel engine was not affected because combustion air is supplied from outside the room through a snorkel. At the time the 32 EDG was declared inoperable, the 31 EDG was out of service for maintenance. As a result, only the 33 EDG was operable. The 32 emergency diesel room ventilation was reestablished and the 32 EDG was declared operable about 45 minutes after the initiation of the event.

The licensee documented in LER 97-10 that a postulated inadvertent actuation of the CO_2 control system concurrent with a loss of offsite power could be mitigated by manual restoration of the ventilation systems. The licensee estimated that manual restoration of the ventilation systems would require about 15 minutes. Although the licensee indicated that the emergency diesel room temperatures would exceed 126°F in about five minutes based on an engineering calculation, the calculation was conservative and did not assume the reduced temperature contribution from the discharge of cold CO_2 into the room. Subsequent to the licensee's submittal of the LER, the licensee completed a test of the heatup of the EDG room and determined that at least 30 minutes would be available before unacceptable room temperatures occur. As a result, the licensee is considering revising the LER to reflect that the 32 EDG, although degraded, was operable.

During the investigation of this event, the licensee identified a potential common mode failure of the CO_2 control systems for the 31, 32 and 33 emergency diesel rooms. The CO_2 control panels were vulnerable to natural phenomena because the panels were not seismically qualified nor protected from damage induced by a seismic event. The inadvertent operation of relays due to natural events may cause the inadvertent discharge of CO_2 into the diesel rooms and the isolation of the diesel room ventilation systems. This CO_2 system was installed by modifications in 1980. The licensee concluded that the modifications were inadequate in that they failed to recognize the interactions of the CO_2 control systems with the diesel room ventilation systems and the requirement for the EDGs to remain functional after a seismic event.

The licensee took several actions to address the design deficiency. The licensee disabled the CO_2 control system to prevent any potential adverse impact on the EDG ventilation systems. Fire watches were established to compensate for disabling the CO_2 control system. Annunciator response procedure ARP-15, "Panel

SMF - Safety Injection" and ARP-27, "Fire Display Control Panel," were revised to address the system interlocks and subsequent actions if expected conditions such as a fire does not occur. The licensee committed to install a seismically qualified auxiliary CO_2 control panel by May 15, 1998. This panel will prevent inadvertent operation from seismic, tornado generated missiles or adverse environment interactions.

Regarding the extent of condition review, the licensee committed to perform a review of the fire protection system to ensure that there are no system interlocks with safety-related systems which can adversely affect that safety-related system or component. Also, the licensee committed to perform a review of plant ventilation systems, which provide a support function to safety-related systems and components to ensure that no interlocks exist that could adversely affect the function of the safety-related systems or components. The licensee committed to completing this item by April 17, 1998.

However, the licensee identified a missed opportunity to identify and correct this deficiency in March 1995. A concern was raised regarding a seismic event initiating a common mode CO_2 control system failure which would isolate ventilation in all three EDG rooms. The inspector noted the licensee's review of the failure to identify and correct the CO_2 control system vulnerability in 1995 was not thorough. The inspector observed no documentation in the deviation event report package that indicated that the licensee conducted a detailed review of the causes of the ineffective corrective action. Instead, the licensee indicated generically that improvements were made in the corrective action process since 1995, which should provide additional assurance that such missed opportunities are prevented in the future. However, the inspector considered that the lack of review the specific circumstances surrounding the failure to identify and correct the CO_2 control system deficiency in 1995 did not assure that similar occurrences would be prevented.

As a result of the observation of a lack of thorough review in 1995, the inspector reviewed the circumstances in 1995 that lead to the failure to identify and correct a the concern associated with the CO_2 control systems. The inspector identified two concerns in the course of this review. The first concern was that the issues identified in 1995 deviation event report (DER) appeared to be handled outside the corrective action process. In 1995, DER 95-397 was closed based on engineering judgement by fire protection contractors on the seismic ruggedness of the CO_2 control systems. This engineering judgement was documented in a memorandum dated March 24, 1995. However, the inspector inferred from memoranda dated April 27, 1995, and October 19, 1995, that the DER originator may not have agreed with the conclusions in the memorandum of March 24, 1995. The inspector considered that this issue was resolved informally and outside the corrective action process.

