

ENCLOSURE

SALP BOARD REPORT

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

INSPECTION REPORT NUMBER

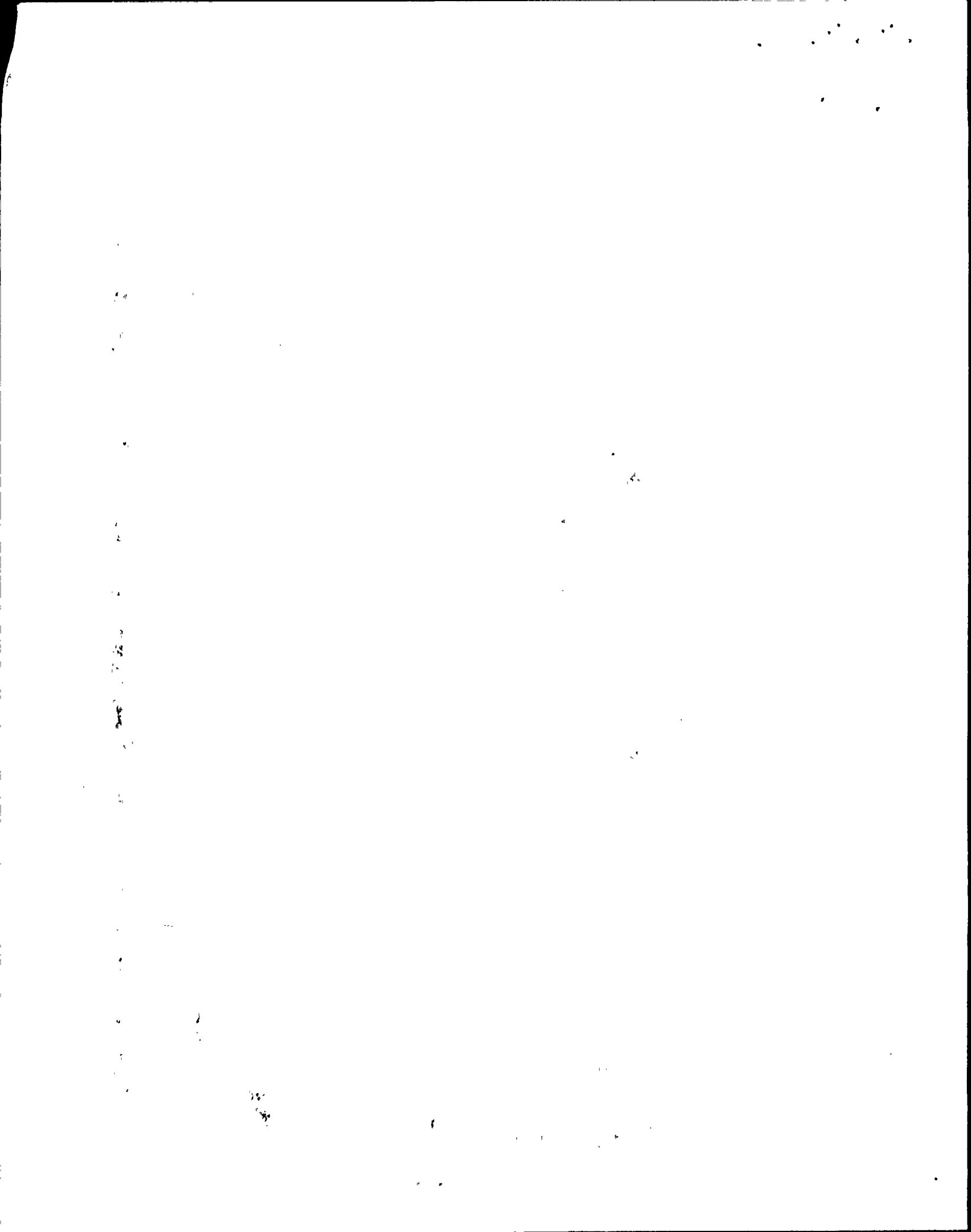
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CAROLINA POWER AND LIGHT COMPANY

SHEARON HARRIS UNIT 1

NOVEMBER 1, 1985 THROUGH JULY 31, 1986

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I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC staff effort to collect 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 determine compliance with NRC rules and regulations. SALP is intended to be sufficiently diagnostic to provide a reactional 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.

An NRC SALP Board, composed of the staff members listed below, met on August 19, 1986, and September 9, 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.

This report is the SALP Board's assessment of the licensee's safety performance at Shearon Harris for the period November 1, 1985 through July 31, 1986.

SALP Board for Shearon Harris:

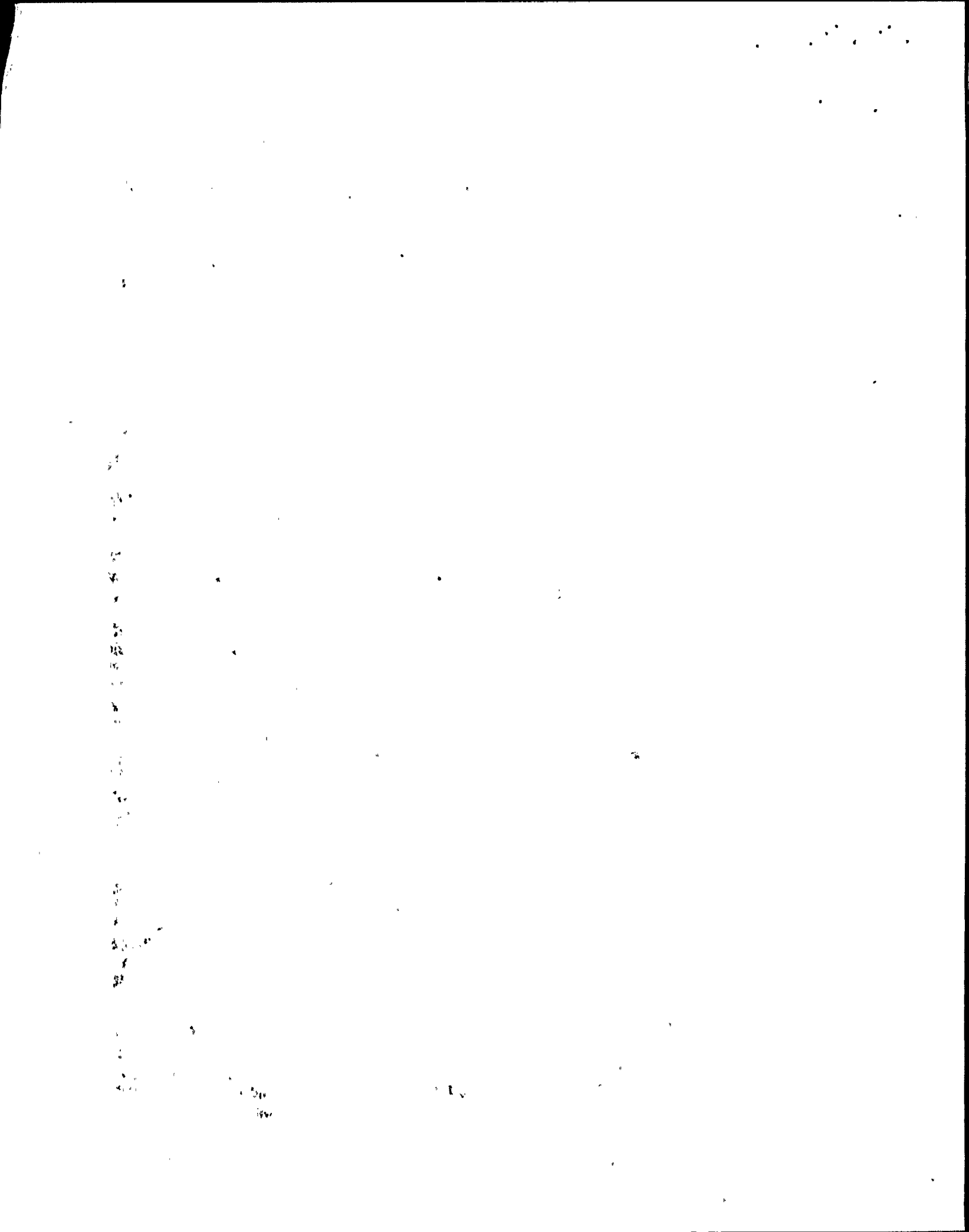
- L. A. Reyes, Deputy Director, Division of Reactor Projects (DRP), Region II
- K. P. Barr, Chief, Nuclear Materials Safety and Safeguards Branch, Division of Radiation Safety and Safeguards (DRSS), RII
- A. F. Gibson, Director, Division of Reactor Safety (DRS), RII
- D. M. Verrelli, Chief, Projects Branch 1, DRP, RII
- L. S. Rubenstein, Director, PWR Project Directorate 2, Division of Pressurized Water Reactor Licensing-A (PWR-A), Office of Nuclear Reactor Regulation (NRR)
- G. F. Maxwell, Senior Resident Inspector, Shearon Harris, DRP, RII
- B. C. Buckley, Senior Project Manager, PWR Project Directorate 2, PWR-A, NRR

Attendee's at SALP Board Meeting

- P. E. Fredrickson, Chief, Project Section 2A, DRP, RII
- L. S. Mellen, Project Inspector, Projects Section 2A, DRP, RII
- K. D. Landis, Chief, Technical Support Staff, DRP

II. CRITERIA

Licensee performance is assessed in selected functional areas, depending upon whether the facility is in a construction, preoperational, or operating phase. Each functional area normally represents areas which are significant to nuclear safety and the environment, and which are normal programmatic areas. Some functional areas may not be assessed because of little or no licensee activities or lack of meaningful observations. Special areas may be added to highlight significant observations.



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

- a. Management involvement and control in assuring quality
- b. Approach to resolution of technical issues from a safety standpoint
- c. Responsiveness to NRC initiatives
- d. Enforcement history
- e. Reporting and analysis of reportable events
- f. Staffing (including management)
- g. Training effectiveness and qualification

However, the SALP Board is not limited to these criteria and others may have been used where appropriate.

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:

Category 1 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 or construction is being achieved.

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

Category 3 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 such that minimally satisfactory performance with respect to operational safety or construction is being achieved.

The functional area being evaluated may have some attributes that would place the evaluation in Category 1, and others that would place it in either Category 2 or 3. The final rating for each functional area is a composite of the attributes tempered with the judgement of NRC management as to the significance of individual items.

The SALP Board may also include an appraisal of the performance trend of a functional area. This performance trend will only be used when both a definite trend of performance within the evaluation period is discernable and the Board believes that continuation of the trend may result in a change of performance level. The trend, if used, is defined as:

Improving: Licensee performance was determined to be improving near the close of the assessment period.

Declining: Licensee performance was determined to be declining near the close of the assessment period.

The Shearon Harris SALP Board review did not identify a performance trend for any of the assessed functional areas.

III. SUMMARY OF RESULTS

Overall Facility Evaluation

During this assessment period, corporate and site management have focused their attention on construction completion, preoperational testing and preparation for unit operation. These activities have been conducted in a very professional manner. Major strengths were identified in the areas of piping systems and supports, auxiliary systems, licensing, emergency preparedness and security.

In the electrical equipment and cables functional area, problems similar to the previous assessment period resulted from inadequate craft guidance and performance, coupled with the failure of QA to identify and correct the craft trend. Although both the electrical construction and QA effort were considered satisfactory, similar QA management weaknesses in the feedback and correction of problems were identified with structural steel welding and the control of unauthorized work. The licensee has aggressively addressed these problem areas and, at the end of the assessment period, appeared to have solved the programmatic deficiencies.

