UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PA 19406-2713

August 11, 2014

Mr. Michael J. Pacilio
Senior Vice President, Exelon Generation Company, LLC
President and Chief Nuclear Officer, Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LIMERICK GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000352/2014003 AND 05000353/2014003 and NRC OFFICE OF INVESTIGATIONS REPORT 1-2013-018

Dear Mr. Pacilio:

On June 30, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Limerick Generating Station (LGS), Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on July 10, 2014 with Mr. D. Lewis, Plant Manager, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one violation of NRC requirements which was determined to be of very low safety significance (Green). However, because of the very low safety significance, and because the issue is entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV), consistent with Section 2.3.2.a of the NRC Enforcement Policy. If you contest the NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at LGS. In addition, if you disagree with the cross-cutting aspect assigned to the finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Resident Inspector at LGS.

This inspection also reviewed actions regarding a reactor protection system actuation signal (scram) on April 16, 2013, while the reactor was shut down. In response, the Region I Field Office, NRC Office of Investigations (OI), initiated an investigation on May 30, 2013, to determine whether employees at LGS, including licensed operators, deliberately failed to follow surveillance procedures and deliberately failed to retain quality assurance records, thereby causing LGS to violate a Technical Specification requirement. Based on testimonial and documentary evidence gathered during the investigation, the NRC concluded that while a violation of a Technical Specification requirement occurred, the NRC was unable to substantiate

that employees at LGS deliberately failed to follow procedures or deliberately failed to retain quality assurance records.

The safety significance of this violation was previously evaluated by the NRC and documented in NRC Inspection Report 05000353/2013003 as a Green finding (FIN 05000353/2013003-03). The enforcement aspects of the Green finding were held open pending the completion of the NRC OI investigation. The NRC is dispositioning this violation of NRC requirements as an NCV in accordance with the Enforcement Policy since it was of very low safety significance, LGS has entered these issues into the corrective action program, it was not repetitive or willful, and compliance was restored within a reasonable period of time. The finding and associated violation will be counted as one input into the plant assessment process.

Please note that final NRC documents, such as the Office of Investigations report described above, may be made available to the public under the Freedom of Information Act (FOIA) subject to redaction of information appropriate under FOIA. Requests under FOIA should be made in accordance with 10 *Code of Federal Regulations* (CFR) 9.23, Request for Records.

In accordance with Title 10 of the *Code of Federal Regulations* (CFR) 2.390 of the NRCs "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records component of the NRC's Agencywide Documents Access Management System (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Fred L. Bower, III, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos.: 50-352, 50-353
License Nos.: NPF-39, NPF-85

Enclosure: Inspection Report 05000352/2014003 and 05000353/2014003
w/Attachment: Supplementary Information

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that employees at LGS deliberately failed to follow procedures or deliberately failed to retain quality assurance records.

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.:	50-352, 50-353
License Nos.:	NPF-39, NPF-85
Report No.:	05000352/2014003 and 05000353/2014003
Licensee:	Exelon Generation Company, LLC
Facility:	Limerick Generating Station, Units 1 & 2
Location:	Sanatoga, PA 19464
Dates:	April 1, 2014 through June 30, 2014
Inspectors:	E. DiPaolo, Senior Resident Inspector R. Montgomery, Resident Inspector J. Ayala, Resident Inspector (Acting) R. Nimitz, Senior Health Physicist J. Bream, Physical Security Inspector A. Turilin, Project Engineer
Approved By:	Fred Bower, Chief Reactor Projects Branch 4 Division of Reactor Projects

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SUMMARY

IR 05000352/2014003, 05000353/2014003; 4/1/2014-6/30/2014; Limerick Generating Station (LGS); Units 1 and 2; Operability Determinations and Functionality Assessments.