The second concern was the inadequate engineering conclusions which did not fully address this issue. The three engineering memoranda (dated March 24, April 27 and October 19, 1995) were narrowly focused. In the memorandum dated March 24, 1995, the structural engineering group was not involved. As a result,

the potential for non-seismic structures to fall on the CO_2 control panels was not considered. In the memorandum dated April 27, 1995, the basis for the acceptability of the CO_2 control system was poorly documented and did not thoroughly review the acceptability of operator action to maintain emergency diesel generator operability. In the memorandum dated October 19, 1995, engineering was narrowly focused on the fact that the general design criteria did not specify the CO_2 control system to be seismic, and did not consider the potential impact of this system on the operability of the emergency diesel generators.

c. Conclusion

Inadequate modifications in 1980 resulted in the potential adverse impact of the carbon dioxide (CO_2) control systems on the emergency diesel room ventilation systems. Although this inadequacy was an old design issue, the licensee failed to identify and correct this significant condition adverse to quality in 1995 when the concern regarding the CO_2 control system was raised. When this issue was identified again in 1997, the licensee conducted a thorough extent of condition review with regard to potential fire protection and ventilation system vulnerabilities. However, the licensee did not thoroughly review the reasons for the failure to identify and correct the deficiency in 1995. The failure to take adequate corrective actions in 1995 is another example of a violation of 10 CFR Part 50, Appendix B, Criterion XVI. **(VIO 98001-03)**

E8 Miscellaneous Engineering Issues (92700, 92903)

E8.1 (Closed) Unresolved Item 50-286/96008-03: potential for waterhammer and inadequate flows due to two phase flow in the fan cooler units. Inspection report 50-287/96008 discusses the inspector's review of the licensee's design calculations for service water flows in the fan cooler units. Generic Letter 96-06, "Assurance of Equipment Operability and Containment Integrity Design-Basis Accident Condition," issued September 30, 1996, requested that licensee's evaluate the susceptibility of their service water piping in the fan cooler units to determine if the systems were susceptible to waterhammer under design basis accident conditions. By letters dated January 28 and March 3, 1997, the licensee responded to the requests in GL 96-06 by submitting the calculations and plans for evaluation regarding the potential for waterhammer in the FCU's. By letter dated September 16, 1997, the NRC made a request for additional information (RAI) regarding the licensees response to GL 96-06. The licensee responded to the RAI by letter dated October 14, 1997. Currently, the Office of Nuclear Reactor Regulation of the NRC is reviewing the submittals by the licensee and will be issuing a safety evaluation report in order to close out the Indian Point Unit 3 generic letter 96-06 response. The inspector considers this item administratively closed.

E8.2 (Closed) Licensee Event Reports 50-286/97010-00 and 97010-01: These LERs described a design deficiency in which the carbon dioxide control system adversely impacted the emergency diesel room ventilation system. This issue is described in detail in section E7.1 of this inspection report. Based on the documented review in section E7.1, the LERs are closed.

E8.3 (Closed) Licensee Event Report (LER) 50-286/97012-00: This LER concerned the degradation of core exit thermocouples due to an original manufacturing defect. This manufacturing defect allowed moisture intrusion into the thermocouple tip area. The moisture intrusion may cause the thermocouple to fail at elevated temperatures due to steam formation inside the thermocouple sheathing. During refueling outage 9, the licensee tested the core exit thermocouples qualified in accordance with Regulatory Guide 1.97 for potential moisture intrusion. The licensee identified that the thermocouples did not meet the established acceptance criteria for insulation resistance.

During the refueling outage, the inspector observed that the licensee took the appropriate actions to return the required number of qualified in-core thermocouples to service through either the upgrade of non-qualified in-core thermocouples or replacement. The licensee exhibited a strong commitment to these efforts as evidenced by the adverse impact on the outage schedule in order to complete this effort. During this inspection period, the inspector conducted an in-office review of the LER. The inspector considered the LER adequate. No violations of NRC requirements were identified.

E8.4 (Closed) Licensee Event Report (LER) 50-286/97032-00: This LER described an event in which the breaker to the 32 residual heat removal pump motor failed to open. The operator performance aspects of this event were discussed in NRC inspection report 50-286/97011. The engineering and maintenance aspects of this event were discussed in NRC special inspection report 50-286/97081. From these inspections, no violations were identified with respect to the failure of the breaker to open.

During this inspection period, the inspector conducted an in-office review of the LER. The inspector considered that the LER was adequate and provided no new information that would affect the conclusions developed in NRC inspection reports 50-286/97011 and 97081. Based on this in-office review, this LER is closed.

E8.5 (Closed) Licensee Event Report (LER) 50-286/97030-00: This LER pertains to a non-conservative setpoint which arms the licensee's ATWS mitigating system actuation circuitry. The details of the identification and short term resolution of this issue were reported in NRC inspection report 50-286/97010. The licensee developed a set point change to be implemented in the next refueling outage. The inspector performed an in-office review and identified no violations. LER 97030-00 is closed.

