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ENCLOSURE 2  
SALP BOARD REPORT

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U. S. NUCLEAR REGULATORY COMMISSION  
REGION II

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SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE  
INSPECTION REPORT NUMBER  
50-325/85-36 AND 50-324/85-36  
  
CAROLINA POWER AND LIGHT CO.  
BRUNSWICK UNITS 1 AND 2  
MAY 1, 1984 THROUGH OCTOBER 31, 1985

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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 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.

An NRC SALP Board, composed of the staff members listed below, met on December 16, 1985, 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 Brunswick for the period May 1, 1984 through October 31, 1985.

### SALP Board for Brunswick:

- R. D. Walker, Director, Division of Reactor Projects (DRP), Region II (RII) (Chairman)
- J. P. Stohr, Director, 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
- J. P. Knight, Assistant Director for Technical Support, Division of Pressurized Water Reactor Licensing A (PWR-A), Office of Nuclear Reactor Regulation (NRR)

### Attendees at SALP Board Meeting:

- P. E. Fredrickson, Chief, Project Section 1C, DRP, RII
- W. H. Ruland, Senior Resident Inspector, Brunswick, DRP, RII
- L. W. Garner, Resident Inspector, Brunswick, DRP, RII
- L. S. Mellen, Project Inspector, Projects Section 1C, DRP, RII
- M. Grotenhuis, Senior Project Manager, BWR Project Directorate 2, NRR
- K. D. Landis, Chief, Technical Support Staff (TSS), DRP, RII
- D. M. Collins, Chief, Emergency Preparedness and Radiological Protection Branch, DRSS, RII
- T. S. MacArthur, Radiation Specialist, TSS, DRP, RII
- G. A. Belisle, Acting Chief, Quality Assurance Program Section, DRS, RII
- D. R. McGuire, Chief, Physical Security Section, DRSS, RII
- T. E. Conlon, Chief, Plant Systems Section, DRS, RII
- B. T. Debs, Acting Chief, Operational Programs Section, DRS, RII

C. M. Hosey, Chief, Facilities Radiation Protection Section, DRSS, RII  
G. A. Pick, Technical Support Inspector, TSS, DRP, RII

## 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 has also categorized the performance trend over the course of the SALP assessment period. The trend is meant to describe the general or prevailing tendency (the performance gradient) during the SALP period. This categorization is not a comparison between the current and previous SALP rating; rather the categorization process involves a review of performance during the current SALP period and categorization of the trend of performance during that period only. The performance trends are defined as follows:

Improving: Licensee performance has generally improved over the course of the SALP assessment period.

Constant: Licensee performance has remained essentially constant over the course of the SALP assessment period.

Declining: Licensee performance has generally declined over the course of the SALP assessment period.

### III. SUMMARY OF RESULTS

#### Overall Facility Evaluation

During this assessment period, corporate and site management continued their strong commitment to improving overall plant performance. This has been evidenced by virtual completion of a maintenance improvement program which included a comprehensive valve maintenance program, a comprehensive upgrade of maintenance surveillance procedures, an improvement in outage control, improvements in unit capacity factors, and no Severity Level III violations.

There have been improvements in the plant operations, maintenance, surveillance, outage and licensing areas. A major strength was demonstrated in the security area. Control room demeanor was professional. Outage scheduling improved during the evaluation period. Also noteworthy was the licensee's performance during the two hurricanes that affected the site.

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Functional Area	Feb. 1, 1983- Apr. 30, 1984	May 1, 1984- Oct. 31, 1985	Trend During Latest SALP Period
Plant Operations	2	2	Improving
Radiological Controls	1	2	Improving
Maintenance	2	2	Improving
Surveillance	2	2	Improving
Fire Protection	2	2	Constant
Emergency Preparedness	1	2	Constant
Security	1	1	Constant
Refueling/Outages	1	2	Improving
Quality Programs and Administrative Controls Affecting Quality	2	2	Constant
Licensing Activities	2	2	Improving
Training	Not Rated	2	Constant

#### IV. PERFORMANCE ANALYSIS

##### A. Plant Operations

##### 1. Analysis

During this assessment period, routine and reactive inspections were performed by resident and regional inspection staffs.

Management involvement with plant operations improved during the assessment period. Overall plant operations directives to the operating staff and shift turnover procedures were formalized and documented. The post-trip review procedure was updated in response to a violation (e below), placing more stringent controls on the post-trip restart process. Corporate management demonstrated their continued involvement with plant operations by maintaining a Vice-President on site after completion of the Brunswick Improvement Program. The operations staff maintained several tracking systems to assist operators in monitoring such things as annunciators, shift turnover requirements, and limiting conditions for operation (LCOs). The operating crew has demonstrated an acceptance of procedural compliance requirements. However, valving errors as indicated by two violations (a and f below) demonstrated an occasional lack of attention to detail. The licensee writes internal operational event reports to address corrective action to major non-reportable events. However, the identification and investigation of personnel errors which did not result in plant events remained a weak area.

Response to NRC initiatives was sound and thorough. For example, the Shearon Harris Energy and Environmental Center helped resolve

the main steam isolation valve solenoid valve safety questions prior to unit restart. Resolution of this issue was sound and timely. On occasion, the licensee failed to clearly identify their position on event related regulatory issues prior to discussion with the NRC. Improvement in this area throughout the report period has been noted.

Simulator use enhanced operator performance as evidenced by rapid control room operator response during an event involving an inadvertent partial reactor scram. The simulator has been operational since January 1984, yet reflects Unit 2 as it existed in December 1981.