The report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. The inspectors identified one finding of very low safety significance (Green) which was a non-cited violation (NCV). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Components Within The Cross-Cutting Areas," dated January 1, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated January 28, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

Cornerstone: Barrier Integrity

- **Green:** The inspectors identified a Green NCV of 10 *Code of Federal Regulations* (CFR) Part 50, Appendix B, Criterion XVI, "Corrective Action," for the failure to adequately evaluate and correct repeat calibration test failures in April 2012 and in February 2014 on the Unit 2 high pressure coolant injection (HPCI) system suppression pool level transmitter LT-055-2N062F. This resulted in LT-055-2N062F, a technical specification (TS) required instrument, being in a degraded and unreliable condition. The inspectors determined that failure to adequately evaluate and correct the condition was reasonably within the ability to foresee and correct, and should have been prevented. LGS personnel promptly replaced the instrumentation and returned the HPCI system to an operable status prior to the Unit 2 startup. LGS also entered the issue into their corrective action program (CAP) for resolution as Issue Reports (IRs) 1646041, 1651480, and 1659171.

  This NRC-identified finding is more than minor because it affected the Barrier Integrity cornerstone attribute of the reliability and availability of structures, systems, or components to maintain the functionality of containment and affected the cornerstone objective to provide reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events. The inspectors evaluated the finding using Appendix A, "The Significance Determination Process for Findings At-Power," to IMC 0609, "Significance Determination Process." This finding was determined to be of very low safety significance (Green) because it was associated with the functionality of the reactor containment but didn't represent an actual open pathway in the physical integrity of containment, the containment isolation system, and heat removal components and, the finding did not involve an actual reduction in function of hydrogen igniters. In addition, the logic for the HPCI pump suction transfer from the condensate storage tank to the suppression pool on high level in the suppression pool is a one-out-of-two logic. The inspectors determined that this function was available because the other channel which performs the function was not affected by the finding and was available during the time period in question with the exception of during brief testing periods.

  The finding has a cross-cutting aspect in Problem Identification and Resolution, Evaluation, because LGS personnel did not thoroughly evaluate the issue to ensure that resolutions addressed the causes and extent of conditions commensurate with their safety significance [P.2]. (Section 1R15)

Other Findings

- None.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period in Operational Condition (OPCON) 5 (Refueling) with the reactor cavity flooded in refueling outage 1R15. Following the completion of outage activities, operators commenced a reactor startup on April 6 and on April 9, operators synchronized the main generator to the electrical grid to end refueling outage 1R15. Full power was achieved on April 12. On April 18, operators reduced power to approximately 63 percent to facilitate planned secondary plant maintenance and to perform a control rod pattern adjustment. Power was returned to 100 percent on April 19. On April 25, operators reduced power to approximately 35 percent to facilitate planned maintenance to repair a steam leak from a drain line on the moisture separator-to-low pressure turbine piping. Power was returned to 100 percent on April 26. Operators reduced power to approximately 68 percent on May 31 to facilitate planned main steam isolation and main turbine valve testing, to perform a control rod pattern adjustment, and to facilitate control rod scram time testing. Power was returned to 100 percent later that day and the unit remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent power. On April 23, operators commenced a planned plant shutdown to commence maintenance outage 2M49 to facilitate inspections of the main low pressure turbine blades. OPCON 4 (Cold Shutdown) was entered on April 24. Following the completion of turbine blade inspections and other maintenance activities, operators commenced a reactor startup on April 29 and 100 percent power was achieved on May 1. Operators reduced power to approximately 63 percent on May 23 to facilitate planned main steam isolation and main turbine valve testing, to perform a control rod pattern adjustment, and to facilitate a main condenser tube leak repair. Operators returned power to 100 percent on May 25 and the unit remained at or near 100 percent for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

.1 Readiness for Seasonal Extreme Weather Conditions (71111.01 – 1 sample)

a. Inspection Scope

The inspectors performed a review of LGS' readiness for the onset of seasonal high temperatures. The review focused on the residual heat removal service water pumps, the emergency service water pumps and the emergency diesel generators. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), TS, control room logs, and the corrective action program to determine what temperatures or other seasonal weather could challenge these systems, and to ensure LGS personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including LGS' seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during hot weather conditions. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

