U.S. NUCLEAR REGULATORY COMMISSION

REGION I

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Report No.	96-10
Licensee:	New York Power Authority
Facility:	Indian Point 3 Nuclear Power Plant
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EXECUTIVE SUMMARY

Indian Point 3 Nuclear Power Plant
NRC Inspection Report No. 50-286/96-10

This integrated inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a seven-week period of resident inspection; in addition, it includes the results of inspections by two region-based inspectors.

Operations

The reactor remained critical throughout the period, however the generator was taken off line for several days due to problems induced by generator vibrations. Additionally, several minor power reductions were made due to generator vibration levels, and a turbine runback to 70 percent power occurred due to a blown fuse on the 31 static inverter. (Section O1.1)

The decision to take the unit off line and thoroughly inspect for loose hardware was conservative and proved to be prudent. Operations demonstrated good performance during this infrequently performed evolution. Two equipment problems challenged the operators during this evolution; however, the operators responded appropriately and obtained good support from maintenance and engineering. Additionally, operators responded well to the 345kV electrical disturbance. Activities were appropriately prioritized and independent walkdowns were utilized to identify affected equipment. (Sections O1.2, O1.3)

NYPA adequately addressed concerns related to the storage of category 1 parts. However, the evaluation and removal of parts that were not appropriate as control room consumables was slow. The evaluation of the programmatic concerns which identified the lack of a governing procedure was notable. The fuse control audit was an opportunity to assess the overall control of category 1 materials by operations, however the scope was only limited to fuses. This event was considered a minor violation and therefore is non-cited in accordance with section IV of the NRC Enforcement Policy. (Section O7.1)

NYPA's approach to determine whether the tactical assessment group coverage should be reduced was sound. The DER review committee is a good initiative to ensure that DERs are appropriately screened and that pertinent issues are raised. However, the effectiveness of the committee and the review process remains to be determined. (Sections O7.2, O7.3)

Maintenance

Maintenance performance during emergent repairs was good. The work related to generator vibrations was planned while the unit was being taken off line, and once authorized, the work proceeded efficiently. The licensee implemented the repair of the 314 emergency diesel room fan promptly and effectively. The coordination and scheduling of the repair efforts were excellent. The licensee has not yet completed the root cause evaluation of the recent fan failure. (Sections O1.2, M1.2)

The material condition of the backup service water system was poor as evidenced by the degraded conditions of the 37 service water pump (SWP) and several valves in the system. The backup SWP was previously not included in the preventive maintenance program, however, in response to the degraded pump, the backup service water system pumps are now scheduled for inspection every four years. (Section M1.3) Additionally there were other service water system material condition issues identified during this period. These included degraded service water check valves (Section E1.2) and a service water system leak. (Section E1.4)

NYPA developed a comprehensive plan to track and correct the electrical safety deficiencies noted in a February 1995 assessment. Significant progress has been made in correcting these deficiencies. (Section M8.1)

Engineering

The inspectors considered the development of the nuclear safety evaluation (NSE) and contingency plan a proactive response to the emergency diesel generator cooling fan failure. However, the NSE was inadequate because it did not assure that the 33 EDG would remain operable during the activity. The failure of the engineering review to identify this issue indicated a lack of attention in the area of engineering oversight. Additionally, PORC review of the NSE was ineffective in identifying this fundamental problem with the NSE. (Section E1.1)

Immediate corrective actions and extent of condition review in response to the degraded service water check valve SWN-1-5 were appropriate. However, the past engineering approach to these degraded conditions in the service water check valves reflected an acceptance of poor equipment design, in which the valve internal components were treated as consumables during preventive maintenance. (Section E1.2)

NYPA conducted a technically sound and thorough review of the inadvertent actuation of the 32 auxiliary boiler feedwater pump. Instrument and control department support and troubleshooting was timely and provided a basis for the operability determination. Engineering appropriately responded to a request for technical review of an operability concern for a minor service water system leak. (Sections E1.3, E1.4)

Plant Support

A radiological worker entered a contaminated area with only hand and foot protection in violation of the radiological work permit. The worker was not contaminated, and the immediate corrective actions were prompt and appropriate. The licensee had identified a series of contamination events, and were taking appropriate corrective actions. This is a minor violation of NRC requirements, and is being treated as a Non-Cited Violation, consistent with Section IV of the NRC Enforcement Policy. (Section R1.1)

The licensee conducted an unannounced, off-hours drill which demonstrated that the emergency response facilities could be staffed within an hour. The drill was effective in

identifying some deficiencies, for which the licensee appropriately initiated action to address. (Section P1.1)

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Summary of Plant Status

The plant began this inspection period at full power. On October 2, NYPA reduced reactor power to take the main generator off line for repair of an electrical conduit to a current transformer. The plant was returned to full power on October 5. Several minor power reductions were made beginning October 16 due to vibrations on the main generator lead box. Power was subsequently reduced to about 90% due to these vibrations on October 21. On October 28, a turbine runback to 70 percent power occurred due to a blown fuse on the 31 static inverter. The plant was returned to full power at the end of the inspection period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

The inspectors conducted frequent reviews of ongoing plant operations. Overall, the licensee conducted plant operations well. The inspector observed good performance in shift turnovers, communications and procedure adherence. Significant events and noteworthy observations are discussed below.

O1.2 Power Reduction for Main Generator Repairs

a. Inspection Scope (71707)

On October 2, 1996, NYPA identified a loose electrical conduit related to the main generator electrical protection circuit. NYPA management elected to take the unit off line to effect the repairs. The inspector observed the power reduction, the repairs and the return to power.

b. Observations and Findings

The loose conduit was a two-inch conduit containing wires from the "A" phase current transformer (CT). The CT's function is to detect electrical imbalances between the output leads from the main generator and would initiate a generator, turbine and reactor trip if problems were detected. The loose conduit was discovered by NYPA during a plant walkdown related to an operating experience (OE) issue on the isophase bolting discovered at another facility. One end of the conduit vibrated free of a junction box and had the potential to pinch or shear the CT wires inside. However, subsequent investigation indicated that the conduit had not slipped enough to pinch the wires.

After the identification, NYPA assembled a team to evaluate the risks and corrective actions. Concerns ranged from the potential plant trip risk if the wires were damaged, to the personnel safety risks associated with high voltages in the area of the conduit. After thorough evaluation, NYPA management decided to take the unit off line to perform the repairs.

Operations reduced power using normal plant operating procedures. The inspectors observed the evolution and noted good performance in operations. The evolution went smoothly with only one notable equipment malfunction. A control oil circuit for a main boiler feed water pump failed to operate properly. This caused a minor delay in the power reduction and caused the operators to shift to the other pump to control steam generator levels. NYPA has experienced problems in the past related to particulate contamination plugging control orifices in the control oil system. The system filters were cleaned and the problem was corrected prior to placing the unit back on line. NYPA engineering was evaluating this for long-term corrective actions.

In addition to repairing the initial conduit, NYPA thoroughly inspected other hardware and wire connections in the area for looseness. NYPA found similar looseness in other conduits as well as numerous loose bolts in the lead box support structure. However, no loose wire terminations were found in any of the junction boxes. The conduits were tightened using locktite in some applications, and the bolting was tightened. NYPA had been experiencing vibration problems in the main generator leadbox area which was causing the looseness. NYPA is planning an extensive generator overhaul during the next refueling outage which should correct this problem. In the interim, match marks were made on the CT conduits that will allow visual identification of looseness during subsequent operation.

The repairs were completed and the return to full power was started on October 3, 1996. The inspectors observed the evolution and again observed good performance from operations. The briefings were thorough with an appropriate focus on previous lessons learned. The control of the evolution was good with formal communications and appropriate procedure use.

Shortly after increasing turbine speed prior to synchronizing, a stator high differential temperature alarm was received. This was caused by a service water temperature control valve (TCV) to the hydrogen coolers that failed to function properly. Operators responded promptly to the alarm and took manual control of the TCV and restored temperatures prior to proceeding with generator synchronization. The reactor was returned to full power on October 5, 1996.

c. Conclusions

This event demonstrated excellent performance throughout the organization. The decision to take the unit off line and thoroughly inspect for loose hardware was conservative and proved to be prudent. Operations demonstrated good performance during this infrequently performed evolution. Two equipment problems challenged the operators, however, the operators responded appropriately and obtained good support from maintenance and engineering. Maintenance performance during the event was good. The work was planned while the unit was being taken off line, and once authorized, the work proceeded efficiently.

O1.3 Operations Response to a Grid Electrical Disturbance

a. Inspection Scope (71707)

On October 30, 1996, a significant electrical disturbance on the 345kV grid caused tripping of various plant equipment. The inspector observed the operations response and plant restoration following this disturbance.

b. Observations and Findings

The disturbance was apparently caused by a transformer fire at the Sprain Brook substation in Yonkers, New York. Although the plant remained on line, the tripping of support equipment created a challenge to plant operators. Support equipment such as the spent fuel pit cooling pump, the primary auxiliary building ventilation system, the control rod drive mechanism cooling fans, the hot penetration blowers, and other balance of plant equipment tripped as a result of the transient. This resulted in numerous control room annunciators alarming at the same time.

The control room crew responded well to the challenge. Operators quickly assessed the nature of the alarms and appropriately prioritized their response. The shift technical advisor and shift manager independently performed control room walkdowns to identify affected equipment. The control room supervisor informed the nuclear plant operators (NPO's) in the field and directed them to restore remotely operated equipment and to perform walkdowns of their plant areas. The control room supervisor appropriately communicated with the load dispatcher and Con Edison to determine the scope and nature of the disturbance.

Power was restored to the affected equipment within several minutes and no increase in spent fuel pit temperature was noted.

c. Conclusions

The operators responded well to the 345kV electrical disturbance. Activities were appropriately prioritized and independent walkdowns were utilized to identify affected equipment.

O7 Quality Assurance in Operations

O7.1 Storage of Operations Consumables

a. Inspection Scope (71707)

On October 4, 1996, the inspector found a number of quality assurance (QA) category 1 parts stored in an uncontrolled area outside of the control room. NYPA initiated deviation event report (DER) 96-2214 to document and resolve this issue. The inspector reviewed NYPA's resolution of this DER. Additionally, the inspector reviewed two NYPA quality assurance audits, A96-002W and SR 6-76, which covered related topics.

b. Observations and Findings

Just outside of the control room, operations maintains a storage area for supplies and parts used in the control room. This area includes a locked cabinet for category 1 parts and open shelving for non-category 1 parts. Category 1 consumables include control board light bulbs, alarm canister flasher units and some of the recorder pens. Non-category 1 consumables include strip chart paper and recorder pens.

However, a number of category 1 components were found on the open shelving. The category 1 parts found were control room alarm canister parts, alarm flashers, alarm flasher terminal boxes, relays and an electric bell. Except for the alarm flashers, which are simple plug-in units, the parts in question did not meet the definition of control room consumables and should not have been stored in the area. The history of the parts was not clear, however, operators stated the materials had been in the area for a number of years. Operations took immediate action to secure the category 1 parts in the locked cabinet. However, the inspector noted that no action was taken to evaluate if the items were appropriate to be stored in the area. Subsequently, on October 29, 1996 the parts were removed and returned to the warehouse for disposition.

Administrative Procedure AP-51, "Materials Management," contains site requirements for storage and handling of category 1 material. Operations reviewed their practices for controlling the category 1 consumables required for normal operation and determined they did not have a procedure governing the practices. As part of the DER resolution, operations opened an item to develop an appropriate procedure.

Quality assurance audits covered related topics but did not specifically address operations control of control room consumables. Audit A96-002W, the annual procurement audit, only looked at how maintenance and I&C handle material and parts. Surveillance SR 6-76, which identified continuing problems concerning inadequate control and storage of fuses by operations, was limited in scope and did not look at how operations handled other category 1 materials.

c. Conclusions

The inspector concluded that NYPA adequately addressed the concerns related to the storage of category 1 parts. However, the evaluation and removal of parts that were not appropriate as control room consumables was slow. The evaluation of the programmatic concerns which identified the lack of a governing procedure was notable. The fuse control surveillance was an opportunity to assess the overall control of category 1 materials by operations, however, the scope was limited to only fuses. This event was considered a minor violation and therefore is non-cited in accordance with section IV of the NRC Enforcement Policy.

O7.2 Tactical Assessment Group

a. Inspection Scope (71707)

During this inspection period, the tactical assessment group (TAG) coverage was reduced from 24 hours per day to 40 hours per week. The inspector reviewed the licensee's assessment to reduce the coverage.

b. Observations and Findings

The TAG is an independent oversight group which was formed in response to an event in October 1995. This event, which involved mis-positioned control switches for the containment spray and recirculation pumps, resulted in escalated enforcement and a civil penalty. Significant contributors were inadequate shift turnover, command and control, communications, and procedural adherence.

The licensee conducted an assessment of the operations shifts for a three-month period from June to August 1996. This assessment considered TAG observations, shift mentor weekly reports, human performance errors, deviation event reports, procedure feedback forms, temporary procedure changes, operations self-assessments, management observations, performance indicators from training, licensee event reports and NRC inspection report findings. The assessment found significant improvement in performance for the areas contributing to the October 1995 event. This assessment was consistent with the NRC's findings observed during routine inspections and an unannounced operations inspection conducted in July 1996. The assessment also found a reduction in the operations human performance error rate. Although the assessment noted areas which still need improvement, the licensee considered the reduction of TAG coverage to 40 hours per week appropriate.