Plant housekeeping remained a strength and continued to receive significant licensee attention. Although one unit was in an outage most of the assessment period, the plant remained clean and the storage of materials and equipment allowed access to plant areas as necessary. The licensee conducted detailed drywell close-out inspections to verify that the drywell was clear and ready for plant operations.

Control room demeanor was professional. Operators wore badges to identify their assignments. Pre-shift briefings and formal turnovers were conducted. Access to the at-the-controls area was well controlled by the shift foreman.

Operations staffing exceeded regulatory requirements. Six operating crews were rotated to allow for leave and training. Recent operator losses have not resulted in excessive use of overtime. Vacant management positions were filled rapidly with qualified individuals.

Clear lines of communication between working groups were not always maintained. For example, the interface between maintenance and the system engineers was not formalized. The responsibilities of the system engineer, a new concept at Brunswick this evaluation period, needs further development.

Eight violations were identified:

- a. Severity Level IV violation for improper valve line-up which resulted in lowering the reactor vessel water level 12 inches, rather than reducing the suppression pool level as intended. (325/84-30 and 324/84-30)
- b. Severity Level IV violation for failure to establish adequate procedures to drain the main steam lines during reactor startup, resulting in a water hammer event. (325/84-35 and 324/84-35)

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- c. Severity Level IV violation for failure to obtain a sample of the residual heat removal system when required by procedure. (324/84-39)
- d. Severity Level V violation for failure to establish adequate procedures for resin slurry transfer operations. (325/85-03 and 324/85-03)
- e. Severity Level V violation for failure to complete post-trip review prior to startup, as required by procedures. (325/85-04)
- f. Severity Level V violation for an improper valve operation, resulting in closing the air supply valves to the scram solenoid air supply header. (324/85-33)
- g. Severity Level V violation for failure to perform an adequate 10 CFR 50.59 review before closing the core spray minimum flow valves. (324/84-27)
- h. Severity Level V violation for failure to adequately correct deficiencies in alarm response procedures. (325/85-22 and 324/85-22)

2. Conclusion

Rating: 2

Trend: Improving

3. Board Recommendations

Performance in this area was evaluated as a Category 2 during the previous SALP assessment. The board commends management for implementation of an effective trip rate reduction program, and recommends continuation of this effort. No change in NRC inspection activity is recommended.

## B. Radiological Controls

### 1. Analysis

During the assessment period, inspections were performed by the resident and regional inspection staffs.

The licensee's health physics, chemistry, and radioactive waste staffing levels were adequate and compared favorably to other utilities having a facility of similar size. An adequate number of ANSI qualified licensee and contract health physics and chemistry technicians were available to support routine and outage operations.

The health physics and chemistry technician training programs were adequate.

Resolution of radiation protection technical issues was a program strength. An example was the facility staff resolution of erroneous thermoluminescent dosimeter (TLD) readings caused by the presence of hydrogen sulfide gas in the work place. The licensee's evaluation determined that high TLD readings could be caused by exposing lithium borate TLD chips to relatively low concentrations of the gas. This evaluation was thorough, well documented and the conclusions were logically supported by test data.

Health physics management was involved sufficiently early in outage preparations to permit adequate planning. The station health physicist received the support of other plant managers in implementing the radiation protection program. The performance of the health physics staff in support of routine plant operations was a program strength. Health physics technicians provided effective coverage of radiological work.

During calendar year 1984, the licensee disposed of 48,000 cubic feet of solid radioactive waste. Through September 1985, the licensee had disposed of 38,350 cubic feet of solid radioactive waste. Based on the projected outage workload through the end of 1985, this trend would indicate a slight overall reduction in the volume of waste shipped at the end of the year. The average volume of solid radioactive waste shipped by BWRs during 1984 was 33,000 cubic feet. Although waste reduction methods were initiated, the waste volume remained above average for similar sized plants due to the type and amount of work during extended outages in the period. The radioactive waste processing program resulted in one violation (a below) for failure to have procedures in place to insure that the freestanding liquid requirements were being met for material sent for burial.

During 1984, the total collective dose was 3,260 man-rem. Through September 30, 1985, the total collective dose was 2,279 man-rem. These doses are substantially higher than the 2,000 man-rem average for a two-unit BWR, but a reduction from the previous evaluation period was evident. The high collective dose for the facility resulted, to a large degree, from major maintenance and modification activities during extended outages. Notwithstanding this reduction, the licensee's program for maintaining radiation exposure as low as reasonably achievable (ALARA) has been ineffective as evidenced by the fact that the plant has produced the highest BWR cumulative radiation dose in the U.S. for the period 1980-1984 and has consistently been above the national average for BWR's.

The radiological environmental monitoring program was adequately managed at both the plant and the corporate environmental monitoring laboratory. Communications between the plant and corporate laboratory staff were adequate to assure program implementation. The environmental laboratory quality control program met the general criteria of Regulatory Guide 4.15 and the results of Environmental Protection Agency interlaboratory cross-check program were satisfactory.

The quality control program for radiological measurements also met the criteria of Regulatory Guide 4.15. Licensee results for gamma-ray measurements of in-plant samples split with the NRC during 1984 were in agreement for all sample types except the charcoal cartridge geometry. This disagreement showed that measurements had not been performed correctly which resulted in a violation (b below) for failure to follow procedures for calibration of a Ge(Li) detector system. In 1985, all of the split sample results were in agreement and the gamma spectroscopy systems were calibrated properly.

The licensee had experienced intergranular stress corrosion cracking (IGSCC) in weld regions of the recirculating water system as well as cracking in disks of low-pressure turbines that has been attributed to improper control of reactor coolant chemistry.

