ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

INSPECTION REPORT 50-410/85-98

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT UNIT 2

ASSESSMENT PERIOD: FEBRUARY 1, 1985 - JANUARY 31, 1986 BOARD MEETING DATE: MARCH 17, 1986

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I. INTRODUCTION

A. <u>Purpose and Overview</u>

The Systematic Assessment of Licensee Performance (SALP) is an integrated NRC staff effort to collect the available observations and data on a periodic basis and to evaluate licensee performance based upon this information. SALP is supplemental to normal regulatory processes used to ensure compliance to NRC rules and regulations. SALP is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful guidance to the licensee's management to promote quality and safety of plant construction and operation.

This SALP differs substantially from previous Nine Mile Point 2 SALPs. The construction related activities have been combined into one functional area. New functional areas were added to address plant operational aspects. As this is expected to be the last SALP issued prior to license issuance, the focus was directed to operational readiness and performance.

A NRC SALP Board, composed of the staff members listed below, met on March 17, 1986 to review the collection of performance observations and data to assess the licensee performance in accordance with the guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." A summary of the guidance and evaluation criteria is provided in Section II of this report.

B. SALP Board

Board Chairman

R.W. Starostecki, Director, Division of Reactor Projects (DRP)

Members

- E. G. Adensam, Director, BWR Project Directorate No. 3
- S. J. Collins, Chief, Projects Branch No. 2, DRP
- W. F. Kane, Deputy Director, Division of Reactor Projects
- S. Ebneter, Director, Division of Reactor Safety
- T. Martin, Director, Division of Radiation Safety and Safeguards
- R. A. Gramm, Senior Resident Inspector, Nine Mile Point Unit 2
- M. F. Haughey, Project Manager, BWR Directorate No.3
- S. D. Hudson, Senior Resident Inspector, Nine Mile Point Unit 2
- J. Linville, Chief, Projects Section No. 2C, DRP

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C. Background

1. <u>Licensee Activities</u>

The licensee has stated the project is 95% complete overall as of January 31, 1986. Construction activities during this assessment period have included the completion of large bore piping and supports, electrical raceways, HVAC duct and supports, and small bore piping and supports. Work is continuing on fire protection and detection systems, painting, cable terminations, and instrument tubing. As of February 24, 1986, ninety one (91) of one hundred and eight (108) systems have been turned over for testing and fifty one (51) of one hundred and thirty six (136) preoperational or acceptance tests have been completed. Significant tests completed include low and high pressure core spray systems, the diesel generator reliability tests, and the Reactor Coolant System hydrostatic test. Major upcoming test milestones include the Loss of Power and Integrated Leak Rate tests. The site work-force has declined significantly from 7200 to 5200 personnel during this period.

2. <u>Inspection Activities</u>

One NRC Senior Resident Inspector for construction was assigned throughout the SALP period. A construction Resident Inspector was onsite through June 1985. A Senior Resident for preoperational testing was assigned on a part-time basis during the period. A Region I Project Engineer was detailed to the site for an extended period to supplement the resident coverage. Team inspections conducted during the period include a Nondestructive Examination Independent Measurement inspection, a Technical Specifications As-Built inspection, a Fire Protection inspection, a Quality First Program (Allegation handling program) inspection and several multi-discipline region based mini team inspections.

Programmatic inspections of the licensee's training programs were conducted, but training effectiveness was not evaluated during this phase of plant activities. Training effectiveness will be evaluated during subsequent SALPs when more operational activities are conducted.

The NRC inspection effort during the assessment period totalled 4501 hours by the resident and region based inspectors. The distribution of inspection hours is shown in Table 2. Inspection activities and enforcement data are summarized in Tables 3 and 4 respectively.



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This report also discusses "Assurance of Quality" as a separate functional area. Although this topic, in itself, is assessed in the other functional areas through its use as an evaluation criterion, this area provides a synopsis. For example, quality assurance effectiveness has been assessed on a day-to-day basis by resident inspectors and as an integral aspect of specialist inspections. Although quality work is the responsibility of every employee, one of the management tools to measure this effectiveness is reliance on quality assurance inspections and audits. Other major factors that influence quality, such as involvement of first-line supervision, safety committees, and worker attitudes, are discussed in each area.

3. Other Activities

In February, 1985, the Advisory Committee on Reactor Safety (ACRS) met with the licensee to review the construction status and the reactor and containment design features of Nine Mile Point, Unit 2. On March 11, 1985, the ACRS reported to the NRC Chairman that there was reasonable assurance that the plant could be operated without undue risk to the public health and safety. They further stated that normal NRC inspection activities should continue.

The Safety Evaluation Report (SER) NUREG-1047 was issued by NRR during February 1985. Supplements 1 and 2 were issued during June and November, 1985 respectively. There are nine outstanding issues and thirty nine confirmatory issues identified in Supplement 2. Several site audits and visits have been performed by NRR during the period.

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II. CRITERIA

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Licensee performance is assessed in selected functional areas, depending on whether the facility is in a construction, preoperational, or operating phase. Functional areas normally represent areas significant to nuclear safety and the environment, and are normal programmatic areas. Special areas may be added to highlight significant observations.

One or more of the following evaluation criteria were used to assess each functional area.

- 1. Management involvement and control in assuring quality
- 2. Approach to resolution of technical issues from a safety standppoint
- 3. Responsiveness to NRC initiatives
- 4. Enforcement history
- 5. Operational and Construction events (including response to, analysis of, and corrective actions for)
- 6. Staffing (including management)
- 7. Training effectiveness and qualification

Based upon the SALP Board assessment each functional area evaluated is classified into one of three performance categories. The definitions of these performance categories are:

<u>Category 1</u>. Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used so that a high level of performance with respect to operational safety and construction quality is being achieved.

<u>Category 2</u>. NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and are concerned with nuclear safety; licensee resources are adequate and reasonably effective so that satisfactory performance with respect to operational safety and construction quality is being achieved.

<u>Category 3</u>. Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear to be strained or not effectively used so that minimally satisfactory performance with respect to operational safety and construction quality is being achieved. . . · · · · . . .

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The SALP Board has also assessed each functional area to compare the licensee's performance during the last quarter of the assessment period to that during the entire period in order to determine the recent trend for each functional area. The trend categories used by the SALP Board are as follows:

<u>Improving</u>: Licensee performance has generally improved over the last quarter of the current SALP assessment period.

