UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report Nos.: 50-325/88-05 and 50-324/88-05

Licensee: Carolina Power and Light Company
P. O. Box 1551
Raleigh, NC 27602

Docket Nos.: 50-325 and 50-324 License Nos.: DPR-71 and DPR-62

Facility Name: Brunswick 1 and 2

Inspection Conducted: February 1-29, 1988

Inspector: S. J. Vias for W. H. Ruland — 3/30/88 Date Signed

Accompanying Personnel: S. M. Shaeffer

Approved by: S. J. Vias for P. E. Fredrickson, Section Chief, Division of Reactor Safety — 3/30/88 Date Signed

SUMMARY

Scope: This routine safety inspection by the resident inspector involved the areas of followup on previous enforcement matters, maintenance observation, surveillance observation, operational safety verification, onsite Licensee Event Reports (LER) review, Q-List Review concerns, Diesel Generator air system seismic qualification, silicon bronze bus bar bolts, hydrogen leak/unusual event, ESF System walkdown, inerting line failure, and plant modifications.

Results: In the areas inspected, no programmatic weaknesses, violations or deviations were identified. Two Unresolved Items were identified: service water system operating mode concerns, and containment atmosphere dilution system discrepancies.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*B. Altman, Principal Engineer
*E. Bishop, Manager - Operations
*J. Brown, Res. Engineer - Engineering
*S. Callis, Onsite Licensing Engineer - Licensing & Nuclear Fuel
*G. Cheatham, Manager - Environmental & Radiation Control
R. Creech, I&C/Electrical Maintenance Supervisor (Unit 2)
*C. Dietz, General Manager - Brunswick Nuclear Project
W. Dorman, Supervisor - QA
*R. Eckstein, Manager - Technical Support
*K. Enzor, Director - Regulatory Compliance
*W. Hatcher, Supervisor - Security
A. Hegler, Superintendent - Operations
*R. Helme, Director - Onsite Nuclear Safety - BSEP
J. Holder, Manager - Outages
*P. Howe, Vice President - Brunswick Nuclear Project
*L. Jones, Director - Quality Assurance (QA)/Quality Control (QC)
R. Kitchen, Mechanical Maintenance Supervisor (Unit 2)
*G. Oliver, Manager - Site Planning and Control
*J. O'Sullivan, Manager - Maintenance
B. Parks, Engineering Supervisor
*R. Poulk, Senior NRC Regulatory Specialist
*J. Smith, Manager - Administrative Support
R. Warden, I&C/Electrical Maintenance Supervisor (Unit 1)
D. Warren, Acting Engineering Supervisor
B. Wilson, Engineering Supervisor
*T. Wyllie, Manager - Engineering and Construction

Other licensee employees contacted included construction craftsmen, engineers, technicians, operators, office personnel, and security force members.

*Attended the exit interview

Joy Industrial Equipment Company

Ralph L. Susey, Manager, Administration and Development

2. Exit Interview (30703)

The inspection scope and findings were summarized on March 4, 1988, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection findings listed below.

Dissenting comments were not received from the licensee. Proprietary information is not contained in this report.

Item Number	Description/Reference Paragraph
325/88-05-01 & 324/88-05-01	*URI - Service Water System Operating Mode Concerns (paragraph 8.b).
325/88-05-05 & 324/88-05-05	URI - CAD System Discrepancies (paragraph 12).
325/88-05-02 & 324/88-05-02	IFI - DG Air Compressor Seismic Testing Performed Without Compressor Running (paragraph 9).
325/88-05-03 & 324/88-05-03	IFI - Sand Introduced Into Torus/Vacuum Breakers from Failed Inerting Line (paragraph 13).
325/88-05-04 & 324/88-05-04	IFI - Hydrogen Leak in Turbine Building Pipe Tunnel (paragraph 11).

Note: Acronyms and abbreviations used in the report are listed in paragraph 15.