The inspector noted that the criteria and conclusions of the assessment were developed with the concurrence of senior NYPA management. The tactical assessment coordinator indicated that the 40 hours per week TAG coverage will focus on backshift hours and high risk activities.

c. Conclusions

The licensee's approach to determine whether TAG coverage should be reduced was sound. The licensee's assessment of operations performance found overall improvement in operations shift turnovers, command and control, communications and procedural adherence. These areas were major contributors to the October 1995 event involving mis-positioned control switches. Senior NYPA management provided input in developing the assessment criteria and approach, and concurred in the assessment findings and the decision to reduce the TAG coverage.

O7.3 Deviation Event Report Review Committee

a. Inspection Scope (71707)

On October 15, the licensee implemented the deviation event report (DER) review committee to review new DERs. The inspector reviewed the DER review committee charter and observed committee meetings.

b. Observations and Findings

In response to findings in NRC inspection report 50-286/96-08 concerning the thoroughness of corrective actions, the licensee implemented the DER review committee to provide an in-depth review and screening of new DERs by a diverse group of site managers. The purpose of this committee is to ensure that the DER problem statement is comprehensive, to develop issues which must be addressed by the DER response, to screen DERs for significance, and to review proposed corrective actions for level A and B DERs. The committee was comprised of the general manager of plant support, the operations support manager, the maintenance manager, the engineering support manager, the planning and scheduling manager, and the tactical assessment coordinator or the quality assurance manager.

The inspector observed the committee's review of several DERs. Overall, the committees screened DERs appropriately, and raised pertinent issues which needed to be addressed by the DER response. During the initial meeting, several clarifications and enhancements to the conduct of committee meetings were discussed. For example, the DER review committee was developing generic screening criteria to ensure that pertinent questions regarding DERs would be raised.

c. Conclusions

The DER review committee is a good initiative to ensure that DERs are appropriately screened and that pertinent issues are raised. However, the long-term effectiveness of the committee and the review process remains to be determined.

O7.4 Final Safety Analysis Report (FSAR) Review

a. Inspection Scope (71707, 37551)

While performing inspections discussed in this report, the inspectors independently verified that the licensee operated the plant in a manner consistent with the applicable portions of the Final Safety Analysis Report (FSAR).

b. Observations and Findings

During this inspection period, the inspector noted that overall the licensee operated in a manner consistent with the FSAR. However, during the review of several failed

individual rod position indication (IRPI) meters, the inspector noted a discrepancy with the FSAR.

The FSAR states that if an IRPI channel is out of service, detailed operating instructions shall be followed to assure the alignment of non-indicated assemblies. These operating instructions require selected pairs of core-exit thermocouples to be monitored in a prescribed sequence and following significant motion of non-indicated assemblies. The operating instructions also call for the moveable detector system to be used to confirm the thermocouple indication of an assembly misalignment.

The inspector's review of operating procedures indicated that the operating procedures do not require the use of the core-exit thermocouples. This issue was raised with the assistant operations manager, who confirmed the inspector's observation and initiated a deviation event report. The assistant operations manager indicated that, in his discussions with reactor engineering, the core-exit thermocouples would not provide any useful information due to its accuracy. However, this discrepancy is left unresolved pending further licensee review and resolution. **(URI 50-286/96010-01)**

c. Conclusions

The inspector identified a FSAR discrepancy concerning the use of core exit thermocouples following significant motion of non-indicating control assemblies. The licensee initiated actions to review and resolve this FSAR discrepancy.

O8 Miscellaneous Operations Issues (92901)

O8.1 (Closed) EA 95-176 (Inspection Report 50-286/95-12): plant operation in unanalyzed condition. The inspector verified the corrective actions described in the licensee's response letter, dated November 15, 1995. No similar problems were identified.

O8.2 (Closed) EA 95-251 (Inspection Report 50-286/95-15): plant heatup with control switches for the recirculation and containment spray pumps in the trip pullout position. The inspector verified the corrective actions described in the licensee's response letter, dated February 1, 1996. No similar problems were identified.

O8.3 (Closed) LER 50-286/95014-01: low pressure operation placed the plant outside the design basis due to inadequate procedures and improper document use. This event was discussed in Inspection Report 50-286/95-12. Revision 1 of this LER provided additional information on the root causes of this event. No new issues were noted during the review of this LER.

O8.4 (Closed) LER 50-286/95018: manual reactor trip due to greater than allowable differential temperatures for the main generator stator. This event was discussed in Inspection Report 50-286/95-13. No new issues were revealed by this LER.

O8.5 (Closed) LER 50-286/95022: plant operating outside procedures and in violation of technical specifications due to personnel error. This event was discussed in Inspection Report 50-286/95-15. No new issues were revealed by this LER.

O8.6 (Closed) LER 50-286/96009: manual reactor trip initiated due to greater than allowable differential temperature for the main generator stator. This event was discussed in Inspection Report 50-286/96-03. No new issues were revealed by this LER.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments (62707)

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

- MWR 95-00711-02, Modify/Install Control Room Ventilation Gravity Damper
- MWR 96-01008-66, Modify/Replace Backup Pressure Regulator PCV-1200
- MWR 96-01170-00, 32 Emergency Diesel Starting Air Pressure Calibration
- MWR 96-03405-02, Toxic Gas Monitor Ammonia Sensor Repair/Troubleshoot
- MWR 96-05105-00, Inspect/Repair 32 Service Water Pump Check Valve
- MWR 96-05724-00, 35 Service Water Motor Preventive Maintenance
- MWR 96-06530-02, Inspect/Repair Main Generator Current Transformer Conduit
- MWR 95-05778-06, Removal of the 38 Backup Service Water Pump
- MWR 96-03815-00, Calibration of the 33 ABFP Pressure Transmitter

The inspectors observed that the work performed under the above work requests (WR) was conducted satisfactorily and in accordance with applicable maintenance and administrative procedures.

M1.2 Failure of 314 Emergency Diesel Room Fan

a. Inspection Scope (62707)

On October 14, the licensee identified that 314 emergency diesel room fan failed, resulting in declaring the 31 emergency diesel generator (EDG) inoperable. The inspector reviewed the licensee's corrective actions, operator actions in response to the failure, and maintenance and engineering efforts to repair the fan.

b. Observations and Findings

The 314 emergency diesel room fan is one of two fans, which provide room cooling to the 31 EDG and its support components. Because of the power supply arrangement to the two fans, 31 EDG operability requires both its room fans to be functional. The specific details of the power supply arrangement and its impact on EDG operability are discussed in licensee event report 50-286/95015. As a result,

the failure of the 314 emergency diesel room fan made the 31 EDG inoperable and placed the plant in a 72 hour limiting condition for operation (LCO).

The licensee implemented the repair of the 314 emergency diesel room fan promptly and effectively. Because a replacement fan was not available, the licensee coordinated with the fan vendor to manufacture a fan of the same specifications. The manufacture and delivery time left less than 24 hours of the LCO for the licensee to inspect, install and test the fan. The licensee completed these actions in 8 hours.

The coordination and scheduling of the repair efforts was excellent. The efforts, which were lead by a system engineering supervisor, included repairing collateral damage caused by the fan failure, exploring alternate power feeds to 315 emergency diesel room fan to enable 31 EDG to be declared operable, conducting an extent of condition review of the failure, initiating a root cause evaluation, and searching for existing replacement parts. Additionally, the licensee developed a contingency plan to remove and replace 314 emergency diesel room fan with 319 emergency diesel room fan, in the event that the new fan could not be delivered on time or would not pass receipt inspection. Overall, the contingency plan was well thought out, however, the inspector identified a significant oversight in the nuclear safety evaluation for the removal of 319 room fan. This is discussed in section E1.1 of this report.

The licensee initiated a root cause evaluation of the fan. This fan was repaired in June 1996, when its bearings seized and it catastrophically failed. The June 1996 bearing seizure was attributed to fan vibrations. During the recent failure, the licensee preliminarily believed that the fan's blade hub had loosened and slowly travelled up the fan shaft. This was evidenced by rust observations where the fan hub was originally installed on the shaft. The movement of the hub up the shaft eventually caused the fan blades to come in contact with the safety screen and the subsequent catastrophic failure of the fan.

The fan hub was held in place on the shaft by two set screws. The licensee was reviewing whether the set screws loosened due to inadequate tightening of the hub during the maintenance conducted in June 1996, or whether the fan hub was loosened due to vibrations. The cause of the failure is left unresolved pending the licensee's determination and the NRC's review. **(URI 50-286/96010-02)**

The licensee inspected the other fans to ensure that the fan hubs were not slowly travelling up the shaft. The other five fan hubs were flush with the end of the shaft. The licensee specified a torque value for the set screws for 314 emergency diesel room fan, and plans to check the set screw torques for the other fans when the quarterly emergency diesel generator maintenance is due.

c. Conclusions

The licensee implemented the repair of the 314 emergency diesel room fan promptly and effectively. The coordination and scheduling of the repair efforts was excellent,

particularly in light of the lead time required to attain the fan replacement which left less than 24 hours remaining in a technical specification action statement to perform the actual work. However, this fan was replaced in June 1996, when vibrations caused a bearing failure. The licensee has not yet completed its root cause evaluation of the recent failure.

M1.3 Backup Service Water System

a. Inspection Scope (37551)

On September 10, 1996, upon removal of the 37 service water pump, the licensee identified that the pump was severely degraded. The pump casing corroded through at several locations, and several large gaps were present in the transition piece between the suction bell and casing. The inspector reviewed the licensee's corrective actions in response to this deficiency.

b. Observations and Findings

The backup service water system is described in the Final Safety Analysis Report (FSAR) to provide cooling water for containment cooling, instrument air compressors and emergency diesel generators in the unlikely event that a storm driven vessel damages the service water intake structure. The system encompasses the 37, 38 and 39 service water pumps (SWPs), with the 38 service water pump designated as the Appendix R service water pump. The backup service water pumps are not credited in the Indian Point 3 individual plant evaluation or design basis accident analysis. The 37 and 39 SWPs were procured commercially.

The 37 SWP showed degrading vibration and differential pressure trends since February 1996. Although the backup SWPs are not part of the in-service test program, the licensee measured and trended pump vibrations and differential pressures quarterly. The vibration and differential pressure trends for the 38 and 39 SWPs indicated no similar degradation. In response to the severely corroded condition of the 37 SWP, the licensee placed the backup service water pumps in the preventive maintenance program. These pumps are now scheduled for inspection every four years.

After the refurbishment of the 37 SWP, the licensee decided remove the 38 SWP and install the refurbished 37 SWP in its place. The licensee considered the removal and inspection of the 38 SWP to be more critical than returning the 37 SWP to service because the 38 SWP is the Appendix R SWP, and the potential existed for degradation similar to the 37 SWP which may not have been detected by vibrations and differential pressure. When the 38 SWP was removed, the pump was observed to be in good condition.

On October 23, 1996, a maintenance activity to replace damaged lagging on various portions of the backup service water system revealed significantly corroded piping, valves and flanges. The piping was evaluated by ultrasonic testing and found acceptable. Two severely corroded valves, which were associated with the

automatic backwash valve for 38 SWP zurn strainer, will be removed and examined. No operability concerns were identified.

c. Conclusions

The material condition of the backup service water system was poor as evidenced by the degraded conditions of the 37 service water pump and several valves in the system. The backup SWP was previously not included in the preventive maintenance program, however, in response to the degraded pump, the backup service water system pumps are now scheduled for inspection and repair every four years.

M1.4 Surveillance General Comments

The inspectors observed all or portions of the following surveillance;

- 3PC-R51D: Saturation Margin Analog Components Check and Calibration
- 3PT-M16: Safety Injection (SI) Pumps Functional Test
- 3PT-Q91A: 31 SI Component Cooling Water Pump Functional Test
- 3PC-R60A: Auxiliary Feedwater Flow Rate Check and Calibration

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

M8 Miscellaneous Maintenance Issues

M8.1 Resolution of Electrical Safety Assessment Findings

a. Inspection Scope (40500)

The inspectors reviewed NYPA's corrective actions to date to address the results of an electrical safety assessment conducted by QA and other department employees in February 1995. That assessment identified a number of electrical safety concerns and program weaknesses including: 1) improper installation of temporary wiring to site trailers, 2) lack of proper identification of switches, breakers, electrical panels and conductors, 3) fuse/breaker sizing errors, 4) improper grounding, and 5) the need for additional training and safety equipment for plant personnel. The concerns noted above were principally focused on facilities and personnel performing non-safety-related functions.

b. Observations and Findings

NYPA has made substantial progress in addressing the findings of the 1995 assessment. Electrical safety program procedures were developed, an electrical safety committee established, personnel training on electrical safety was conducted and a master electrician was hired. In addition, electrical panel schedules have been

prepared for most electrical panels and will be installed in the near future. The inspector toured the fabrication shop and trailers in question and noted the correction of the immediate and short-term safety problems noted in the 1995 assessment. In addition, the tool shop stocks of electrical tools and safety equipment such as gloves and mats were examined and found in excellent condition.

c. Conclusions

NYPA developed a comprehensive plan to track and correct the electrical safety deficiencies noted in the February 1995 assessment. Significant progress has been made in correcting these deficiencies, with few corrective actions still outstanding as noted in a followup March 1996 reassessment and in a September 1996 status report. The most significant corrective actions which remain involve the completion and installation of electrical panel schedules in the plant and the reconfiguration/ redesign of the electrical supplies to several of the facility trailers and the fabrication shop. Completion of these electrical supply modifications and the extent of these modifications are contingent upon NYPA's plans to replace a number of the trailers with more permanent office facilities.