<u>Consistent</u>: Licensee performance has remained essentially constant over the last quarter of the current SALP assessment period.

<u>Declining</u>: Licensee performance has generally declined over the last quarter of the current SALP assessment period.

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III. <u>SUMMARY OF RESULTS</u>

A. <u>Overall Facility Evaluation</u>

During this assessment period the licensee's performance was satisfactory in all areas. However, performance in the surveillance area was marginal because of weak management oversight of contractor development of the Preservice Inspection Program. Improved craft attitudes regarding the necessity to build quality into the plant were apparent, while management maintained oversight of construction quality through a site trending effort that tracked key parameters. In addition, the acceptability of previously installed components was assured through reinspection efforts. The licensee has demonstrated aggressive management involvement in the areas of Security and Fire Protection. However, poor housekeeping conditions, occasional lapses in the implementation of complete corrective actions and control of Final Safety Analysis Report commitments are areas where improvement is needed.

The preoperational test activities have been executed by generally knowledgeable personnel and the field testing has been well controlled. Close monitoring of preoperational test activities has been maintained by Quality Assurance personnel. Also, permanent plant staff have been actively involved in the system turnover and preoperational testing process to gain system familiarization and to exercise plant operating procedures. Nonetheless, in preparation for fuel load, increased management attention is warranted in performing more timely reviews of preoperational test results to assure that satisfactory test completion is achieved.

The official schedule maintained by the licensee during the past year has proven to be unrealistically optimistic. This, coupled with inadequate routine assessments of plant status, has made it difficult for NRC to schedule inspection resources for the plant. In addition, numerous inspection and licensing issues remain to be resolved prior to license issuance.

Finally, the NRC continues to identify too many issues that should have been identified by the licensee's management reviews or Quality Assurance program. Once specific problems are identified; acceptable cures are usually proposed; however, corrective actions fail to be broad enough to insure that similar problems do not recur. 1 2 7 44 6

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B. <u>Facility Performance</u>

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Functional <u>Area</u>		Category Last Period (10/1/83-1/31/85)	Category This Period <u>(2/1/85-1/31/86)</u>	Trend
Α.	Readiness for Operations	N/A	2	No Basis
Β.	Radiological Controls	N/A	2	No Basis
C.	Surveillance	N/A	3	No Basis
D.	Preoperational Testing	N/A	2	No Basis
Ε.	Fire Protection	n N/A	1	No Basis
F.	Security	N/A	1	No Basis
G.	Construction	*	2	Consistent
Ή.	Assurance of Quality	2 ·	2	Consistent
I.	Licensing	• 2	2	Consistent

*During the last SALP period, this area included the following 8 areas with the indicated category ratings: Containment and Safety Related Structures - 2, Piping and Supports - 2, Mechanical Safety Related Components - 1, Support Systems - 1, Electrical Equipment and Cables - 3, Instrumentation and Control System - 2, Nondestructive Examination - 2, and Engineering - 3.



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IV. PERFORMANCE ANALYSIS

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A. <u>Readiness for Operations</u> (408 hours, 9%)

1. <u>Analysis</u>

This functional area was not addressed in previous SALP assessment periods. During the current assessment period, one specialist team inspection of Technical Specifications was performed. The resident inspectors also assessed this area during the review of preoperational testing.

The comparison of Technical Specifications and selected Interim Operating Procedures with the FSAR and the as-built systems found no major discrepancies. The licensee used its experienced, previously licensed Shift Supervisors in the preparation and review of each of these documents to help ensure their accuracy. The Interim Operating Procedures were developed to allow validation and revision during the preoperational testing phase. The management controls to ensure that accurate Operating Procedures are issued prior to licensed operation were found to be adequate.

The Operations Department has been actively involved in the system turnover process from construction. Operator walkdowns of systems and aggressive management involvement has helped ensure that system deficiencies are promptly identified and corrected. The operators have performed valve line-ups and participated in the preoperational testing program to gain additional familiarity with the plant.

The implementation of the tagging and jumper controls program is adequate. Some exceptions, which appear to have been isolated cases, were noted during the reactor vessel hydrostatic test.

The fuel receipt inspection proceeded smoothly. This was an integrated plant operation involving security, fire protection, radiation protection and maintenance department mechanics who perform the actual fuel handling and inspection. This evolution was well controlled, utilizing detailed procedures and knowledgeable personnel, with the exception of a personnel error which caused two unopened boxes of fuel to topple over when a lifting sling caught on one of the boxes. Although the event was not reportable, the NRC was promptly informed by the licensee, and a technically accepted recovery plan was implemented by the licensee.

There are 18 licensed Senior Reactor Operators and 21 licensed Reactor Operators on the staff. This should allow for adequate shift manning without excessive use of overtime. The Station Superintendent, Operations Superintendent, all shift supervisors and all shift operating foremen have more than a year of hot power operating experience each. •



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During the current assessment period, two sets of Operator and Senior Operator licensing examinations were administered. A team inspection was also conducted which examined the Unit 2 initial operator training program and technical training for mechanics, electricians, and instrument and control (I&C) technicians.

The first licensing examination, administered in June 1985, resulted in 9 of 12 RO and 2 of 12 SRO candidates failing the examinations. The licensee attributed this to a lack of a fully integrated training program and poor screening of candidates.

A subsequent inspection of the licensed operator training program found that the licensee had addressed the above deficiencies. The licensee has provided excellent physical facilities for training. Instructors are knowledgeable and students have a positive attitude towards training. When the NRC identified a lack of a structured on-the-job training program for fuel handling, the licensee promptly agreed to provide this training.

The second licensing examinations were administered in December 1985, and significant improvement over the first license examination results was noted. Eighteen of 20 RO and 9 of 12 of the SRO candidates will receive operating licenses. The 3 failures of SRO candidates is somewhat higher than normal, however a distinct separation between passing and failing exam scores was observed. These results indicate the cause for the failures to be attributable to individual deficiencies and not programmatic deficiencies. A weakness in the area of reactor theory was observed in each of the candidates that failed. Marked improvement in the simulator performance was noted during the second examination. However, the licensee should continue an aggressive program for improving the simulator fidelity.