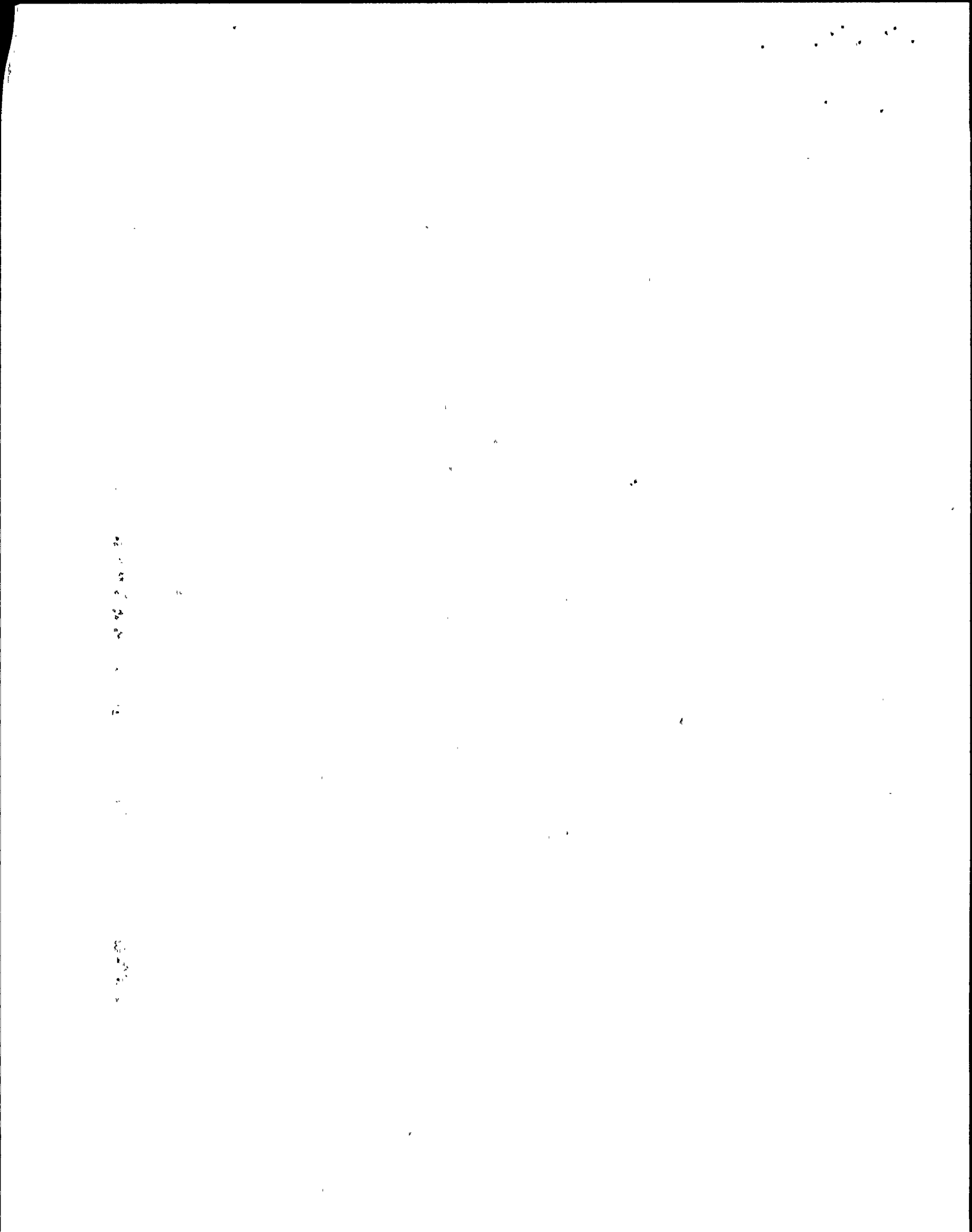
The licensee has progressed through the preoperational testing program with a minimum amount of retest or delay. Problems did surface with respect to procedure acceptance criteria and attention to detail but appeared to be resolved by the end of the assessment period.

The flow from construction through preoperational testing to operations appeared to be managed in a very professional manner. Although the licensee's estimates for completion of several operational readiness milestones were somewhat optimistic, actual completion dates were consistent with previous construction projects. Even though the operational readiness effort progressed satisfactorily, a problem surfaced with respect to licensed operator simulator training and qualification. The problem in this area will be resolved prior to licensing.

Preliminary inspections revealed that no major problems have developed with the generation of procedures necessary for plant operation. The security plan has been implemented in an orderly and timely fashion and emergency preparedness inspections continue to reveal a strong program. The transition from Construction QA to Operations QA appeared to be functioning effectively. Problems with post-accident sampling hardware design extended to the end of the assessment period, but appeared to be headed toward satisfactory resolution. The fire protection program appeared to be developing in a satisfactory manner. Management of the licensing activity has been strong. Resolution of issues has been both prompt and comprehensive. Overall, the plant at the end of the assessment period, was progressing satisfactorily toward licensing and is expected to resolve those problems still ongoing at the end of the assessment.

<u>Functional Area</u>	<u>5/1/84</u> <u>10/31/85</u>	<u>11/1/85</u> <u>7/31/86</u>
Soils and Foundations	1	NI
Containment, Safety Related		
Structures and Major Steel Supports	1	NR
Piping Systems and Supports	1	1
Safety Related Components - Mechanical	2	NR
Auxiliary Systems	2	1
Electrical Equipment and Cables	3	2
Instrumentation	2	2
Quality Programs and Administrative		
Controls Affecting Quality (Construction)	2	2
Licensing	2	1
Architect/Engineer Design	2	NI
Preoperational Testing	2	2
Operational Readiness	NI	2
Radiological Controls	NR	2
Fire Protection	NI	2
Emergency Preparedness	2	1
Security	NI	1
Training and Qualification Effectiveness	NI	2
Quality Programs and Administrative		
Controls Affecting Quality (Operations)	NI	2

Note: NI - Not Inspected/Rated
NR - Not Rated



I. Construction

A. Containment, Structural Steel and Steel Supports

1. Analysis

During this assessment period, inspections were performed by the regional inspection staff. Inspections involved review of Quality Assurance (QA) implementing procedures, observation of activities, and review of quality records related to installation, erection, welding, heat treatment, and inspection of the containment and other safety related structures.

The review of quality assurance implementing procedures indicated evidence of prior planning and an assignment of priorities and well stated procedures for the control of activities. Observation of work and work activities showed that procedures and policies were strictly adhered to. The review of quality records indicated that records were well maintained and readily retrievable. Quality assurance/quality control (QA/QC) personnel involved in this area were well qualified for their job functions and knowledgeable in procedural requirements. Staffing in this area was adequate for the level of construction activity in progress. A QA problem in the area of structural steel welding is addressed in the Quality Programs (Construction) functional area.

No violations were identified.

2. Conclusion

Category: Not rated

3. Board Comments: This functional area is not being rated due to the limited licensee activity required at this stage of construction; however, NRC inspections indicate the licensee is continuing to aggressively close the remaining outstanding issues.

B. Piping Systems and Supports

1. Analysis

During this assessment period, inspections were performed by regional and resident inspection staffs. Inspections included reviews of procedures; observation of work activities; and review of records in the areas of pipe welding, pipe support installation and welding, welder qualification, welding filler material control, welding repair, pipe storage, preservice inspection, and IE Bulletins 79-02 and 79-14. The majority of the inspection effort involved pipe support installation and preservice inspection.

The licensee's program for installation and inspection of pipe supports is a very comprehensive program which provided more than adequate assurance that supports are installed in accordance with design requirements.

The licensee's preservice inspection (PSI) program is a comprehensive program controlled by the licensee plant staff. PSI procedures met NRC and ASME code requirements and PSI activities were consistently performed in accordance with these procedures.

Evaluation of the licensee's response to violations indicated an active management involvement in addressing and correcting problems. Observations and discussions with Quality Control (QC) inspectors demonstrated that staffing and training were appropriate for work activities in progress.

Four violations were identified.

- a. Severity Level V Violation for incorrectly referencing preservice subsequent code addenda (400/85-48-01)
- b. Severity Level V Violation for failure to follow procedure for correction of examination data (400/85-48-03)
- c. Severity Level V Violation for failure to follow as-built documenting procedure for piping (400/86-05-01)
- d. Severity Level V Violation for failure to adequately implement a pipe support design calculation procedure (400/86-21-01)

2. Conclusion

Category: 1

3. Board Comments: None

C. Safety Related Components-Mechanical

1. Analysis

During this assessment period, inspections were performed by the regional inspection staff. Inspections were conducted in the areas of: receipt inspection; equipment storage; installation of equipment; installation of reactor vessel internals; and preservation and maintenance of safety related equipment.

Examination of procedures and specifications, work activities and quality records showed that the licensee has a quality assurance program for the control of safety related components. Work activities were performed in accordance with procedure and specification requirements. Receipt inspection and storage, including

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preservation and maintenance activities, were found to be well controlled, documented properly and in compliance with regulatory requirements.

The review of quality records indicated that records were well maintained and readily retrievable. Quality assurance/quality control personnel involved in this area were well qualified for their job functions and knowledgeable in procedural requirements. Staffing in this area was adequate for the level of construction activity in progress.

No violations were identified.

2. Conclusion

Category: Not rated

3. Board Comments: This functional area is not being reported due to limited licensee activity required at this stage of construction; however, NRC inspections indicate the licensee is continuing to aggressively close the remaining outstanding items.

D. Auxiliary Systems

1. Analysis

During this assessment period, regional and resident inspection staffs performed inspections in the areas of the fire protection/detection program; fire protection systems; and heating, ventilation and air conditioning (HVAC) systems.

Licensee management has increased its involvement in the implementation of the fire protection program, as evidenced by the continued effort to upgrade the training programs for fire brigade personnel; installation of site permanent plant fire detection and suppression systems; installation and inspection of seal penetrations; and installation of fire doors, barriers, walls and dampers.

The licensee has conducted frequent fire protection training drills for the site, with participation of both the operations and construction fire brigades. The progress of the fire brigade training is continuously monitored by the licensee. NRC personnel reviewed selected fire brigade personnel training records to insure that they met the applicable guidance and standards. The construction fire brigade remains a strong and positive group, exceeding industry standards.

Maintenance of fire protection systems and equipment was routinely performed by the responsible group with no major discrepancies identified. Portions of the fire protection systems and equipment have been preoperationally tested and turned over to operations.

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Routine inspections were conducted by regional and resident inspection staffs in the area of HVAC. The licensee expended significant resources toward completion of the installation inspection and acceptance of installed HVAC equipment and ductwork. These efforts were performed in accordance with the licensee's revised HVAC management control program.

One violation was identified where the documentation for the high efficiency particulate air filters for the a safety-related air handling unit did not comply with the purchase specification. The filters were not receipt inspected because they were erroneously identified as non-nuclear safety-related. This misidentification occurred a number of years previous to this assessment period but was only recently identified as a result of the current inspection effort. The licensee continues to work on resolution of this item.

The review of quality records indicated that records were well maintained and readily retrievable. Quality assurance/quality control personnel involved in this area were well qualified for their job functions and knowledgeable in procedural requirements. Staffing in this area was adequate for the level of construction activity in progress.

Examination of procedures and specifications, work activities and quality records showed that the licensee has improved the quality assurance program for control of fabrication installation and inspection of the HVAC systems. Work activities were performed in accordance with procedures and specification requirements.

Procurement, receipt inspection, and storage activities were reviewed and found to be well controlled, documented properly and in compliance with regulatory requirements.

The resident inspectors conducted walkdowns of the HVAC systems in the control room, containment and the reactor auxiliary building. The walkdowns verified that the installed HVAC equipment and ductwork was built in accordance with applicable drawings.

One violation was identified:

Severity Level IV violation for failure to control the purchase of piping and high efficiency particulate air filters in accordance with the applicable purchase requirements (400/86-41-02).

2. Conclusion

Category: 1

3. Board Comments: None

E. Electrical Equipment and Cables

1. Analysis

During this assessment period, inspections were performed by regional and resident inspection staffs. The areas inspected included: electrical equipment; conduit/raceway; quality records; 10 CFR 50.55(e) and previously identified NRC items.

The majority of the licensee's efforts were in the areas of cable and conduit installation. Additional work occurred in the areas of electrical system startup and electrical system turnover.

A special announced team inspection was performed by regional, resident, and contractor inspection personnel to assess the licensee's compliance with the NRC positions described in Generic Letter 83-28 "Required actions based on generic implications of Salem Anticipated Transient Without Scram (ATWS) events" and CP&L's responses to NRC dated November 7, 1983 and May 31, 1985. Areas inspected included post-trip review, equipment classification, vendor interface and manual control, post-maintenance testing and reactor trip system reliability. Weaknesses were identified regarding failure to incorporate vendor recommendations appropriately into procedures for reactor trip breaker maintenance and shunt trip attachment replacement. With these exceptions, the licensee's procedures and staffing appeared to be good. Technical issues were resolved in a conservative manner and licensee management was actively involved in assuring quality and responsiveness to NRC initiatives. Examples of management involvement are as follows:

- The licensee has developed procedures which clearly define responsibilities, authorities, methods and equipment needed to perform timely post-trip reviews.
- The licensee has provided initial training and established controls for refresher training for personnel with post-trip analysis responsibilities.
- The licensee has developed controls for vendor manuals and established contacts with vendors.
- The licensee has developed a computerized component label Q-list which identifies sub-components and replacement parts.
- The licensee has enhanced reactor trip system reliability by modifying the reactor trip system with the automatic shunt modification provided by the Westinghouse Owners Group and by developing a trending program for reactor trip breaker parameters.

