



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

Report Numbers: 50-321/88-42 and 50-366/88-42

Licensee: Georgia Power Company
P.O. Box 1295
Birmingham, AL 35201

Docket Numbers: 50-321 and 50-366

License Numbers: DPR-57 and NPF-5

Facility Name: Hatch 1 and 2

Inspection Dates: December 24, 1988 - January 20, 1989

Inspection at Hatch site near Baxley, Georgia

Inspectors:	<u><i>John E. Menning</i></u>	<u>2-14-89</u>
	John E. Menning, Senior Resident Inspector	Date Signed
	<u><i>Randall A. Musser</i></u>	<u>2-14-89</u>
	Randall A. Musser, Resident Inspector	Date Signed
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	Marvin V. Sinkule, Chief, Project Section 3B Division of Reactor Projects	Date Signed

SUMMARY

Scope: This routine inspection was conducted at the site in the areas of Operational Safety Verification, Maintenance Observations, Surveillance Testing Observations, ESF System Walkdown, Reportable Occurrences, Operating Reactor Events, Followup on NRC Bulletin 88-03, Followup on NRC Bulletin 85-03, 10 CFR Part 21 Report Followup, and Cold Weather Preparations.

Results: Three licensee-identified violations, which are not being cited, were identified (paragraph 6). One licensee-identified violation was for an inadequate equipment clearance which contributed to the inadvertent wetting of SGTS charcoal filters and the second licensee-identified violation was for inadequate work instructions which contributed to the inadvertent wetting of SGTS charcoal filters, and the third licensee-identified violation was for inadequate control of a replacement HPCI EGR and resulted in inoperability of the HPCI system.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *C. Coggin, Training and Emergency Preparedness Manager
- D. Davis, Manager General Support
- J. Fitzsimmons, Nuclear Security Manager
- *P. Fornel, Maintenance Manager
- *O. Fraser, Site Quality Assurance Manager
- *M. Googe, Outages and Planning Manager
- J. Lewis, Acting Operations Manager
- W. Kirkley, Acting Health Physics and Chemistry Manager
- *C. Moore, Plant Support Manager
- *H. Nix, General Manager
- T. Powers, Engineering Manager
- H. Sumner, Plant Manager
- *S. Tipps, Nuclear Safety and Compliance Manager

Other licensee employees contacted included technicians, operators, mechanics, security force members, and office personnel.

NRC Resident Inspectors

- *J. Menning
- *R. Musser

*Attended exit interview

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2. Operational Safety Verification (71707) Units 1 and 2

The inspectors kept themselves informed on a daily basis of the overall plant status and any significant safety matters related to plant operations. Daily discussions were held with plant management and various members of the plant operating staff. The inspectors made frequent visits to the control room. Observations included instrument readings, setpoints and recordings, status of operating systems, tags and clearances on equipment, controls and switches, annunciator alarms, adherence to limiting conditions for operation, temporary alterations in effect, daily journals and data sheet entries, control room manning, and access controls. This inspection activity included numerous informal discussions with operators and their supervisors. Weekly, when on site, selected ESF systems were confirmed operable. The confirmation was made by verifying the following: accessible valve flow path alignment, power supply breaker and fuse status, instrumentation, major component leakage, lubrication, cooling, and general condition.

General plant tours were conducted on at least a weekly basis. Portions of the control building, turbine building, reactor building, and outside areas were visited. Observations included general plant/equipment conditions, safety-related tagout verifications, shift turnover, sampling program, housekeeping and general plant conditions, fire protection equipment, control of activities in progress, radiation protection controls, physical security, problem identification systems, missile hazards, instrumentation and alarms in the control room, and containment isolation.

In the area of housekeeping, one discrepancy was observed by the inspector on January 19, 1988, and was brought to the attention of licensee personnel. More specifically, a piece of rope and some plastic material were noted to be half inside and half outside a controlled contamination area located near the Decon Room on elevation 185 in the Unit 1 reactor building.

During this reporting period, the inspector reviewed the licensee's controls on overtime of personnel who perform safety-related functions. Section 6.2.2.g of the technical specifications establishes requirements for the control of such overtime, and Section 8.4 of licensee procedure 30AC-OPS-003-OS, "Plant Operations," provides implementing instructions to support the technical specification requirements. The inspector reviewed an Operations Department Overtime Report for the month of November and determined that technical specification and procedural requirements had been met.