The licensee has clearly strengthened its training programs for electricians, mechanics, and I&C technicians. The quality of instruction is excellent, classroom environment and training aids have improved, and the training department is receptive to plant-identified training needs. Although INPO will not accredit training programs prior to licensing, none of the licensee's training programs, including Unit 1, have received INPO accreditation to date.

2. Conclusion:

Rating: 2

Trend: No Basis

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- 2. Conclusion
 - Rating: 2

Frend: No Basis

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3. Board Recommendations:

Licensee: None

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- NRC: 1. Conduct management meeting in early summer to assess readiness for fuel load and status of operational activities.
 - 2. Perform Readiness for Operations Inspection prior to fuel load.

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B. <u>Radiological Controls</u> (153 hours, 3%)

1. <u>Analysis</u>

This area was not addressed in the previous SALP. Within this assessment period, four radiation specialist inspections were performed.

The Radiological Control Program at Unit 2 is primarily the Unit 1 program extended to cover Unit 2. Accordingly, the inspections determined that this extension was generally being performed acceptably.

The proposed organization and projected staffing appeared to be adequate to support the combined operations. The position responsibilities and authorities were generally clearly defined. Walkdowns of installed solid and liquid waste processing systems and ventilation filter trains found them consistent with FSAR descriptions. The receipt and inspection of new fuel was well planned, and the training associated with this effort was acceptable.

Some of the licensee's radiological control efforts were noteworthy. Specifically, the installation of a state-of-the-art radioactive waste control room, including computer controlled processing, and a separate bridge with associated equipment for decontaminating the reactor cavity demonstrated a willingness to design the plant with radiological control considerations. Also, polishing the reactor cavity walls demonstrated a good ALARA approach. Further, the licensee's investigation of a potential alpha source leak was comprehensive, timely, and technically sound. Finally, efforts to incorporate the experiences of other licensees into radiation shield survey procedures were very good.

Inspection results indicated that some program aspects needed additional planning and coordination. Specifically, the program for training, qualifying, and retraining radiological control personnel was not well defined, and areas such as the scope and frequency of training were undecided. Subsequent to the initial NRC review, a program was developed to train personnel in safety significant procedures and procedure changes, but the program did not include a method to evaluate its effectiveness.

In addition, the application of NRC bulletins, circulars, and generic letters to appropriate operational procedures and training programs was not comprehensive or continuously maintained throughout the life of the project. This shortcoming was most apparent in the areas of cross contamination between radioactive and non-radioactive systems and storage of radioactive material. · · · ۲. ۲. ×. • • • с том **в**е с том с

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NRC presence has been necessary in this area to assure proper development of the Unit 2 program. Management attention to assure thorough application of program requirements is warranted.

2. Conclusion:

Rating: 2

Trend: No Basis

3. Board Recommendations:

Licensee: Thoroughly apply published NRC guidance to development of operational procedures and training program.

NRC: None

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C. Surveillance (95 hours, 2%)

1. Analysis

This area was not addressed in the previous SALP. Within the assessment period three specialist inspections, supplemented by some routine resident inspections, were performed in the Preservice Inspection (PSI) area which provides a baseline for future surveillance activities.

The field implementing procedures were found technically adequate. Examinations were performed by qualified personnel, and the resulting data was properly recorded and evaluated. Inprocess ultrasonic and liquid penetrant examinations were found to meet ASME requirements. The PSI contractor appears to have sufficient personnel resources to effectively carry out the examination program.

The licensee implemented a conservative approach regarding volumetric weld examination. The ASME code requires that only the lower third of the weldment be examined while the PSI site program specifies the entire weld be examined.

Review of the docketed PSI program showed that the program list of weldments was not consistent with the ASME code categorization, as the welds were listed by plant system in lieu of code category, and the scope of weldments covered by the program was ambiguous. The licensee has since re-submitted a completely revised program.

Review of ultrasonic examination records identified that neither the licensee nor any of the contractor organizations were taking responsibility for the acceptability of the data.

The initial program shortcomings can be attributed to an overreliance upon the contractor to develop the PSI program and a lack of licensee oversight of the contractor's efforts.

2. Conclusion:

Rating: 3

Trend: No Basis

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3. Board Recommendation:

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- Licensee: Institute program to assure development, approval and implementation of technically adequate surveillance procedures.
- NRC: Review adequacy of licensee's program prior to fuel load.

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D. <u>Preoperational Testing</u> (710 hours, 16%)

1. Analysis

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This area was not addressed in the previous SALP. During the current assessment period, three specialist inspections were performed in addition to resident inspector coverage.

Several examples were found in which the procedure acceptance criteria were inconsistent with the stated value in the FSAR. This indicates inadequate review of the procedures by the licensee to ensure compliance with licensing commitments. Most procedures were found to yield a valid test of the system's function and logic. An exception to this was an improper valve line-up in the reactor vessel hydrostatic test procedure that 'would have prevented subjecting a portion of the system to test pressure. This issue, identified by the NRC, was corrected prior to the test.

After the reactor vessel hydrostatic test, the licensee discovered portions of five small bore pipes that had not been correctly inspected. Four were due to valve line up errors, and one was an instrument line that the licensee failed to examine during the hydro. Each of these lines was subsequently individually hydrostatically tested.

The licensee's program for testing is divided into two phases: preliminary testing of individual components and preoperational tests of systems and components to satisfy the requirements of the FSAR. The inspectors noticed that the licensee was using some of the preliminary test results to satisfy FSAR acceptance criteria. While this is an acceptable approach, the licensee was slow in responding to NRC requests for a list of those preliminary tests so that they could be reviewed and inspected. Errors were identified in the list when submitted.

To date, preoperational testing is complete for only six safetyrelated systems. The performance of preoperational tests have generally been acceptable. Test engineers are knowledgeable of their systems and the administrative controls for testing, and Quality Assurance personnel are witnessing the testing.

Preliminary testing of the Diesel Generator units has identified numerous problems. These involved wiring errors, improper circuit design, lube oil hose damage, and unit operation at excessive load. If left uncorrected, several of the deficiencies would have made the diesel generators inoperable during emergency conditions. While the test program satisfactorily identified these problems prior to plant operation, discovery

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of these problems was an indication of poor quality design and fabrication. As testing effort progresses, the licensee must be aware that similar problems may be identified in other plant systems.