During this assessment period, while examining a workers' concern, interviews were conducted with a number of site inspection personnel. Responses obtained during the interviews raised several questions with regard to the adequacy of licensee inspections to assure compliance with Regulatory Guide (RG) 1.75, Physical Independence of Electric Systems, and exceptions to this Regulatory Guide which were described in a Wyle Laboratory test report and approved by the NRC.

NRC inspectors conducted an inspection in the Fuel Handling Building (FHB) using the licensee's inspection procedures. This building was chosen because it had been inspected and accepted by the licensee and was turned over to nuclear operations. This inspection identified several discrepancies which had not been previously identified by the licensee. The separation discrepancies observed were of several categories; between raceway components of redundant safety divisions, between raceway components of a single division and a non-nuclear safety division, and between raceway components of one safety division and exposed cable of another safety division or non-nuclear safety division.

Based on the above NRC inspection findings, the licensee reinspected the FHB and several areas in the Reactor Auxiliary Building. The licensee's reinspection revealed that approximately 30% of the discrepancies identified had not been identified on the initial inspections. After evaluation, only a relatively small number of the total discrepancies were determined to be deficient and would require rework. A significant number of those discrepancies requiring rework were also not identified by QC during the initial inspection.

The licensee was cited during a previous assessment period for two violations that involved cable separations. One of the violations (400/85-04-01) identified inadequate inspection for separation between nonsafety cable trays and a safety related conduit in the RAB. The other violation (400/85-08-01) involved design approval of a Field Change Request (FCR) E-1304 which was in direct conflict with the requirements of RG 1.75 and IEEE 384-1974. In view of the current problem, it is clear that the licensee failed to recognize the full implication of Violation 400/85-08-01 and as a result of that failure, the corrective action specified was inadequate to preclude further deficiencies in cable separation.

Enforcement related to cable separation deficiencies is under review by the NRC. No violations were issued in the electrical area during this assessment period.

2. Conclusion

Category: 2

3. Board Comments: None

F. Instrumentation

1. Analysis

During this assessment period, routine inspections were performed by regional and resident inspection staffs. These inspections covered tubing installation; tube supports, components; panels; wiring and startup activities.

The major efforts during the assessment period were the installation of instruments, instrument tubing, supports and checkout for turnover to nuclear operations.

Construction deficiency reports in the instrument area have been evaluated by design, corrective action assigned and issues corrected in a reasonable time frame. There appeared to be adequate effort in design and construction in this area.

There was one violation identified in this area during the assessment period. This violation related to the inadequacy of the corrective action assigned to a nonconformance report (NCR) which allowed continuing damage to installed and inspected instrument tubing.

The overall instrumentation program now appears adequate as a result of NRC attention in this area. The inspectors have found that the equipment is installed and inspected in accordance with the instrumentation program. The tubing installation appears to be well controlled and supports are installed as required on the drawings. The inspectors observed that installed tubing has been damaged and that there is not a programmatic effort to protect installed tubing from construction damage. The licensee's intentions are to identify and correct tubing damage deficiencies during walkdowns, conducted after QC inspection.

One violation was identified.

Severity Level V violation for inadequate corrective action to prevent damage to instrument tubing (400/86-50-01)

2. Conclusion

Category: 2

3. Board Comments: None

G. Quality Programs and Administrative Controls Affecting Quality (Construction)

1. Analysis

During this assessment period, routine inspections were conducted by regional and resident inspection staffs. Inspectors specifically reviewed the following areas: licensee management of QA activities; as-built drawings; in-depth QA inspection of performance; licensee action on previous enforcement matters; and previously identified inspector follow-up matters.

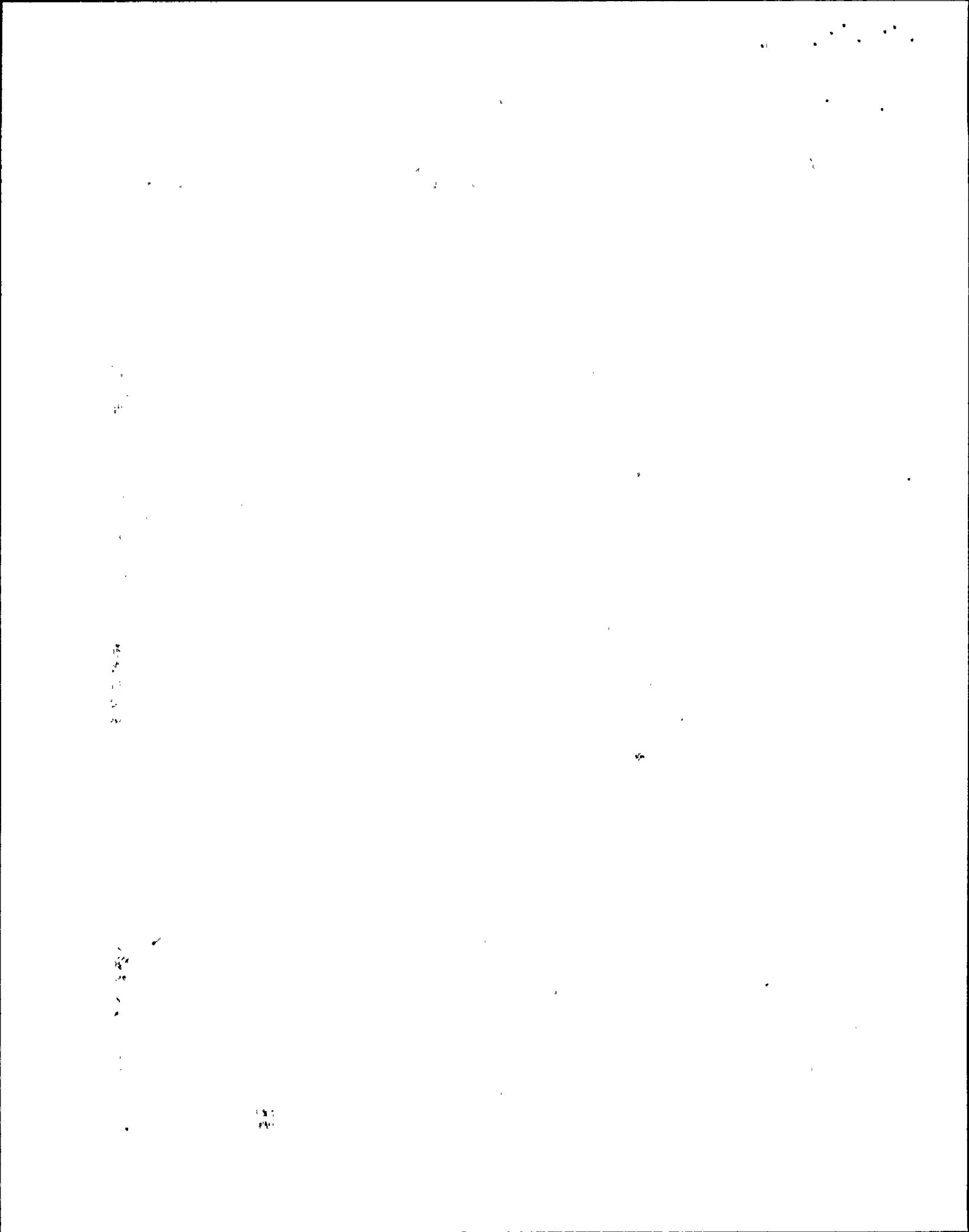
The licensee is responsive to NRC concerns as evidenced by successful closure of previously identified items.

The NRC inspection of QA activities involved the review of QA program changes, procurement activities, design activities, and control of drawings. The NRC inspection of as-built drawings involved the review of governing procedures, status of construction turnover and a review of piping systems, electrical, instrumentation and structural steel. Based on the samples reviewed in these areas, the inspectors concluded that these activities were being performed in accordance with the measures established.

Inspectors have conducted walkdown inspections on all major safety related piping systems. The as-built drawings were found to accurately depict the location and routing of piping systems and components.

A weakness was identified in preventing repeat nonconforming conditions. Examples of this weakness were identified through the following:

- Electrical cable separation discrepancies were not identified and corrected even though similar problems had been brought to the licensee's attention by NRC violations in 1985. More recent inspections of electrical cable separation by the NRC and followup inspection by the licensee revealed numerous deficiencies as described in the Electrical Equipment and Cables functional area. Although some of these deficiencies had been previously identified by site QC personnel, not all of the previously identified deficiencies had been corrected.
- In order to determine if the programmatic deficiencies in the cable separation area extended to other activities, an additional inspection was performed in the areas of structural steel and electrical supports. This inspection found that the licensee had identified problems in the structural steel area similar to problems in the electrical cable separation area, in that QC personnel had failed to identify all



deficiencies in structural steel welds; however, the weld deficiencies appeared to be minor in nature. Management is also reviewing welds on additional selected critical structural steel components. This review revealed that no repair or rework was needed to meet design specifications.

- Unauthorized work has been conducted on safety related equipment and continued through the end of the assessment period, even though this problem was reported to management by site QC personnel. A large number of nonconformances were written, identifying instances where unauthorized work was conducted. This large number reflects a lack of management effort in assuring prompt corrective action.

The presence of these problems reflects negatively upon the effectiveness of the Construction QA program.

Enforcement related to structural steel and conduct of unauthorized work is under review by the NRC. No violations were issued in the Construction QA area during the assessment period.

2. Conclusion

Category: 2

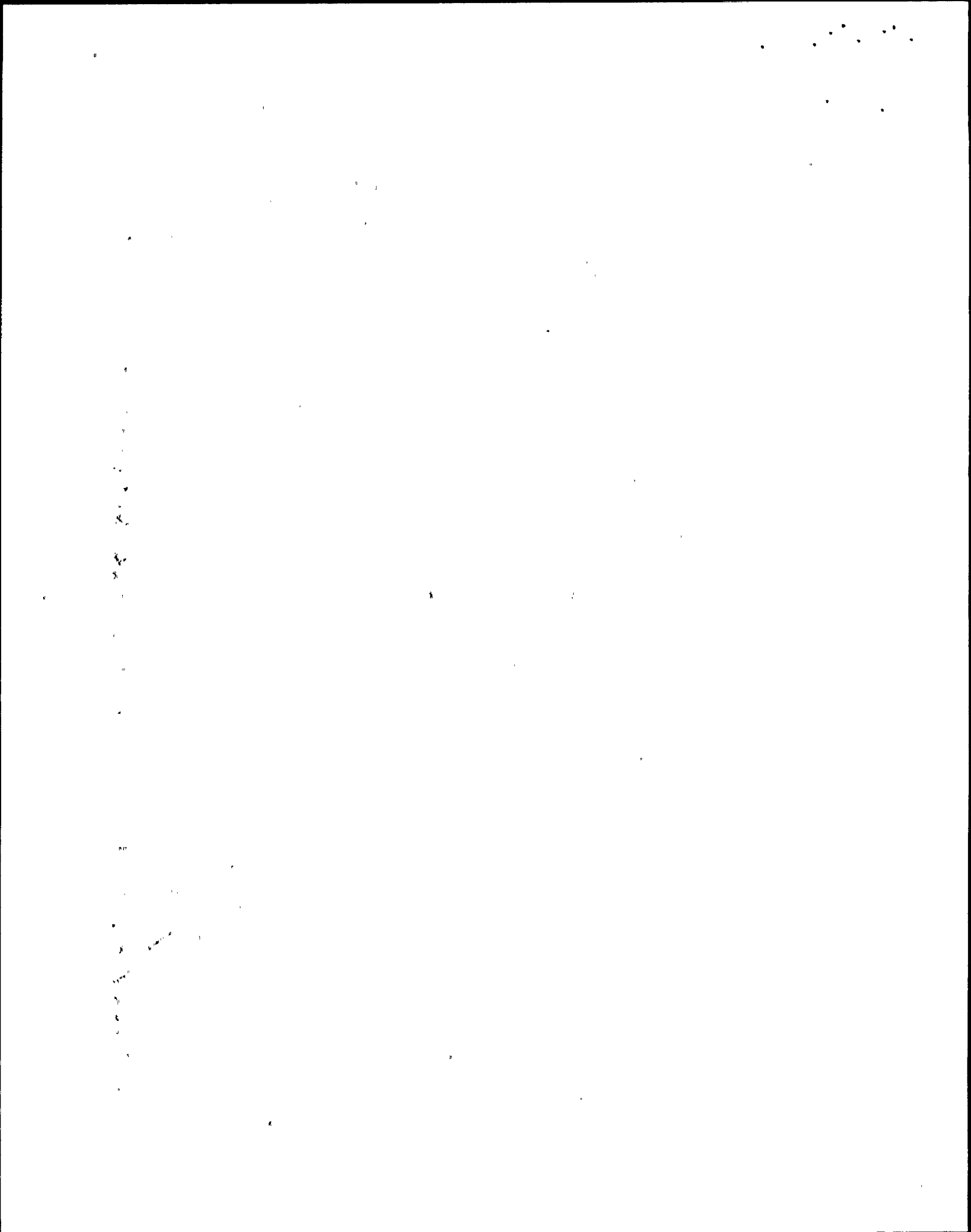
3. Board Comments: The board recognizes that problems identified in structural steel and unauthorized work were identified after the end of the assessment period. Due to their apparent QA linkage to the cable separation problem, the board decided to include these problem areas in this assessment.