E1 Conduct of Engineering

E1.1 Safety Evaluation for 319 Emergency Diesel Room Fan

a. Inspection Scope (37551)

In response to the failure of the 31 emergency diesel generator (EDG) exhaust fan 314, NYPA developed a contingency plan to cannibalize the redundant fan 319 from 33 EDG to keep 31 EDG operable. The inspectors reviewed nuclear safety evaluation NSE 96-3-327 EDG that was developed to support this contingency.

b. Observations and Findings

The nuclear safety evaluation was written on October 16, 1996, in response to the October 14th failure of fan 314. The loss of fan 314 made the 31 EDG inoperable and placed the plant in a 72 hour LCO. However, due to the configuration of the fan power supplies, the 33 EDG only required one fan to be considered operable. Therefore, a contingency plan was developed to take the backup fan from the 33 EDG and move it to the 31 EDG. Although the contingency plan was developed, it was not used because replacement parts were procured in time to support the repairs.

The NSE described the details of removing the fan from the 33 EDG cell. This procedure was critical because the plan intended the 33 EDG to remain operable throughout the evolution. The NSE was reviewed and approved by the plant operating review committee (PORC) on October 16, 1996. The NSE concluded that the removal of the fan 319 from the 33 EDG cell did not constitute an unreviewed safety question.

The inspectors reviewed the NSE and concluded that the NSE failed to address the flow path that would be created in the 33 EDG cell after fan 319 was removed. Following the sequence outlined in the NSE, the remaining fan would have been rendered ineffective due to the large flow path created by the removal of the fan 319 exhaust louvers which normally function to seal off this flow path. The two EDG cell fans sit side-by-side at one end of the cell. Rather than drawing air from the inlets at the opposite end of the building, the air would have entered through the exhaust of fan 319 and exited via fan 318.

NYPA initiated deficiency event report (DER) 96-2287 to address the problem with the NSE. The DER resolution was not completed at the end of the inspection period.

c. Conclusions

The inspectors considered the development of the NSE and contingency plan a proactive response to an equipment failure. However, the NSE was inadequate because it did not assure that the 33 EDG would remain operable during the activity. The failure of the engineering review to identify this issue indicated a lack of attention in the area of engineering oversight. Additionally, PORC review of the NSE was ineffective in identifying this inadequacy in the NSE.

E1.2 Service Water Check Valve Bolt Corrosion

a. Inspection Scope (37551, 62707)

On September 23, 1996, during preventive maintenance, the licensee identified that the internal studs and nuts for 35 service water pump (SWP) discharge check valve (SWN-1-5) were severely corroded. Check valve SWN-1-5 contains two sets of internal studs and nuts which hold the clapper hinge bracket to the valve body. The inspectors reviewed the licensee's corrective actions, the extent of conditions and the engineering calculations that showed the valves were still functional.

b. Observations and Findings

The licensee's immediate corrective actions and extent of condition review were appropriate. The equipment failure evaluation identified that the cause was galvanic corrosion due to the interaction of the steel studs and nuts with the monel disc pin. The licensee repaired SWN-1-5 by replacing the corroded components with new steel studs and nuts. This was an interim measure to ensure valve operability and reliability until a modification could be developed and implemented to the internals to eliminate the galvanic corrosion. An action commitment tracking system (ACTS) item was initiated to ensure that the modification would be implemented within a year. The licensee considered this an appropriate time frame based on the three-year preventive maintenance cycle on this check valve.

The licensee inspected similar check valves in the service water system to determine the extent of the condition review. The check valves for 32, 33, 34 and

35 SWPs were inspected. Although there was evidence of galvanic corrosion, the studs, bolts and nuts were in much better condition than for SWN-1-5. The check valve for 31 SWP was inspected on April 27, 1996, and therefore was not expected to have degraded substantially. The other service water check valves, including those associated with the backup service water pumps, were reviewed and determined to be of a different design and vendor, and to not have dissimilar metals causing galvanic corrosion.

In discussions with the maintenance engineer, the studs, nuts and bolts were replaced during every three-year preventive maintenance activity on these check valves. Additionally, during the 1988 to 1990 time frame, the check valves for the 31, 33, 34 and 35 SWPs had to be modified because the support taps for the hinge bracket had corroded requiring the bolts to be replaced with studs and nuts. During the time of this modification, the licensee had considered replacement of the check valves, but determined that the modification coupled with the three-year preventive maintenance cycle was adequate.

The inspector reviewed the modification to replace the bolts with studs and nuts and concluded that it did not exacerbate the existing galvanic corrosion mechanism in the check valves. The licensee was reviewing other potential contributors which may have accelerated the galvanic corrosion of the 35 SWP, such as the extended outage from 1993 to 1995 and the operation of the chlorination system.

The inspectors concluded that the past engineering approach to the degraded studs, nuts and bolts reflected an acceptance of poor equipment design. The degrading components of the check valve were compensated by periodic replacement rather than a clear understanding of the cause and the exploring of other technical solutions. The corrosion of these parts was not specifically identified as galvanic corrosion and a modification similar to the one currently being developed was not considered. Instead, these components were treated as consumables during preventive maintenance.

Although the licensee's current approach and resolution of degraded valve SWN-1-5 reflected improvement from past performance, this event also reflected the challenges to NYPA personnel with respect to questioning practices which have been ingrained for many years. As mentioned before, preventive maintenance was conducted on the 31 SWP check valve in April 1996. The replacement of the degraded studs and nuts during that activity, although not as severe as valve SWN-1-5, was not questioned or explored. Discussions with NYPA personnel indicated that the replacement of these components was expected.

The inspector reviewed the licensee's past operability determination for valve SWN-1-5. The operability determination indicated that the valve remained operable, based on tests conducted on the degraded studs and nuts, and Calculation IP3-CALC-SWS-02103. However, the inspector noted that the calculation did not address dynamic forces as a result of the potential check valve cycling. The licensee subsequently showed that these forces would be small and within the conservatism of the original calculations. This additional information was added to

the calculation. The inspector concluded that the degraded check valve would have performed its function based on the licensee's revised calculation and the past in-service testing.

c. Conclusions

The licensee's immediate corrective actions and extent of condition review in response to the degraded service water check valve SWN-1-5 were appropriate. However, the past engineering approach to this degraded condition in the service water check valves reflected an acceptance of poor equipment design, in which the valve internal components were treated as consumables during preventive maintenance. Although the licensee's current approach and resolution of degraded valve SWN-1-5 reflected improvement from past performance, this event also reflected the challenges to NYPA personnel with respect to questioning past practices.

E1.3 Inadvertent Start of 32 Auxiliary Boiler Feed Pump

a. Inspection Scope (37551, 62707)

On October 9, 1996, the 32 auxiliary boiler feed pump (ABFP) inadvertently started. At the time, the 32 emergency diesel generator (EDG) output breaker had just been closed. The licensee made a four-hour 10 CFR Part 50.72 report for emergency safeguard feature actuation. The inspector reviewed the licensee's troubleshooting and operability determination for the 32 ABFP.

b. Observations and Findings

The instrument and control (I&C) department's troubleshooting of the equipment after the inadvertent actuation revealed that relay BFPL, the relay which automatically starts the 32 ABFP, picked up. One of the signals, which actuates relay BFPL, is an undervoltage signal from 480-volt bus 6A. The closure of the 32 EDG output breaker generates the undervoltage signal. However, when this breaker is manually closed, the breaker switch provides an input to the "non-safety injection blackout logic defeat" circuitry to block the undervoltage signal on bus 6A to the ABFP start logic. If the block of the undervoltage signal is slow, the circuitry may sense the closed output breaker and a momentary ABFP start signal would result. The licensee concluded that this sequence of events probably resulted in the inadvertent start of the ABFP, and was caused by a breaker switch contact problem or a sluggish relay response.

The equipment response was consistent with the licensee's conclusion on the probable sequence of events and cause. Based on computer printouts, the 32 ABFP started about 12 seconds after the EDG output breaker was closed, which was consistent with the time needed for the build up of pressure in the ABFP steam header. A momentary signal would not have started the motor driven ABFPs, because the motor driven ABFP circuitry has a time delay feature and does not have a seal-in feature when an actuation signal is received. The licensee observed

various relays while closing the EDG output breaker and noted the proper sequencing of relays. The problem did not reoccur, and the 32 ABFP did not inadvertently start. The licensee also checked the circuitry to ensure the DC voltages and grounds were acceptable, and performed a functional test of relay BFPL.

The other three signals which cause relay BFPL to pick up are an undervoltage signal from 480-volt bus 3A, an ATWS mitigation system actuation signal and steam generator low-low level logic signal. These signals were considered unlikely because multiple component failures would have been necessary to result in the inadvertent actuation of the 32 ABFP. Also, the actuation of other alarms and automatic actions would have been expected. During the event, there were no other unexpected alarms, actuations, trips or dropped relay flags.

The licensee concluded that 32 ABFP was operable and would have performed its intended function. The manual start circuitry would not prevent the start of the 32 ABFP if an actual safety injection or blackout signal occurred. The licensee initiated a deviation report and is preparing a licensee event report.

c. Conclusions

NYPA conducted a technically sound and thorough review of the inadvertent actuation of the 32 ABFP. I&C support and troubleshooting was timely and provided an appropriate basis for the operability determination.

E1.4 Service Water System Leakage Evaluation

a. Inspection Scope (37551)

On October 16, 1996, NYPA identified a small service water leak of about 0.25 gpm downstream of the containment fan coolers. The inspectors reviewed NYPA's response and operability determination 96-061, which was performed to document the condition of the piping.

b. Observations and Findings

The pinhole leak was in an 18-inch safety-related pipe located inside the primary auxiliary building. The leak was inside the seismic boundary, but outside of the ASME code boundary. Based on previous experience with service water leaks of this nature, operations with concurrence of system engineering, determined the piping was operable but required further evaluation. Following the guidance of administrative procedure AP-8, "Deviation & Event Reporting and Operability Determination Procedure," Revision 36, operations assigned system engineering to provide an evaluation within 24 hours.

System engineering responded to the request in two parts. Within 24 hours, system engineering reviewed previous operability determinations and determined that pending the results of ultrasonic testing the piping would remain operable.

Although this was not final, the interim report supported the original operability determination and provided a documented technical bases. The following day, the results of the ultrasonic testing were evaluated and the operability determination was finalized.

NYPA installed a temporary patch for housekeeping considerations and replacement of the pipe was recommended for the next outage.

c. Conclusions

The inspectors concluded that engineering appropriately responded to the AP-8 request for technical review of an operability concern. The two-part response provided information to operations in a timely manner and also allowed resources to be applied commensurate with the significance of the leak.

E8 Miscellaneous Engineering Issues (92903)

E8.1 (Closed) LER 50-286/95002: potential unavailability of Appendix R equipment due to inadequate controls for replacement of fuses. In January 1995, NYPA identified that they did not properly analyze the installed fuses for the 10 CFR 50, Appendix R alternate power supply to the 32 component cooling water pump and the 38 backup service water pump. Engineering determined that the fuses were undersized and had the potential to open, which could have prevented the fulfillment of safety functions needed to mitigate the consequences of a fire.

The cause of this event was attributed to inadequate administrative controls for sizing and replacement of fuses. The potential safety impact of this issue was minimal, because the pumps had been successfully tested during surveillance testing. However, the 32 component cooling water pump failed its test in November 1994, which led to this discovery. After an in-depth review, NYPA engineering determined that the existing one-amp fuses should be replaced with three-amp fuses.

The inspector concluded that this issue revealed weaknesses in NYPA's fuse sizing and control programs. Appropriate corrective actions were completed to address these weaknesses. The inspector reviewed the corrective actions and had no further questions.

E8.2 (Closed) LER 50-286/95021: vapor containment pipe penetrations in a condition prohibited by technical specifications due to personnel error. In September 1995, NYPA identified deficiencies associated with the weld channel and containment penetration pressurization system (WCCPPS). Three of four WCCPPS supply lines originally connected to containment penetrations 00 and 0101 and the supply line to spare process line 474 were found to be disconnected, resulting in a portion of the WCCPPS not capable of being pressurized. The WCCPPS acts to continuously pressurize weld channels over welds in the containment steel liner and zones in containment penetrations, seals and isolation valves. These deficiencies were

identified by a system engineer during a walkdown of the WCCPPS as part of a review of containment penetrations.

The cause of this event was determined to be personnel error during maintenance activities performed in 1989. NYPA completed a number of corrective actions following the identification of the deficiencies, including reconnecting the supply lines, inspecting other portions of the system, and counseling personnel on work practices. NYPA also considered that other, previously completed process improvements in work control, testing and modifications also addressed the issue. The inspector reviewed the corrective actions and concluded that they were appropriate.