At 0610 on December 25, 1988, Unit 2 was manually scrammed during scheduled testing of the main turbine stop valves. The unit's two recirculation pumps unexpectedly tripped when the No. 2 stop valve was closed. Operations personnel then manually scrammed the unit as required by both the technical specifications and the licensee's procedures. The unexpected trips of the recirculation pumps were attributed to the failure of a limit switch on the No. 4 turbine stop valve. Events surrounding this scram are discussed in detail in paragraph 7. Unit 2 achieved criticality again at 0325 on December 26, 1988, and the unit's main generator was synchronized with the grid at 1225 on the same day. The unit achieved rated power at 1412 on December 28, 1988.

No violations or deviations were identified.

3. Maintenance Observations (62703) Units 1 and 2

During the report period, the inspectors observed selected maintenance activities. The observations included a review of the work documents for adequacy, adherence to procedure, proper tagouts, adherence to technical specifications, radiological controls, observation of all or part of the actual work and/or retesting in progress, specified retest requirements, and adherence to the appropriate quality controls. The primary maintenance observations during this month are summarized below:

<u>Maintenance Activity</u>	<u>Date</u>
a. RCIC Semi-Annual and Annual Preventive Maintenance per procedure 52PM-E51-004-2 and MWOs 2-88-3502 and 2-88-3510 (Unit 2)	01/10/89
b. Trouble Shooting of Fission Product Monitor Gas Detector 2D11-K630C per MWO 2-89-0110 (Unit 2)	01/18/89
c. Six Month Preventive Maintenance of the Service Air Compressor 1P51-C001B per MWO 1-88-5728 and procedure 52PM-P51-001-1 (Unit 1)	01/18/89
d. Repair of Drywell Mid-Range Pressure Transmitter 1T48-N023A per MWO 1-89-124 (Unit 1)	01/19/89

No violations or deviations were identified.

4. Surveillance Testing Observations (61725) Units 1 and 2

The inspectors observed the performance of selected surveillances. The observation included a review of the procedure for technical adequacy, conformance to technical specifications, verification of test instrument calibration, observation of all or part of the actual surveillances, removal from service and return to service of the system or components affected, and review of the data for acceptability based upon the acceptance criteria. The primary surveillance testing observations during this month are summarized below:

<u>Surveillance Testing Activity</u>	<u>Date</u>
a. Test of Electric Fire Pump 1X43-C001 per procedure 42SV-FPX-004-0S (Units 1 and 2)	01/09/89
b. Core Spray Pump 1B Operability per procedure 34SV-E21-001-1S (Unit 1)	01/12/89
c. HPCI Pump Operability per procedure 34SV-E41-002-1S (Unit 1)	01/17/89

- d. APRM Functional Testing per
procedure 34SV-C51-002-2S
Unit 2)

01/19/89

No violations or deviations were identified.

5. ESF System Walkdown (71710) Unit 2

The inspectors routinely conducted partial walkdowns of ESF systems. Valve and breaker/switch lineups and equipment conditions were randomly verified both locally and in the control room to ensure that lineups were in accordance with operability requirements and that equipment material conditions were satisfactory.

The Unit 2 emergency D/Gs were walked down in detail on January 12-13, 1989. Several apparent labeling discrepancies involving D/G air start valves were observed at that time. More specifically, the inlet and discharge valves on the air receivers of the "2A" and "2C" D/Gs appeared to be incorrectly labeled. These discrepancies were brought to the attention of the Unit 2 Shift Supervisor on January 13, 1989. Further investigation showed that the involved valves were correctly labeled. However, temporary identification markings on the air receivers were found to be incorrect. The Unit 2 Shift Supervisor informed the inspector on January 18, 1989, that steps were being taken to have the incorrect markings removed from the air receivers.

No violations or deviations were identified.

6. Reportable Occurrences (90712 and 92700) Units 1 and 2

A number of LERs were reviewed for potential generic impact, to detect trends, and to determine whether corrective actions appeared appropriate. Events which were reported immediately were also reviewed as they occurred to determine that technical specifications were being met and the public health and safety were of utmost consideration.