.2 Summer Readiness of Offsite and Alternate Alternating Current (AC) Power Systems (71111.01 – 1 sample)

a. Inspection Scope

The inspectors performed a review of plant features and procedures for the operation and continued availability of the offsite and alternate AC power system to evaluate readiness of the systems prior to seasonal high grid loading. The inspectors reviewed Exelon's procedures affecting these areas and the communications protocols between the transmission system operator and LGS. This review focused on changes to the established program and material condition of the offsite and alternate AC power equipment. The inspectors assessed whether LGS established and implemented appropriate procedures and protocols to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system. The inspectors evaluated the material condition of the associated equipment by interviewing the responsible system manager, reviewing condition reports and open work orders, and walking down portions of the offsite and AC power systems including the 500 kilovolt (kV) and 220 kV switchyards.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04 – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 1 HPCI system while the reactor core isolation cooling (RCIC) system was inoperable on April 8, 2014
- Unit 2 RCIC system while the HPCI system was inoperable for planned maintenance on June 18, 2014
- Unit 2 HPCI system following its restoration from planned maintenance on June 24, 2014

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable operating procedures, system diagrams, the UFSAR, TS, work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify

that there were no deficiencies. The inspectors also reviewed whether LGS staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

On May 28, 2014, the inspectors completed a full system walkdown of accessible portions of the Unit 2 emergency diesel generators to verify the existing equipment line-up was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hanger and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related condition reports and work orders to ensure LGS personnel appropriately evaluated and resolved any deficiencies.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Resident Inspector Quarterly Walkdowns (71111.05Q – 4 samples)

a. Inspection Scope

The inspectors conducted tours of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that LGS controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in the area pre-fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit 1, HPCI Pump Room 109, Fire Area 34 on April 3, 2014
- Unit 1, RCIC Pump Room 108, Fire Area 33 on April 3, 2014
- Service Water Pipe Tunnel Room 202, Fire Area 75 on April 17, 2014
- Remote Shutdown Room 540, Fire Area 26 on April 17, 2014

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (71111.05A – 1 sample)

a. Inspection Scope

The inspectors observed an unannounced fire drill scenario conducted on June 17, 2014, that involved the radioactive waste building, Fire Area 121. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that LGS personnel identified deficiencies, openly discussed them in a self-critical manner at the critique, and took appropriate corrective actions as required. The inspectors evaluated specific attributes as follows:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses
- Employment of appropriate fire-fighting techniques
- Sufficient fire-fighting equipment brought to the scene
- Effectiveness of command and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of pre-planned strategies
- Adherence to the pre-planned drill scenario
- Drill objectives met

The inspectors also evaluated the fire brigade's actions to determine whether these actions were in accordance with LGS' fire-fighting strategies.

b. Findings

No findings were identified.

1R06 Flood Protection Measures

.1 Internal Flooding Review (71111.06 – 1 sample)

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to assess susceptibilities involving internal flooding. The inspectors also reviewed the CAP to determine if LGS identified and corrected flooding problems and whether operator actions for coping with flooding were adequate. The inspectors focused the inspection on the Unit 1 'B' and 'D' residual heat removal pump room to verify the adequacy of equipment seals located below the flood line, floor and water penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, control circuits, and temporary or removable flood barriers.

b. Findings

No findings were identified.

.2 Annual Review of Cables Located in Underground Bunkers/Manholes (71111.06 – 1 sample)

a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could affect risk-significant equipment. On May 22, 2014, the inspectors performed walkdowns of risk-significant areas, including Manhole 108 West containing power cables to the Spray Pond Pumphouse, to verify that the cables were not submerged in water, that cables and/or splices appeared intact, and to observe the condition of cable support structures. When applicable, the inspectors reviewed sump pump operation and verified level alarm circuits were set in accordance with station procedures and calculations to ensure that the cables will not be submerged. The inspectors also ensured that drainage was provided and functioning properly in areas where dewatering devices were not installed.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (711111.07A – 1 sample)