The inspector determined that the disconnection of WCCPPS to penetrations 00 and 0101 and process line 474 was a violation of technical specification 3.3.D.1.a, which requires that all portions of the four WCCPPS zones be pressurized above 43 psig when above cold shutdown. This licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy.

E8.3 (Closed) LER 50-286/96004: vapor containment isolation valves were inoperable and in a condition prohibited by technical specifications. The licensee identified that two air-operated valves, which were containment isolation valves in series, would not close under certain system conditions. These valves were RC-AOV-519 and RC-AOV-522, which provided primary water to the pressurizer relief tank spray and the reactor coolant pump standpipes.

The deficiency was discovered during post maintenance testing of the valves while the plant was in cold shutdown. NYPA determined the cause to be inadequate original design. The valves were modified with upgraded air operators and air supply solenoid valves. Additionally, similarly configured valves were reviewed and none were identified with a similar design deficiency.

The inspector reviewed the issue and the completed corrective actions. The potential safety impact of the event was minimal. The valves would not close at a system pressure above 120 psig, with no pressure differential across the valves. However, NYPA engineering determined that the valves would close at accident design pressure or when pressure dropped below 120 psig. Additionally, the valves are normally closed during operation.

The inspector determined that the failure of valves RC-AOV-519 and RC-AOV-522 to perform their intended function under certain conditions was a violation of technical specification 3.6.A.1, which applies to containment integrity. This licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy.

E8.4 (Closed) LER 50-286/96008

a. Inspection Scope (92903):

The inspector reviewed NYPA's actions following identification of a lack of design basis information for the nitrogen tank pressure required to support isolation valve seal water system (IVSWS) operation.

b. Observations and Findings:

In March 1996, NYPA system engineering determined that there was no design basis calculation for the nitrogen supply pressure to the IVSWS seal water tank. After further evaluation, NYPA found that the nitrogen supply, which consists of three nitrogen bottles on a bank, had been below that required for IVSWS operability during plant operation. NYPA reported this issue in LER 50-286/96-008.

The IVSWS engineered safety feature (ESF) that provides assurance that the containment leak rate is lower than that assumed in accident analyses, by injecting seal water to various containment isolation valves. The FSAR, section 6.5, indicates that the seal water tank is sized to provide a 24-hour supply of water. However, no design basis documentation for the adequacy of the nitrogen supply bank could be identified by system engineering.

After performing calculations for the minimum nitrogen bottle pressures, NYPA determined that operator log specifications for bottle pressures were in error in the non-conservative direction. Also, NYPA noted that recorded log values had been below the previously required pressure for several months during plant operation in 1992.

NYPA performed a number of corrective actions in response to this issue, including revising operator log specifications, revising procedures, establishing leakage monitoring, and reviewing design basis documentation supporting operating log parameters. NYPA found that the design bases for many log parameters were not substantiated or out of date. Also, NYPA noted there was no mechanism by which these existing log design bases would be updated to reflect plant modifications, revisions to calculations or other changes. The operations department initiated actions to enhance the basis documentation.

NRC review of this issue noted that on two previous occasions, similar deficiencies associated with nitrogen supplies to other ESF systems had been discovered. The corrective actions for both of these issues did not identify the related deficiencies with the IVSWS. Specifically, NYPA reported in 1993 (LER 50-286/93-016) that the weld channel and containment penetration pressurization system nitrogen backup supply lacked a design basis calculation. Also, in January 1996, after NRC questioning, NYPA found that the operator log specification for the auxiliary feedwater system valves backup nitrogen supply minimum pressure was in error. The corrective actions for the current IVSWS issue appropriately included review of the design bases and log specifications for other nitrogen backup systems.

c. Conclusions:

The inspector determined that NYPA's actions were appropriate in response to the identification of a lack of design basis for the nitrogen supply to the IVSWS. The potential safety impact of the issue was minimal, as no credit is taken for IVSWS in offsite accident dose calculations. While the identification of this issue was positive, it demonstrated a long-term lack of understanding of the support system requirements of the IVSWS.

This event also revealed weaknesses in corrective actions for previous issues. The inspector noted that corrective actions for similar, previously-identified deficiencies associated with nitrogen supply/backup systems failed to identify the IVSWS deficiency. In addition, NYPA recognized that previous corrective actions taken to provide design basis documentation for operator log specifications were limited and needed substantial enhancements.

The inspector determined that the failure to maintain IVSWS nitrogen pressure above the minimum requirements during plant operation was a violation of technical specification 3.3.C.1, which requires the IVSWS to be operable above cold shutdown. This licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 Poor Radiological Work Practice

a. Inspection Scope (71750)

On September 23, the inspector observed a radiological worker entering a contaminated area with only hand and foot protection. However, as a result of the limited work space, the individual was climbing over and leaning against piping which was not allowed unless fully dressed in protective clothing. The inspector reviewed the licensee's corrective actions in response to this event.

b. Observations and Findings

Upon raising the issue to the radiological worker, he immediately recognized his error and took appropriate, immediate corrective actions to conduct a whole body frisk. After determining he was not contaminated, he donned a full set of protective clothing. Deviation event report (DER) 96-2129 was issued, which indicated that the radiation worker did not follow his radiation work permit as required by administrative procedure AP 7, "Radiation Protection Control Program," Revision 19.

Prior to the inspector's observation, the inspector noted several DERs, which were recently issued concerning personnel contaminations. The licensee was cognizant of these contamination events and initiated several corrective actions, including the

issuance of a site-wide memorandum re-emphasizing radiological work practices, conducting tailgate meetings, and briefing each individual entering the radiologically controlled area of the radiological requirements. Additionally, the licensee was drafting a new radiological services procedure to establish formal requirements for restricting personnel access to the radiologically controlled area, including restricting personnel for poor radiological worker practices.

c. Conclusions

The inspector considered this event to be of minor safety consequence. The radiological worker was not contaminated, and his immediate corrective actions were prompt and appropriate. The licensee had identified a series of contamination events, and were taking appropriate corrective actions. The failure of the radiological worker to adhere to administrative procedure AP-7 is a minor violation of NRC requirements, and is being treated as a Non-Cited Violation, consistent with Section IV of the NRC Enforcement Policy.

P1 Conduct of Emergency Preparedness Activities

P1.1 Emergency Facility Staffing Drill

a. Inspection Scope (71750)

On October 7, 1996, the licensee conducted an unannounced, off-hours drill to demonstrate that the emergency response facilities (ERFs) could be staffed within an hour. The inspector observed activities in the control room, technical support center and the emergency offsite facility.

b. Observations and Findings

The licensee staffed ERFs in 58 minutes despite a delay in the receipt of beeper pages by some of the response personnel. After the security department had activated the beepers, some response personnel did not receive a beeper page until about 16 minutes later. The licensee initiated a deviation event report (DER) to document this delay and was meeting with the company that provided the beeper service to explore possible enhancements. The licensee also identified that some Roster I personnel did not call into the security department and some Roster II personnel did not respond. DERs were also initiated for these identified deficiencies.

c. Conclusions

The licensee demonstrated that the ERFs can be staffed within one hour. The drill was effective in identifying some deficiencies, for which the licensee appropriately initiated action to address.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of the licensee management at the conclusion of the inspection on November 6, 1996. 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.

X3 Management Meeting Summary

On October 30, 1996 the NRC and NYPA management held a meeting in the Region I office to discuss the plant's current material condition, the maintenance rule implementation and system engineering initiatives. The meeting was open for public observation. Attachment A is the list of attendees and Attachment B is a copy of NYPA's slide presentation.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

H. Salmon, Vice President, Nuclear Operations
R. Barrett, Plant Manager, Indian Point 3 (IP3)
J. Comiotes, General Manager, Support
N. Heuberger, General Manager, Maintenance
M. Pearson, Operations Manager
J. DeRoy, Director, IP3 Engineering

NRC

C. Beardslee, Reactor Engineer, Division of Reactor Safety (DRS)
D. Dempsey, Reactor Engineer, Systems Engineering Branch
T. Kenny, Senior Operations Engineer, Systems Engineering Branch
L. Prividy, Senior Reactor Engineer, Systems Engineering Branch
G. Wunder, Project Manager, NRR
L. Harrison, Reactor Engineer, DRS
J. Nick, Radiation Specialist, DRS

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 40500:	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 92901:	Followup - Plant Operations
IP 92903:	Followup - Engineering
IP 93702:	Prompt Response to Events at Operating Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

URI 96-10-01	FSAR Discrepancy Regarding Use of Core Exit Thermocouples
URI 96-10-02	Failure of 314 Emergency Diesel Room Fan

Closed

EA 95-176	Plant Operation in Unanalyzed Condition
EA 95-251	Plant Heatup With Control Switches for the Recirculation and Containment Spray Pumps in the Trip Pullout Position
LER 95014-01	Low Pressure Operation Placed the Plant Outside Design Basis Due to Inadequate Procedures and Improper Document Use
LER 95018	Manual Reactor Trip Due to Greater Than Allowable Differential Temperatures for the Main Generator Stator
LER 95022	Plant Operating Outside Procedures and in Violation of TS
LER 96009	Manual Reactor Trip Initiated Due to Greater Than Allowable Differential Temperature for the Main Generator Stator
LER 95002	Potential Unavailability of App R Equipment Due to Inadequate Controls for Replacement of Fuses
LER 95021	Vapor Containment Pipe Penetrations in a Condition Prohibited by TS
LER 96004	Vapor Containment Isolation Valves Were Inoperable and in a Condition Prohibited by TS
LER 96008	Inadequate Supply of Nitrogen to the Isolation Valve Seal Water System

ATTACHMENT A

LIST OF ATTENDEES AT THE OCTOBER 30TH MANAGEMENT MEETING

Licensee

W. Cahill, Chief Nuclear Officer
H. Salmon, Vice President, Nuclear Operations
R. Barrett, Plant Manager, Indian Point 3
J. DeRoy, Engineering Director - Indian Point 3
M. Pearson, Operations Manager
J. Kelly, Director - Regulatory Affairs and Special Projects
J. Leary, Public Affairs
W. Josiger, Vice President - Engineering and Project Management
R. Deasy, Vice President Appraisal and Compliance Services

NRC

H. Miller, Regional Administrator, Region I
R. Crlenjak, Acting Deputy Director, Division of Reactor Projects (DRP)
J. Wiggins, Director, Division of Reactor Safety (DRS)
S. Bajwa, Acting Project Director, I-1, Office of Nuclear Reactor Regulation (NRR)
C. Cowgill, Chief, Projects Branch 2, DRP
W. Dean, Regional Coordinator, Office of the Executive Director for Operations
D. Lew, Senior Resident Inspector
R. Barkley, Project Engineer
G. Wunder, Project Directorate I-1, NRR

LIST OF ACRONYMS USED

ABFP	Auxiliary Boiler Feed Pump
ACTS	Action Commitment Tracking System
ATWS	Anticipate Transient Without Scram
CT	Current Transformer
DC	Direct Current
DER	Deviation Event Report
ERF	Emergency Response Facilities
ESF	Engineered Safety Feature
FSAR	Final Safety Analysis Report
IP3	Indian Point 3
IRPI	Individual Rod Position Indication
IVSWS	Isolation Valve Seal Water System
NPO	Nuclear Plant Operator
NRC	Nuclear Regulatory Commission
NSE	Nuclear Safety Evaluation
NYPA	New York Power Authority
NYS	New York State
OE	Operating Experience
PDR	Public Document Room
QA	Quality Assurance
SWP	Service Water Pump
TAG	Tactical Assessment Group
TCV	Temperature Control Valve
URI	Unresolved Item
WCCPPS	Weld Channel and Containment Penetration Pressurization System
WR	Work Request

NYPA-NRC PLANT PERFORMANCE REVIEW MEETING

King of Prussia, PA

October 30, 1996

New York Power Authority

New York Power Authority
Indian Point 3 Nuclear Power Plant

William J. Cahill, Jr.	Chief Nuclear Officer
Harry Salmon, Jr.	Vice President Nuclear Operations
Robert J. Barrett	IP3 Plant Manager
Marc Pearson	IP3 Operations Manager
Joe DeRoy	IP3 Director Design Engineering

NYPA-NRC Plant Performance Review Meeting
King of Prussia
October 30, 1996

AGENDA

Opening Remarks	W. Cahill
Station Performance Overview	R. Barrett
Operations - On the right track	M. Pearson
Maintenance - Supporting Safe Operation	R. Barrett
Engineering - A New Focus	J. DeRoy
The Road Ahead - Superior Performance	H. Salmon

Station Performance Overview

- Plant status update
- Steady record of conservative decisions
- Using risk-informed management
- Improvement tools are in place
- Measurable progress achieved
- Continuing to build on successes

OPERATIONS *On the right track*

- Operator performance improvements

  Focus on questioning attitude & teamwork

- Reducing operator challenges

  Operations staff support

  Corrective action program effectiveness

Performance Improvement Results

- Questioning Attitude
  - Stand-alone Shift Technical Advisors
  - Human performance error rate improved
- Knowledge of Licensing and Design Basis
  - Computerized LCO tracking program
  - Operators challenged after simulator evaluations
- Procedure Quality and Adherence
  - Additional resources
  - Procedure adherence monitoring

Performance Improvement Results

- Material Condition
  - Low threshold for problem identification
  - Operators assigned to fix-it-now team
- Teamwork
  - Improved shift turnover is noteworthy
  - Improved control room and crew teamwork
  - Improved off-shift communications