H. Licensing

1. Analysis

The basis for assessment was the licensee's performance in support of licensing actions that were either completed or had a significant level of activity during the current assessment period.

Management continues to exercise management control and overview in the licensing area as evidenced by the resolution of an issue on fire protection and certain other issues such as TMI administrative and procedural issues, the Post-Accident Sampling System (PASS), steam generator tube vibration and others that have been resolved and will be reported in Supplement No. 4 to the Safety Evaluation Report, and in the full time assignment of licensee personnel in the preparation of the plant Technical Specifications which resulted in the issuance of the Final Draft of the Technical Specifications. The licensee continues to inform the NRC Licensing Project Manager (LPM) on construction status of the plant and on major milestones that the LPM or the Advisory Committee on Reactor Safeguards may have expressed an interest.



Management takes a strong and aggressive approach in resolving issues, and continues to show a good understanding of the various technical and licensing issues. Licensing personnel who are in daily contact with the LPM have demonstrated excellent understanding of a wide spectrum of technical issues, including the plant Technical Specifications.

The licensee is actively involved in various owners groups for the development of resolutions for generic issues. In cases where generic issues arise, the licensee uses the resources available through the industry owners groups to obtain satisfactory resolution.

The licensee has adequate staffing which demonstrate a sound working knowledge of the regulations, guides, standards and generic issues as applicable to Shearon Harris. The Environmental Qualification (EQ), Pump and Valve Operability Review Team (PVORT), and Seismic Qualification Review Team (SQRT) audits, which were conducted in November and December 1985, did not identify any significant deficiencies which indicated the assignments of appropriate resources and personnel and prior planning which culminated in successful audits. Overall coordination of the licensing staff has resulted in prompt and timely responses to the NRC staff needs in the area of licensing.

2. Conclusion

Category: 1

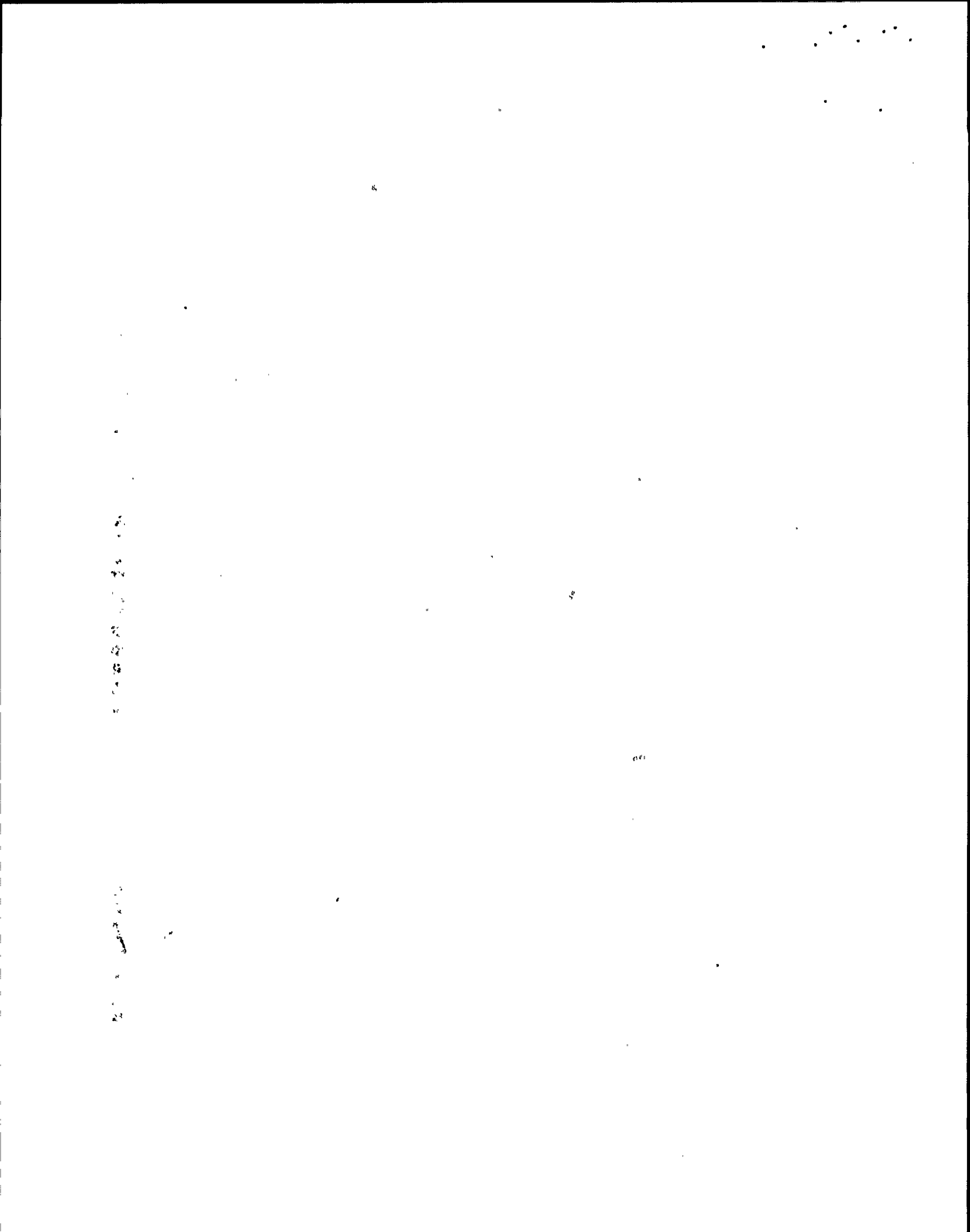
3. Board Comments: None

II. Preoperational Testing

1. Analysis

During the assessment period, routine inspections were conducted by regional and resident inspection staffs in the areas of test procedure reviews, witnessing of tests in progress, evaluation of completed test results and implementation of preoperational test program administrative controls. Major preoperational test milestones completed during the assessment period included Integrated Hot Functional Testing, Containment Integrated Leak Rate Test, Reactor Protection System/Engineered Safety Features Logic and Response Time Tests.

Management involvement and control during the preparation and the successful completion of the above milestones was evident by the well coordinated effort displayed between the licensee's startup, operations and engineering groups. The licensee's approach to the resolution of technical issues identified with components, systems and structures during this complex testing was thorough to assure proper functioning and conformance with design requirements.



Weaknesses were noted with the licensee's review and approval process to ensure that definitive, usable acceptance criteria had been incorporated into preoperational test procedures. This specific concern was identified in a violation (item a below) involving the controlling preoperational test procedure for integrated hot functional testing, where acceptance criteria provided were vague and imprecise. In addition, examples were identified where test procedure steps and data tables did not prescribe quantitative or qualitative acceptance criteria. The licensee provided two separate responses to the violation, yet additional examples were identified where inadequate acceptance criteria statements were found in preoperational test procedures. Additionally, two deviations (items b and c below) were issued which described a failure to fully incorporate acceptance criteria from FSAR Chapter 14, Preoperational Test Summaries into preoperational test procedures.

The lack of attention to detail in the preparation review and approval of preoperational test procedures prompted the licensee to expand corrective actions which included comprehensive operator training and revisions to the Harris Startup Manual. These actions resulted in improvements to acceptance criteria, baseline data and the preparation of test procedures. In addition, the licensee formed a task force to review preoperational tests in progress and those test procedures which had been completed and approved. This review was to ensure that acceptance criteria provided were acceptable to evaluate the test results. A test review group has been established to provide an independent review of preoperational test procedure and test results prior to the final review and approval by management. The licensee has been responsive to NRC concerns in these areas and has taken effective corrective action.

One violation and two deviations were identified:

- a. Severity Level IV violation for failure to provide appropriate acceptance criteria and identify the data recorder for Integrated Hot Functional Test Procedure. (400/85-47-04)
- b. Deviation from FSAR Test Summary 14.2.12.1.34 for failure to conduct reliability test of the steam driven auxiliary feedwater pump from cold conditions and measure steam pressure operating ranges. In addition, test procedure 1-3065-P-02 specified four consecutive cold starts in lieu of five. (400/86-04-01)
- c. Deviation from FSAR Test Summary 14.2.12.1.16 for failure to fully incorporate the eight criteria of regulatory guide 1.108 section C.2.a. to demonstrate reliable emergency diesel generator performance. (400/86-04-01)

2. Conclusion

Category: 2

3. Board Comments: None

III. Operations

A. Operational Readiness

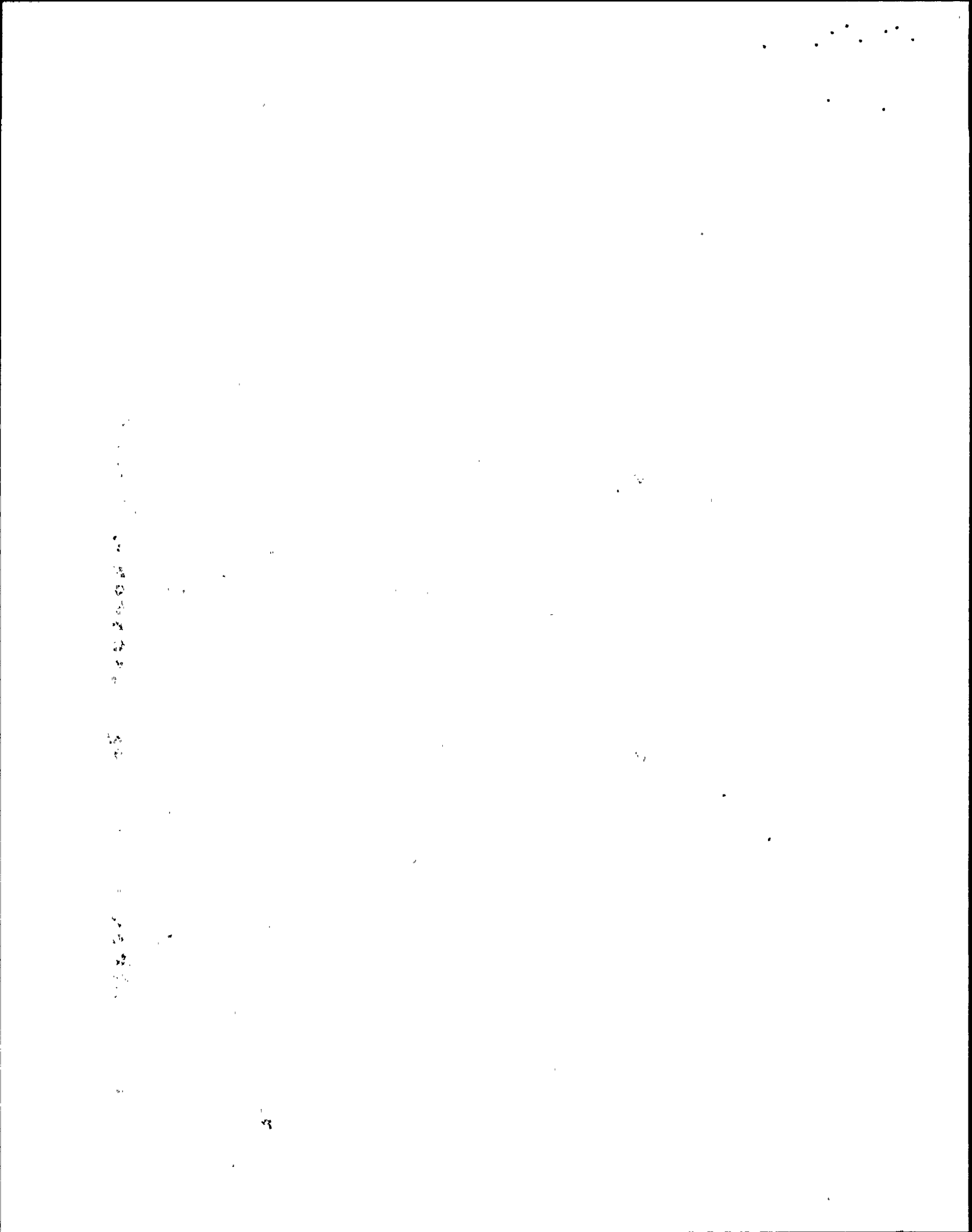
1. Analysis

During this assessment period, inspections were conducted by regional and resident inspection staffs in the areas of control room operations, comparison of as-built plant to FSAR description, operations staffing inspections, operations maintenance, plant operating procedures, plant housekeeping, major milestone completions, safety committee activities, fuel receipt and inspection, TMI action items and Technical Specification review. Plant management was generally responsive to the NRC concerns identified in the operations area.