Review of the training and qualification of system test engineers identified problems such as incomplete and unavailable records which precluded NRC determination of the adequacy of the training and qualification of these personnel. Documentation of the acceptability of the architect engineer's (AE's) training program for startup personnel was not available nor were all resumes of personnel readily available for review. When brought to the licensee's attention, a comprehensive audit of the training, qualification, and experience of startup personnel was performed. The review of the AE's training program was documented and the resumes of all individuals were located.

In this area, NRC presence is mandatory. While the pace at which testing is performed is not a safety concern, the lack of an accurate schedule of testing is indicative of poor planning, which precludes effective resource allocation by both the licensee and the NRC. The conduct of testing and quality assurance witnessing of testing indicates appropriate management control. However, we are concerned that extensive NRC involvement is required to identify deficiencies in the preparation of preoperational test procedures. Additional management attention is warranted in this area.

2. Conclusion:

Rating: 2

Trend: No Basis

- 3. Board Recommendation:
 - Licensee: Based on mediocre past test preparation performance, the licensee should evaluate the methods in place to verify test accuracy and adequacy of test results reviews to ensure compliance with FSAR commitments.

NRC: None

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E. <u>Fire Protection</u> (157 hours, 4%)

1. Analysis

This area was not addressed in the previous SALP. Within the assessment period two specialist inspections were performed.

A team inspection was performed during October 1985, to assess the plant safe and remote shutdown capabilities in the event of a design basis fire. An essential cabling study had been performed by NMPC, and the separation of redundant cables was verified by computer analysis. The plant procedures for achieving remote shutdown were found adequate.

The licensee fire protection staff and consultants were knowledgeable, and the plant routinely exhibited a conservative design philosophy to assure plant safety. The licensee records were complete and well maintained. Corporate management was frequently involved during the NRC inspection to resolve items of concern and to provide timely formal commitments. Several specific items of concern, such as fire detectors, emergency lighting and some fire proof installations remain open due to the relatively low level of construction completion in this area at the time of the inspection.

A special review was performed to support fuel receipt activities. Areas examined included fire brigade training, control of combustibles, and operability of fire extinguishing systems. Licensee management had directed that continuous and roving fire watches be established as certain fire mitigating systems were not yet operational. The overall program was found adequately implemented.

2. <u>Conclusion</u>:

Rating: 1

Trend: No Basis

3. Board Recommendations:

Licensee: None

NRC: None

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F. <u>Security</u> (92 hours, 2%)

1. <u>Analysis</u>

This area was not addressed in the previous SALP. Three preoperational security program reviews, including one inspection of the implementation of security and other storage requirements for new fuel, and one inspection of the licensee's program for control and accountability of Special Nuclear Material (SNM), were performed by regional-based safeguards inspectors.

The licensee was very aggressive in the development of the physical security program and its integration into the existing security program for Unit 1. The licensee modified the existing security management staff, redesigned security plant implementing procedures and orders, and conducted security training and orientation in new security systems. These additional security tasks have been accomplished with minimal impact on the daily operation of the Unit 1 security program.

The licensee aggressively pursued resolution of outstanding issues identified during Region I preoperational security program reviews. All security program plans were found to be professionally prepared, well organized and submitted in a timely manner. Changes necessitated as a result of NRC review were accomplished in a timely and cooperative manner, demonstrating the licensee commitment to an effective security program and their responsiveness to regulatory requirements.

Management interest in an effective program was further demonstrated by the construction of a modern two story security office building. Facilities include a document control vault, special purpose offices and a modern physical fitness room with lockers and showers. In addition, the ground floor of this building serves as a protected area control point that includes a weather protected vehicle entrapment area.

QA auditors and survey personnel were aggressive and prompt in following up on identified issues. Project engineers, responsible for the systems and equipment, and on-site security management personnel were found to be very knowledgeable of program status, testing schedules, turnover dates and NRC performance criteria. NRC reviews found that the licensee's integrated security resources were ample, well defined and effective. Attention generally was found to be directed toward practical applications and lessons learned. However, in one instance, some hardware problems were identified by NRC inspectors. These problems should have been detected prior to NRC involvement. **v** 1 **%.** 1) 1 • • •

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Security personnel received specialized training on Unit 2 security equipment and systems. The training was administered by qualified personnel and was consistent with the requirements of the current NRC-approved Training and Qualification Plan for Unit 1. Unit 2 security personnel were observed by the NRC staff to have progressively improved their capabilities during this assessment period.

In contrast to other support areas, clear evidence was obtained of corporate management involvement and prior planning in the areas of security and safeguards aspects of licensing, as discussed in section I of this assessment.

2. <u>Conclusion</u>:

Rating: 1

Trend: No Basis

3. Board Recommendation:

Licensee: None

NRC: None





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G. <u>Construction</u> (2512 hours, 56%)

1. <u>Analysis</u>

The previous SALP evaluated the following construction areas separately: containment; piping systems; mechanical components; support systems; electrical equipment; instrumentation systems; nondestructive examination; and engineering. These areas have been combined under the Construction functional area for this SALP. It is anticipated that future assessments will reflect completion of construction activities and will concentrate on the operational assessment areas.

Concerns identified in the previous SALP included: improper structural steel connection bolting; pipe supports not installed in accordance with design documents; control of preventive maintenance program; SWEC procurement quality assurance not always effective; adequacy of design change documents; and electrical equipment wiring deficiencies.

Inspection coverage in this area has been performed by both specialist and resident inspectors. A second nondestructive examination (NDE) van inspection was performed. The conduct of the SWEC Engineering Assurance Technical Audit was inspected by both Region I and Inspection & Enforcement personnel.

Vendor wire termination deficiencies were identified during sample reinspections of installed electrical equipment. Based upon the unsatisfactory results, an inspection was performed of all safety-related electrical equipment to assure the adequacy of the vendor workmanship. Inspection of other electrical installations found conformance to the design requirements.

The electrical separation problems of the Power Generation Control Complex (PGCC) have been evaluated in previous SALPs. NMPC instituted significant field efforts to rectify the conditions including numerous panel walkdowns, enhanced cable marking and enhanced inspection attributes. After the completion of the licensee's corrective actions, an NRR site audit identified another PGCC panel for which General Electric (GE) had not invoked the separation requirements. Completion of additional NMPC separation walkdowns, that are scheduled, are necessary to resolve the outstanding PGCC separation concerns.