Performance Improvement Results

- Staffing
  - 7 SROs and 1 RO licensed this year
  - Shift Manager qualification
  - 8 non-licensed operators completing training
  - Well-managed overtime

- Self-Assessment
  - Implemented self-assessment program
  - Conducted self-assessment

Focus on Questioning Attitude and Teamwork

- Operations management discussion of turbine-driven AFW pump steam trap tagging activity
- Feedback regarding work control
- Objective criteria for Shift Manager and crew performance developed
- INPO SOER 96-1, "Control Room Supervision, Operational Decision-Making, and Teamwork"

Continuous Improvement

- Evaluating weekly simulator scenarios
- Self-assessment program
- Applying objective criteria for SM and crews
- Management observation program
- HPE and overtime trending

Reducing Operator Challenges

- Work management improvements
- Material condition improvements
- Improved system engineering support
- Increased Operations staff support
- Improved corrective action effectiveness

Operations Staff Support

- Procedure upgrade
- Reduced administrative burden on Assistant Operations Manager and shift personnel
- Non-licensed operator rounds improvements
- Communication and assessment of operator work arounds and control room deficiencies
- Reduced overtime through staff support for vacancies
- Supporting operations involvement in other station organizations
- More effective corrective action implementation

Corrective Action Program Effectiveness

- Status
  - Initiation threshold
  - Self-identified rate
  - Evaluation age
- Team review of corrective action effectiveness

Corrective Action Program Improvements

- DER Review Committee
  - Ensure that DERs properly define problem
  - Ensure appropriate level of investigation
  - Ensure "high value" corrective actions properly prioritized
- Training
  - DER evaluator training course
  - Employee communication
- Monitoring
  - Acceptance rates
  - Providing feedback

MAINTENANCE *Supporting safe operation*

- Backlog status update
- Assessments of material condition
- Focus on high priority items
- Noteworthy material condition issues

Corrective Maintenance Backlog - Status

- Non-Outage Backlog
  - 1257 items on 9/30/96
  - 993 items on 10/29/96
- Outage Backlog
  - 931 items on 10/29/96
- Priority of non-outage CM backlog on 10/29/96
  - 0 priority 1 items (threat to health/safety)
  - 1 priority 2 items (commitment, short LCO, etc)
  - 96 priority 3 items (redundant component, limited time)
  - 670 priority 4 items (economic, when time permits)
  - 226 priority 5 items (convenience items)
  - 0 priority 6 item (to be canceled)

Assessments of Material Condition

- Plant material & equipment condition assessments
  - Performed three times in early 1996 prior to restart
  - Assessed individual and aggregate impact

- Five categories of items:
  - Outstanding work requests
    (100% of priority 1, 2, & 3 and 10% of priority 4 & 5)
  - Control room deficiencies
  - Operator work arounds
  - Temporary modifications
  - Catch containments

Assessments (Continued)

- Included 23 IPE risk significant systems
- Incorporated system engineering status reports
- Utilized documented evaluation plans
- Performed by cross disciplinary teams
- Presented to Operations management

Continual Focus on High Priority Items

- Daily focus on locked-in alarms
- Weekly discussion on:
  - Catch containments
  - Control room deficiencies
  - Operator work arounds
  - Temporary modifications
- Monthly assessment of these items
  - using formal procedure
  - individual and aggregate impact
- Quarterly corrective maintenance assessment
  - currently in progress
  - uses same method followed for restart assessment

Backlog Reduction Focus

- 10/11/96 All hands meeting
  - Communicated IP3 material condition vision
  - Described actions underway to achieve vision
  - Established work-off goals through end of 1996
  - Work effectiveness team formed to maintain focus
- Improved loading of weekly schedule
- Improved worker productivity
  - FSS relocated and Operations turnover effects addressed
  - PTO & Work Package feedback now required
  - Augmented maintenance 2nd shift
  - Streamlined FIN team process
- Improved adherence with 12-week milestones
- Monthly INPO assist visits

Results to Date

- Backlog assessment successfully supported restart
- Schedule adherence improving
  - 90.1% during past seven weeks
- FIN team productivity improving
  - 46 per week (past 6 weeks)
  - 20 per week prior to September
- Schedule loading improvements
  - Goal of >60/week
  - Currently 46 /week and increasing (next 6 weeks)
  - Was approx. 25/week in July/August
- Corrective maintenance backlog
  - Decreasing at 58/week (past 4 weeks)
  - Projected <700 by 1/1/97

Noteworthy Material Condition Issues

- PORVs
  - Started leaking after ISLT on 3/26/96
  - Stopped leaking on 10/3/96 during power reduction
  - Block valves open since 10/3/96, one closed on 10/28/96
  - Modification will be installed next CSD
  - Need ISLT Tech Spec change issued

- Weld channel backup regulators
  - Frequent failures during April-June 1996
  - New regulators obtained and are being installed
  - No failures since August

Noteworthy Issues (Continued)

- Service water system corrosion
  - Several housekeeping repairs installed
  - System Engineering action plan in place
  - RF09 scope involves replacing:
    - FCU return piping
    - CCR A/C supply piping and valves
    - CCR A/C condenser
    - Hydrogen seal oil outlet piping

  and elimination of:
    - FCU inlet flange
    - Housekeeping repairs

Noteworthy Issues (Continued)

- Generator vibrations
  - Being controlled by limiting load
  - Frame foot loading adjustment in progress
  - Lead box stiffening modification due late November
  - Will replace generator rotor in RF09
- Emergency Diesel Generators
  - Two breaker failures
  - Three turbocharger pre-lube check valve failures
  - Two failures of 31 EDG ventilation fan
  - Will realign fan power supplies
  - Working to reduce excessive PM requirements

Noteworthy Issues (Continued)

- House Water Factory
  - Cost benefit supports use of a mobile system
  - Over two-thirds of U.S. plants use a mobile system
  - Pilot demonstration budgeted for 1997
  - Action plan to install in early 1997
  - Over 112 CM items (10% of backlog) on this system

ENGINEERING *A new focus*

- Engineering work management and planning
- System Engineering and equipment performance
- Self-assessment and corrective action

Engineering Work Management and Planning

- Design Engineering Plant Support Team
- Identification and reduction of backlogs
- Resource planning & budgeting
- Process improvements

System Engineering and Equipment Performance

- System Engineering Ownership
  - Responsible for system performance
  - Focal point for resolving problems
  - Recently moved staff inside protected area
- System Improvement Action Plans
  - Pressurizer modulating heaters
  - Boric acid heat trace
  - Blended makeup flow
  - Radiation monitors
- Design Basis Initiatives
  - Fuse control
  - Drawing updates
  - Design Basis Document updates

Engineering Self-assessments and Corrective Actions

- Active self-assessment program in place
  - Modification engineering
  - Calculation reviews
  - Action item timeliness and quality
- Maintenance Rule assessment
- INPO Assistance

THE ROAD AHEAD *Superior Performance*

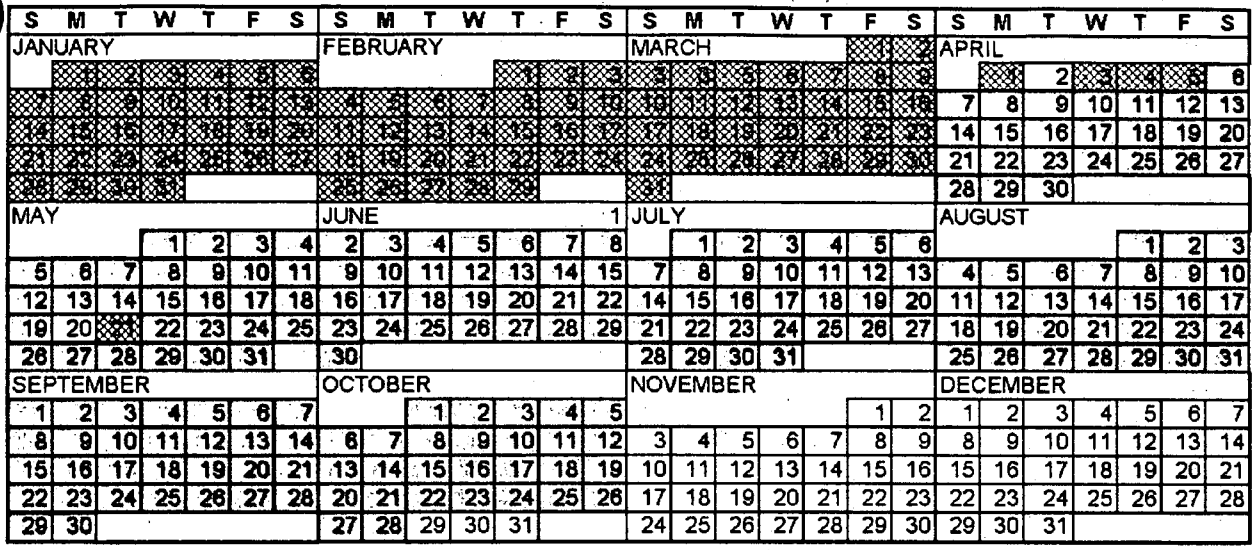
- Business Plan
- TAG reduction
- Entergy
- ITS project
- FSAR and licensing basis review
- Outage planning and preparation

NYPA - NRC
PLANT PERFORMANCE REVIEW MEETING FOR INDIAN POINT 3
KING OF PRUSSIA, PA
OCTOBER 30, 1996

CHART PACKAGE

INDIAN POINT #3

1996 PERFORMANCE



KEY EVENTS DURING 1996

1/20/96 Loss Of Off Site Power - Failed Surge Arrester
2/24/96 Commenced Reactor Startup
3/2/96 SALP Period Ends
3/11/96 New Plant Manager R. Barrett
3/12/96 Proceeded To CSD - Repair Charging Header (Operator Challange)
3/23/96 Commenced Reactor Startup
3/26/96 PORV 456 / Safety Relief Valves Leak By - Unit Cooled To 510 Deg./1610 PSIG
3/27/96 Unit @ NOP/NOT
4/2/96 Generator On Line @ 1458 Hrs.
4/2/96 Reactor Manually Tripped @ 1612 Hrs. - Hi Temp. Across H2 Coolers
4/8/96 Generator On Line @ 2306 Hrs.
4/10/96 NRC/FEMA Observed Exercise
5/13/96 Restored I&C Manager And Maintenance Manager Positions. Created Gen. Supv. Electrical Maintenance Position
5/15/96 SALP Meeting
5/16/96 E-Plan Drill NRC Observed
5/20/96 Unit Shut Down Manually - 34 MISV Broken Air Line
5/22/96 Generator On Line @ 2242 Hrs.
6/14/96 Visit To IP3 By NRC Chairman S. Jackson
7/8/96 Hub Miller Visits Site
7/11/96 Unit Commences Pwr. Reduction @ 0810 Hrs. To 600 MWe @ 1150 Hrs. For Repair Of Extract. Stm. Leak
7/13/96 Further Pwr Reduction To 450 MWe @ 0100 Hrs. For Support Of FT-416 Calibration
7/15/96 Unit @ 100% Pwr @ 2325 Hrs.
7/22/96 Unit Commences Manual Shut Down @ 1430 Hrs. For Repair of SI-AOV-876B
7/23/96 Unit @ 100% Pwr @ 0130 Hrs.
8/14/96 Turbine Run-Back To 800 MWe @ 2020 - Attributed To Instrument Bus Spike While Installing Fuses In R13
8/15/96 Unit @ 1000 MWe @ 1023 Hrs.
8/25/96 Power Reduction To 60% To Repair Pzr. Spray Valve 455B
8/27/96 Unit Returned To 100% Pwr.
9/5/96 Unit Pwr. Reduced To 930 MWe - To Maintain Main Generator Lead Box Vibs. <.94 in/sec
10/2/96 Commenced Unit Pwr. Reduction @ 2000 Hrs. For Repair Of Isophase "A" Ground Differential Wiring
10/3/96 Main Turbine Tripped @ 0800 - Unit On Line @ 2032
10/28/96 Turbine Runback @ 1652 - Due To 31 Inverter Inst. Bus Failure - @ 1654 Runback Stopped @ 70% Rx Pwr. - @ 1731 PORV Block Vlv. MOV 536 Shut To Preclude PORV Leakage Caused By Runback