Conduct of operations in the control room was reviewed to insure that access and egress was properly controlled. Additionally, operator logs were reviewed to determine if accurate and timely information was obtained and properly recorded. Supervisory personnel were aware of the outstanding work activities in progress.

Inspections were performed in the area of comparison of plant as-built conditions to the FSAR description. These inspections included reviews of the latest revised system drawings (site and vendor), verification of the physical plant system configuration, and implementation of the system which controls changes to these drawings. One violation was identified, (item a below) where the licensee failed to incorporate changes into the current approved copy of the vendor controlled drawing. The licensee's corrective action included measures to rectify the identified problem and measures to prevent similar problems. These actions included documenting the change required on a field change request for the specific item identified, the performance of a complete drawing review, and personnel were instructed about the importance of updating drawings.

The licensee has implemented an operational staffing plan which is based on a five shift rotation with 12 hour work rotation and an eight hour training program. Administratively, the licensee plans to maintain seven licensed and four non-licensed operators to meet the requirements of Technical Specifications. Currently the licensee has 32 NRC licensed operators. All operations management and supervisory positions were filled at the end of this rating period. In general, operations personnel were adequately trained



and adequate procedures were in place. However, one violation (item b below) was issued concerning adherence to procedures. The operations group failed to adequately review a clearance which was cancelled and subsequently resulted in a partial flooding of the Spent Fuel Pool. This indicated a need for further training and supervision in the procedures area. The corrective action implemented by the licensee included retraining in the area of restoration of equipment or systems after a clearance is cancelled. The retraining emphasized the requirement for plant personnel to review applicable shift notes and reports and obtain proper authorization for clearances.

The inspectors reviewed the licensee's operations maintenance program to verify the licensee's compliance to applicable requirements and commitments. This review was performed by conducting interviews with operations maintenance management and staff to ensure that personnel and administrative controls were adequate to perform the required task. One procedural violation, (item c below), was issued during this assessment period with regard to the operations maintenance section. The procedural violation occurred because the maintenance staff failed to document the status of equipment after work had been performed. The licensee's actions to correct and prevent recurrence of similar problems included rectification of the identified problem, procedural changes for clarity and retraining of applicable personnel. The violation in this area is not considered as an indication of a programmatic breakdown. In general, the licensee has conducted corrective and preventive maintenance in accordance with approved procedural requirements.

In the area of plant housekeeping, one violation, (item d below) was identified, where the licensee failed to maintain controlled areas in accordance with the requirements of their administrative procedures. The licensee has commenced the required corrective action in response to this violation. The licensee has made a comprehensive cleanup of the Harris site and plant areas. However, additional efforts are required and planned in order to reach the level which should be attained prior to declaring the plant ready for operations.

The NRC conducted inspections to verify that the scope of management controls involved with the plant procedure system was adequate to control operations within the guidelines of ANSI 18.7-1976. These inspections included verification of the requirement to perform safety review (10 CFR 50.59) of all new and revised procedures.

One deviation, (item e below) from commitments was identified concerning the implementation of operational shift notes. This deviation identified several instances in which shift notes had not been reviewed and unauthorized changes had been made to these documents without use of proper administrative controls. This

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deviation does not indicate a significant problem in the operations program. Inspectors have routinely evaluated the activities of the plant operations staff and have found overall plant staff activities to be conducted in accordance with approved program requirements.

Management involvement in the successful completion of integrated hot functional testing was evident by the well coordinated effort of the CP&L staff during this test.

Instructions and procedures of the Corporate Nuclear Safety organization and independent review group, were examined and found to sufficiently address group independence, internal communications, interfaces, provisions for follow-up action, and record distribution and maintenance.

A review of operations personnel training records and procedures was performed to verify that the licensee was ready to receive and move fuel. The inspectors verified there was adequate control of the environment for fuel receipt and storage, fuel was stored in a safe array in a seismically designed storage rack and operations personnel were knowledgeable of applicable requirements, regulations and procedures.

The licensee continues to work on the resolution of Three Mile Island (TMI) action items and the progress of this work is consistent with the licensee's commitments. The corporate licensing section has consistently provided well documented TMI action item packages, based on sound engineering judgement, to the NRC staff for resolution.

Four violations and one deviation were identified:

- a. Severity level IV violation for failure to incorporate changes into system drawings. The system flow diagram for the Reactor Coolant System did not include the piping for the Reactor Vessel Water Level Instrumentation System. (400/85-49-01)
- b. Severity level V violation for failure of operations personnel to follow the procedural requirements while posting system clearance tags. (400/86-24-02)
- c. Severity level V violation for failure of maintenance personnel to document system status after work performance. (400/86-24-01)
- d. Severity level V violation for failure to maintain proper cleanliness as required by site procedures. (400/86-46-02)

- e. Deviation from Special Orders for failure of operations personnel to review shift notes. (400/86-46-01)

2. Conclusion

Category: 2

3. Board Comments: None

B. Radiological Controls

1. Analysis

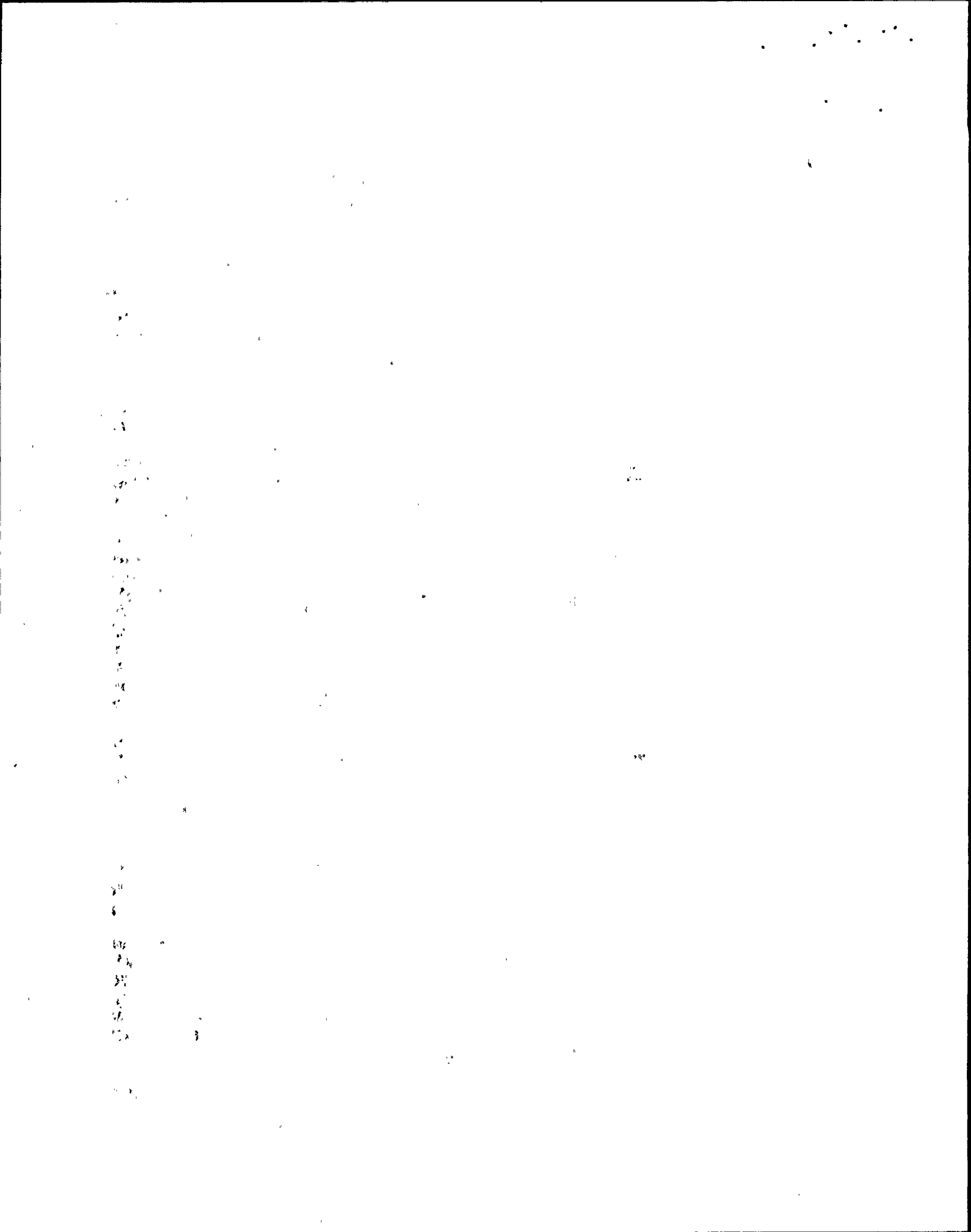
During the assessment period, inspections were performed by regional and resident inspection staffs in the area of radiological controls and chemistry, including radiation protection, radioactive waste management, environmental protection, independent measurements, plant chemistry, and radioactive effluent control and monitoring.

Pre-startup activities of the radiation protection program were generally well managed and ready to support fuel load and startup testing. The licensee appeared to have a sufficient number of trained radiation protection staff members (supervisory and technician) for plant operation. The licensee was maintaining adequate development and training programs for the health physics staff. Individuals hired as health physics technicians met the requirements of the proposed Technical Specification. Further, the licensee had elected to send health physics technicians to operating nuclear plants to acquire further commercial nuclear power plant experience.

During the first half of the assessment period, the licensee was slow to appoint chemistry supervisors. At the end of the period, the licensee had firmed up the chemistry organization (both supervisors and staff), which included both licensee personnel and contractors. This augmentation of supervision and staff added both management skill and technical expertise to the chemistry staff. The staff appeared to be adequate to develop and implement the chemistry control program and to support pre-operational testing.

The facility had sufficient calibrated equipment and adequate facilities to support in-plant radiological controls and chemistry programs.

At the end of the assessment period, the licensee was not ready to process and dispose of liquid radioactive waste. Areas which were not complete included preparation of procedures, training of radwaste operators, pre-operational testing of waste processing equipment, and training of appropriate personnel on transportation



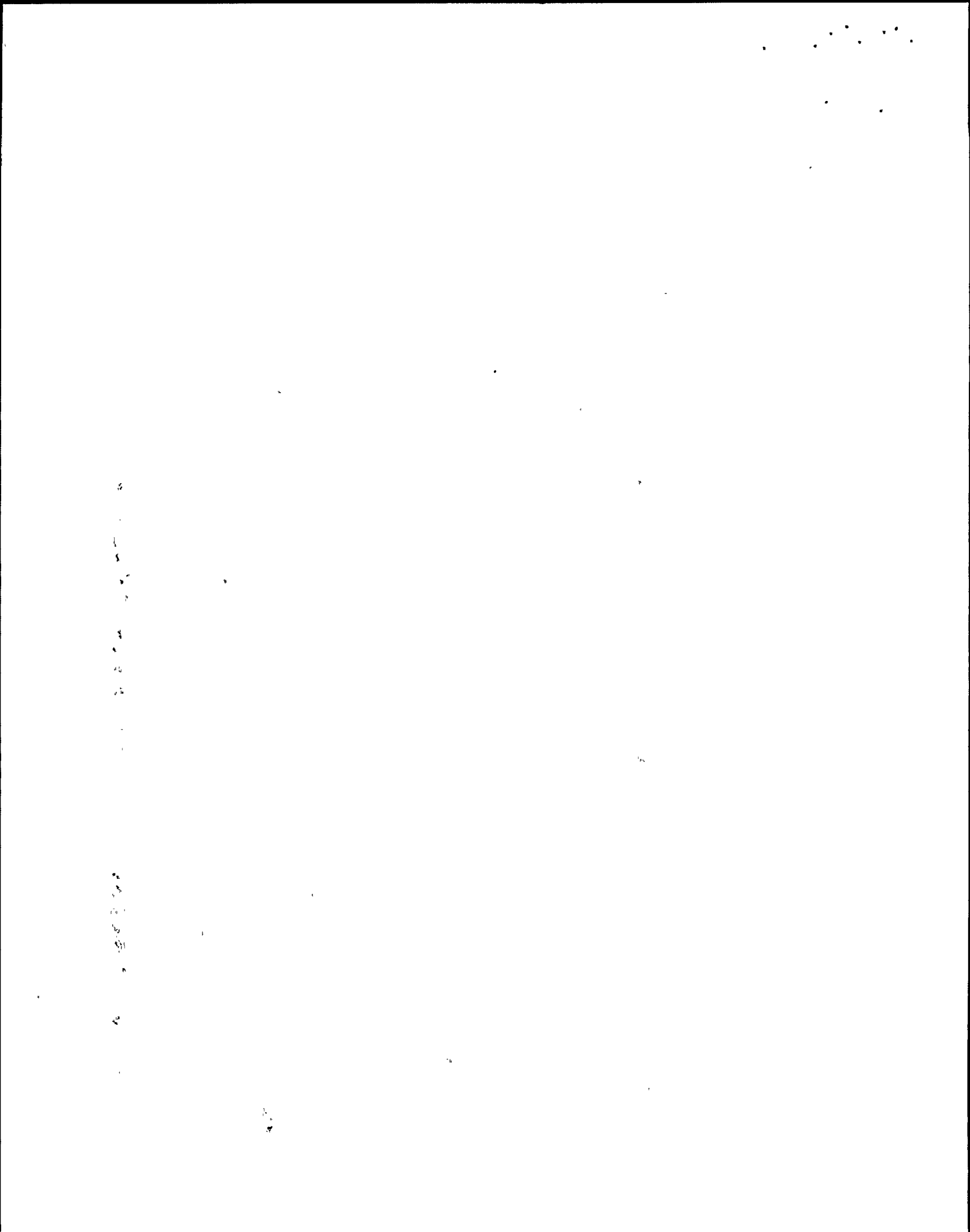
regulations and 10 CFR 61 requirements. The waste solidification portions of the licensee's permanent radioactive waste systems were not scheduled to be operable prior to plant startup.