However, as the industry's understanding of these types of chemical degradation has improved, the licensee has taken action (both in plant design and chemistry control) to minimize further deterioration of the primary pressure boundary.

Two violations were identified:

- a. Severity Level IV violation for failure to establish adequate procedures for solid waste systems which would ensure compliance with the requirements of 10 CFR 61.56(a)(3). (325/85-17 and 324/85-17)

- b. Severity Level V violation for failure to follow procedures relating to minimizing dead time for radiation detection equipment. (325/84-14 and 324/84-14)

2. Conclusion

Category: 2

Trend: Improving

3. Board Recommendations

Performance in this area was evaluated as Category 1 during the previous SALP assessment. The board noted that the most significant contributor to the decline in this area was an apparently ineffective ALARA program. Increased licensee management involvement is recommended to minimize personnel exposure, especially during plant maintenance. Increased NRC inspection effort in the area of exposure control is recommended.

- C. Maintenance

1. Analysis

During this assessment period, inspections were performed by the resident and regional inspection staffs. Special inspections were conducted in the areas of environmental qualification (EQ) and licensee response to Generic Letter (GL) 83-28, "Required Actions Based on Generic Implications of Salem ATWS Events."

Significant management attention has been directed to improve the maintenance program. The licensee's intention is to rewrite all maintenance instructions; however, this program remained in the conceptual stage. Implementation of the valve maintenance program demonstrated the licensee's commitment to resolve long standing valve problems. One supervisor was assigned responsibility for complex valve maintenance, both electrical and mechanical. The licensee conducted specialized training to improve plant valve maintenance expertise. The technical manual review program demonstrates long range planning by the licensee. Only limited resources have been used to date to verify that technical manual recommendations have been incorporated into maintenance instructions. The Maintenance Improvement Program established activities to upgrade the entire maintenance area. Staff sensitivity to abnormal conditions in the plant has improved. However, a few errors in this area still occurred. The standby liquid control system was returned to service with the heat tracing circuit inoperable. Improper control rod drive hydraulic control unit mounting problems resulted in two violations (a and b below). Walkdown of systems by system engineers, initiated at the

end of the evaluation period, should help prevent recurrence of problems noted above.

The licensee resolved technical issues through extensive use of the plant nuclear safety committee (PNSC), the onsite nuclear safety (ONS) review group, and technical support group assistance. PNSC meetings were conducted to resolve issues, not to just meet regulatory requirements. Maintenance management regularly utilized ONS to review issues for generic implications when a more objective look was desired. Final resolution of issues demonstrated the licensee's foresight and conservatism. Issues were not always resolved rapidly, but the licensee willingly postponed start-up until an issue was resolved.

Maintenance staffing was appropriate to complete the necessary work without excessive overtime or backlog. Supervisory and technical staffing were stabilized, enabling supervisors to grow in their positions.

Maintenance training was a positive contributor to improved maintenance on site. Vendor representatives were hired to train personnel in maintenance procedures, diagnostic approaches, and overall equipment knowledge. Vendor representatives from Terry Turbine and Cooper Industries were included. The corporate training department made training films on various maintenance practices.

Minor weaknesses were identified in post-maintenance breaker testing, existing electrical cable installations, fuse control, fire protection/separation, and materials restoration after cable replacement. The licensee's corrective action program was adequate in that problems identified in the course of testing were documented and repaired, and the resolution of technical issues was normally sound and thorough.

Management had a review cycle for completed maintenance requests that will be entered into a trending program. Inspection revealed a backlog in the review cycle that caused the desired information to be slow and/or unavailable for input into the trending program.

Plant personnel preparing and reviewing post-trip documentation were familiar with plant systems, equipment, and plant operations. Personnel participating in activities affecting equipment on the Q-List were aware of the appropriate level of QA controls. The craft personnel performing maintenance and surveillances were knowledgeable of the maintenance procedures and equipment. Maintenance work records indicated that reviews and approvals were received prior to beginning work, forms were properly classified as Q-List, appropriate post-maintenance testing was conducted, and records were well maintained and retrievable.

Licensee management was involved in assuring quality and was responsive to NRC initiatives. This was observed by the scheduling, developing, reviewing, and submittal of adequate responses to GL 83-28, which entailed considerable management participation. The licensee's responses were found to be timely, concise, and adequate. Review of licensee responses revealed that they understood the requirements of GL 83-28 and had adequately resolved technical issues. Management has made a substantial commitment to GL 83-28 items as indicated below:

- In the area of post-maintenance testing, the licensee has initiated steps to review all safety-related test and maintenance procedures as well as Technical Specifications. This assures that post-maintenance testing is required which verifies that equipment is capable of performing its intended safety functions.
- The licensee has committed to check all vendor and engineering recommendations for safety-related equipment to ensure that appropriate test guidance is included in the test and maintenance procedures or the Technical Specifications. This program is scheduled to be completed by December 1985.
- The licensee began development of a detailed component Q-List which identifies sub-components and associated parts and should be completed some time in calendar year 1987.

The licensee's EQ program demonstrated good prior planning and priority assignment on resolution of EQ issues. However, responsiveness to 10 CFR 50.49 requirements was weak in that the licensee was not timely in the initiation of the EQ program. Also, the licensee exhibited a weakness in the integration of EQ maintenance activities into existing plant maintenance procedures. With the exception of program timeliness and EQ maintenance, the licensee's overall EQ program was being implemented satisfactorily.