KEY PERFORMANCE INDICATORS

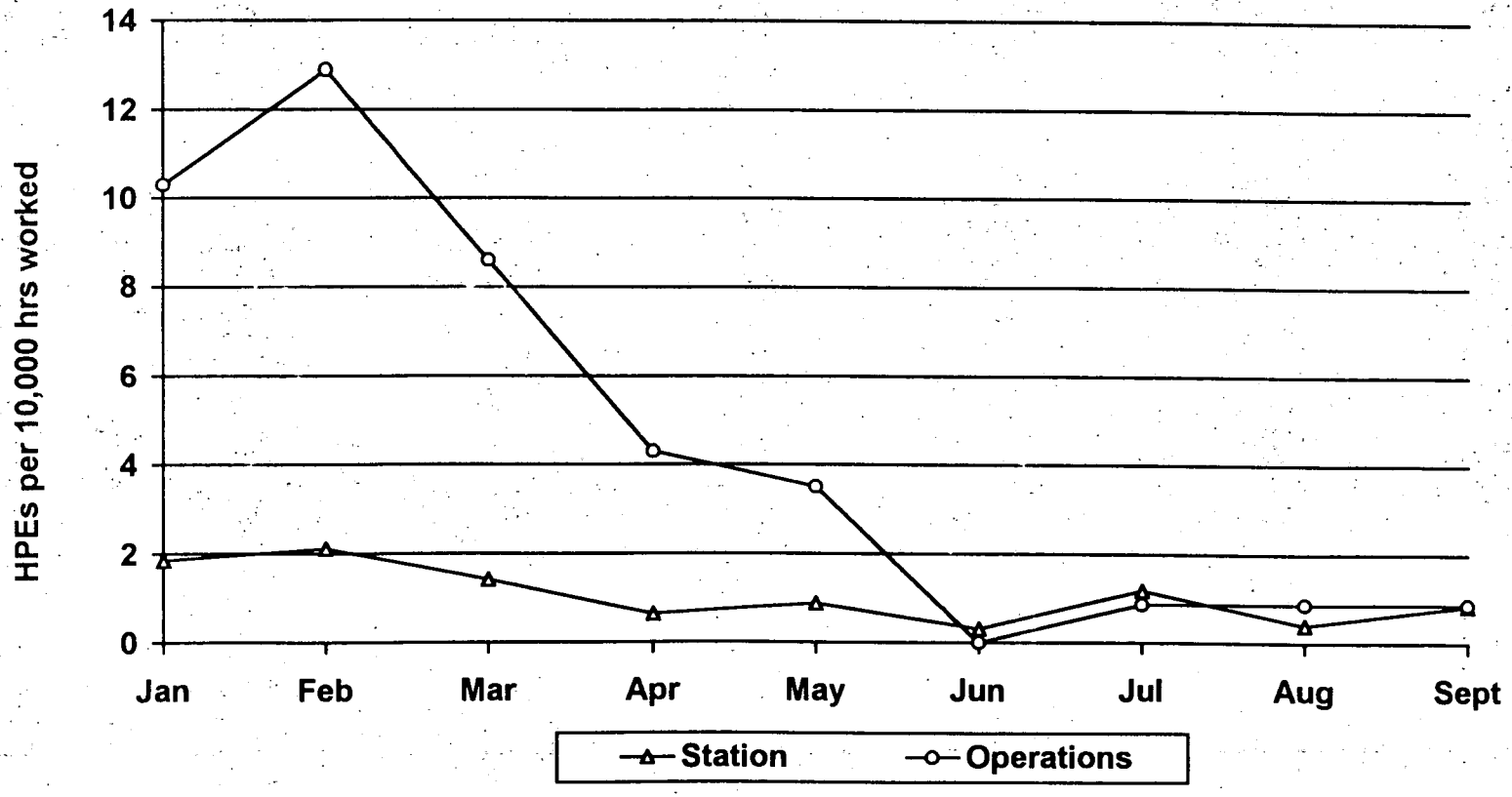
Results as of 9/30/96

	GOAL	RESULT
SALP	<2.5	2.25
Net Elec. Cap. Factor (YTD)	>42.9%	60.0
Thermal Performance	>99.5%	99.0
NRC Civil Penalties	0	0
NRC Violations (Level 1,2,Or 3)	0	0
Forced & Planned Cap. Loss	<5%	4%
Unplanned Scrams @ Pwr.	0	0
Unplanned Safety System Actuation	0	1
Site Recordable Injury Rate	<2.14	2.19
Site Lost Time Accident Rate	<0.48	.55

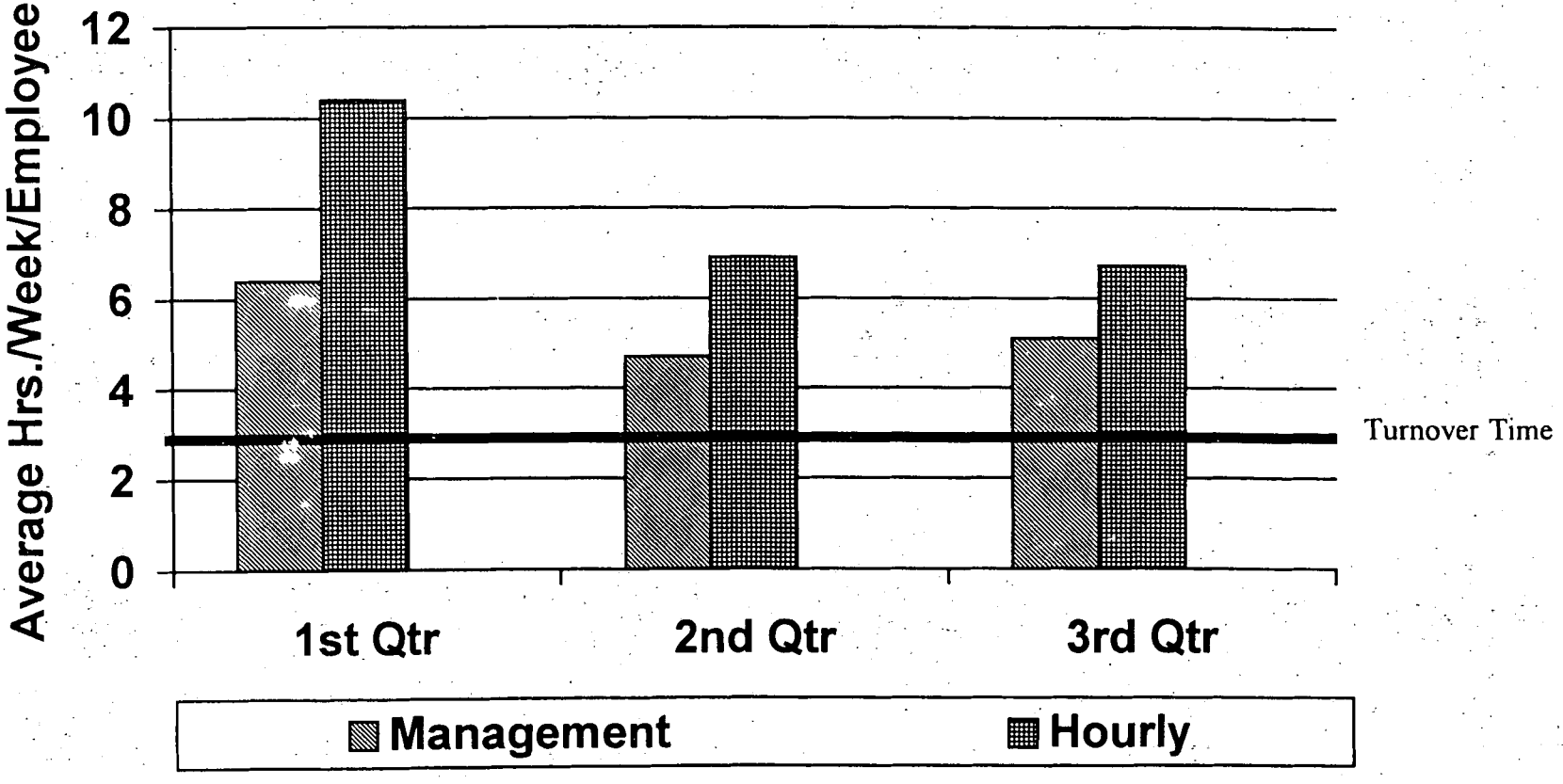
	GOAL	RESULT
Collective Rad. Exposure (REM)	<34	18.6
Personnel Contamination Events	<10	4.42
Bdgt. Perf. (Yr. To Date In $ Mils)	42.5	53.2
Overtime (% Base Payroll)	<9.7	20.5
Temp Mods (Open)	<32	83
DER Performance (Av. Eval. Wks.)	3	4.6
Personnel Error Rate		
-Significant Errors	<0.05	0
-All Errors	<1.00	1.06
Chemistry Indicator	<1.17	1.07