3. Followup on Previous Enforcement Matters (92702)

(CLOSED) Violation 324/87-03-01, Failure to Maintain Fuel Pool Storage Capacity Within Technical Specification Limits.

The inspector reviewed the licensee's response dated April 29, 1987. The licensee has completed modification work (PM-83-004) involved with the installation of the Unit 2 high density fuel storage racks. A request for license amendment was submitted on June 23, 1987, regarding number of assemblies allowed in the spent fuel pool for both units.

No significant safety matters, violations, or deviations were identified.

4. Maintenance Observation (62703)

The inspectors observed maintenance activities, interviewed personnel, and reviewed records to verify that work was conducted in accordance with approved procedures, Technical Specifications, and applicable industry codes and standards. The inspectors also verified that: redundant components were operable; administrative controls were followed; tagouts were

*An Unresolved Item is a matter about which more information is required to determine whether it is acceptable or may involve a violation or deviation.

adequate; personnel were qualified; correct replacement parts were used; radiological controls were proper; fire protection was adequate; quality control hold points were adequate and observed; adequate post-maintenance testing was performed; and independent verification requirements were implemented. The inspectors independently verified that selected equipment was properly returned to service.

Outstanding work requests were reviewed to ensure that the licensee gave priority to safety-related maintenance.

The inspectors observed/reviewed portions of the following maintenance activities:

88-ABJN1	Installation of Snubber 2-E51-40SS84.
88-BAPH1	Installation and Removal of MSIV Pit HVAC Discharge Check Valve 1-VA-CV-RB.
SP-87-082, Rev. 0	Temporary Power Package for 2-B32-F023B Suction Valve.
SP-88-006, Rev. 0	Reactor Vessel Water Level Adjustment for Repair of 12 Inch Recirculation Nozzle.

No significant safety matters, violations, or deviations were identified.

5. Surveillance Observation (61726)

The inspectors observed surveillance testing required by Technical Specifications. Through observation, interviews, and record review, the inspectors verified that: tests conformed to Technical Specification requirements; administrative controls were followed; personnel were qualified; instrumentation was calibrated; and data was accurate and complete. The inspectors independently verified selected test results and proper return to service of equipment.

The inspectors witnessed/reviewed portions of the following test activities:

OI-3.1	Unit 1 Control Operator Daily Surveillance.
OI-3.2	Unit 2 Control Operator Daily Surveillance.

Other surveillance activities were observed or reviewed throughout the reporting period.

No significant safety matters, violations, or deviations were identified.

6. Operational Safety Verification (71707)

The inspectors verified that Unit 1 and Unit 2 were operated in compliance with Technical Specifications and other regulatory requirements by direct observations of activities, facility tours, discussions with personnel, reviewing of records and independent verification of safety system status.

The inspectors verified that control room manning requirements of 10 CFR 50.54 and the Technical Specifications were met. Control operator, shift supervisor, clearance, STA, daily and standing instructions, and jumper/bypass logs were reviewed to obtain information concerning operating trends and out of service safety systems to ensure that there were no conflicts with Technical Specifications Limiting Conditions for Operations. Direct observations were conducted of control room panels, instrumentation and recorder traces important to safety to verify operability and that operating parameters were within Technical Specification limits. The inspectors observed shift turnovers to verify that continuity of system status was maintained. The inspectors verified the status of selected control room annunciators.

Operability of a selected Engineered Safety Feature division was verified weekly by insuring that: each accessible valve in the flow path was in its correct position; each power supply and breaker was closed for components that must activate upon initiation signal; the RHR subsystem cross-tie valve for each unit was closed with the power removed from the valve operator; there was no leakage of major components; there was proper lubrication and cooling water available; and a condition did not exist which might prevent fulfillment of the system's functional requirements. Instrumentation essential to system actuation or performance was verified operable by observing on-scale indication and proper instrument valve lineup, if accessible.