Three violations were identified:

- a. Severity Level V violation against 10 CFR 50, Appendix B, Criterion V for missing bolts in the control rod drive hydraulic control units (HCU). (325/85-22 and 324/85-22)
- b. Severity Level V violation for failure to have the proper bolts for the HCU. (324/85-27)
- c. Severity Level V violation for failure to follow procedure that requires the maintenance and technical support managers to report monthly on jumpers installed by work requests. (325/85-24 and 324/85-24)

2. Conclusion

Rating: 2

Trend: Improving

3. Board Recommendations

Performance in this area was evaluated as a Category 2 during the previous SALP assessment. The previous and current ratings in this area are primarily a result of the Maintenance Improvement Program and further improvement is expected. No change in NRC inspection activity is recommended.

D. Surveillance

1. Analysis

During the assessment period, inspections were performed by resident and regional inspection staffs. Nine inspections were performed in the inservice inspection program.

Management made a significant commitment to improving surveillance performance on-site. Operations surveillance procedures were completely revised during the previous evaluation period. Inadequate logic system functional tests and response time tests, as demonstrated by a violation (b below), resulted in a major commitment by the licensee to completely revise the surveillance procedures performed by maintenance groups. After some initial start-up problems with General Electric managing the Maintenance Surveillance Testing (MST) project, the licensee assumed project management. A staff of over 30 contract and CP&L procedure writers contributed to all the MST procedures. Over 450 procedures were written using 25 man-years of effort. Project completion is scheduled for early 1986. The licensee's efforts in the MST area far exceeded regulatory requirements. These efforts should reduce the number of LERs and violations in the surveillance area. With the completion of the full-scale MST work, the licensee plans to keep some procedure writers to maintain and revise the procedures as necessary. With the MST program procedures in place and maintained, the licensee should continue to improve in this area.

The type C containment testing, snubber surveillance program and excess flow check valve programs showed evidence of prior planning. Procedures were well defined for control of surveillance activities. Decision making was usually at a level that ensured adequate management review. Records were complete, retrievable, well maintained, and legible. Staffing was adequate.

Personnel performing surveillance activities were trained in a well-defined formal training program.

One violation (d below) was identified which brought into question the technical adequacy of certain ultrasonic testing (UT) examinations. Immediate corrective actions were taken at that time and plans were made by the licensee to strengthen the inspection program to preclude recurrence. Subsequent inspections again identified technical concerns with augmented nondestructive examinations (NDE) which were performed in accordance with the recommendations of Generic Letter 84-11. The technical concerns raised questions concerning marginal vendor procedures and the licensee's ability to properly control vendor NDE activities. As a result of these findings, an enforcement meeting was held with the licensee on June 6, 1985, to discuss the management and control of the inservice inspection (ISI) program. Further inspection observed improvement in this area and although similar concerns were noted, no violations were identified.

Although weaknesses were identified with the licensee's ability to properly control vendor NDE activities relative to ISI, overall performance in the ISI area continued to improve. Site and corporate management were visibly involved in decision making relating to preplanning, strengthening organizational weaknesses, incorporating advance inspection systems and techniques into the normal surveillance programs, and constantly re-evaluating ISI progress and problems to insure that quality objectives were obtained. Specific organizational improvements consisted of transferring the ISI Group to work under a more experienced supervisor, and hiring a past Level III examiner into the ISI group. Corporate management also supported the site's objectives by furnishing corporate Level II examiners to provide field surveillance of ongoing ISI NDE activities. This surveillance was productive in identifying examination limitations.

Six violations were identified:

- a. Severity Level IV violation for failure to adequately test the recirculation loop discharge and discharge bypass valves. (325/84-30 and 324/84-30)
- b. Severity Level IV violation for inadequate surveillance procedure that led to failure to perform satisfactory logic system functional test for standby gas treatment system valves and reactor building ventilation suction valves. (324/84-31)
- c. Severity Level IV violation for failure to bypass an Average Power Range Monitor (APRM) upon resumption of a Local Power

Range Monitor (LPRM) surveillance test. (325/85-05 and 324/85-05)

- d. Severity Level IV violation for failure to follow ultrasonic test procedure. (325/84-34)
- e. Severity Level V violation for failure to follow plant procedures requiring routing procedure identification forms to all responsible groups, which resulted in untimely completion of several surveillance tests related to recent Technical Specification amendments. (325/84-13 and 324/84-13)
- f. Severity Level V violation for failure to establish an adequate procedure, per Technical Specifications, to test the mast fuel gripper slack cable cutoff. (325/85-16 and 324/85-16)

## 2. Conclusion

Rating: 2

Trend: Improving

## 3. Board Recommendations

Performance in this area was evaluated as Category 2 during the previous SALP assessment. No change in NRC inspection activity is recommended.

## E. Fire Protection

### 1. Analysis

During this assessment period, inspections of the licensee's fire prevention and fire protection program were conducted by regional and resident inspection staffs.

The licensee has issued procedures for the administrative control of fire hazards within the plant; surveillance and maintenance of the fire protection systems and equipment; and the organization and training of a plant fire brigade. A review of the procedures indicated that they comply with NRC requirements and guidelines.

The staff reviewed the licensee's implementation of the fire protection program and administrative controls. General plant housekeeping and control of ignition sources and combustible/flammable materials were satisfactory.

The fire protection suppression and detection systems were found to be in service. The licensee's Fire Seal Evaluation Program identified numerous unqualified fire barrier penetration seals throughout the plant; however, those areas have fire watches posted in accordance with the Technical Specifications. Surveillance inspections, tests, and maintenance activities for the fire protection systems and features were satisfactory except in the areas of emergency lighting units and fire barriers. These items have been identified and corrective actions are being implemented under the Brunswick Plant Fire Protection Improvement Program.

The organization and staffing of the plant fire brigade met NRC guidelines. Training and drills for the brigade members met the frequency specified by procedures and NRC guidelines.