Unsat Fair Good

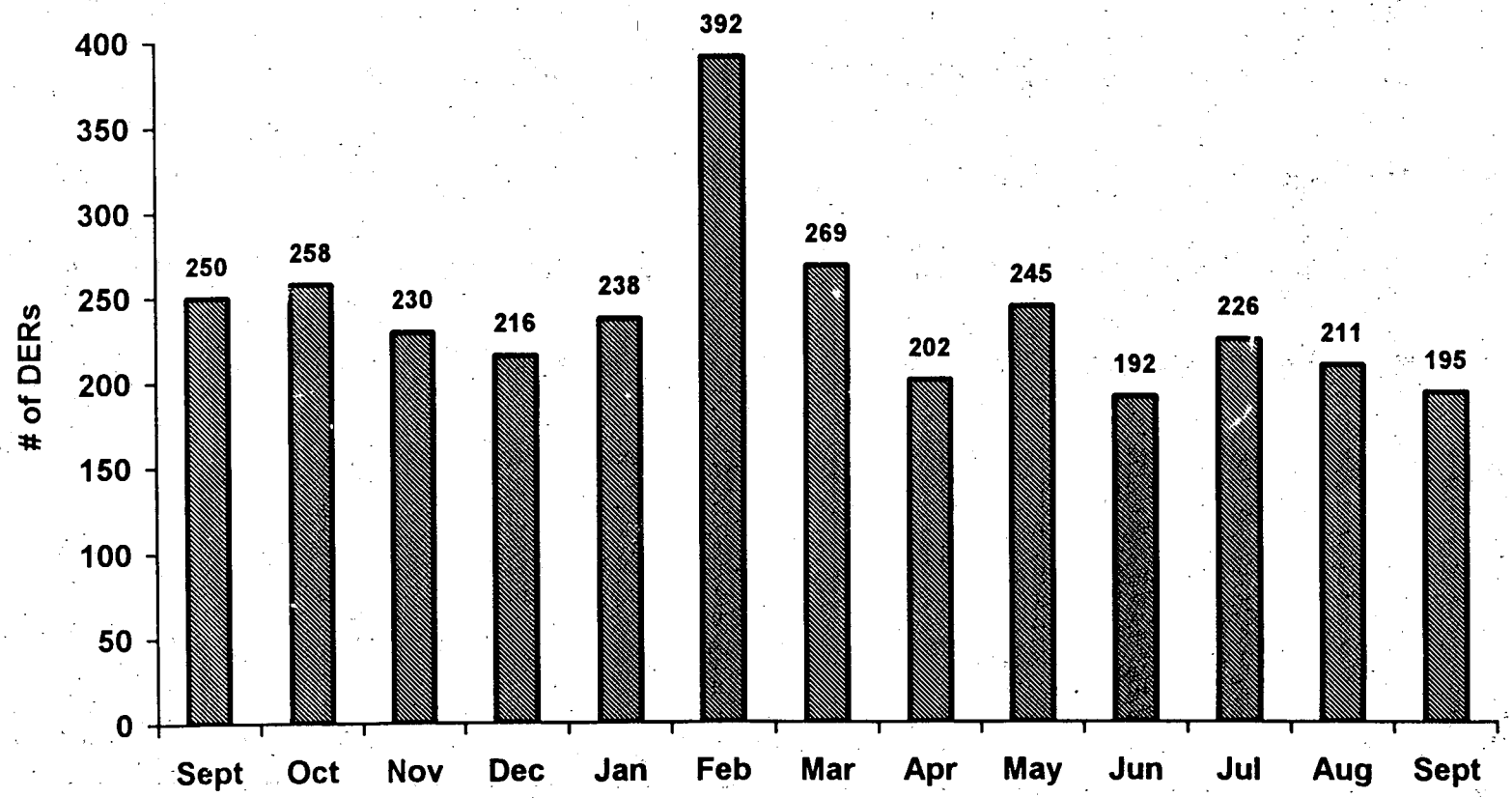
HUMAN PERFORMANCE ERROR RATE



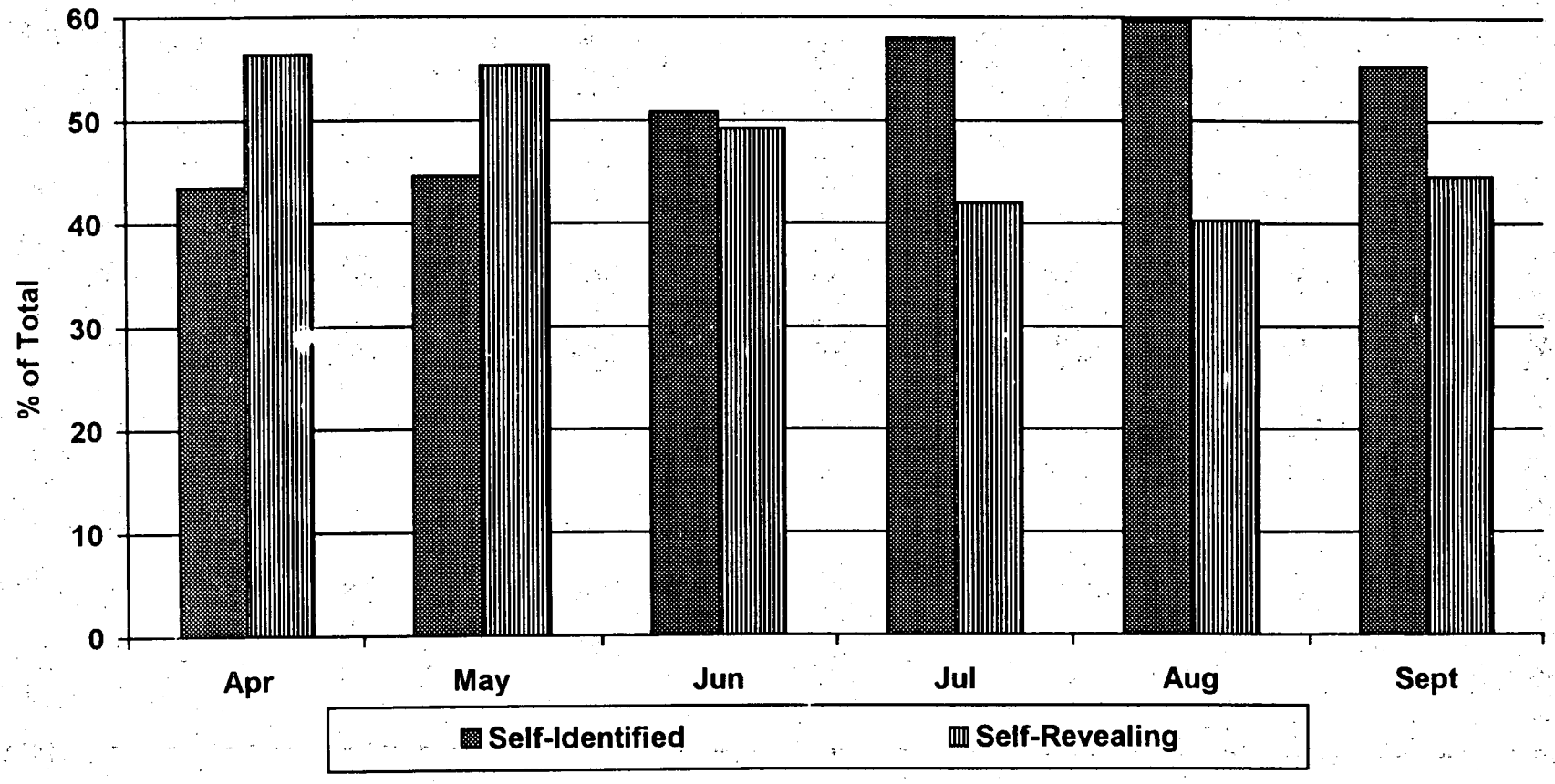
OPERATIONS DEPARTMENT OVERTIME



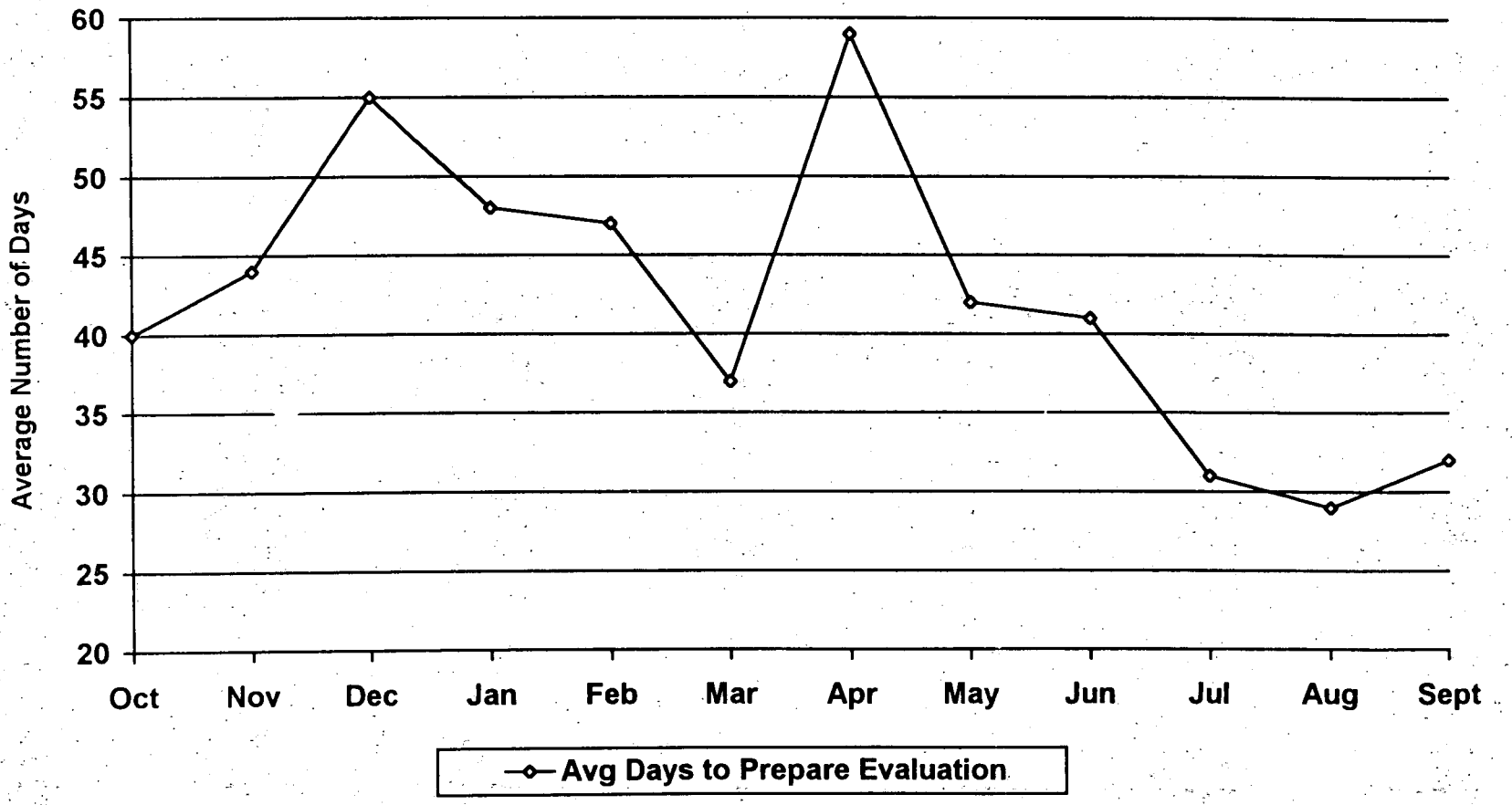
DER INITIATION RATE



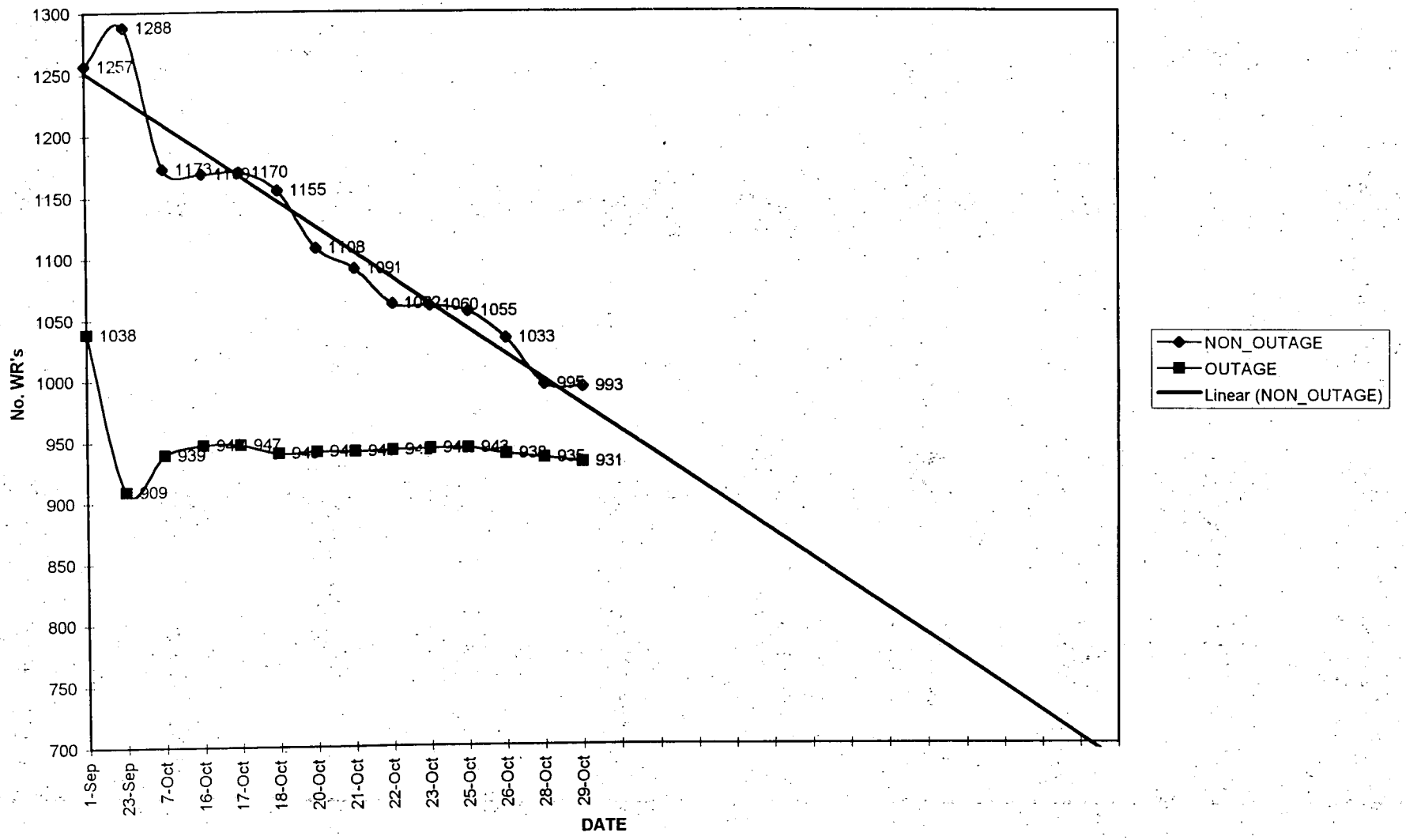
SELF-IDENTIFIED VERSUS SELF REVEALING DERs



DER EVALUATION AGE



IP-3 WR BACKLOG



EQUIPMENT PERFORMANCE VISION

TO BECOME A RECOGNIZED INDUSTRY LEADER IN PLANT MATERIAL CONDITION AND EQUIPMENT PERFORMANCE.

PERFORMANCE EXPECTATIONS TO ACHIEVE THE VISION

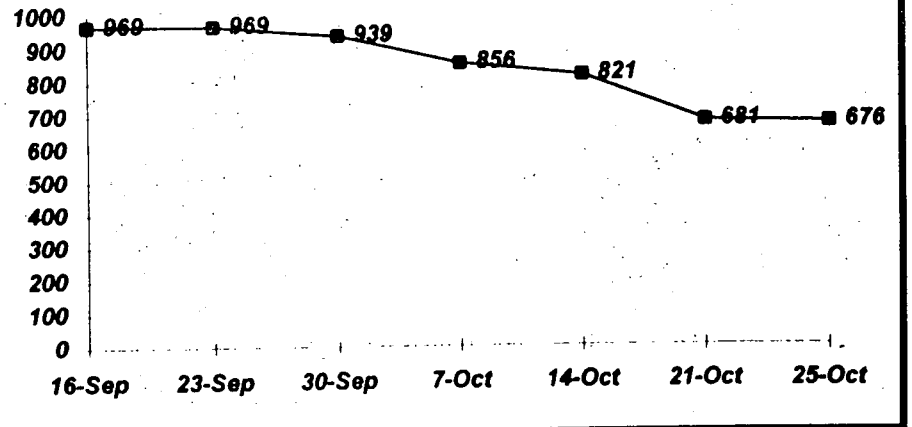
Through the remainder of 1996 we will achieve the following:

- Schedule adherence > 90%
- Net non-outage corrective maintenance workoff >60 per week until we achieve <700 overdue by the end of the year
- Overdue PMs are reduced by seven per week until there are none overdue by the end of the year
- No plant trips, forced shutdowns, or unplanned power reductions as a result of maintenance activities
- Reduce the number of corrective maintenance items on engineering hold by 40 per week until there are < 75 by the end of the year
- Reduce the number of corrective maintenance items on materials hold by 25 per week until there are < 25 by the end of the year
- Reduce unplanned/non-outage corrective maintenance items by 20 per week
- Operations will support maintenance starting work at 0700 hours each day