The inspectors verified that the licensee's health physics policies/procedures were followed. This included observation of HP practices and a review of area surveys, radiation work permits, posting, and instrument calibration.

The inspectors verified that: the security organization was properly manned and security personnel were capable of performing their assigned functions; persons and packages were checked prior to entry into the protected area; vehicles were properly authorized, searched and escorted within the PA; persons within the PA displayed photo identification badges; personnel in vital areas were authorized and effective compensatory measures were employed when required.

The inspectors also observed plant housekeeping controls, verified position of certain containment isolation valves, checked a clearance, and verified the operability of onsite and offsite emergency power sources.

The inspector toured the Unit 1 torus and reviewed the results of the newly implemented AI-96, Rev. 0, Drywell Closeout, for Unit 1 drywell prior to Unit 1 startup after a maintenance outage. The licensee resolved all problems identified during the inspection prior to startup. Problem resolution, per procedure, was presented to PNSC for approval. The problems found included a misaligned RWCU snubber pipe clamp (1-G31-1553) and sand in the torus inerting penetration (see paragraph 8). Maintenance replaced the snubber and included the problem as caused by a system transient in the RWCU system. The system had been placed back in service during unit operation and the gasket on the 1A F/D had failed. This event was reported in LER 88-04. Any followup on the event will be inspected as part of the LER closeout.

No significant safety matters, violations, or deviations were identified.

7. Onsite Review of Licensee Event Reports Unit 2 (92700)

The listed LERs were reviewed to verify that the information provided met NRC reporting requirements. The verification included adequacy of event description and corrective action taken or planned, existence of potential generic problems and the relative safety significance of the event. Onsite inspections were performed and concluded that necessary corrective actions have been taken in accordance with existing requirements, licensee conditions and commitments. The following reports are considered closed.

(CLOSED) LER 2-86-08, Automatic Closure of Reactor Water Cleanup System Due to Erroneous Area High Temperature Signal. The licensee replaced the failed module and calibrated the new module as per MI-03-03. The inspector reviewed the licensee's TS compliance and the completed work package.

(CLOSED) LER 2-86-15, Autoactuation of Control Building Emergency Air Filtration Trains 2A and 2B. The cause for the intermittent system actuation was due to failure of an area radiation monitor/indicator trip unit for the Control Building common air intake supply duct. The licensee replaced the failed part and returned the unit to service. The licensee is also submitting a revision to the LER to include specific component information on the failed part as pertaining to NPRDS reportability requirements. The inspector reviewed the Instrument and Calibration Failure Analysis and the completed work package.

No significant safety matters, violations, or deviations were identified.

8. Q-List Review Concerns (71707)

Sargent & Lundy raised questions by letter dated February 3, 1988, concerning the classification of certain relays in safety related circuits. S&L was under contract with the licensee to develop a Q-list to the component level. Two potentially significant issues were raised:

a. BOP-27-1 Undervoltage Relay

S&L postulated a failure of a normally energized undervoltage relay (27-1) on each non-safety related bus feeding each emergency bus. Should the relay fail to drop out or certain contacts fail to open, the core spray pump and RHR pump on the associated bus would start simultaneously (block start) vice sequential start during a LOCA with a loss of off-site power.

The licensee concluded that startup of Unit 1 was allowed because their preliminary review of the design showed no common mode failure and that the design met the original design basis. The inspector concluded that no immediate safety issue existed since the licensee

had tested the diesel generators with block starting the LOCA loads during startup testing. The inspector reviewed Pre-Operational Test PO-47, Integrated ECCS Test, performed September 4, 1976, that documented that voltage and frequency on the E busses met the Regulatory Guide 1.9, March 10, 1971, voltage and frequency requirements during the starting transient. Also, the inspector verified that the 27-1 relays in the BOP busses appeared installed in a satisfactory manner and that the DG overcurrent relay with voltage restraint appeared correctly set. By letter dated February 19, 1988, UE&C informed the licensee that:

(1) the 27-1 relays were considered safety related in the original plant design,

(2) relays were purchased to the same specification as other safety related relays,

(3) both the safety related and BOP switch gear were purchased to the same specification.