Inspection of instrument systems identified a generally high degree of design conformance. Followup inspection of an allegation received by Region I identified deficiencies regarding Neutron Monitoring System (NMS) cable installations and associated installation procedures. The NRC inspection additionally identified inadequate licensee investigation of the concerns regarding the actual method utilized to install the NMS cables.

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Subsequently, at the request of the NRC, the NMS cable installations were demonstrated acceptable during engineering mock pulls.

The rework of the Main Steam Isolation Valves (MSIVs) involved an overlay of the inlet and outlet spool bores. The need for the MSIV rework was based upon licensee recognition of problems at a foreign nuclear facility that utilized similar ball valves. The rework process was well controlled. Site organizations, namely engineering, construction and quality, appeared to interface effectively.

The second NDE van inspection independently confirmed satisfactory conduct of site weld inspections. Licensee corrective actions to resolve adverse conditions were reviewed and found acceptable. The previously identified problems with radiographic film duplication, film interpretation, and film indexing were resolved.

The multifunction and enterprise supports fabricated by Reactor Controls Incorporated (RCI) were reinspected by NMPC on several occasions to establish the adequacy of the weldments. RCI instituted several measures at NMPC insistence, such as use of work packages, to better control in-process work activities. During NRC inspections of RCI activities, RCI site personnel were unable to provide responses to technical concerns such as fit-up requirements for fillet welds and installation tolerances for pipe restraints. Based upon the large number of reinspections performed on RCI installations as a result of NRC concerns identified initially by the Construction Appraisal Team (CAT) inspection, and the lack of RCI technical expertise, it is apparent that a quality product was achieved only as a direct result of licensee response to NRC concerns over the past three years.

Inspection of ITT pipe support installations have verified the effectiveness of corrective actions to address both welding and mechanical deficiencies.

NRC inspection identified two situations, involving HVAC baseplate shimming criteria and embedment welding restrictions, where SWEC engineering failed to identify the requisite inspection attributes for Quality Control inspection. In addition, inconsistent design information had been promulgated in regard to duct support bracing that resulted in indeterminate support configurations. Reinspections were performed, and all field installations were ultimately determined to be acceptable:

SWEC was responsible for the implementation of the pre-turnover Preventive Maintenance (PM) program. The PM group has been adequately staffed with supervisory and craft personnel, and dedicated Quality Control inspectors were provided for PM n 4 1, 16 \$ 32

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activities. PM schedules were maintained on a computerized system. SWEC engineering reviewed Environmental Qualification and equipment manuals to identify all necessary PM measures. The site program was revised to incorporate all of the requisite PM requirements. The post-turnover PM activities are similarly guided by a computerized scheduling system. NMPC maintenance personnel are available to supplement SWEC efforts.

Plant housekeeping conditions have deteriorated in some plant areas, particularly those that have not been turned over to NMPC. The lack of proper cleanliness levels can lead to potential degradation of permanent plant equipment and is reflective of poor personnel practices and inadequate supervisory oversight. Although the overall plant cleanliness remains poor, those areas which have been turned over to NMPC exhibit improved control of cleanliness.

Improvements have been noted in the overall licensee performance in this area. A substantial amount of NRC inspection resources were utilized to review licensee corrective actions implemented in response to NRC open items identified by the 1983 CAT and followup inspections. As a result of the problems identified, extensive efforts were necessitated and successfully implemented during this appraisal period by NMPC to verify the adequacy of installed plant hardware.

2. Conclusion:

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Rating: 2

Trend: Consistent ·

3. Board Recommendation:

Licensee: None

NRC: None

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H. Assurance of Quality (374 hours, 8%)

1. <u>Analysis</u>

This area was jointly assessed in the previous SALP with that of Project Management. The previous concerns included commitment tracking, inter-organization communication interfaces, and hardware reinspection results.

During this assessment period, Quality Assurance is again being considered as a separate functional area. Management involvement and control in assuring quality continues to be one evaluation criterion for each functional area.

The various aspects of Quality Assurance Program requirements have been considered and discussed as an integral part of each functional area and the respective inspection hours are included in each one. Consequently, this discussion is a synopsis of the assessments relating to the quality of work conducted in other areas.

The Quality Performance Management Program (QPMP) has monitored key parameters such as hardware quantity installed, quantity inspected, QC acceptance rates, outstanding design changes, and nonconformance document closure rates. The QPMP was implemented in response to an NRC order that mandated licensee tracking of performance indicators. Based upon NRC observation, the QPMP was helpful to diagnose construction problems and to assess the adequacy of corrective actions.

Licensee QA personnel have developed extensive checklists for guidance during the conduct of surveillances. The checklists are based upon regulatory requirements, FSAR commitments, industry codes, and design specifications. The use of the checklists during the review of preoperational test activities represents a strengthened involvement of QA in the independent verification of construction and site test activities in relationship to licensing commitments.

Review of NMPC audit reports and associated audit checklists indicates that while auditors are examining plant hardware, the audit reports do not reflect the total scope of the audit. The reports on occasion serve as an executive summary and do not document the complete extent of the audit in an explicit manner.

In response to deficiencies identified during the NRC Construction Appraisal Team inspection (50-410/83-18), NMPC instituted a large number of hardware reinspection efforts to ascertain the conformance of hardware installations with the design

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requirements. The sample reinspections included piping and pipe supports, instrument tubing and supports, HVAC duct supports, mechanical equipment, concrete, structural steel, nuclear coatings, expansion anchors, electrical raceway, and cables. The identified deficiencies were evaluated by engineering. A total plant reinspection was performed of electrical equipment vendor terminations, and Quality Control inspection procedures were revised as necessary.

Significant effort was finally made by the licensee to address long outstanding NRC open items particularly in the Nondestructive Examination area and those identified during the CAT inspection. NRC review of licensee actions has identified two shortcomings within the corrective action program. The scope of some underlying problems was not fully identified which resulted in the implementation of incomplete corrective actions. Some cases were also found where long term corrective actions had not been effectively maintained.

Major licensee initiatives included an FSAR verification program to ensure implementation of and accuracy of the FSAR. However, FSAR inaccuracies continue to be identified during routine inspection activities. The Preparedness for Operation Plan was conducted to assure that all required NMPC procedures have been developed, that requisite training has been accomplished and that responsible organizations are prepared for the operation of the plant.