The licensee had not fully completed installation or pre-operational tests of the process and effluent radiological monitoring systems, the post accident sampling system (PASS), or effluent air cleaning systems. These systems had either not been fully installed due to the late delivery of components, had not received their acceptance tests, or had failed the acceptance tests.

Potential design deficiencies in two interrelated sampling systems were identified. In the containment atmosphere hydrogen monitoring system, the licensee encountered difficulties when attempting to deliver an adequate sample. The licensee was pursuing resolution of this problem at the end of the assessment period. A second deficiency involved inadequate design of the containment atmosphere radioactive particulate and aerosol monitor system for detection of primary coolant pressure boundary leakage into containment. In this case, the licensee did not appear to meet an FSAR commitment to design and install the sampling line in accordance with ANSI N13.1-1974. The licensee acknowledged an awareness of the problem but apparently had not made a significant effort to correct it until the NRC identified the problem. The licensee verbally committed to arrange for an onsite test of the sampling line by a contractor and/or to redesign the system to meet the design criteria of ANSI 13.1-1974. Recently, the licensee has redesigned the sampling system and intends to have an alternate system in place and ready for testing by approximately September 15, 1986.

There were no identified programmatic deficiencies that would affect the readiness of the radioactivity counting room for routine operation. However, there was a need to complete or revise some of the radwaste sampling procedures. Inspections also disclosed several technical problems with the plant effluent sampling system. Sampling line installations for the main turbine area gaseous effluent monitor and particulate sampler were longer than recommended in ANSI N13-1986, and contained two 90° elbows, resulting in a high potential for line losses of both radioiodines and particulates.

During the period between March and June 1986, the licensee made significant progress in finalizing the chemistry program in preparation for fuel loading. Although some modifications to the makeup water storage tanks, initiated by the licensee to improve oxygen control, were not completed, all the remaining chemistry-related components of the balance of plant had been constructed and readied for operations. All chemistry laboratories and sampling facilities were operable. The staff was relatively well trained for this stage of licensing and was effectively supporting



the preoperation tests. There had been significant involvement by corporate management and the corporate training center and considerable cross-training at the Robinson Plant. The chemistry department appeared to be ready to support the plant for fuel loading.

2. Conclusion

Category: 2

3. Board Comments: None

C. Fire Protection

1. Analysis

During the assessment period, inspections were conducted by the regional inspection staff in the areas of permanent plant fire prevention and protection features, the licensee's implementation of the fire protection program for the fuel storage area, and the status of the licensee's implementation of their commitments regarding the safe shutdown requirements and guidelines of NUREG 0800, Standard Review Plan, Section 9.5.1, Fire Protection Program.

Permanent fire protection features reviewed included fire pumps, interior fire hose systems, automatic sprinkler systems, fire detection systems, fire dampers, fire doors, fire barrier penetration seals, structural steel fireproofing and fire-rated enclosure wraps for cable trays and conduits. This area has received strong management attention during this assessment period and a significant amount of construction work has occurred. However, as identified in the inspection reports during this assessment period, many of these fire protection features for safety-related plant areas were not completely installed and have not had preoperational functional tests.

The inspectors reviewed the licensee's implementation of their commitments regarding the fire protection program and safe-shutdown requirements of NUREG 0800, Standard Review Plan, Section 9.5.1. The licensee's cable separation review for NUREG-0800 was precise and straight forward, and no discrepancies were identified. However, several Reg Guide 1.75 electrical cable separation discrepancies were discovered. These are discussed in the Electrical Equipment and Cables functional area.

Several findings were identified in the area of safe shutdown for a fire event. These include such issues as incomplete safe shutdown analysis to retain reactor coolant pump seal integrity, incomplete operator training for safe plant shutdown in the event of fire, inadequate labeling of emergency safe shutdown control components, inadequate demonstration that sufficient time and manpower is available to achieve hot standby conditions in event

of a fire, and inadequate fire fighting techniques used by the fire brigade. These discrepancies were not identified as fire protection violations since, at the time of the inspections, the unit was not an operating plant. To correct these discrepancies, the licensee reevaluated several fire areas, performed numerous fire system walkdowns, proposed several plant design modifications, revised operational procedures, implemented an intensive fire brigade retraining and drill program, and provided supplemental fire protection submittals in support of the plant licensing effort. The licensee's corrective actions for these findings are scheduled to be completed prior to fuel load.

In general, the management involvement and control in assuring quality in the fire protection program was adequate as evidenced by the issuance and implementation of the plant fire protection administrative procedures that met the minimum NRC requirements and guidelines.

During the fire protection team audits, the licensee's engineering staff, consultants and architect engineers displayed a clear understanding of the fire protection issues. The licensee's additional fire protection commitments for increased fire brigade drill frequency, and design and procedural modifications related to maintaining reactor coolant pump (RCP) seal integrity in the event of fire indicated a conservative approach toward providing an adequate level of plant safety. These actions indicated the licensee's diligence toward achieving completion of work required to close out open fire protection issues.

No violations were identified.

2. Conclusion

Category: 2

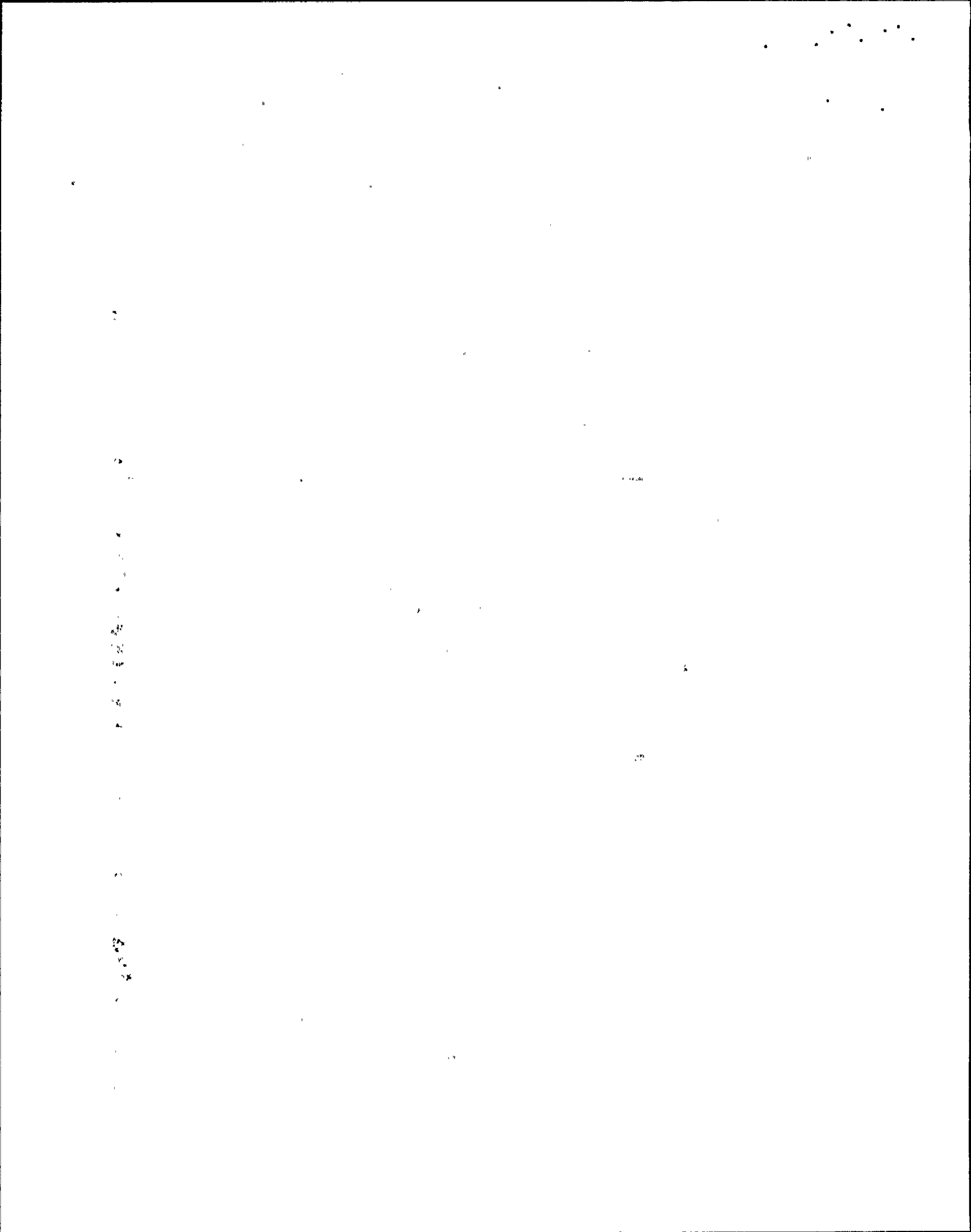
3. Board Comments: None

D. Emergency Preparedness

1. Analysis

During the assessment period, inspections were performed by regional and resident inspection staffs. These included routine followup inspections assessing the status of corrective actions for items identified during the emergency preparedness appraisal conducted in March of 1985.

The emergency preparedness appraisal identified one deficiency concerning initiating conditions for unusual events. Additionally, 34 emergency preparedness improvement items and 49 incomplete items were identified. The licensee has demonstrated an aggressive approach to implementing required corrective actions for the



items identified. Corrective actions for the deficiency and all improvement items have been completed and formally closed. Forty-four emergency preparedness incomplete items have been resolved and formally closed. Items identified during the exercise, including an NRC identified exercise weakness, have been resolved. The licensee has established a program for identifying, tracking and reporting to management all emergency preparedness drill and exercise weaknesses, and their required improvements.

The inspection conducted June 1986, disclosed that the following emergency response elements were acceptable: emergency detection and classification; protective action decision making; notification and communications; shift staffing and augmentation; training; dose calculation and assessments; and public information.

Other observations of the licensee's emergency preparedness program during the assessment period focused on the apparent inadequate scenario package submitted for the emergency exercise originally scheduled for June 14, 1986. The licensee augmented the package following discussions of the scenario's weakness in providing sufficient player response to adequately assess the scope and objectives as presented. Following a thorough review of the revised scenario, the NRC requested a management meeting with licensee's corporate and plant personnel responsible for the emergency exercise. The meeting's primary purpose was to emphasize the need for a scenario of sufficient scope to permit testing of selected aspects of the emergency plan which would provide assurance to the NRC that adequate protective measures can be taken in the event of a radiological emergency. The emergency exercise is now scheduled for October 2, 1986.

No violations were identified.