(4) these relays were listed in FSAR table 8.3.1-17, including their location, showing review by NRC.

Based on the documents provided to the inspector and further interviews with plant personnel, the inspector has no further questions at this time. A Licensee Identified Item: BOP 27-1 Relays Treated as Safety Related (325/88-05-06 and 324/88-05-06), will be opened and closed for documentation.

See paragraph 14 for additional inspection performed in the area.

b. Service Water V106 Valve

S&L also identified four "non-safety" relays whose failure would prevent 1-SW-V106 or 2-SW-V106, SW Header to Reactor Building Closed Cooling Water Heat Exchangers Primary Isolation Valve, from closing during an accident. The four relays fed the loss of off-site power signal to the V106 closing circuit. Normally, on a LOCA with a LOSP, V106 receives a close signal, isolating the SW to the RB CCW HXs. However, since V106 does not have a redundant valve, its failure must already be assumed during a LOCA with LOSP. Therefore, the logic failure modes assumed by S&L are bounded by a DG failure. For example, if DG No. 3 failed during a LOCA/LOSP, the E-3 bus would be dead, resulting in no power to Unit 2 V106 and Nuclear Service Water Pump 2A and Conventional Service Water Pump 2A. This results in a failed open V106 and only NSW pump 2B running on the Unit 2 NSW header. The licensee has documented how they were operating the SW pumps in Enclosure 2 to the report. Per Enclosure 2, the licensee would permit operation of the SW system, for example with NSW pumps 2A and 2B operable together with CSW pumps 1B, 1C, 2C and 2B. Thus

with a failed DG No. 3, Unit 2 V106 and NSW pump 2A, NSW pump 2B would be required to supply SW to all four diesels (3,000 GPM) the vital header loads (470 GPM), SW pump bearing lubrication (150 GPM) and the RB CCW HXs (7200 GPM). This total (10,820 GPM) exceeds the capacity of the single NSW pump 2A (8,000 GPM). All flow numbers are taken from Table 9.2.1-1 of the FSAR.

The licensee issued a standing instruction to operations to restrict RB CCW HX flow to 5,000 GPM during normal operation. This flow, together with the other flow requirements, would limit the flow on one NSW pump to 8,620 GPM, or 7.2% above the design flow of the pump. The licensee reported to the inspector that one NSW pump could handle the excess flow requirements.

The licensee has issued engineering work order (PID) to have BESU evaluate the impact of these questions. Further, the licensee is in the process of accepting design basis information from UE&C. Once that information is in hand, it should be easier to explain the design rational for the current design. The licensee will continue to limit flow to the RB CCW HXs to 5,000 GPM until the issue is resolved further.

The inspector interviewed the system engineer and discussed the issue with plant management to ascertain whether the licensee had adequately addressed the issue. Results of the document review will be covered in next month's Inspection Report Nos. 325,324/88-14. The inspector also verified that the RB CCW flow transmitter had been replaced on January 24, 1988, and it was successfully calibrated under WR/JO 87-ANPL1. This matter remains unresolved pending further inspector review and NRR review of the acceptability of the design and current CP&L SW pump operating modes: Service Water System Operating Mode Concerns (325/88-05-01 and 324/88-05-01).

No significant safety matters, violations, or deviations were identified.

9. Diesel Generator Air System Seismic Qualification (71707)

During a review of NUREG-1275, Volume 2, Operating Experience Feedback Report - Air Systems Problems, the inspector came across a statement regarding a problem identified in the report referring to Brunswick. On pages 36 and 37, the report stated that, "as of March 1987, the licensee... for Brunswick station could not confirm that the EDG pneumatic control systems would continue to operate following a design basis event." The licensee showed the inspector an internal memorandum where the licensee agreed to supply the information to the author of NUREG-1275. However, the licensee failed to supply the information to AEOD. When asked by the inspector, the licensee had still not obtained the information.