IP3 ENGINEERING DEPARTMENT PERFORMANCE INDICATORS

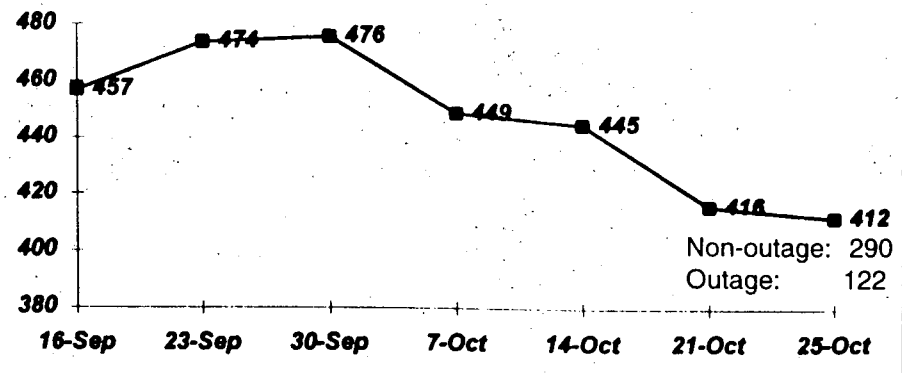
SYSTEM ENGINEERING BACKLOG

12/31 GOAL: < 450



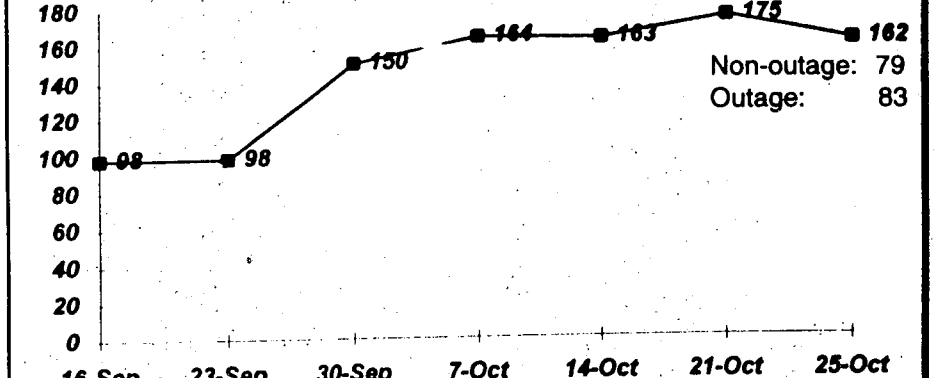
CORRECTIVE MAINTENANCE HOLDS

12/31 GOAL: < 175



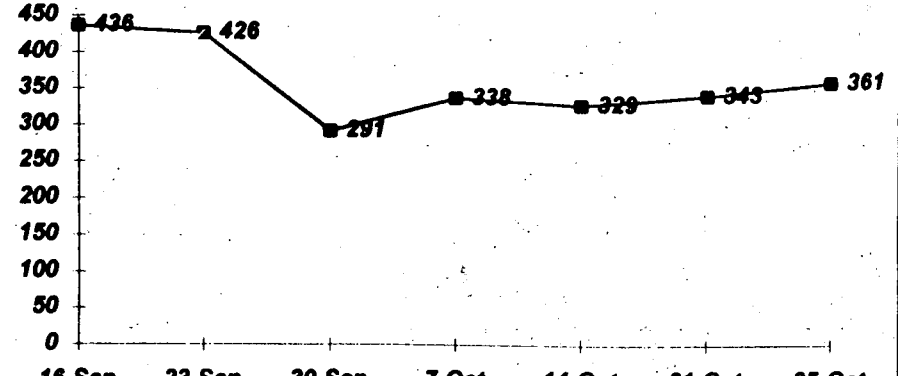
PREVENTATIVE MAINTENANCE HOLDS

12/31 GOAL: < 100

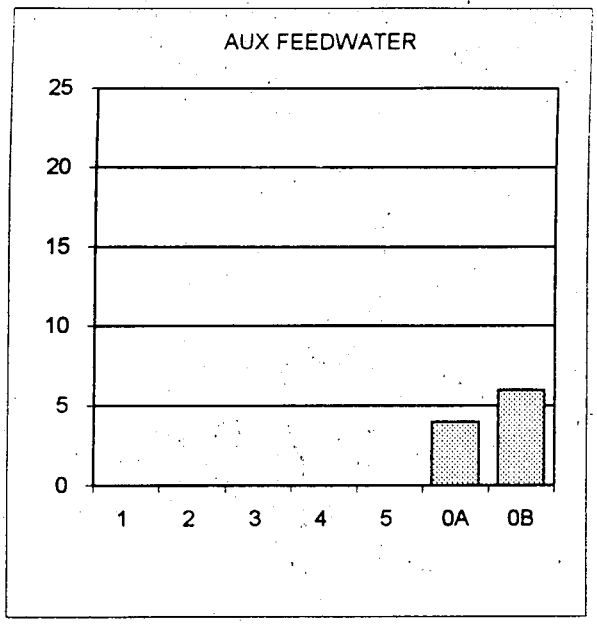


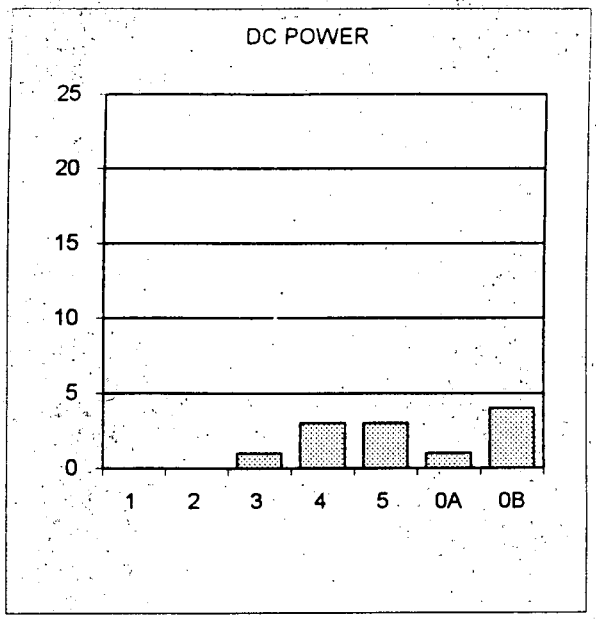
OTHER ENGINEERING

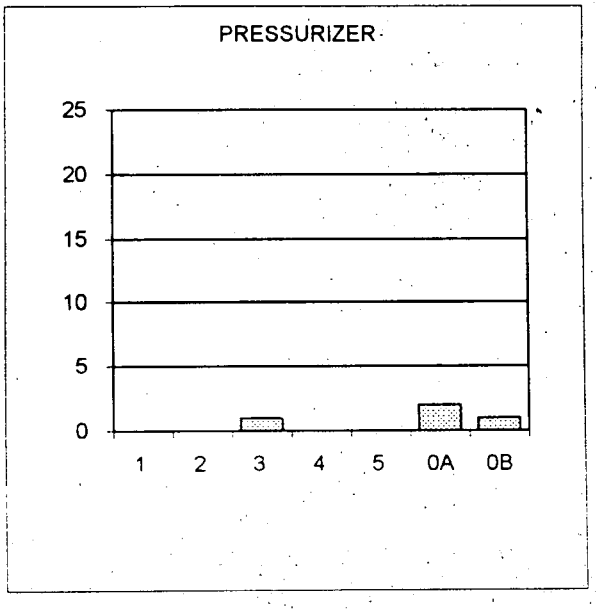
12/31 GOAL: < 250

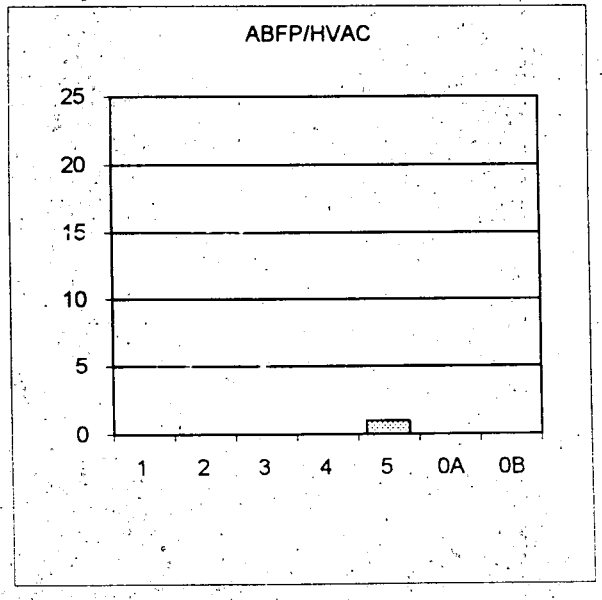


RISK SIGNIFICANT / SAFETY RELATED
WRs/PIDs by PRIORITY
BY PLANT SYSTEM CONTRIBUTION TO SAFETY









RISK SIGNIFICANT / SAFETY RELATED
WRs/PIDs by PRIORITY
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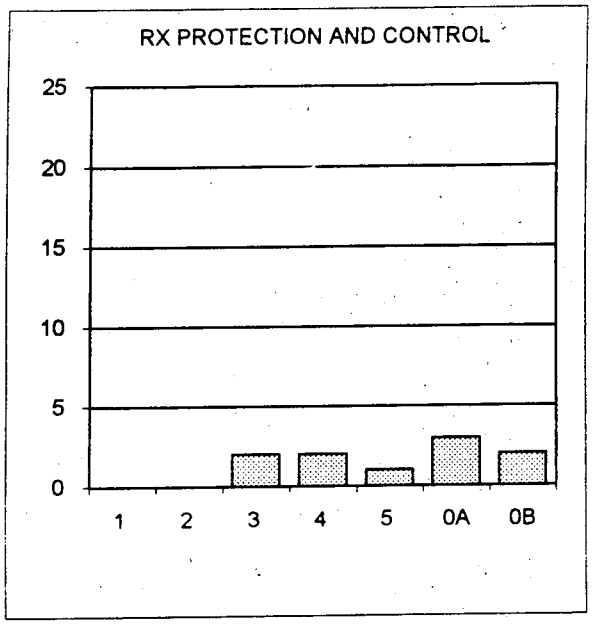

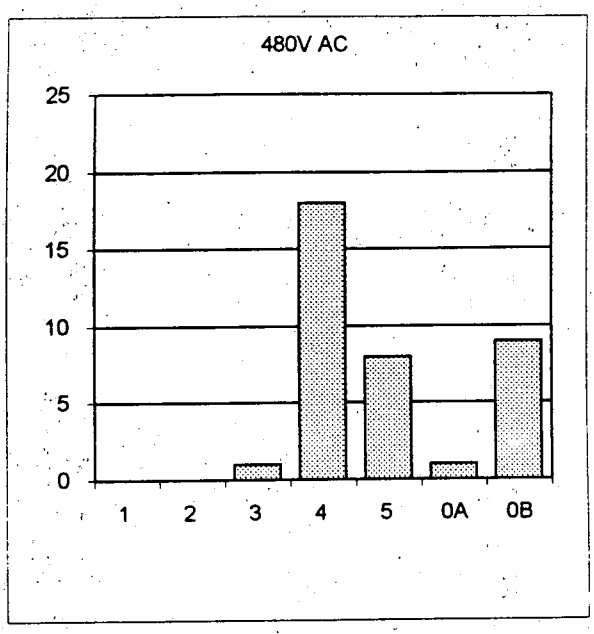

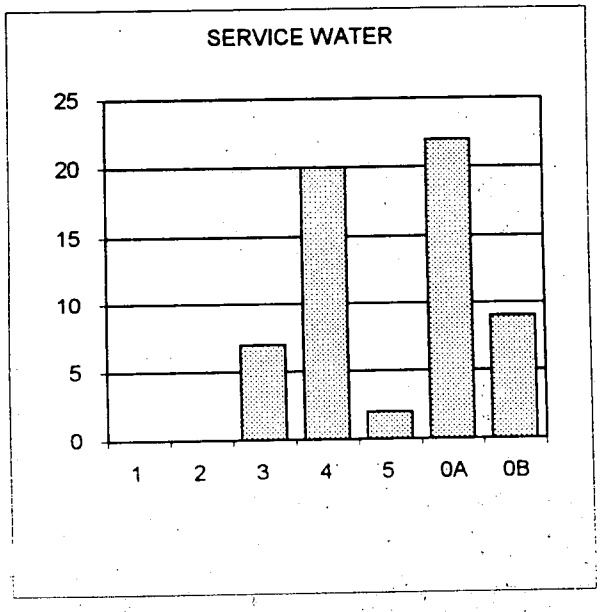

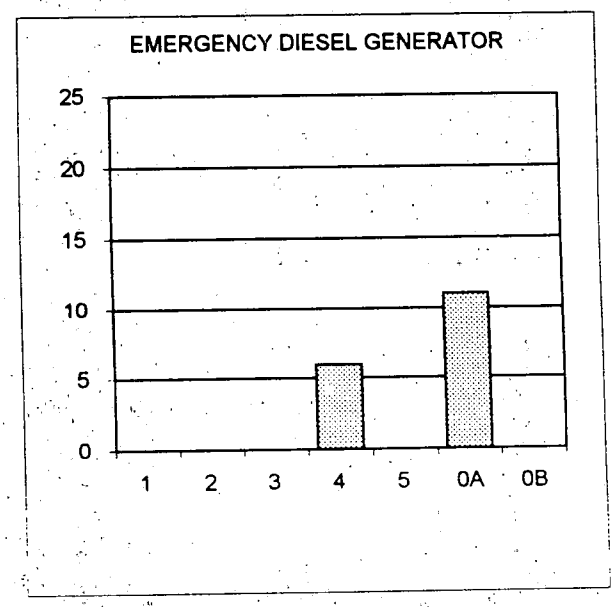

Date		Average Percent of Unavailability				
12/31/94		24.4				
12/31/95		11.1				
9/30/96		1.897