The annual fire protection/prevention audit, the 24 month QA fire protection program audit by offsite organization, and the triennial audit by an outside fire protection organization required by the Technical Specifications were reviewed. These audits were conducted within the specified frequency and covered all essential elements of the fire protection program. The licensee implemented corrective action on discrepancies identified by the audits. The licensee identified, analyzed, and reported the plant's fire protection events and discrepancies as required by license conditions or Technical Specifications.

In general, management involvement and control in assuring quality in the fire protection program was adequate due to the issuance and implementation of fire protection procedures that met NRC requirements and guidelines.

The licensee's approach to resolution of fire protection technical issues indicated an adequate understanding of the specific fire protection principles involved. Considerable NRC effort has been required to resolve a number of fire protection issues related to the plant's compliance with 10 CFR 50, Appendix R. This includes monthly NRC meetings with the licensee, and other special site meetings to resolve technical issues involving over 40 exemption requests from the requirements of the rule. Several of these fire protection issues remain open.

Fire protection staff positions were identified and authorities and responsibilities were defined. Contractor personnel had key fire protection staff positions at the site. These people were qualified for their assigned duties. The fire brigade training program was adequately defined and implemented. No violations or deviations were identified during this assessment period.

## 2. Conclusion

Category: 2

Trend: Constant

## 3. Board Recommendations

Performance in this area was evaluated as Category 2 during the previous SALP assessment. The number of control room ventilation isolations from spurious fire detector alarms should be reduced to minimize safety system actuations and nuisance alarms which detract from operator attentiveness. No change in NRC inspection activity is recommended.

## F. Emergency Preparedness

### 1. Analysis

During the assessment period, inspections were performed by regional and resident inspection staffs. These included observation of two emergency preparedness exercises and two routine inspections. Five revisions of the licensee's emergency plan were reviewed.

The licensee's performance during 1984 and 1985 emergency preparedness exercises demonstrated that the plan and procedures could be effectively implemented. However, exercise weaknesses were observed in the 1985 exercise. During the exercise, it was noted that notifications to the county organizations were delayed. The licensee notified the State within 15 minutes of declaration of an emergency and assumed that the State would make notifications to the counties. Approximately 30 minutes later, the State informed the licensee that the State's Emergency Response Team was not yet fully activated and the State had not notified the counties. The licensee immediately made the required additional notifications. This delay did not adversely effect protective actions on the part of the counties but could have delayed the counties' emergency preparations. This delay could have resulted in delay of protective actions during another scenario or in a fast-moving emergency. In addition, the licensee misjudged the evacuation time related to plume movement, resulting in an unappropriate protective action recommendation. The licensee promptly identified this error and corrected the recommendation. This problem area was also identified by the licensee for evaluation and corrective action. The remaining weaknesses identified areas where additional training or modifications to update procedures were required including notifications to the State. The licensee's observations of the exercises were detailed and the corrective actions implemented to correct weaknesses observed in the 1984 exercise were observed during the 1985 exercise to have been effective.

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During routine inspections, the following essential elements for emergency response were determined to be acceptable: emergency detection and classification; notification and communications; changes to the emergency preparedness program; shift staffing and augmentation; training; and audits of the emergency preparedness program. The inspections identified one violation involving protective action recommendations. A review of licensee's procedures and interviews with Shift Operating Supervisors revealed that the procedures did not clearly specify that a protective action recommendation was to be issued immediately upon declaration of a General Emergency, and that the minimum recommendation would be sheltering in a two mile radius and five miles downwind. The corrective action was verified to have been implemented during a followup inspection.

The licensee demonstrated superior performance during the hurricanes that affected the site. Precautionary shutdowns during the hurricanes revealed the licensee's commitment to safety.

One violation was identified:

Severity Level IV violation for failure to establish procedures which unambiguously direct the Site Emergency Coordinator to promptly provide offsite authorities with an appropriate protective action recommendation. (325/84-17 and 324/84-17)

2. Conclusion

Rating: 2

Trend: Constant

3. Board Recommendations

Performance in this area was evaluated as Category 1 during the previous SALP assessment. The board noted that the most significant contributors to the decline in this area were the weaknesses identified in the 1985 exercise; however, no change in NRC inspection activity is recommended.

G. Security

1. Analysis

During this assessment period, routine inspections of security and safeguards activities were performed by the regional and resident inspection staffs. No special inspections or safeguards events occurred during this period.

The staffing level of the licensee's contract security force was adequate as evidenced by the effectiveness of security operations. The continued effectiveness of the Brunswick Security Program is attributed to the dedicated professionalism of security management personnel and the security staff's attitude toward strict adherence to regulatory requirements.

Safeguards issues were aggressively addressed by security management with corporate involvement and support. The authority and detailed responsibilities associated with security operational activities were identified and clearly defined in security plans and procedures. A recent change in the contract security force management at the plant has not detracted from or degraded the level of security expertise available to security supervisors. The effectiveness of the licensee's security program continued and improved as evidenced by the lack of security violations during this evaluation period.

The licensee's efforts to ensure the resolution of operational and functional security issues continued to be positive and reflected effective managerial attention and corporate support. Responsiveness to NRC initiatives was timely. The licensee consistently provided evidence of prior planning and proper assignment of priorities to safeguards matters. The licensee completed installation and operational implementation of electronically controlled turnstiles at two primary vital area access portals that eliminated long standing compensatory posts.

The operational capability of the security organization was enhanced by an effective training program. The effectiveness of the training and qualification program was evident in personnel performance and positive morale.

No violations were identified relative to the licensee's implementation of the Physical Security Program.