E8.6 (Closed) Violation 50-286/96001-02: three examples of incomplete engineering by the design engineering group. NRC inspection report 50-286/96001 identified: (1) the design change for the service water flange failed to address the design requirements of the original flange design, (2) the design change for the emergency generator lube oil check valves failed to address the structural requirements of the supports used by the original design and (3) the temporary modification of the instrument air system failed to address the cleanliness requirements of the original design.

The inspector reviewed the licensee's response to the violation as documented in a NYPA letter to the NRC dated May 16, 1996. The inspector considered the documented corrective actions to be reasonable. In addition, the inspector independently verified the completion of selected corrective actions documented in the NYPA response to the violation. These corrective actions were: (1) the revision of design change 95-3-028, "Service Water FCU #32 Flange Belzona Repair," to reflect a clear statement of its purpose and prerequisites, (2) the conduct of a meeting between engineering management and maintenance and planning supervisors on the lessons learned from design change 96-03-053, "Emergency Diesel Generators 31, 32 and 33, and Appendix R Diesel Generator One-Inch Lube Oil Check Valve Replacement," and (3) the revision of procedure AP-13,"Temporary Modifications," to reflect cleanliness requirements.

The inspector verified by review of controlled microfiche that the purpose and pre-requisites were clarified in design change 95-03-028, revision 2. The inspector verified that the engineering management meeting with maintenance and planning supervisors was documented. Based on the observed attendance sheet, the inspector concluded that meetings were conducted on May 15, 17, 20 and 21, 1996. However, the documentation did not indicate who within engineering management conducted the meetings with maintenance and planning supervisors. The inspector interviewed the person who was the procurement engineering supervisor in May 1996. This individual indicated that he met with the maintenance and planning supervisors. The inspector also reviewed procedure AP-13, revision 21, and verified, in step 4.1.12, that the requirement of cleanliness was incorporated. Based on the inspector's review, this violation is closed.

E8.7 (Closed) Violation 50-286/97001-05: failure to fulfill a fire brigade training requirement. NRC inspection report 50-286/97001 documented a violation in which several members of the Indian Point 3 fire brigade exceeded the frequency for receiving hands-on periodic training in fire extinguishment as established in an NRC safety evaluation event report (SER) dated May 2, 1980. The SER stated the frequency of this training was annual. The SER was based on other documents which established annual to mean regular intervals not to exceed one year. However, the licensee's fire protection program inappropriately interpreted annual to mean once per calendar year.

The licensee responded to the violation by letter dated May 28, 1997. The inspector considered the licensee's response to the violation appropriate and reviewed selected parts of the commitments identified in the letter. Specifically, the inspector reviewed nuclear safety evaluation (NSE) 96-03-175FP, revision 1, which provided the basis for establishing a new periodicity for hands-on training that is 12 months with an allowable maximum extension of three months. Based on the review, the inspector considered the NSE to be reasonable and that the revision did not degrade the fire protection program. The inspector verified that administrative procedure TNG-AD-16, revision 2, "Fire Protection Training Program," reflected the revised periodicity. In addition to verifying selected parts of the licensee's commitments, the inspector reviewed fire brigade training records for 1996 and 1997. The inspector selected the training records for five fire brigade members and

verified that hands-on training was conducted within the new periodicity. Based on this review, this violation is closed.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Radiological Controls-External and Internal Exposure

a. Inspection Scope (83750)

The inspector reviewed the licensee's control of external and internal exposures, specifically, whole-body, skin, extremity, and internal exposure results since the last inspection, quality control measures in the personal dosimetry program, control of exposures of declared pregnant women, control of locked high radiation areas, and posting and labeling practices. Information was gathered through observation of activities, tours of the main radiologically controlled area (RCA) including the primary auxiliary building (PAB), radioactive machine shop (RAMS), and fuel storage building (FSB), discussions with cognizant personnel, and review and evaluation of procedures and documents.

b. Observations and Findings

Control of external occupational exposures was implemented effectively. Individual exposure results for 1997 and for the start of 1998 and selected personal dose record files were reviewed and met regulatory requirements. A review of several radiation work permits (RWPs) and the observed radiological work activity for the transfer of a radioactive waste high integrity container between two shielded containers demonstrated that appropriate protective clothing requirements, personnel protective equipment requirements, and instructions were provided commensurate with the radiological conditions. The inspector noted active HP coverage within the RCA. Use of teledosimetry to reduce occupational exposure incurred while performing routine surveys was evident. Changes had been made to the physical layout of the main HP control point which increased the ability of HP personnel to control ingress and egress from the RCA and to provide HP assistance to the radiation workers.