Since the question was re-asked, the licensee has completed a JCO on the starting air system (EER-88-0071). DG No. 4 three inch control air line has been qualified with the other 3 DGs systems deemed qualified by similarity until the verification can be completed by BESU.

Documentation was found on seismic testing for the air compressors but only with the air compressors not running. No seismic qualification data exists with the air compressors running. The licensee rational for continued operation included the following points:

- Failure of the air compressors would not prevent DG start. The seismic Class I air receivers would provide the starting air.

- The long term control air requirements are necessary to keep the run/stop cylinders pressurized. Loss of air to these cylinders would shut the fuel racks, stopping the diesel.

- Assuming a 5 psig pressure loss in the air receiver and only 1 of 2 air receivers operable, the licensee calculated that the DG could operate for 20.5 hours after a simultaneous DG start and Operating Basis Earthquake. Damage assessment teams are directed by emergency procedure to inspect plant equipment subsequent to an OBE (0.08g). Measures could then be taken to supply air to the DG Control Air system.

- Similar air compressors have been qualified with the compressor running.

The licensee has established an internal action item to permanently resolve the DG air compressor issue within one year.

The inspector will follow the licensee's complete resolution of this issue in an Inspector Followup Item: DG Air Compressor Seismic Testing Performed Without Compressor Running (325/88-05-02 and 324/88-05-02).

A significant safety matter regarding qualification of the DG air compressors was identified; no violations or deviations were identified.

10. Silicon Bronze Bus Bar Bolts (93702)

The licensee found a potential common mode failure of DC switchgear. Multiple failures of 5/16 inch silicon bronze bolts were found in the four site DC switchboards. The bolts are used to make the electrical connections for the switchgear bus bars. An incorrect torque specification (18 ft.-lbs.) had been supplied by GE early in construction of the plant (in 1974). The problem had been identified by UE&C at that time and GE revised the drawing, specifying 9 ft.-lbs. Re-inspection of the switchgear was done at that time. In mid 1986, the licensee discovered 1 or 2 silicon bronze bolts with cracked or detached heads in 480V and DC MCCs. Each bus bar connection is made with two silicon bronze bolts. The

licensee found only 1 or 2 bolts broken per MCC, and never found both bolts broken at the same connection. At that time, the licensee performed a record review of previous problems, and discovered the construction problem reported above. They also found that the Maintenance Instruction used to perform preventative maintenance on the MCCs did not include any torque valve for the 5/16 inch silicon bronze bolts. Licensee review of old construction records during the mid 1986 time did not reveal any correlation between construction documented torque valves with bolt failures found. Based on a lack of correlation and the small number of bolt failures per MCC, the licensee elected to use MI-10-2K1 and MI-10-2I1 performed over the next outages to inspect and replace the silicon bronze bolts. The DC switchboards, 1A, 1B, 2A, 2B, were inspected this month with over 50 damaged bolts found, including both bolts broken for the safety related battery connections for battery 1A-2 and 2B-2.

The licensee had replaced all silicon bronze bolts on safety related switchgear, on Unit 1, prior to startup. All Unit 2 MCCs except 2xDA and 2xDB have had the silicon bronze bolts inspected and replaced.

The two remaining switchgear's bolts will be replaced prior to startup of Unit 2. The inspector will continue followup on this item after the LER is issued. NRR Vendor Branch has been informed of the event. They have been in contact with GE concerning the bolting material and will continue to address generic aspects of the event.

The inspection was conducted through interviews with plant engineers, review of recent and construction documentation, and in plant examination of hardware.

A significant safety matter related to silicon bronze bolts was identified; no violations or deviations were identified.