2. Conclusion

Rating: 1

Trend: Constant

3. Board Recommendations

Performance in this area was evaluated as Category 1 during the previous SALP assessment. No change in NRC inspection activity is recommended.

## H. Outages

### 1. Analysis

During the assessment period, both units underwent lengthy outages involving refueling and extensive modifications. Inspections were performed by resident and regional inspection staffs.

Management remained committed to strong oversight of outages. A dedicated management organization controlled outage scheduling, aided by a computerized scheduling system. Corporate management on site frequently became involved in outage problems. Outage schedule and critical path activities were highlighted during management meetings. The post-maintenance testing requirement system improved the licensee's control of returning of equipment to service. Two events, the inadvertent core spray initiation described in the licensee activities section and the Steam Jet Air Ejector (SJAE) radiation monitor violation listed in the Quality Programs area, both involved incorrect plant modifications and inadequate acceptance testing. Modification packages were approved that required numerous field modifications, complicating the installation, scheduling, and acceptance testing processes.

The licensee completed the Unit 2 refueling outage in 229 days, 17 days behind schedule. The Unit 1 outage, after the Unit 2 outage, was completed in 224 days, seven days behind schedule. That the outages conducted during the previous assessment period were completed approximately 100 days behind schedule demonstrates that the licensee has improved outage scheduling. Further improvement in this area is expected.

Refueling activities demonstrated evidence of prior planning and assignment of priorities. Management was involved in the resolution of technical issues. For example, modifications to the refueling mast to correct a deficiency were thoroughly reviewed by the plant staff and further reviewed and approved by the plant nuclear safety committee.

Major modifications included replacement of reactor instrumentation isolation valves, overlay weld repairs, and induction heat stress improvement (IHSI). Management involvement and control in assuring quality was evident by advance planning and staging of work. Procedures were well stated and training of personnel was effective and well documented. Documentation of results and actions taken were complete, legible and easily obtained. Decision making was usually at a level that ensured adequate management review. In-process work was supervised. Resolution of technical issues was sound and thorough.

No violations were identified.

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## 2. Conclusion

Rating: 2

Trend: Improving

## 3. Board Recommendations

Performance in this area was evaluated as Category 1 during the previous SALP assessment. NRC has broadened the evaluation of this area to include overall outage management, rather than solely refueling activities as evaluated in previous SALP assessments. The board believes that the present licensee outage management program will continue to improve performance in this area. No change in NRC inspection activity is recommended.

## I. Quality Programs and Administrative Controls Affecting Quality

## 1. Analysis

During this assessment period, routine inspections were performed by the resident and regional inspection staffs.

The site QA department appears to interface well with other site departments while maintaining independence. QA personnel utilized experience within their group for performing procedure reviews and surveillances. They were also active in assuring that regulatory requirements, such as Technical Specification changes, were incorporated into lower-tier documents.

The surveillance testing and calibration control program has shown some improvement. Maintenance surveillance test procedures are being rewritten. Personnel responsible for scheduling surveillances appeared confident that the system was correct and efficient. An issue of whether or not to perform out-of-tolerance evaluations for installed process instruments was raised. This issue is currently being evaluated.

The licensee's program for handling special tests and experiments was in place, working, and met regulatory requirements.

Procurement activities were generally controlled and documented. Receipt, storage, and handling of equipment and materials were well organized and personnel involved in this area were conscientious.

Problem areas were identified in the document control and records management programs; however, the licensee had previously performed an independent audit in these areas during which similar problems were identified. These problems were being addressed and corrective action was being implemented.

One violation (b below) was identified concerning the failure to verify environmental conditions in the calibration laboratory. Other aspects of the Measurement and Test Equipment (M&TE) Program implementation were functioning properly.

The licensee was generally responsive to NRC QA initiatives in that eight previously identified items were reinspected and all eight were closed.

Five violations and one deviation were identified:

- a. Severity Level IV violation for failure of the acceptance test procedure in PM 83-262 to adequately verify performance requirements for a SJAE radiation monitor. (324/84-31)
- b. Severity Level V violation for failure to verify environmental conditions in the electrical and instrumentation calibration laboratory. (325/85-02 and 324/85-02)
- c. Severity Level V violation for failure to accomplish activities affecting quality in accordance with documented procedures and drawings. (325/85-19 and 324/85-19)
- d. Severity Level V violation for failure of two pipe supports to meet documented requirements. (324/85-19)
- e. Severity Level V violation for failure to review new Technical Specification surveillance requirements as required by a quality assurance procedure. (325/84-13 and 324/84-13)
- f. Deviation for failure of the tank car siding chlorine detectors to meet requirements of the Final Safety Analysis Report. (325/84-31 and 324/84-31)

2. Conclusion

Rating: 2

Trend: Constant

3. Board Recommendations

Performance in this area was evaluated as Category 2 during the previous SALP assessment. No change in NRC inspection activity is recommended.

JAN 15 1986

## J. Licensing Activities

### 1. Analysis

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

The licensee's management demonstrated active participation in licensing activities and kept abreast of current and anticipated licensing actions. Licensee management actively participated in an effort to work closely with the NRC staff to establish realistic integrated schedules for all modifications of the Brunswick facilities. The plan for the integrated schedule was completed and is currently under review. In addition, management involvement in licensing activities assured timely response to the requirements of the Commission's rules related to fire protection. The licensee's management maintained effective communication with the NRC staff. The Brunswick Pilot Effort was successful in reducing the number of outstanding amendments early in this evaluation period due to close cooperation by the licensee. The close communication was especially effective during the recent long Unit 1 refueling outage, during which 11 actions were required for unit startup. The applications for these actions were timely, allowing sufficient time for reviews before the scheduled startup date.