Unit 1: 87-17 Personnel Errors in Clearance and Work Steps Result in Wet Carbon Filter in an ESF

The events of this LER concern the inadvertent wetting of the bottom tray of charcoal filters in the "A" SGTS filter train. Maintenance was in progress to remove and relocate some fire protection valves associated with the Unit 1 SGTS filter trains. Fire protection header isolation valve 1T43-F001H leaked and failed to isolate the fire protection header from the "A" and "B" SGTS filter trains. The inadvertent wetting was attributed to a combination of an inadequately developed equipment clearance and inadequate work step sequencing.

The equipment clearance for this work (1-87-1826) relied upon valve 1T43-F001H to provide isolation between the fire water system and the work area. It did not provide for the opening of a drain valve downstream of 1T43-F001H. Precaution 6.1.3 in licensee procedure 30AC-OPS-001-0S, "Control of Equipment Clearances and Tags," requires that whenever possible, an atmospheric drain and/or vent between equipment to be worked and the source of pressure be DANGER tagged in the open position. With the drain valve closed, leakage past valve 1T43-F001H ultimately entered the SGTS filter train. Technical Specification 6.8.1.a requires that written procedures be implemented as recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Section 1 of Appendix A of Regulatory Guide 1.33 recommends procedures for equipment control (e.g., locking and tagging). The failure to provide for an atmospheric drain downstream of valve 1T43-F001H is a violation of Technical Specification 6.8.1.a.

In reviewing the failure to provide an atmospheric drain, the inspector noted that the matter was licensee-identified and had been properly reported to the NRC. Corrective action involved replacing the wet charcoal filters, returning the "A" SGTS filter train to operable status, and counselling operations personnel relative to the event. The inspector also observed that the event would not have been prevented by corrective actions for previous violations. This violation meets the criteria specified in Section V of the NRC Enforcement Policy for not issuing a Notice of Violation and, therefore, is not being cited. This matter, identified as LIV 50-321/88-42-01, is considered to be closed.

In addition to the inadequately developed equipment clearance, the work sequencing did not provide for any component to stop the flow of water in the event that the single isolation valve leaked. Technical Specification 6.8.1.a requires that written procedures be established and implemented as recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Section 9 of Appendix A of Regulatory Guide 1.33 states that maintenance that can affect the performance of safety-related equipment should be performed in accordance with documented instructions appropriate to the circumstances. This instance of inadequate work instructions is considered to be a violation of Technical Specification 6.8.1.a.

In reviewing the matter of inadequate work instructions, the inspector noted that the event was licensee-identified and properly reported to the NRC. Corrective action involved reviewing other MWO packages, counselling engineering personnel, and reviewing the design of SGTS system piping in Unit 2. This instance of inadequate work instructions would not have been prevented by corrective actions for previous violations. This violation meets the criteria specified in Section V of the NRC Enforcement Policy for not issuing a Notice of Violation and, therefore, is not being cited. This matter, identified as LIV 50-321/88-42-02, is considered to be closed.

Review of this LER is closed.

Unit 2: 87-04

Procedure Defect and Personnel Errors Cause System Inoperability and ESF Actuations

This LER concerns a failure of the HPCI system to perform properly during scheduled surveillance testing and two subsequent inadvertent isolations of HPCI steam supply valve 2E41-F002. The steam supply valve closed on two occasions as operations personnel were attempting to demonstrate system operability following maintenance to correct the surveillance problem. Erratic system operation during the surveillance testing was determined to be caused by a faulty EGR. The malfunctioning EGR was inadvertently replaced with a reverse acting EGR. To function correctly, a direct acting EGR was required or the wiring between the EGR and EGM needed to be rolled. (The direct acting and reverse acting EGRs are identical except that two internal wires are reversed.) With the reverse acting EGR installed, the HPCI governor valve opened instead of closed as turbine speed increased above the HPCI controller setpoint during the post-maintenance operability testing. This condition resulted in high steam line flow and the closure of steam supply valve 2E41-F002.