The project design process was assessed by the SWEC Engineering Assurance Technical Audit. The NRC reviewed the audit program plans. Conduct of the audit was monitored as well as the corrective action phases. Some concerns were observed with the auditors exercising independent judgement on design adequacy and accepting design guides without verification of appropriate regulations. The SWEC audit concluded that the overall design process was implemented in a controlled manner.

A team inspection was performed of the NMPC allegation handling program (Quality First). The inspection scope included review of identified concerns, interviews of Quality First personnel, review of concern resolutions, examination of related site procedures and hardware, and interviews of site personnel not affiliated with the Quality First Program. The resolution of safety related concerns was found satisfactory. Some program weaknesses were identified in the area of handling of wrongdoing issues and level of Quality First documentation to substantiate concern closure.

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2. <u>Conclusion</u>:

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Rating: 2

Trend: Consistent

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3. Board Recommendation:

Licensee: None

NRC: None

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I. Licensing

1. Analysis

The licensing area had a significant level of activity during the period, particularly in the areas of responses to NRC requests for information, responses to SER outstanding and confirmatory issues, support for the ACRS full and subcommittee meetings, support for NRR on-site audits, support of the Technical Specification review, and response to the downcomer bracing issue.

Management support for licensing activities has been evident. NMPC provided timely and technically adequate responses to concerns from the ACRS full and subcommittee meetings which resulted in the issuance of a favorable full power letter from the ACRS. A large number of onsite audits were performed by NRR during the assessment period to support the licensing effort. The audits were generally well supported by the licensee, as evidenced by availability of appropriate documentation and personnel, and the audit results show evidence of prior planning.

The NMPC resolution of technical issues has been generally acceptable. This included the responses to SER issues and was also noted during the Technical Specification review process. The NMPC responses generally exhibited an understanding of the technical issues, and viable, generally sound and thorough approaches were proposed. The downcomer analysis is an exception, as this issue was the source of technical disagreement during the later stages of the period. NMPC ultimately applied extensive effort to respond to most of the staff concerns in a short period of time.

A recent FSAR amendment included two caveats that the FSAR plant description may vary from the as-designed or as-built conditions. In particular NMPC stated that dimensions and quantities stated in the FSAR are nominal. Region I review of the Standby Liquid Control (SLC) system design and preoperational test procedures, a few days after the close of the assessment period, identified that the two SLC pumps are rated for a cumulative flow rate of 82.4 GPM in lieu of 86 GPM as specified in the FSAR. This error impacts the SER acceptance of the SLC system in regards to 10 CFR 50.62, which requires the capability to inject a minimum of 86 GPM at 13 weight percent sodium pentaborate solution. The accuracy of the FSAR is critical for the performance of the licensing review. The NMPC attitude that the FSAR is not a design document fosters the problems noted regarding the FSAR inaccuracies. As indicated in section H of this SALP, an FSAR verification program has been implemented by NMPC. The identification of further inaccuracies of this nature after the conduct of the associated licensee verification efforts indicates further attention is required in this area.

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Followup effort to the October 1984 Caseload Forecast Panel Meeting was conducted. NMPC chose not to revise the projected Fuel Load date even though evidence existed to support the NRC projected slip in the Fuel Load date. In January 1986, the licensee Fuel Load date was revised. NMPC was continually unable to adhere to scheduled commitment dates made to the NRC staff. This process posed difficulties for effective NRC resource scheduling, both licensing and inspection.

The safeguards area continued, in this SALP period, to be an area of effective performance. There was consistent evidence of prior planning by utility (including corporate level) management. Responses regarding safeguards matters were technically sound and consistent, demonstrating the existence of well developed policies and procedures for control of securityrelated activities. The licensee's responses in the safeguards area were submitted promptly and in most cases were acceptable the first time. The Security Organization positions and responsibilities are well defined, and the security staff is considered to be more than ample to implement the facility physical protection program.

The timely resolution of licensing issues will remain dependent upon NMPC responsiveness. In order to avoid impact upon the licensing process, management attention needs to be focused on issuance of operating procedures, testing of Kaman isolators, justification for deferral of preoperational tests, and justification for alternate means to provide structural steel fire protection.

2. <u>Conclusion</u>:

Rating: 2

Trend: Consistent

3. Board Recommendation:

Licensee: None

NRC: None

V. SUPPORTING DATA AND SUMMARIES

A. Construction Deficiency Reports (CDRs)

The licensee identified twenty seven (27) potential 10 CFR 50.55(e) Construction Deficiencies during the assessment period, three of which were subsequently found as not reportable. Table 1 identifies the reported items and the current NRC item status. Analysis of the CDRs for causal linkage has resulted in the identification of the following linked chains:

- CDRs 85-00-06, 85-00-14, 85-00-23, 85-00-27, 85-00-29. Vendor or SWEC design errors resulted in deficiencies that would preclude proper operation of the Diesel Generator units.
- CDRs 85-00-11, 85-00-13. Improper vendor or site craft practices "resulted in a hardware configuration that would degrade the operability of the Diesel Generator units.

B. <u>Allegations Summary</u>

During the assessment period 13 allegations were received by the NRC.

Routine inspection followup has been performed in response to ten of the allegations. Seven of the allegations were found invalid. Two violations were issued for a valid allegation regarding the NMS cable installations. The remaining two valid allegations were found to have been properly addressed by the licensee.

C. <u>Escalated Enforcement Actions</u>

No escalated enforcement actions were initiated during this SALP period. Section IV.C of the Enforcement Action 83-137 Order was modified on March 15, 1985 to defer indefinitely the requirement to perform a third party independent appraisal of organizational responsibilities, management controls, staffing levels, communications, and operating practices.

D. <u>Management</u> Conferences

- February 6, 1985 A management meeting was convened at NMPC request. The Management Analysis Corporation report was discussed that had been generated in response to the CAT Order. The interim results of the NMPC hardware reverification efforts were presented.
- February 27 and March 15, 1985 A management meeting was convened at NRC request. The SWEC Engineering Technical Audit program was reviewed. The proposed scope and conduct of the final technical audit was also reviewed.