Weakness was observed in the licensee review of amendment requests, responses to generic letters, and requests for additional information. On occasion, the issues were not clearly described and adequately evaluated. For example, the evaluations for significant hazards considerations in amendment requests did not clearly support the conclusions reached. Some improvements were observed in these areas.

The licensee's management and staff generally demonstrated sound technical understanding of issues involving licensing actions. Their approach to resolution of technical issues demonstrated expertise in most technical areas involving licensing actions. Decisions related to licensing issues exhibited conservatism in relation to significant safety matters. The licensee's frequent visits to and communication with NRC provided appropriate technical discussions needed for resolution of safety issues and improved efficiency of NRC processing and review of submittals. The licensee effectively resolved several complex technical issues, including adequacy of station electric distribution voltage, Regulatory Guide 1.97, TMI NUREG-0737 Technical Specifications, and environmental qualification. However, a recent request to extend the environmental qualification completion date was not viewed favorably by the commission based on the licensee's early efforts in this area.

The licensee was generally responsive to NRC initiatives, making efforts to meet established commitments, as illustrated by their responses to Multi-Plant Actions (MPAs) and TMI NUREG-0737 action items; the timely completion of the report on alternate shutdown capability; environmental qualification; and adequacy of station electric voltage. In addition, the licensee spent considerable effort in developing and adopting an integrated schedule plan for all safety-related modifications.

The licensee made efforts to upgrade and increase the number of licensing staff members. Early in the SALP period, too few personnel and less than adequate communication between licensing staff and plant staff led to a backlog of less important licensing actions. The backlog of licensing actions was being reduced as evidenced by the influx of new submittals to NRC. Recent licensee staff losses have slowed this effort. During this evaluation period, a licensing staff member has been permanently located at the plant site. This has led to better communication between the corporate licensing staff and the plant staff, and is also proving helpful in resolving questions for the NRC staff more expeditiously. In addition, the position of principal engineer has been designated for the Brunswick facility rather than for all plants, as it was in the past.

In summary, there was evidence of prior planning and assignment of priorities. Reviews were generally timely, thorough, and technically sound. Responses were generally on time with few outstanding regulatory issues delayed by the licensee. The licensee generally proposed acceptable resolutions to technical problems. Corporate licensing management was frequently involved in site activities. Key positions were identified and authorities and responsibilities were defined. Records were generally complete, well maintained and available.

The understanding of issues was apparent and conservatism was generally exhibited by the licensee.

2. Conclusion

Rating: 2

Trend: Improving

3. Board Recommendations

Performance in this area was evaluated as Category 2 during the previous SALP assessment. No change in NRC inspection activity is recommended.

## K. Training

### 1. Analysis

During this assessment period, routine inspections of plant training programs were performed by the regional and resident inspection staffs. Management continued to be responsive to NRC initiatives and concerns and sought improvements to the plant training programs.

The reactor operator replacement training program was reviewed and found acceptable. Operator licensing replacement examinations were administered by the NRC during this period. Five reactor operator replacement examinations were administered with five candidates passing and thirteen senior reactor operator (SRO) replacement examinations were administered with nine candidates passing. These results are comparable to the industry average for replacement examinations.

Additionally, requalification examinations were administered by the NRC to Brunswick licensed operators and senior operators. In October 1985, four reactor operator requalification examinations were administered with four operators passing and eleven senior reactor operator requalification examinations were administered with eight senior operators passing. These examinations and a review of the requalification program resulted in the satisfactory rating for the requalification program.

The licensee's general employee training and other unlicensed employee training was considered to be adequate. The licensee is implementing a Craft and Technical Development Program in the area of maintenance training. This program prescribes five distinct levels of training for each maintenance discipline. Each level requires technicians to become proficient in various job factors or skills. Prior to progressing to the next higher level, the employee must demonstrate competency by successfully passing an examination.

One violation and one deviation were identified:

- a. Severity Level IV violation for failure of an individual to meet the criteria for passing his annual written exam for the 1984 calendar year. (325/85-01 and 324/85-01)
- b. Deviation for allowing an SRO upgrade candidate to take the NRC SRO upgrade examination without successfully completing the CP&L administered SRO upgrade examination. (325/85-01 and 324/85-01)

## 2. Conclusion

Rating: 2

Trend: Constant

## 3. Board Recommendations

Performance in this area was not evaluated during the previous SALP assessment. No change in NRC inspection activity is recommended.

## V. SUPPORTING DATA AND SUMMARIES

## A. Licensee Activities

During this assessment period, major licensee activities included normal power operations, refueling of both units, and extensive modifications and repairs as follows:

Unit 1

- Complete Mark I Containment Torus Modifications
- HFA Relay Replacements
- Recirculation Pipe Inspection, Weld-Overlays, and Induction Heat Stress Relieving
- Main Generator Rewind
- Reactor Water Clean-Up (RWCU) Pipe Replacement
- Low Pressure Turbine Rotor Replacement
- Environmental Qualification Modifications

In November 1984, the unit underwent an 11 day forced outage for snubber replacement, local leak rate testing, and recirculation pipe inspections. The licensee derated the unit upon restart until shutdown for refueling on March 29, 1985, to optimize fuel burn.

The licensee was preparing for unit startup at the end of the report period, after a scheduled 31 week refueling outage.

Unit 2

- Complete Mark I Torus Modifications
- Main Condenser Re-Tubing with Titanium
- Install Off-Gas Recombiner
- Main Generator Rewind
- Low Pressure Turbine Rotor Replacement
- Auxiliary Turbine Overhauls

The unit started the report period in a 217 day refueling outage which ended on October 26, 1984. The unit set a CP&L continuous operating run record of 147 days. The unit finished the report period operating on three main steam lines due to a failed main steam isolation valve DC solenoid.