Control of internal occupational exposures was implemented effectively. There were only two recorded (equal to or greater than 10 millirem) individual internal exposure results for 1997 and none for the start of 1998. Each of the two recorded individual internal exposure results for 1997 was less than 20 millirem.

c. Conclusions

Control of external and internal occupational exposures was implemented effectively.

R1.2 Radiological Controls-Radioactive Materials, Contamination, Surveys, and Monitoring

a. Inspection Scope (83750)

The inspector reviewed the licensee's control of radioactive materials, contamination, surveys, and monitoring, specifically verification of operability of selected area radiation monitors, the calibration of survey and monitoring instruments, proper use of personnel monitors and friskers, availability of survey information, licensee evaluation of contamination events, decontamination efforts, efforts to reduce the volume of contaminated trash, and record keeping for decommissioning planning. Information was gathered through observation of activities, tours of the RCA including the PAB, RAMS, and FSB, discussions with cognizant personnel, and review and evaluation of procedures and documents.

b. Observations and Findings

Overall, control of radioactive materials and contamination was generally effective. During tours of the RCA, the inspector verified that radiation areas were properly posted and controlled. Additional information was supplied along with the required postings to make individuals aware of potential radiation exposures and to minimize their exposures. Properly calibrated personal frisking equipment was available in adequate numbers. Selected calibration procedures and records were reviewed and found to be adequate. Containers for potentially contaminated reusable protective clothing, for potentially contaminated disposable items, and for uncontaminated items (green-is-clean) were readily available. The licensee was continuing efforts to decontaminate additional floor space in the waste holdup tank area, one of the last areas where operators needed to wear protective clothing while performing routine inspections. A travel path through this area had recently been released as uncontaminated, and this allowed operators to perform routine inspection activity without the need for wearing protective clothing.

The licensee self-identified this program area as an area for improvement in performance. This was based on a trend involving a combination of self-identified minor deficiencies involving free release of materials in a few cases, improper placement of potentially contaminated items in waste receptacles designated for uncontaminated items in several instances, several discrepancies in shipments of radioactive materials, and the fact that the 1997 annual goal for the personnel contamination event rate had been slightly exceeded (10 versus 10.9 events per 10,000 RCA entries, goal and actual rate respectively). Accordingly, the licensee established a twelve-point action plan for improvement which was being tracked as ACTS (Action and Commitment Tracking System) items. In addition, the licensee established a challenging 1998 goal of 5 events per 10,000 entries.

c. Conclusions

Overall, control of radioactive materials and contamination was generally effective. Minor deficiencies were identified through self-assessment activities and were being appropriately addressed.

R1.3 Radiological Controls-As Low As Reasonably Achievable (ALARA)

a. Inspection Scope (83750)

The inspector reviewed the licensee's ALARA program, specifically staffing, basis for establishment of goals and objectives, radiation exposure reduction methods, worker awareness of ALARA, ALARA job reviews, and comparison of actual dose to goal projections. Information was gathered through tours of the RCA including the PAB, RAMS, and FSB, discussions with cognizant personnel, and review and evaluation of procedures and documents.

b. Observations and Findings

Performance in ALARA continued to be aggressive. The licensee had set a challenging 1997 outage person-rem goal of 160 which, if met, would have become the lowest refueling outage person-rem total for this plant since the lowest previous refueling outage actual person-rem total was 164. This goal was based on the then-defined outage work scope and an outage length of 60 days. The actual person-rem for the 1997 outage was 207. This included person-rem attributed to additional work scope, identified after the start of the outage, and the effect of the actual outage length of 121 days. The 1997 annual person-rem total of 234 was their second lowest refueling year exposure total and resulted in a three-year rolling average of 105 (industry top quartile status). The person-rem goal for 1998 was set at 22 which included an operational goal of 17.5 and which challenged their previous best performance of 22.2.

Program and procedural changes to improve effectiveness continued. The ALARA procedures had been further revised with additional requirements being moved into other procedures, such as the RWP procedure, to emphasize that ALARA was everyone's responsibility. The only ALARA-specific procedure to remain as such was the temporary shielding procedure.