2. Conclusion

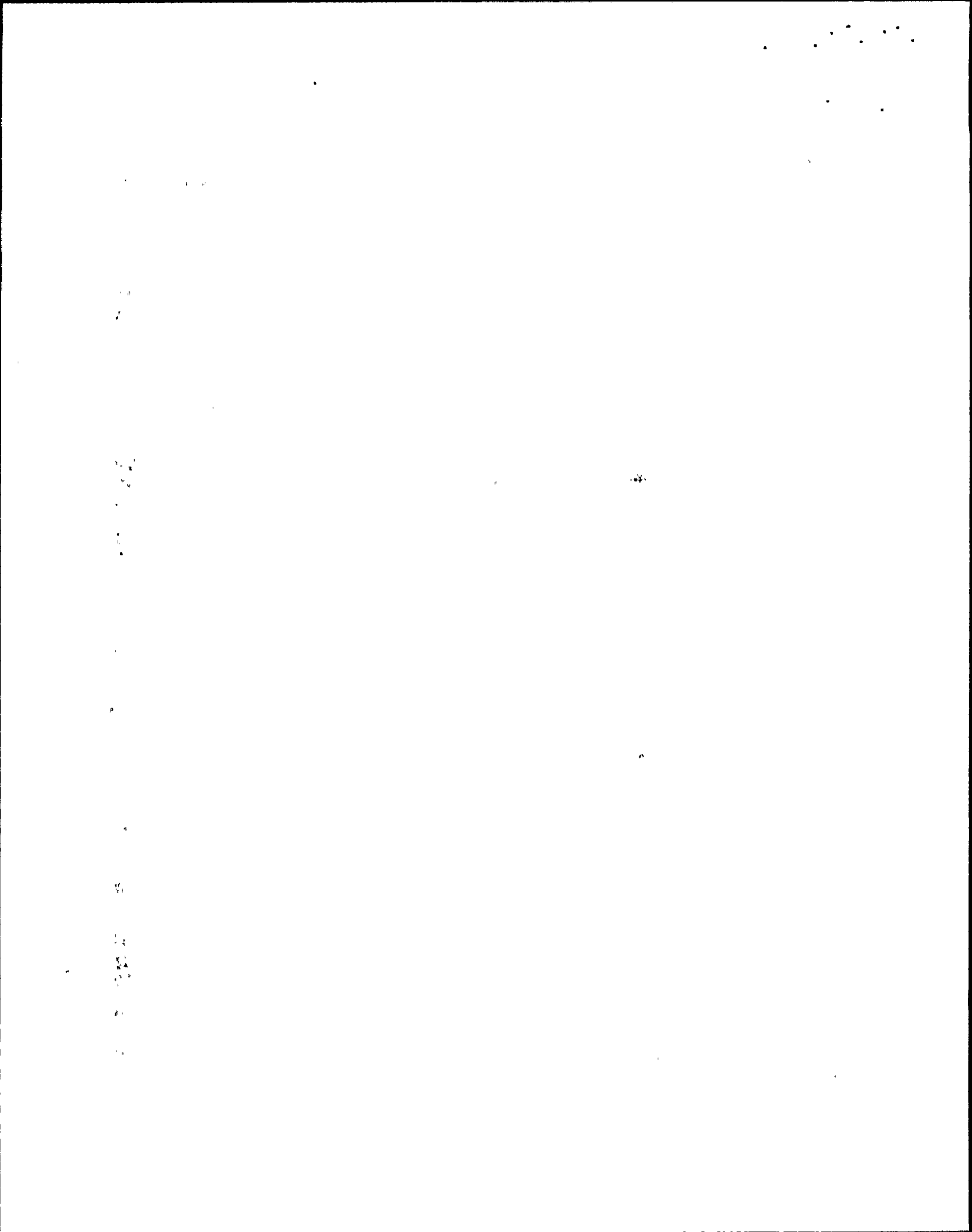
Category: 1

3. Board Comments: None

E. Security

1. During this assessment period, preoperational inspections have been performed by the regional staff and a site confirmatory visit was conducted by the Safeguards Licensing Reviewer from the NRC Office of Nuclear Material Safety and Safeguards.

The licensee's security program has progressed smoothly from the construction phase into the stage of receiving and storing new fuel, and now appears prepared for the issuance of a license. These inspections verified that appropriate plant and corporate



management involvement, planning and review have been exercised. Security professionalism and day-to-day experience were reflected at the appropriate levels of the licensee's structure.

The licensee has exhibited technical expertise in the design and construction of its security structures, hardware and electronics. The understanding of technical issues and resolution of site specific applications reflect a knowledgeable staff composed of security and engineering personnel.

The contract security force is trained and qualified to meet the licensee's commitments. Procedures appear adequate and the licensee continues to audit its program as it adheres to all NRC requirements.

Although the licensee's program to account for and to control special nuclear material was not completely implemented, the program had been adequately developed and personnel were trained and demonstrated good knowledge and understanding of their assigned functions. The material control and accountability procedures were well written and approved by appropriate management.

No violations were identified.

2. Conclusion

Category: 1

3. Board Comments: None

F. Training and Qualification Effectiveness

1. Analysis

During this assessment period, there was one routine inspection conducted in the area of training at the Shearon Harris facility, as well as several examinations of licensed operator candidates. The inspection concentrated primarily on cold license training. The licensed and non-licensed operator programs were determined to be generally satisfactory.

The results for operator examinations for Group 1 (November 1985) and Group 2 (May 1985) candidates were as follows: In Group 1, 33 of 34 candidates (3 ROs and 30 SROs) passed the written and oral examinations. For Group 2, 35 of 36 candidates (12 ROs and 23 SROs) passed the written examination. Oral and simulator examinations were administered to 34 Group 2 and (and 1 Group 1 retake) candidates, of which 23 passed. This represents a pass rate of 68 percent, which is below the industry norm for initial licensing candidates of approximately 80 percent.

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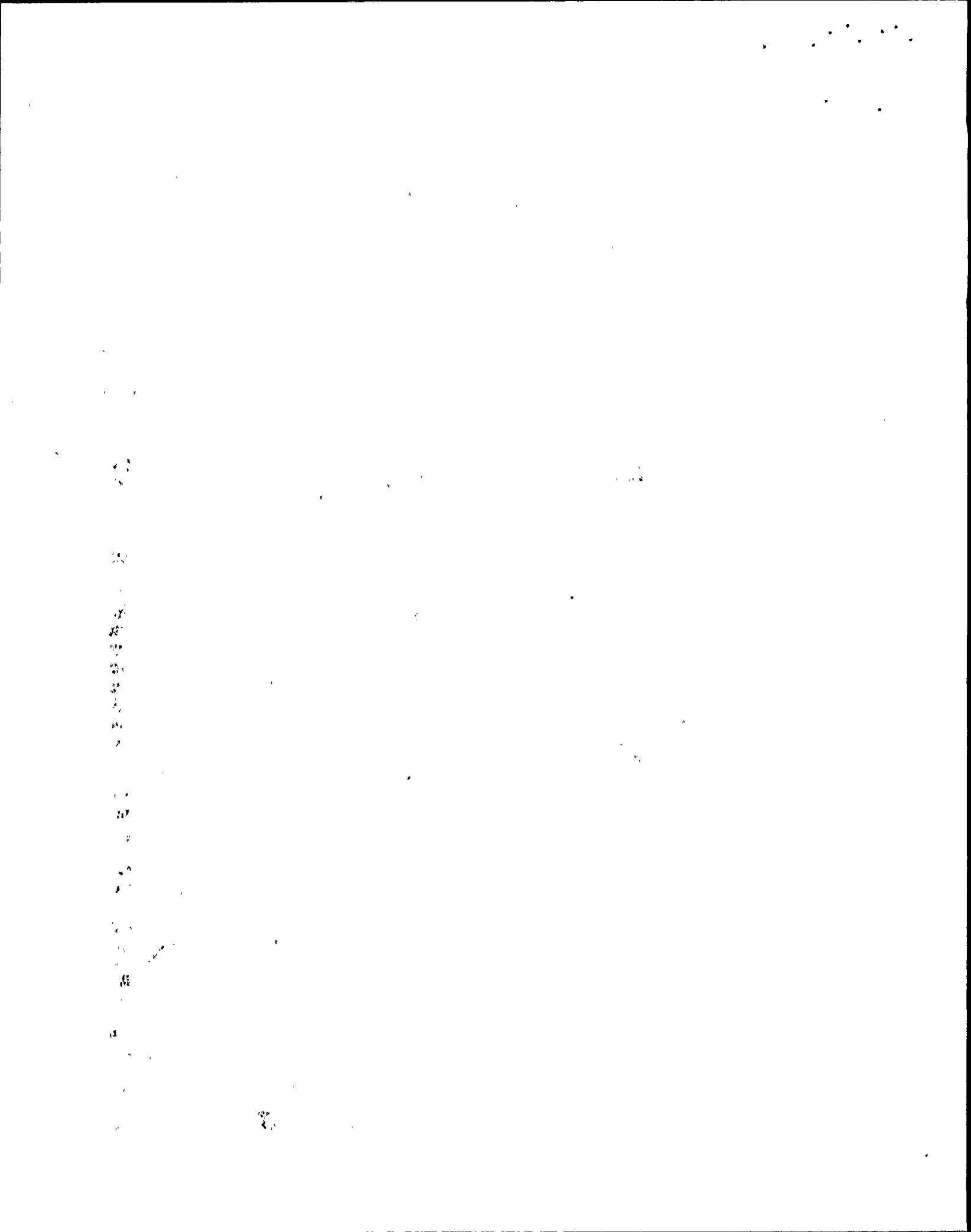
In 1985, Carolina Power and Light Company voluntarily replaced its existing Shearon Harris simulator with a more modern, site-specific simulator. This demonstrates a strong management commitment to quality training. Cold license Group 1 candidates were not administered NRC simulator examinations since the new simulator was not operational at the time of examination. Cold license Group 1 candidates were subsequently observed by the NRC performing simulator evolutions and did not display the expected degree of performance considered necessary for licensed operators. This was based on inspectors observations of two groups of trainees and review of licensee administered simulator evaluations. As a result of the Group 2 simulator examination pass rate, the licensee has committed to several weeks of additional training for cold license Group 1 candidates prior to power operation. Group 1 candidates and the Group 2 candidates who failed the simulator exams will be administered NRC simulator examinations during the weeks of September 22 and November 3, 1986, and one week in early 1987.

Inspector interviews with some licensed and non-licensed individuals revealed knowledge deficiencies in normal and emergency service water systems. This suggested a weakness in system walkdown training, however, additional interviews and a review of license examination results gave no evidence this deficiency existed in other systems with the possible exception of in-core nuclear instruments.

Training records examined were complete and well maintained. Additionally, lectures were found, in general, to be conducted in a professional manner with well prepared and responsive instructors.

Training conducted for plant management and supervisory personnel was reviewed and found to meet the commitment in the Final Safety Analysis Report (FSAR). Shift Technical Advisor (STA) training was also determined to be in conformance with the FSAR. The documentation of training and the training program appeared adequate to meet the needs of the technical staff and managers. In the area of maintenance training, weaknesses were noted with the plant specific training program in that this program was not procedurally or formally controlled. The licensee has implemented a General Employee Training Program for radiation and health physics, and this program has been in effect for longer than one year. This program is considered to be very effective in familiarizing employees with the guidelines necessary for insuring personnel safety in working at a nuclear power plant.

No violations were identified.