11. Hydrogen Leak/Unusual Event (93702)

The licensee declared an Unusual Event at 4:49 p. m. on January 4, 1988, when hydrogen gas concentrations of 8% to 10% were reported in the electrical cable tunnel and breezeway. Unit 1 was defueled in a refueling outage while Unit 2 was in cold shutdown for maintenance. The licensee had unisolated the hydrogen gas banks about 3:00 p. m. the same day after completion of a modification for hydrogen gas water chemistry addition. At 4:00 p. m., during a hydrogen gas system walkdown in the electrical cable tunnel between the reactor building and turbine building, a technician discovered a packing leak on a newly installed hydrogen gas valve, 0-HWCH-V012. The hydrogen gas banks were isolated at about 4:20 p. m. The area was evacuated and all sources of ignition were secured. Normal ventilation was maintained to remove the hydrogen gas. HP measurements of the hydrogen gas concentration in the breezeway were reported to the control room as 5% hydrogen gas in the breezeway and 8% hydrogen gas in the electrical tunnel general area, with local hydrogen gas concentrations near the leak as 16% hydrogen gas. After the UE declaration, the Emergency Director (Shift Operating Supervisor) found that the reports of

hydrogen gas concentration in the breezeway and electrical tunnel were actually in percent of the lower explosive limit of hydrogen gas (4%) and not actual concentrations. The leaking valve was tightened at 5:45 p. m. The UE was terminated when no detectable hydrogen gas was found.

The inspector verified through observation during the event, subsequent interviews and record review, that the licensee implemented the applicable portions of their emergency plan. Initial licensee actions included evacuation of the area, isolation of the hydrogen tanks, stopping all hot work, and pre-positioning the fire brigade in the Unit 1 cable spreading room. Two mechanics equipped with spark-resistant tools tightened the valve packing nut, stopping the leak. The licensee used PEP-010, Fires Involving Flammable Gases, Rev. 0, to respond to the event.

The inspector will review the licensee's permanent corrective action and root cause when the OER is issued. This is an Inspector Followup Item: Hydrogen Leak in Turbine Building Pipe Tunnel (325/88-05-04 and 324/88-05-04).

No significant safety matters, violations, or deviations were identified.

12. Engineered Safety Features System Walkdown (71710)

The inspector performed an inspection of the accessible components of the Unit 1 and 2 Containment Atmospheric Dilution System to verify system operability. The inspection included verification of: integrity of the CAD vessel and system piping up to the drywell penetrations, proper valve alignment, condition of seismic supports and hangers, power availability to major components and instrumentation, and proper component labeling. Nitrogen lines through the HPCI rooms of both units were not observed because of accessibility. The inspector reviewed the monthly surveillance of Periodic Test Procedure PT-16.1, Rev. 12, System Checklists, in OP-24, Rev. 22, Containment Atmosphere Control System Operating Procedure, and numerous plant drawings.

The inspector found several problems that were identified late in the reporting period. These items will be addressed in Inspection Report Nos. 325,324/88-14. This item remains Unresolved: CAD System Discrepancies (325/88-05-05 and 324/88-05-05).

No significant safety matters, violations or deviations were identified.

13. Inerting Pipe Failure (93702)

The licensee found sand in both units' torus inerting lines. Unit 1 was in cold shutdown and Unit 2 was defueled. On January 4, 1988, the underground inerting line (non-safety) between the liquid nitrogen tank and the reactor buildings cracked, removing four feet of earth that covered the pipe. The licensee performed a temporary repair on the 8 inch pipe the same day using a pipe clamp. On January 10, both Unit 2 reactor building-to-torus vacuum breakers failed their local leak rate tests. On February 7, maintenance personnel found sand in the bottom of the vacuum