The inadvertent installation of the reverse acting EGR was caused by errors on the part of vendor and site personnel. Vendor personnel failed to supply the specified direct acting parts and site personnel failed to detect the vendor error. Criterion VIII in Appendix B of 10 CFR Part 50 requires that measures for the identification and control of parts and components be designed to prevent the use of incorrect parts and components. This matter is considered to be

a violation of Criterion VIII. The inspector observed that the matter was licensee-identified and properly reported to the NRC. Corrective action involved placing a hold on all Unit 1 and Unit 2 HPCI turbine EGRs, conducting a 10 CFR Part 21 evaluation of the event, and counselling involved QC personnel. This violation meets the criteria specified in Section V of the NRC Enforcement Policy for not issuing a Notice of Violation and, therefore, is not being cited. This matter, identified as LIV 50-366/88-42-03, is considered to be closed.

Additionally, review of the LER is closed.

87-07 Personnel Fail to Verify Isolation Logic During Trouble Shooting and Cause ESF Actuation

This LER concerns an unanticipated PCIS Group I isolation that occurred while maintenance personnel were trouble shooting the alternate EHC power supply. Unit 2 was in the startup mode at the time of this event, and all Group I isolation valves with the exception of two closed. Maintenance personnel failed to determine and document that an ESF actuation would occur during the trouble shooting. Since the isolation was unanticipated, it was reportable pursuant to 10 CFR Parts 50.72 and 50.73. Investigation revealed that Group I isolation valves 2B21-F019 and 2B21-F020 failed to close because an instrument root valve (RV-1) was closed. This root valve is on an instrument line between the main condenser and vacuum switches 2B21-N056C and D. Root valve RV-1 was not open because the valve disc became separated from the valve stem. The disc separation was attributed to normal wear.

Corrective action involved reemphasizing the necessity of identifying and documenting an anticipated ESF actuation with personnel in the operations, engineering, and maintenance departments. The inspector reviewed records of this departmental training. Additionally, similar root valves in Unit 2 and Unit 1 were inspected. The Unit 2 valves were inspected per MWO 2-88-0068. The Unit 1 valves were inspected per MWO 1-88-0073 and MWOs 1-88-1471 through 1475. The inspector reviewed the MWOs for the Unit 1 valve inspections and noted that no discrepancies were identified.

Review of this LER is closed.

88-03 Spurious Valve Closure is Reported as an Engineered Safety Feature Actuation

This LER concerns the unanticipated closing of RWCU system isolation valve 2G31-F004. At the time of this event, non-licensed operations personnel were returning the RWCU "B" filter/demineralizer to service. No alarms were received to indicate the reason for the isolation. Investigation by the licensee failed to identify any ongoing plant evolutions, abnormal plant conditions, or equipment deficiencies that could have caused the isolation. The licensee ultimately characterized this event as a spurious isolation. The inspector reviewed the licensee's investigative efforts as delineated in the LER and concluded that they were proper.

Review of this LER is closed.

Three licensee-identified violations, which are not being cited, were identified.

7. Operating Reactor Events (93702) Unit 2

The inspectors reviewed activities associated with the reactor event listed below. The review included determination of cause, safety significance, performance of personnel and systems, and corrective action. The inspectors examined instrument recordings, computer printouts, operations journal entries, and scram reports and also had discussions with operations, maintenance, and engineering support personnel, as appropriate.

At 0610 on December 25, 1988, Unit 2 was manually scrammed during the performance of main turbine stop valve testing per procedure 34SV-N30-001-C. Load had previously been reduced to approximately 90 percent of rated to accommodate this testing. During full closure testing of the No. 2 stop valve, both recirculation pumps tripped. The unit was then manually scrammed since both the technical specifications and the licensee's procedures prohibit power operations without forced circulation. Reactor vessel level was initially controlled with the "A" RFP and dropped to a minimum of minus 18 inches as indicated on the reactor vessel level instrumentation following the scram. Reactor pressure was initially controlled by the turbine bypass valves and maintained less than 930 psig. The MSIVs were closed to limit the reactor coolant system cooldown rate approximately 25 minutes after the scram. Reactor vessel level was subsequently controlled via manual operation of RCIC. Reactor pressure was then controlled by operation of SRVs in the LLS mode. With the exception of the unexpected recirculation pump trips, plant systems functioned properly during this event.