During tours, the inspection noted the use of signs designating ALARA waiting areas and the use of temporary shielding in the RCA and, outside the RCA, an ALARA bulletin board and posters encouraging dose reduction. During discussions with ALARA personnel, the licensee stated the trigger levels for ALARA job reviews were being lowered in order to facilitate meeting the 1998 annual person-rem goal. The inspector reviewed several 1998 post-job reviews, one for 18 millirem expended and another for 33 millirem expended.

c. Conclusions

Performance in ALARA continued to be aggressive. Program and procedural changes to improve effectiveness and a challenging annual person-rem goal for 1998 were good initiatives.

R7 Quality Assurance, Appraisals, Self-Assessments, and Problem Identification/Resolution in RP&C Activities

a. Inspection Scope (83750)

The inspector reviewed the quality assurance (QA), appraisal, self-assessment, and problem identification activities to determine the effectiveness of problem identification and resolution, specifically selected audits, appraisals, and self-assessments, and problem identification experience were reviewed for number and quality of findings, elevation, analysis, and corrective action for same, and expansion of scope. Information was gathered through discussions with cognizant personnel and review and evaluation of documents.

b. Observations and Findings

The quality assurance audits, appraisals, and self-assessment efforts were frequent and generally thorough. The inspector reviewed QA audits of the qualifications of contracted health physics technicians and of the continuing training program for licensee health physics technicians. These audits were detailed and resulted in several recommendations. Numerous self-assessments and issue evaluations were inspected and were found to be normally detailed and self-critical. Some of these were of only average depth and of limited scope. The number and type of DERs (Deviation and Event Reports) and RERs (Radiological Event Reports) identified by the licensee indicated that such deficiencies were being identified by licensee personnel for corrective action and program improvement.

The evaluations and corrective actions for findings were usually detailed and effective. The trend in control of radioactive materials and contamination control and subsequent corrective action plan were discussed in Section R1.2. A QA audit found deficiencies in the continuing training program for licensee health physics technicians. Again, the licensee identified this as an area for improvement, developed and documented an action plan to resolve the deficiencies, and was tracking the completion of related action items in the ACTS.

c. Conclusions

The quality assurance audits, appraisals, and self-assessment efforts were frequent and generally thorough. The evaluations and corrective actions for findings were usually detailed, appropriate, and tracked for completion.

S1 Conduct of Security and Safeguards Activities

a. Inspection Scope (81700)

Determine whether the conduct of security and safeguards activities met the licensee's commitments in the NRC-approved security plan (the Plan) and NRC regulatory requirements. The security program was inspected during the period of February 17-20, 1998. Areas inspected included: access authorization program;

alarm stations; communications; protected area access control of personnel and packages.

b. Observations and Findings

Access Authorization Program. The inspector reviewed implementation of the Access Authorization (AA) program to verify implementation was in accordance with applicable regulatory requirements and Plan commitments. The review included an evaluation of the effectiveness of the AA procedures, as implemented, and an examination of AA records for 8 individuals. Records reviewed included both persons who had been granted and had been denied access. The AA program, as implemented, provided assurance that persons granted unescorted access did not constitute an unreasonable risk to the health and safety of the public. Additionally, the inspector verified by reviewing access denial records and applicable procedures, that appropriate actions were taken when individuals were denied access or had their access terminated which included a formalized process that allowed the individuals the right to appeal the licensee's decision.

Alarm Stations. The inspector observed operations of the Central Alarm Station (CAS) and the Secondary Alarm Station (SAS) and verified that the alarm stations were equipped with appropriate alarms, surveillance and communications capabilities. Interviews with the alarm station operators found them knowledgeable of their duties and responsibilities. The inspector also verified, through observations and interviews, that the alarm stations were continuously manned, independent and diverse so that no single act could remove the plant's capability for detecting a threat and calling for assistance and the alarm stations did not contain any operational activities that could interfere with the execution of the detection, assessment and response functions.

Communications. The inspector verified, by document reviews and discussions with alarm station operators, that the alarm stations were capable of maintaining continuous intercommunications, communications with each security force member (SFM) on duty, and were exercising communication methods with the local law enforcement agencies as committed to in the Plan.

Protected Area (PA) Access Control of Personnel and Hand-Carried Packages. On February 18 and 19, 1998, the inspector observed personnel and package search activities at the personnel access portal. The inspector determined, by observations, that positive controls were in place to ensure only authorized individuals were granted access to the PA and that all personnel and hand carried items entering the PA were properly searched.

c. Conclusions

The licensee was conducting its security and safeguards activities in a manner that protected public health and safety. This portion of the program, as implemented, met the licensee's commitments and NRC requirements.