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- 3. June 17, 1985 A management meeting convened at NRC request. The NMPC reverification of ITT-Grinnell large bore pipe supports was discussed. NMPC instituted program enhancements and performed engineering analysis to demonstrate the acceptability of the pipe supports.
- 4. July 23, 1985 A management meeting convened at NRC request. The NMPC reverification of instrument tubing supports, HVAC duct supports, and electrical equipment were discussed. Additionally the electrical separation program and FSAR verification efforts were discussed.
- 5. January 22, 1986 A management meeting convened at NRC request. The plant completion status with respect to construction, preoperational testing, and operational readiness were discussed. This information will be utilized by the Region I Near

....,Term Operating License (NTOL) Review Panel to guide NRC inspection activities.

E. <u>Licensing Activities</u>

1. NRR Licensee Meetings

A large of number of meetings were held with the applicant in Bethesda to resolve/discuss staff concerns. These are documented by meeting summaries.

2. NRR Site Visits & Audits

Instrumentation and Control Audit January 7-9, 1986 Environmental Qualification Audit December 16-20, 1985 Seismic Qualification Review Team Audit July 8-12, 1986 July 8-12, 1986 Pump and Valve Operability Review Team Audit Containment Systems Site Visit January 7, 1986 December 17-18, 1985 Electrical Power Systems Site Visit DCRDR Audit March 19-22, 1985 Safety Parameter Display System Audit July 17-18, 1985 Revetment Ditch Audit August 27, 1985

3. Licensing Documents Issued

FESApril 1985SERFebruary 1985SSER-1June 1985SSER-2November 1985Draft Technical SpecificationsAugust 29, 1985Proof-and-Review Technical SpecificationsNovember 20, 1985

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4. Applicant Responses

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a. Responses to requests for information.

b. Letters & FSAR updates to respond to SER concerns.

c. Responses to ACRS questions.

d. Responses to concerns on downcomer supports.

e. Support for the Technical Specification review.

f. Support for the ACRS full and subcommittee meetings.

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TABLE 1 CONSTRUCTION DEFICIENCY REPORTS (February 1, 1985 - January 31, 1986) NINE MILE POINT, UNIT 2

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CDR No.	Subject	Cause <u>Code</u>	<u>Discipline</u>	<u>Status</u>
85-00-04	MSIV actuator latching bearing failure	В	3	Open
85-00-05	ECCS manual control switches do not main- tain run position	В	5	Closed
85-00-06 ·	Overheating of DG con- trol cabinet due to non-safety coil failure	В	5	Closed
85-00-07	Anaconda flexible con- duit bend radius vio- lations	D	4	Open
85-00-08	DG jumpers missing	Determined reportable	not	Closed
85-00-09 '	ITT design of trim details without SWEC review	A	2	Closed
85-00-10	Structural steel sub- supplier did not have a Appendix B quality assurance program	C	1	Closed
85-00-11	DG lube oil hose abraded by timing chain	C	4	Closed
85-00-12	Motor lead connections sealed with unapproved insulation material	A	4	Closed
85-00-13	DG timing chain sprocket locknuts missing	F	4	Closed
85-00-14	DG load shedding timer	В	4	Open

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CDR No.	Subject	Cause Code	Disci	ipline	<u>Status</u>
85-00-15	Missing jumpers for limit switch assembly on MOV	A		3	Open
85-00-16	Unqualified filler material used for attach- ment welds to contain- ment liner	A		1	Closed
85-00-17	DG tested in excess of rated power	Determined reportable	l not		Closed
85-00-18	Linear indication in tube steel seam weld	С		4	Open
85-00-19	ITT disassembled valves without pro- cedure	Determined reportable	l not		Open
85-00-20	RCIC suction line isolation valve missing	В		2	Closed
85-00-21	Erroneous RCIC steam- line drain trap set- point	В		3	Open
85-00-22	Limitorque motor operator failed qualification testing	E		4	Open
85-00-23	DG current trans- former wiring error	C .		4	Closed
85-00-24	PGCC solder connec- tions nonconforming	F		5	Open
85-00-25	Valve CMTR did not document test coupon heat treatment para- meters	C		3	Open
85-00-26	Panel boards not mounted in qualified arrangement	В		4	Open
85-00-27	UPS induced DC noise cancelled DG emergency start signal	С		4	Open

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			Cause			
<u>CDR No</u> .	Subject		<u>Code</u>	Discipline	<u>Status</u>	
85-00-28	Insufficient engagement of motor anchor	thread SWP bolts	F	3	. Open	
85-00-29	DG exciter fi cuit incorrec	eld cir- tly sized	В	4	Open	
85-00-30	Spatial cleara lations betwee tural steel a	ance vio- en struc- nd containm	F ent	1	Open ,	
<u>Cause Codes</u>			-	T.		
A - Personnel Error D - Defective Procedure B - Design Error E - Component Failure C - External Cause F - Fabrication Error						
Summary						
<u>Cause Coc</u>	le	Tota	<u>l Number</u>			
A. Personnel B. Design Er C. External D. Defective E. Component F. Fabricati	Error Cause Procedure Failure on Error		4 8 6 1 1 4	·		
Total 24						
CONSTRUCTION DEFICIENCY REPORTS CORRELATED BY DISCIPLINE						
<u>Disciplin</u>	<u>e</u>	<u>Cause Code</u>	<u>es</u>	<u>Total</u>		
1. Safety Related Structures 1/A, 1/C, 1/F 3 2 Pining Systems and 1/A 1/B 2						

۷.	riping systems and	1/A, 1/B	2
~	Supports		
3.	Mechanical Components	1/A,2/B,1/C,1/F	5
4.	Electrical Components	1/A,3/B,4/C,1/D, 1/F, 1/F	11
5.	Instrumentation Control Systems	2/B, 1/F	3

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TABLE 2

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INSPECTION HOURS SUMMARY (2/1/85 - 1/31/86) <u>NINE MILE POINT UNIT 2</u>

	Functional <u>Areas</u>	<u>Hours</u>	<u>% of Hours</u>
A. B. C. D. F. G. H. I.	Readiness for Operations Radiological Controls Surveillance Preoperational Testing Fire Protection Security Construction Assurance of Quality Licensing	408 153 95 710 157 92 2512 374	9 3 2 16 4 2 56 8 -
	Total	4501	100

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TABLE 3

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SUMMARY OF INSPECTION REPORTS (2/1/85-1/31/86) NINE MILE POINT, UNIT 2