Investigation into the cause of the unexpected recirculation pump trips revealed a broken pin in the actuating arm of limit switch 2N32-N400B on

the No. 4 main turbine stop valve. The defective limit switch was unable to respond properly to movement of the No. 4 valve, and provided an input to the RPT logic which indicated that this valve was closed. Since the RPT logic is satisfied when both the No. 2 and No. 4 stop valves are closed, the RPT occurred when the No. 2 valve was closed during testing. The defective limit switch was subsequently repaired and satisfactorily functionally tested. Related Unit 1 and Unit 2 surveillance procedures were also temporarily revised to require verification that RPT logic relays are energized prior to and after the stroking of each main turbine control or stop valve. The temporary revisions will remain in place until permanent revisions are made effective.

Within the areas inspected, no violations or deviations were identified.

8. Followup on NRC Bulletin 88-03 (92701) Units 1 and 2

NRC Bulletin 88-03 requested licensees to inspect their plants to ensure that all GE latching-type HFA relays installed in Class 1E applications have adequate latch engagement. The licensee's response to the Bulletin dated July 5, 1988, stated that the subject latching-type HFA relays are not used in safety-related systems at Plant Hatch. In a letter to GPC dated December 2, 1988, the NRR Licensing Project Manager acknowledged the licensee's response and indicated that review of this matter was considered closed for Plant Hatch. Review of this matter by Region II is also closed.

9. Followup on NRC Bulletin 85-03 (92701) Units 1 and 2

As requested by Action Item "e" of Bulletin 85-03, "Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings," the licensee identified the selected safety-related valves, the valves' maximum differential pressures, and a program to assure valve operability in GPC's letters dated May 14, 1986, October 2, 1986, March 12, 1987, and April 8, 1987. Review of these responses indicated the need for additional information which was contained in the NRC Region II letter dated April 4, 1988.

Review of the licensee's May 4, 1988, response to this request for additional information indicates that the licensee's selection of the applicable safety-related valves to be addressed and the valves' maximum differential pressures meets the requirements of the bulletin and that the program to assure valve operability requested by Action Item "e" of the bulletin is now acceptable, with the exception of providing justification in cases where testing with maximum differential pressure cannot practicably be performed. Differential pressure testing of valves to demonstrate operability for Hatch was discussed in Inspection Report Nos. 50-321/88-08 and 50-366/88-08 and at a Fall 1988 meeting between NRC and Georgia Power Company personnel.

As requested by Action Item "e" of Supplement 1 to Bulletin 85-03, "Motor-Operated Valve Common Mode Failures During Plant Transients Due to

Improper Switch Settings," the licensee's letters dated May 27, 1988, and September 6, 1988, identified the additional valves to be addressed in its program in response to the original bulletin.

Review of this response indicates that the licensee's selection of the additional valves to be addressed in its program in response to the original bulletin meets the requirements of Action Item "e" of the supplement to the bulletin and is acceptable.

This matter remains open pending the results of the inspections to verify proper implementation of this program and the review of the final response required by Action Item "f" of the bulletin, which will be addressed in additional Inspection Reports.

10. 10 CFR Part 21 Report Followup (92701) Unit 1

During an inspection of MSIVs at Enrico Fermi Unit 2 in May 1986, four inner-external closure springs were found to be broken. The failures were attributed to quench cracking caused by the heat treatment during manufacturing. The subject springs were produced by Duer Spring and Manufacturing Company and supplied to nuclear power plants on MSIVs manufactured by Atwood & Morrill. This matter was the subject of NRC Information Notice 86-81. The Information Notice identified Hatch Unit 1 as a facility having Atwood & Morrill MSIVs with external closing springs produced by Duer Spring and Manufacturing Company. The inspector reviewed the licensee's followup on this matter and determined that steps have been taken to assure that the closure springs in Unit 1 are suitable for service.

The outer-external and inner-external closure springs on all Unit 1 MSIVs were visually inspected during the 1986 fall outage. These inspections, which were performed under MWO 1-86-9504, showed no evidence of cracking. The external closure springs on all Unit 1 MSIVs were again visually inspected during the 1988 fall outage. These inspections, which were performed under MWO 1-88-1476, revealed no evidence of cracking. External closure springs on all inboard MSIVs and one outboard MSIV were also replaced with new springs during the 1988 refueling outage. During this outage, the outboard MSIV (1B21-F028B) failed an LLRT, and the springs were replaced during subsequent maintenance.