Three notices of unusual event classifications were made during this assessment period:

- a. On September 13, 1984, Hurricane Diana passed directly over the site. Highest sustained wind was 110 mph. The licensee brought Unit 1 to cold shutdown as a precaution. Unit 2 was in an outage. No significant damage was done to the plant.
- b. On July 31, 1985, the Unit 1 "A" core spray system inadvertently injected 21,000 gallons of water into the reactor vessel with the unit defueled. The vessel overflowed water into the lower level reactor building ventilation ducts.
- c. On September 26, 1985, Hurricane Gloria passed within 50 miles of the site. Highest sustained wind was approximately 44 mph. Unit 2, the operating unit, was shutdown as a precaution. No damage to the plant occurred.

One Institute of Nuclear Power Operations evaluation was conducted November 5-16, 1984.

#### B. Inspection Activities

The routine inspection program was performed during this period. Three resident inspectors were assigned to the site for 16 months of the assessment period.

The routine program was enhanced through additional routine inspections during the recirculation piping inspection and weld overlay work. Special inspections were conducted to augment the routine program as follows:

July 11-20, 1984, Special inspection in the areas of IGSCC inservice inspection and cracking of the HPCI turbine nozzle reversing chambers.

August 13-15, 1984, Special inspection in the area of sizing of previously identified IGSCC indication.

May 20-24, 1985, Special inspection concerning licensee's response to GL 83-28, "Required Actions Based on Generic Implications of the Salem Anticipated Transient Without Scram Events."

August 12-16, 1985, Special inspection in the area of electrical equipment qualification.

### C. Licensing Activities

During this evaluation period, licensing activities included Technical Specification amendment requests, requests for exemption, responses to generic letters, relief from surveillance requirements, and NUREG-0737 items. Actions which involved a significant level of activity are summarized below.

27 multi-plant actions of which 17 were completed:

- Inservice Testing
- Alternative Shutdown Capability
- Environmental Qualification of Equipment
- Control of Heavy Loads, Phase I and Phase II
- Instruments to Follow the Course of an Accident,  
Regulatory Guide 1.97
- Reporting Requirements Affected by Revision of 10 CFR 50.72  
and 50.73
- Masonry Wall Design
- Generic Letter 83-28, ATWS, Items 1.1, 1.2, 3.1.1, 3.1.2, 3.1.3,  
3.2.3, 4.5.1
- Technical Specifications for NUREG-0737
- Inspections of BWR Stainless Steel Piping

142 plant-specific actions of which 88 were completed:

- Improved Thermal Hydraulic Code
- Degraded Voltage Technical Specifications
- Appendix J Exemption - Local Leak Rate Test
- IGSCC Inspection
- Operator Replacement Training Program
- Relief from Section XI Hydrostatic Test
- Direct Current System Limiting Condition for Operation  
and Surveillance Requirements
- ADS Logic Modifications
- Integrated Schedule
- Environmental Qualification Extension
- Raychem Cable Test
- Drywell Hydrogen/Oxygen Monitors

17 NUREG-0737 actions of which 11 were completed.

#### NRR Site Visits

- Fire Protection - August 27, 1985
- EQ Audit (with IE) - August 16, 1985
- Fire Protection, Integrated Schedule et. al. - March 18-19, 1985

Schedular Extension Granted

An environmental qualification schedular exemption was granted for Unit 2.

Reliefs Granted

One inservice test relief was granted for Unit 1, and a hydrostatic test relief was granted for both Units 1 and 2.

Exemptions Granted

One technical and three schedular exemptions were granted.

Emergency Exercise - Schedular  
Hydrogen Control - Schedular  
Appendix J, Local Leak Rate Test (LLRT) - Schedular  
Appendix R, Fire Protection/Prevention - Technical

Emergency Technical Specifications Issued

Two emergency Technical Specification amendments were issued.

## D. Investigation and Allegation Review

Nine allegations were reviewed during the assessment period. Five of these were unsubstantiated or not under NRC jurisdiction. The remaining four will be examined during the next routine inspection.

## E. Escalated Enforcement Actions

None.

## F. Management Conferences Held During the Assessment Period

An enforcement conference was held on June 6, 1985, to discuss management control of inservice inspection contractors.

## G. Confirmation of Action Letters

None.

## H. Review of Licensee Event Reports (LERs) and 10 CFR 21 Reports Submitted by the Licensee

## 1. Licensee Event Reports

During the assessment period, 77 LERs submitted by the licensee were evaluated by the NRC staff to determine event cause.

The distribution of these events were as follows:

<u>Cause</u>	<u>Unit 1</u>	<u>Unit 2</u>
Component Failure	17	3
Design	11	0
Construction, Fabrication or Installation	4	0
Personnel		
- Operating Activity	3	2
- Maintenance Activity	9	1
- Test/Calibration	10	2
- Other	0	1
Out of Calibration	1	0
Other	6	7
TOTAL	61	16

2. 10 CFR Part 21 Reports

None.

I. Enforcement Activity

FUNCTIONAL AREA	NO. OF DEVIATIONS AND VIOLATIONS IN EACH SEVERITY LEVEL					
	D	V	IV	III	II	I
Plant Operations		5	3			
Radiological Controls		1	1			
Maintenance		3				
Surveillance		2	4			
Fire Protection						
Emergency Preparedness			1			
Security						
Outages						
Quality Programs and Administrative Controls Affecting Quality	1	4	1			
Licensing Activities	1		1			
Training						
TOTAL	2	15	11			