S2 Status of Security Facilities and Equipment

a. Inspection Scope (81700)

Areas inspected were: PA assessment aids; PA detection aids and personnel search equipment.

b. Observations and Findings

Assessment Aids. On February 19, 1998, the inspector evaluated the effectiveness of the assessment aids, by observing on closed circuit television (CCTV), a SFM conducting a walkdown of the PA. The assessment aids had good picture quality and excellent zone overlap. Additionally, to ensure Plan commitments are satisfied, the licensee has procedures in place requiring the implementation of compensatory measures in the event the alarm station operator is unable to properly assess the cause of an alarm.

PA Detection Aids. On February 17, 1998, the inspector observed testing of all the intrusion detection systems in the plant protected area. Two of the zones failed to detect intrusion attempts made by the SFM, as required by the licensee's testing procedure. Upon detection of the failures, the licensee implemented immediate corrective actions which included the establishment of compensatory measures and submission of a work order to the instrumentation and controls (I&C) department. The inspector determined, by observations and by reviewing the testing documentation associated with the equipment repairs, that the repairs were made in a timely manner and that the equipment was functional and effective, and met the requirements of the Plan.

Personnel and Package Search Equipment. The inspector observed both the routine use and the daily performance testing of the licensee's personnel and package search equipment. Personnel search equipment was being tested and maintained in accordance with licensee procedures and the Plan and personnel and packages were being properly searched prior to PA access.

However, while observing licensee testing of the explosive detector, it was noted that the testing procedure, used as guidance by the SFM conducting the testing, failed to contain definitive guidance in the event the equipment failed to detect the test sample. The licensee's practice was to retest the equipment until it passed and not take the equipment out of service. This practice only existed with the testing criteria associated with the explosive detector. Based on a review of the remaining security equipment testing procedures, definitive guidance does exist in the event the equipment failed the required testing to include taking the equipment out of service and if needed, implementing compensatory posting. The licensee immediately implemented corrective actions which included revising the applicable procedure and retraining the security force on the revised testing criteria. The inspector determined, by observations and procedural reviews, that the search equipment performs in accordance with licensee procedures and Plan commitments.

c. Conclusions

The licensee's security facilities and equipment were determined to be well maintained and reliable and except as noted, were able to meet the licensee's commitments and NRC requirements.

S3 Security and Safeguards Procedures and Documentation

a. Inspection Scope (81700)

Areas inspected were: implementing procedures and security event logs.

b. Observations and Findings

Security Program Procedures. The inspector verified that the procedures were consistent with the Plan commitments, and were properly implemented. The verification was accomplished by reviewing selected implementing procedures associated with PA access control of personnel, testing and maintenance of personnel search equipment and the vehicle barrier system.

Security Event Logs. The inspector reviewed the Security Event Log for the previous seven months. Based on this review, and discussion with security management, it was determined that the licensee appropriately analyzed, tracked, resolved and documented safeguards events that the licensee determined did not require a report to the NRC within 1 hour.

c. Conclusions

Security and safeguards procedures and documentation were being properly implemented. Event logs were being properly maintained and effectively used to analyze, track, and resolve safeguards events.

S4 Security and Safeguards Staff Knowledge and Performance

a. Inspection Scope (81700)

Area inspected was security staff requisite knowledge.

b. Observations and Findings

Security Force Requisite Knowledge. The inspector observed a number of SFMs in the performance of their routine duties. These observations included alarm station operations, personnel and package searches, intrusion detection system testing, and exterior patrol alarm response. Additionally, the inspector interviewed SFMs and based on the responses to the inspector's questioning, determined that the SFMs were knowledgeable of their responsibilities and duties and could effectively carry out their assignments.

c. Conclusions

The SFMs adequately demonstrated that they have the requisite knowledge necessary to effectively implement the duties and responsibilities associated with their position.

S5 Security and Safeguards Staff Training and Qualifications (T&Q)

a. Inspection Scope (81700)

Areas inspected were security training and qualifications and training records.

b. Observations and Findings

Security Training and Qualifications. On February 19, 1998, the inspector randomly selected and reviewed T&Q records of 7 SFMs. Physical and requalification records were inspected for armed and supervisory personnel. The results of the review indicated that the security force was being trained in accordance with the approved T&Q plan.

Training Records. The inspector was able to verify, by reviewing training records, that the records were properly maintained, accurate and reflected the current qualifications of the SFMs.

c. Conclusions

Security force personnel were being trained in accordance with the requirements of the T&Q Plan. Training documentation was properly maintained and accurate and the training provided by the training staff was effective.