This matter, tracked by Region II as item 321/P2186-02, is closed.

11. Cold Weather Preparations (71714) Units 1 and 2

During this inspection period, the inspector performed an examination of the licensee's program of protective measures for extreme cold weather. A verification that the licensee had inspected systems susceptible to freezing was done by the review of the completed data packages for procedure 52PM-MEL-005-OS, Rev. 1, "Cold Weather Checks." The procedure was completed by the licensee on September 21-24, 1988. The completed data sheets were reviewed and found to be acceptable. Additionally, the inspector performed a walkdown on a sample of the affected systems. These

systems included the Unit 1 and 2 Condensate Storage Tank Areas, the Units 1 and 2 Circulating Water Pump Areas, the Fire Tanks, the Units 1 and 2 Service Water Pits, and the Intake Structure. Within the areas checked, the inspector noted the following:

- a. Valve 2P11-F034, a drain valve on the Unit 2 condensate storage tank, was not heat traced or insulated.
- b. The Unit 1 circulating water pit sump pump discharge lines were not insulated or heat traced as they are in Unit 2.

These items were discussed with the applicable system engineer and the Operations Superintendent. The system engineer for the Condensate Storage and Transfer system indicated that valve 2P11-F034 is not required to be insulated and heat traced as it is greater than 6 inches in diameter. (Valve 2P11-F034 and its associated line are 8 inches in diameter, and the procedure governing insulation and heat tracing only requires valves 6 inches in diameter or smaller to be protected.) The inspector was informed that the Unit 2 circulating water pit sump pump discharge lines were inadvertently and unnecessarily heat traced and insulated as there is either flow in the lines or in the case when the sump pumps are not operating, the discharge lines will drain. Therefore, there is no need for these the Unit 1 lines to be protected.

Within the areas inspected, no violations or deviations were identified.

12. Exit Interview (30703)

The inspection scope and findings were summarized on January 23, 1989, with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and discussed in detail the inspection findings. Particular emphasis was placed on the three licensee-identified violations indicated in paragraph 6. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during this inspection. Dissenting comments were not received from the licensee.

<u>Item Number</u>	<u>Status</u>	<u>Description/Reference Paragraph</u>
50-321/88-42-01	Opened and Closed	LIV - Inadequate Equipment Clearance (paragraph 6)
50-321/88-42-02	Opened and Closed	LIV - Improper Work Instructions (paragraph 6)
50-366/88-42-03	Opened and Closed	LIV - Inadequate Control of HPCI Replacement EGR (paragraph 6)

Licensee management was also informed that the four LERs discussed in paragraph 6, the NRC Bulletins discussed in paragraphs 8 and 9, and the 10 CFR Part 21 followup report discussed in paragraph 10 were considered

to be closed. Other subjects discussed at the exit interview included the circumstances surrounding the manual reactor scram described in paragraph 7 and the licensee's cold weather preparations described in paragraph 11.

13. Acronyms and Abbreviations

APRM - Average Power Range Monitor
DCR - Design Change Request
D/G - Diesel Generator
EGM - Electric Governor Magnetic Pickup
EGR - Electric Governor Remote Servo
EHC - Electro-hydraulic Control
ESF - Engineered Safety Feature
GE - General Electric Company
HPCI - High Pressure Coolant Injection
LER - Licensee Event Report
LIV - Licensee-identified Violation
LLRT - Local Leak Rate Test
LLS - Low Low Set
MSIV - Main Steam Isolation Valve
MWO - Maintenance Work Order
NRR - Office of Nuclear Reactor Regulation
P&ID - Piping and Instrumentation Drawing
PCIS - Primary Containment Isolation System
QC - Quality Control
RCIC - Reactor Core Isolation Cooling
RFP - Reactor Feedwater Pump
RPS - Reactor Protection System
RPT - Recirculation Pump Trip
RWCU - Reactor Water Cleanup
SGTS - Standby Gas Treatment System
SRV - Safety Relief Valve