2. Conclusion

Category: 2

3. Board Comments: None

G. Quality Programs and Administrative Controls Affecting Quality (Operations)

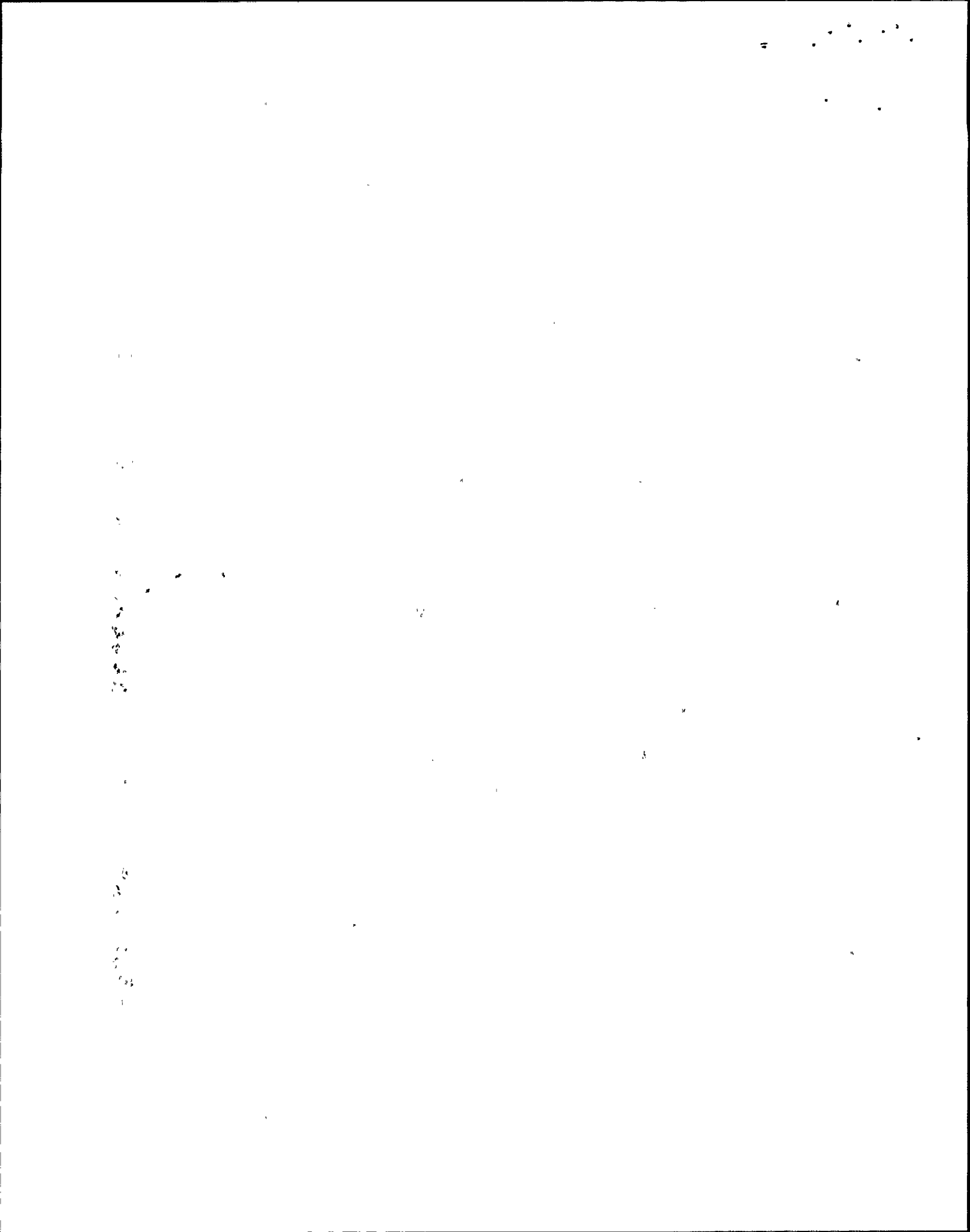
1. Analysis

During this assessment period, the following areas were reviewed by the regional staff: QA/QC administration; audits; records; document control; preoperational test records; QA for the startup test program; preoperational testing QA; design control; tests and experiments; procurement; receipt, storage and handling of equipment and material; surveillance testing and calibration control; and measuring and test equipment.

Review of the audit program identified that the program is developed and procedurally delineated. However, one area of programmatic weakness was identified, which concerned the QA program requirement for test control. The corporate program as described in the Corporate Quality Assurance Manual (CQAM) does not specifically delineate the program requirements for preoperational startup tests. This appears to have been an administrative oversight. Audits of preoperational testing activities had been scheduled on numerous occasions; however, none were actually accomplished until July 1986. An additional audit had been scheduled for September 1986. This scheduling of preoperational testing audits but not actually accomplishing them, for whatever reason, displayed a lack of internal coordination.

Preoperational test records were stored in a facility which is in compliance with the management's position regarding temporary storage of records. Further, in accordance with their commitment, QA records are stored in a temporary storage facility for periods in excess of three months with the approval of the Manager, Corporate Quality Assurance. These records are stored in one hour fire rated cabinets. However, because this facility was initially intended to be used only for temporary storage of QA records it does not meet the requirements of a permanent storage facility. The licensee has a permanent storage facility and is planning to transfer these preoperational test records to this facility at a later date.

An orderly transition from the administrative controls of the Construction QA program to the Operations QA program for on site surveillance of preoperational tests and QC inspections of plant activities has been achieved by the licensee. Delays in preparing implementing procedures for the site operations QA/QC organization required that some operations type surveillances and inspections



be performed under the administrative controls of the construction QA program. This situation has been corrected, and the operations QA program is presently being fully implemented by the site QA/QC group. Management's involvement in assuring that commitments delineated in the FSAR are performed was apparent from the planning and priority assignment of tasks involved in this transition process.

The licensee's records and document control program was still in the formative stage at the time this functional area was inspected. A final list of required records to be maintained was being formulated as well as their retention times. A delay in transferring construction QA records to the permanent record storage facility was also observed. Despite the above, two areas were noteworthy in demonstrating licensee management's involvement in assuring quality. The permanent records storage vault fully meets the licensee's commitments delineated in the operations QA program. Additionally, a computer based records retrieval system, "STAIRS", was demonstrated to be highly efficient in the retrieval of records already entered into the system.

The QA program for portable measuring and test equipment was found to be in compliance with regulatory requirements. However, a programmatic weakness was identified with the administrative controls for compliance installed process instruments. These instruments have not yet been fully identified, nor have measures been established to include them in a calibration program. The licensee is in the process of establishing controls for these instruments.

Inspections of the design change and surveillance testing and calibration programs were performed to assess the licensee's operational readiness in these functional areas. The licensee's operational design change program is in the early formative stages, consequently an assessment of this functional area could not be made. Currently, design changes are being controlled by the Construction QA program. The surveillance testing and calibration program was not fully developed in that the master schedule for surveillance testing was incomplete. The final draft Technical Specifications had been issued after this particular area had been inspected. The licensee was awaiting their issuance so that they could complete the master schedule for surveillance testing. Management's involvement in assuring quality, however, is demonstrated by existing procedures which adequately delineate administrative controls for surveillance testing and calibration activities.

Examination of documentation and interviews with licensee personnel indicated that an adequate program for procurement activities associated with safety related items has been established. Observations of the receipt, storage, and handling process verified that these activities were accomplished in accordance with regulatory standards and the licensee's QA program.

No violations were identified.

2. Conclusion

Category: 2

3. Board Comments: None

IV. Supporting Data and Summaries

A. Licensee Activities

Between November 1, 1985 and July 31, 1986, the construction project progressed from 93 to 97 percent complete. Current construction staff level is approximately 5,000 personnel. Construction staffing decreased as construction work neared completion. Emphasis was placed on preoperational testing and startup activities.

Construction activities made significant progress in the areas of equipment installation, large and small bore piping, pipe supports, electrical cable installation and HVAC. The majority of work activities remaining to be completed are in the areas of electrical, instrumentation and control, and fire protection.

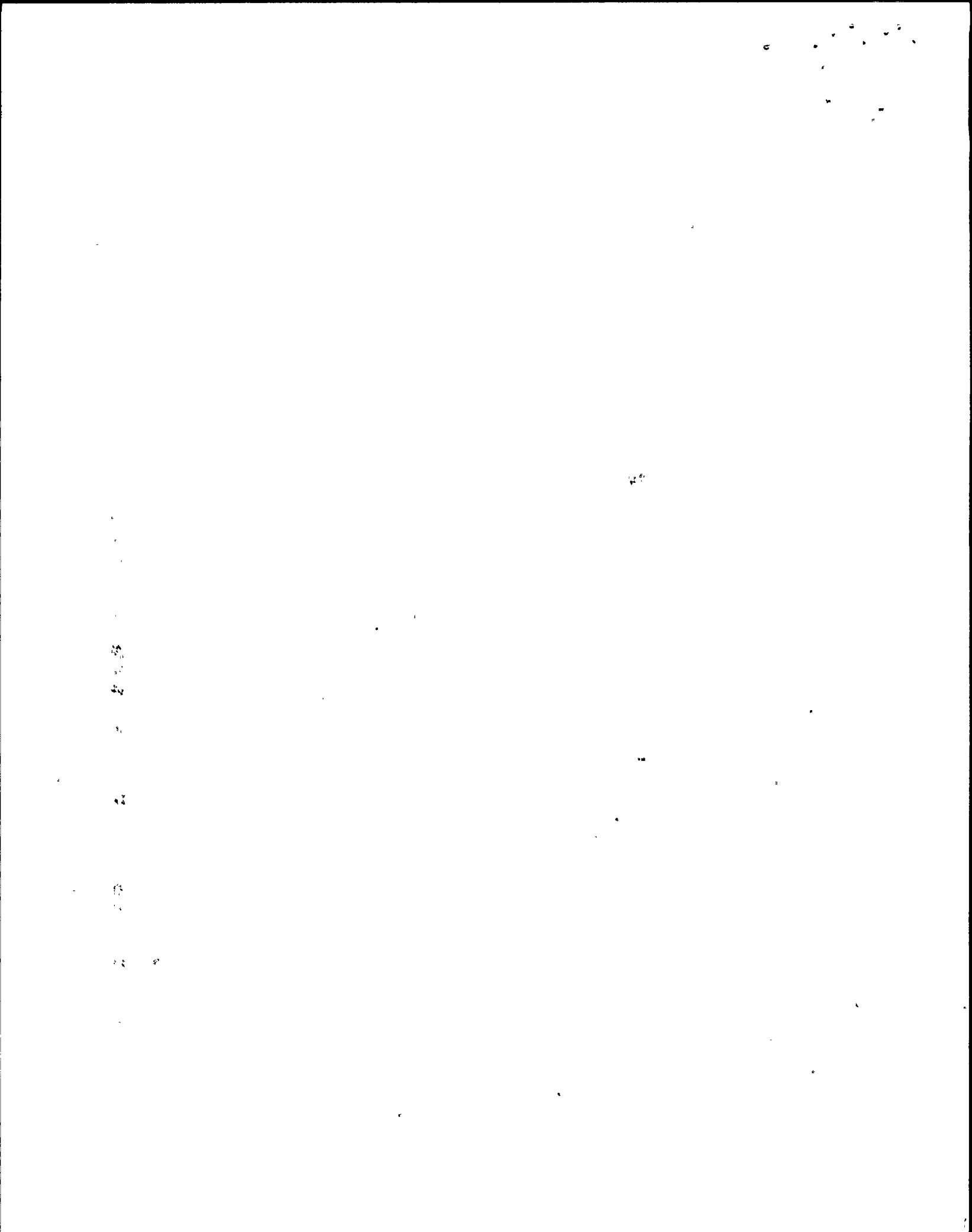
Approximately 67 percent of the preoperational tests have been completed. The following four major evolutions have been completed with no major problems: reactor coolant system cold hydro, hot functional testing, the structural integrity test and the integrated leak rate test. The simulator is on site and is up to date with the plant configuration.

The Institute of Nuclear Power Operations conducted five accreditation evaluations. The licensee was accredited in the areas of electrical maintenance technician, radiochemistry technician, instrument and control technician, and management and technical staff.

B. Inspection Activities

During this assessment period the routine program was conducted by regional and resident inspection staffs. Special inspection were conducted in the following areas:

- Operational Readiness
- NUREG 0800, Fire Protection



- Licensed Operator Training Exams
- Equipment Qualification
- Hot Functional Test Witnessing
- Integrated and Local Leak Rate Testing
- Structural Integrity Test
- Generic Letter 83-28: "Required Actions Based on Generic Implications of Salem Anticipated Transient Without Scram (ATWS) Events"
- Emergency Preparedness

C. Licensing Activities

Significant licensing issues addressed during this assessment period included resolution of issues that will be reported in Supplement 4 to the SER, post accident sampling system, fire protection, and steam generator tube vibration.

D. Investigations and Allegation Review

There are currently nine open allegations under review. Seven allegation cases were closed during this assessment period. The closed cases involved drug abuse, administrative, and construction related concerns.

E. Escalated Enforcement

None.

F. Management Conferences Held During this Assessment Period

1. A management meeting was held on June 20, 1986, to discuss the Emergency Exercise scenario.
2. A management meeting was held on June 20, 1986, to discuss operational readiness and preoperational testing.
3. A management meeting was held on July 30, 1986, to discuss the licensed operator qualification program and electrical separation.

G. Confirmation of Action Letters

None

H. Review of Construction Deficiency Reports Submitted by the Licensee

Review of Construction Deficiency Reports submitted during this assessment period. The distribution of these deficiencies was as follows:

Material	2
Mechanical	1
Electrical	2
Design	4

I. Enforcement Activity

Functional Area	No. of Deviations and Violations in each Severity Level					
	D	V	IV	III	II	I
Containment, Structural Steel, and Steel Supports						
Piping Systems and Supports		4				
Safety Related Components - Mechanical						
Auxiliary Systems			1			
Electrical Equipment and Cables						
Instrumentation		1				
Quality Programs and Admini- strative Controls Affecting Quality (Construction)						
Licensing						
Preoperational Testing	2		1			
Operational Readiness	1	3	1			
Radiological Controls						
Fire Protection						
Emergency Preparedness						
Security						
Training and Qualification Effectiveness						
Quality Programs and Admini- strative Controls Affecting Quality (Operations)						