INSPECTION REPORT <u>NUMBER</u>	INSPECTION HOURS	AREAS INSPECTED
84-21	269	Concrete expansion anchors, design control, HVAC supports, rework control, PSI, QA corrective action systems
85-02	40	Welding procedures; RCI and JCI welding operations
85-03	102	Preventive maintenance, electrical, instrumentation, HVAC
85-04	110	Welding inspection, FSAR verification, electrical equipment wiring
85-05		Management conference on NMPC hardware reverification and Management Analysis Corporation report
85-06	112	QA/QC for preoperational testing, NSSS pipe supports
85-07		Cancelled
85-08	105	Electrical and Instrumentation equipment
85-09		Management conference on Engineering Assurance Technical audit
85-10	473	Reactor Coolant system hydrostatic test, spent fuel racks, nitrogen inerting system
85-11	112	Reactor Coolant system hydrostatic test

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INSPECTION REPORT <u>NUMBER</u>	INSPECTION HOURS	AREAS INSPECTED
85-12	28	Open item closure, cable pull sidewall tension calculations.
85-13	238	Engineering assurance audit, diesel generator exhaust, startup quality assurance, control rod drive system installation and hydrostatic testing, MSIV testing, piping and pipe supports, structural steel, preoperational test procedure review
85-14		Review of EA/QA Audit plans
85-15	·	Operator licensing examinations for 12 SROs and 12 ROs
85-16	26	Preservice Inspection of procedures and data
85-17	37	Electrical equipment and open item review
85-18		SWEC Engineering Assurance Audit implementation
85-19	157	Quality Assurance, RPV internals, preliminary testing, flood control berm
85-20	93 .	Preoperational radiological controls, radiation protection organization, training, facilities
85-21		Management meeting to discuss NMPC re-verification of large bore pipe supports
85-22	·	Cancelled
85-23	24	Preservice Inspection program, review of PSI data, inprocess PSI examinations

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INSPECTION REPORT <u>NUMBER</u>	INSPECTION HOURS	AREAS INSPECTED
85-24	42	HVAC installations, open item review
85-25	187	Instrumentation components, piping and pipe supports, hydrostatic testing, diesel generator testing, RPV internals
85-26	,	Management meeting to discuss NMPC hardware reverification, electrical separation, FSAR verification, and transitional organization
85-27	367	Local leak rate testing, pipe welds, HPCS walkdown, Preventive Maintenance, preoperational test procedure review, QA audits
85-28		Results and corrective actions of SWEC Engineering Assurance Technical Audit
85-29	41	Resolution of welding issues
85-30	37	<pre>Preoperational test program, procedures, QA/QC interface</pre>
85-31	72	Piping system as-built stress reconciliation, ITT large bore pipe supports
85-32	29	Radiological controls inspection, preoperational testing, shield survey program, fuel receipt preparations, staffing, and training
85-33	38	Mechanical equipment, review of open items
85-34	138	Safe shutdown systems, emergency lighting system

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INSPECTION REPORT <u>NUMBER</u>	INSPECTION HOURS	AREAS INSPECTED
85-35	34	Electrical equipment, open item review
85-36	110	Preoperational testing, preliminary testing, electrical equipment, Operational Preparedness Plan, Reactor Core Isolation Cooling system walkdown
85-37	50	Licensed operator training programs, technical training for mechanics/electricians / I&C technicians
85-38 ,	32	Security plan and procedures implementation for fuel receipt, security systems preoperational review, open item review
85-39		Cancelled
85-40	8	Nuclear material control and accounting, receiving, storage, inventory, records, management
85-41	-	Operator Licensing examinations for 12 SROs and 20 ROs
85-42	55	Neutron Monitoring system cable and raceway installations.
85-43	483	Nondestructive Examination van inspection
85-44	202	Fuel receipt, preoperational testing, Information Notices, open item review
85-45	15	Fire Protection Program readiness to receive fuel
85-46	40	Preservice Inspection program, procedures and data, review of open items

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INSPECTION REPORT <u>NUMBER</u>	INSPECTION HOURS	AREAS INSPECTED
85-47	23	Radiological Controls program, organization and staffing, personnel training and qualifi- cation, GET, fuel receipt, preoperational testing
85-48	52	Security Program implementation
86-02	300 .	Technical Specification As-Built Inspection
86-03	28	Preoperational test program, procedure review
86-04	160	Team inspection of Quality First allegation handling program
86-06	21	Management meeting for Near Term Operating License Panel

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TABLE 4

ENFORCEMENT DATA (2/1/85 - 1/31/86)

Α.	Number and Severity	Level	of Violat [.]	ions
	Severity Level	I	0	
	Severity Level	II	0	
	Severity Level	III	0	•
	Severity Level	IV	2	
	Severity V		6	
	Deviation		0	
	Tot	al '	8	

B. Violation correlated by Functional Area

· Functional Areas		Severity Levels				
		I	II	ĪII	IV	V
Α.	Readiness for Operations	0	0	0	0	0
Β.	Radiological Controls	0	0	0	0	0
C.	Surveillance	0	0	0	0	0
D.	Preoperational Testing	0	0	0	0	0
ε.	Fire Protection	0	0	0	0	0
F.	Security	0	0	0	0	0
G.	Construction	0	0	0	1	4
Н.	Assurance of Quality	0	0	0	1	2
Ι.,	Licensing	<u>0</u>	0	0	0	0

Totals

U	U	U	0	U	
0	0	0	0	0	
0	0	0	0	0	
0	0	0	1	4	
0	0	0	1	2	
0	0	0	0	0	
0	0	0	2	6	

C. Summary

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Inspection <u>Report No</u> .	Severity <u>Level</u>	Functional <u>Area</u>	<u>Violation</u>
84-21	IV	H	Improper QA ⁻ classification of Refueling Bridge
	IV	G	Inconsistent design drawings for HVAC duct supports
85-03	V	Н	HVAC support baseplate gaps not inspected

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Inspection <u>Report No</u> .	Severity <u>Level</u>	Functional <u>Area</u>	, <u>Violation</u>
	V	G	Preventive maintenance not performed on Diesel Generator Systems.
85-10	V	G	Concrete expansion anchors improperly installed
85-36	V	Η	Improper bolting of Remote Shutdown Panel unistrut connections
85-42	V	G	Minimum cable bend radius violations
	V	G	Cable installed without pull tension monitoring and documented procedures
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