breaker pipe in Unit 2. The sand had apparently gotten into the inerting line and been carried by the nitrogen gas into the torus and on one side of the butterfly valve vacuum breakers. The licensee removed the sand and performed additional inspections to determine the scope of the problem. The licensee had adjusted the stops on the vacuum breakers, re-performed the Unit 2 LLRTs, with one penetration passing and the other failing. Unit 1 LLRTs were performed successfully on February 11, 1988, without removing any sand. The licensee replaced the carbon steel underground inerting line with Plexco, a polyethelyene pipe that is resistant to corrosion and brittle fracture. The licensee is writing an OER on the event. The inspector will review the OER after its issuance to verify the adequacy of the licensee's corrective actions. A regional inspector reviewed the licensee's documentation of repair activities; that review will be included in Inspection Report Nos. 325,324/88-14.

This is an Inspector Followup Item: Sand Introduced Into Torus/Vacuum Breakers from Failed Inerting Line (325/88-05-03 and 324/88-05-03).

No violations or deviations were identified. A safety concern regarding a non-safety system failure affecting safety related components was identified and resolved short-term since all valves were tested satisfactorily prior to startup.

14. Plant Modifications - Unit 2 (37700)

Reviewed plant modification PM-86-025 which concern eliminates block loading of emergency loads on the emergency buses if a LOCA signal is received and offsite power is available. As of March 4, 1988, all modification work has been completed. Acceptance testing has been completed for core spray loops A & B and RHR loop A, and interim operability established. Acceptance test for RHR loop B is scheduled to be completed week of March 7, 1988. See paragraph 8.a for a related issue.

The inspector reviewed and observed the acceptance test for PM-84-017, (Rev. 7), Local Control and Circuit Enhancement for 480V Switchgear. The test was conducted in accordance with procedure, QC sign-offs were completed as necessary, and the acceptance criteria was met. The responsible engineer supervised the test with operations personnel operating the equipment.

No significant safety matters, violations, or deviations were identified.

15. List of Abbreviations for Unit 1 and 2

AEOD	Office of Analysis and Evaluation of Operational Data
AI	Administrative Instruction
BESU	Brunswick Engineering Sub Unit
BOP	Balance of Plant
BSEP	Brunswick Steam Electric Plant
CAD	Containment Atmospheric Dilution
CP&L	Carolina Power & Light Company
CSW	Conventional Service Water
DC	Direct Current
DG	Diesel Generator
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EER	Engineering Evaluation Report
ESF	Engineered Safety Feature
F/D	Filter Demineralizer
FSAR	Final Safety Analysis Report
g	Acceleration of Gravity
GE	General Electric
GPM	Gallons Per Minute
HP	Health Physics
HVAC	Heating, Ventilating, Air Conditioning System
HX	Heat Exchanger
I&C	Instrumentation and Control
IE	NRC Office of Inspection and Enforcement
IFI	Inspector Followup Item
JCO	Justification for Continued Operation
LER	Licensee Event Report
LLRT	Local Leak Rate Test
LOCA	Loss of Coolant Accident
LOSP	Loss of Off-Site Power
MCC	Motor Control Center
MI	Maintenance Instruction
MSIV	Main Steam Isolation Valve
NPRDS	Nuclear Plant Reliability Data System
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
NSW	Nuclear Service Water
NUREG	Nuclear Regulation
OBE	Operating Basis Earthquake
OER	Operating Experience Report
OP	Operating Procedure
PA	Protected Area
PEP	Plant Emergency Procedure
PID	Project Identification
PM	Plant Modification
PNSC	Plant Nuclear Safety Committee
PO	Pre-Operational
PT	Procedure Test

QA	Quality Assurance
QC	Quality Control
RBCCW	Reactor Building Closed Cooling Water
RHR	Residual Heat Removal
RWCU	Reactor Water Cleanup
S&L	Sargent & Lundy
SW	Service Water
TS	Technical Specification
UE	Unusual Event
UE&C	United Engineers & Constructors
URI	Unresolved Item
V	Volt
WR/JO	Work Request/Job Order