S6 Security Organization and Administration

a. Inspection Scope (81700)

Areas inspected were management support, effectiveness and staffing levels.

b. Observations and Findings

Management Support. The inspector reviewed various program enhancements made since the last program inspection, which was conducted in June 1997. These enhancements included the procurement of an electronic documentation imaging system to reduce record storage and a photo identification badging system to improve badging efficiency.

Management Effectiveness. The inspector reviewed the management organizational structure and reporting chain. The Security Manager's position in the organizational structure provides a means for making senior management aware of programmatic needs. Senior management's positive response to requests for equipment, training

and resources, in general, has contributed to the effective administration of the security program.

Staffing Levels. The inspector verified that the total number of trained SFMs immediately available on shift meets the requirements specified in the Plan. However, the inspector noted that SFMs are presently working 25%-35% overtime due to low staff levels. The inspector discussed the overtime concerns with security management and was informed, by security management, that to reduce overtime concerns, seven new hires are scheduled to begin initial qualification training the week of February 23, 1998.

c. Conclusions

The level of management support was adequate to ensure effective implementation of the security program, and was evidenced by the hiring of additional security force members and the allocations of resources to support programmatic needs.

S7 Quality Assurance in Security and Safeguards Activities (VIO 98001-05)

a. Inspection Scope (81700)

Areas inspected were: audits, problem analyses, corrective actions and effectiveness of management controls.

b. Observations and Findings

Audits. The inspector reviewed the 1997 QA audit of the fitness-for-duty (FFD), conducted January 18 - 23, 1998, (Audit No. 97-171) and the 1997 QA audit of the access authorization (AA) program, conducted January 13 - 17, 1997, (Audit No. 97-01W). To enhance the effectiveness of the audits, both audit teams included an independent technical specialist.

The FFD audit report identified no findings and two recommendations. The inspector determined, based on discussions with the FFD Coordinator, that the recommendations would enhance program effectiveness.

The AA audit identified no findings and three recommendations. However, the inspector determined that the audit was not performed in accordance with regulatory requirements and licensee commitments. The determination was based on the audit teams' use of a Nuclear Energy Institute (NEI) document, (94-02), Part 2, titled "Standardized Access Authorization Audit Checklist," as the method of auditing the licensee's AA program. This particular audit checklist was developed by NEI, for use by industry auditors when conducting shared audits of licensee-approved contractor/vendor access authorization programs, not for the auditing of the licensee's program. Additionally, this document was not endorsed by the NRC and several key elements of the licensee's program were excluded during the audit process, including the evaluation criteria for unescorted access and grandfathering of employees under the provisions of 10 CFR 73.56. The licensee's failure to

properly audit the access authorization program is a violation of NRC requirements. **(VIO 50-286/98001-05)**

Problem Analyses. The inspector reviewed data derived from the security department's self-assessment program. Potential weaknesses were being properly identified, tracked, and trended.

Corrective Actions. The inspector reviewed corrective actions implemented by the licensee in response to the QA audit and self-assessment programs. The corrective actions were effective as evidenced by a reduction in personnel performance issues and loggable safeguards events.

Effectiveness of Management Controls. The inspector observed that the licensee has programs in place for identifying, analyzing and resolving problems. They include the performance of annual QA audits, a departmental self-assessment program and the use of industry data such as violations of regulatory requirements identified by the NRC at other facilities, as a criterion for self-assessment.

c. Conclusions

The review of the licensee's audit program indicated that the AA audit was inadequate in scope and depth, resulting in a violation of NRC requirements. However, a review of the documentation applicable to the self-assessment program indicated that the program was effectively implemented to identify and resolve potential weakness.

S8 Miscellaneous Security and Safeguards Issues

S8.1 (Closed) Violation 50-286/97006-05: During the previous security inspection conducted in July 1997, the inspector determined, based on discussions with security management, observations, and document reviews, that the licensee failed to control vital area personnel access as required in the Plan and applicable procedures.

With respect to this violation, the inspector determined that the corrective actions described in the licensee's September 29, 1997 letter, in response to the NRC's Notice of Violation were reasonable, complete and appeared to be effective. This violation is closed.

S8.2 (Closed) Licensee Event Report (LER) 50-286/97026-00: This LER concerned a contractor requesting access to the Indian Point 3 facility who had falsified the background information requested in the processing documents. A regional security inspector conducted an in office review of this LER and identified no violations. The inspectors consider this LER closed.

V. MANAGEMENT MEETINGS

X1 Exit Meeting Summary

Regional inspectors conducted exit meetings on February 20, 1998, concerning security and safeguards findings and on February 27, 1998, concerning radiological protection findings. The resident inspectors presented the inspection results to members of the licensee's management at the conclusion of the inspection on March 27, 1998. The licensee acknowledged the findings presented.

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

ATTACHMENT 1

PARTIAL LIST OF PERSONS CONTACTED

Licensee
R. Barrett, Site Executive Officer
J. Comiotes, GM-Operations
L. Dauer, Radiological Engineering Supervisor
R. Deschamps, General HP Supervisor
J. DeRoy, Director, IP3 Engineering
D. Mayer, RES Manager
J. Odendahl, Security Manager
K. Peters, Licensing Manager
J. Russell, General Manager-Maintenance

NRC
J. McFadden, Radiation Specialist
G. Wunder, Project Manager
B. Wetzel, Project Manager (GL96-06)

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 83750	Occupational Radiation Exposure
IP 92700:	Onsite Followup of Written Reports of Nonroutine Events
IP 92903	Followup - Engineering
IP 92901	Followup - Plant Operations
IP 81700	Physical Security Program for Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

NCV 98001-01	Three examples of failure to follow procedures concerning protective tagging and surveillance testing
VIO 98001-02	Two examples of inadequate procedures concerning EDGs and SW
VIO 98001-03	Inadequate corrective actions in response to a FCU breaker failure and an EDG ventilation-CO_2 interaction design deficiency
NCV 98001-04	Failure to follow the temporary modification process
VIO 98001-05	Failure to properly audit the access authorization program

Closed

IFI 94026-03	Selective sampling of commitments needs verification
LER 97010-00	Less than the required number of EDGs were operable
LER 97010-01	Less than the required number of EDGs were operable

LER 97012-00	Condition causing multiple core exit thermocouples inoperable
LER 97026-00	False background information for a contractor access authorization request
LER 97030-00	Non-conservative setpoint that arms the licensee's ATWS mitigation system actuation circuitry
LER 97032-00	480 Volt bus inoperable due to failure of 32 RHR pump to open
NCV 98001-01	Three examples of failure to follow procedures concerning protective tagging and surveillance testing
NCV 98001-04	Failure to follow the temporary modification process
URI 96008-03	Resolve potential for waterhammer and inadequate flows
URI 97009-02	Failure to follow the temporary modification process
VIO 96001-02	Three examples of incomplete engineering by design engineering group
VIO 97001-05	Failure to fulfill annual fire brigade training requirement
VIO 97006-05	A vital area was left unlocked and unalarmed for 19 days
VIO 97007-01	Five examples of inadequate procedures/plant transients

LIST OF ACRONYMS USED

AA	Access authorization
ABFP	Auxiliary Boiler Feed Pump
ACTS	Action and Commitment Tracking System
ALARA	As low as reasonably achievable
AP	Administrative procedure
ARP	Annunciator response procedure
ATWS	Anticipated Transient Without Scram
CAS	Central Alarm Station
CCTV	Closed circuit television
COL	Checkoff list
DER	Deviation and event report
EDG	Emergency diesel generator
FCU	Fan cooler unit
FFD	Fitness for duty
FSAR	Final safety analysis report
FSB	Fuel storage building
FSS	Field Support Supervisor
GL	Generic letter
HP	Health physics
HPE	Human performance errors
I&C	Instrument & controls
IFI	Inspector followup item
IMC	Inspection manual chapter
IP3	Indian Point 3
IST	Inservice testing
LCI	Load Commutated Inverter
LEFM	Leading edge flow meters
LER	Licensee event report

LOOP	Loss of offsite power
NCV	Non cited violation
NEI	Nuclear Energy Institute
NPO	Nuclear plant operator
NSE	Nuclear safety evaluation
NUMARC	Nuclear Management Resources Council
PA	Protected area
PAB	primary auxiliary building
PDR	Public Document Room
PERC	Performance enhancement review committee
PID	Problem identification deficiency
PTO	Protective Tag Out
QA	Quality Assurance
RAI	Request for additional information
RAMS	Radioactive machine shop
RCA	Radiologically controlled area
RER	Radiological event report
RHR	Residual Heat Removal
RO9	Refueling outage 9
RP&C	Radiation Control and Chemistry
RWP	Radiation work permit
SAS	Secondary alarm station
SER	Safety evaluation report
SFM	Security force member
SOP	System operating procedure
SRO	Senior reactor operator
T&Q	Training and qualification
TPC	Temporary procedure change
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved item
VIO	Violation
WR	Work request