a. Inspection Scope

The inspectors reviewed the emergency diesel generator (EDG) D24 jacket water, lubricating oil, and intercooler heat exchanges inspections during a 24-month diesel generator overhaul on June 11, 2014 to determine the EDG's readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified LGS' commitments to NRC Generic Letter 89-13. The inspectors observed the material condition of the heat exchangers and reviewed the results of previous inspections of the heat exchangers. The inspectors discussed the results of the most recent inspection with engineering staff and reviewed pictures of the as-found conditions. The inspectors verified that LGS initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program

.1 Quarterly Review of Licensed Operator Requalification Testing and Training (71111.11Q – 1 sample)

a. Inspection Scope

The inspectors observed a graded simulator scenario for operating crew 'D' on May 5, 2014. The scenario included a loss of emergency core cooling systems, a steam leak in secondary containment, a failure of a secondary containment system, and a pipe rupture in the drywell. The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of abnormal and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classifications made by the shift manager and the technical specification action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room (71111.11Q – 1 sample)

a. Inspection Scope

The inspectors observed and reviewed licensed operator performance during Unit 1 startup activities from refueling outage 1R15 on April 6 and during Unit 2 startup activities from maintenance outage 2M49 on April 29. The inspectors verified operator compliance and use of plant procedures, performance of procedure steps in proper sequence, alarm respond card implementation, and proper TS usage. Pre-job briefs, the use of human error prevention techniques, communications between crew members, and supervision of activities were also observed to verify that they were performed consistent with established plant practices.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 2 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structures, systems, and components (SSC) performance and reliability. The inspectors reviewed system health reports, corrective action program documents, maintenance work orders, and maintenance rule basis documents to ensure

that LGS was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR 50.65 and verified that the (a)(2) performance criteria established by LGS staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that LGS staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- Issue report (IR) 1620444, Unit 2 HPCI system suppression pool level transmitter calibration check failures
- 10 CFR 50.65 (a)(3) Maintenance Rule Periodic Assessment for the period March 1, 2012 through February 28, 2014

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that LGS performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that LGS personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When LGS performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Troubleshooting of reactor pressure oscillations during digital electro-hydraulic control system modification testing during Unit 1 power ascension on April 9, 2014
- Unexpected loss of continuity for the Unit 2 'B' standby liquid control squib valve (emergent) while Unit 2 was in Yellow online risk due to 'B' standby gas treatment system being removed from service on April 23, 2014
- Unit 2 control rod 22-35 was unable to be withdrawn (emergent) during reactor startup on April 29, 2014, resulting in the requirement to insert the control rod and bypass the rod worth minimizer
- Unit 1 Yellow online risk on May 6, 2014, due to the 'B' main control room chiller, the 'B' turbine enclosure cooling water pump, and the 'B' residual heat removal (RHR) pump being out-of-service due to planned maintenance on May 6, 2014

- Unit 2 Yellow online risk from May 27-28, 2014 during the 'B' RHR pump system outage window, emergent risk change to Orange on May 27, 2014 due to a severe thunderstorm warning for Montgomery County, and Yellow online risk during the 201 offsite source outage on May 28, 2014

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 5 samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

- IR 1645430, Unit 1 control rod 46-47 recoupling on April 10, 2014
- IR 1646041, Issue reports not generated for surveillance tests failing acceptance criteria on April 14, 2014
- Operability of the Unit 2 RCIC system when performing the RCIC operability verification surveillance testing only using the manual quick start method on April 29, 2014
- IR 1676600, Operability of EDGs during room exhaust fan preventive maintenance on May 13, 2014
- Functionality of Unit 1 digital electro-hydraulic control system after receiving indications of a failure of a pressure regulator on May 4, 2014

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and UFSAR to LGS' evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by LGS. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

Introduction: The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the failure to adequately evaluate and correct repeat calibration test failures in April 2012 and in February 2014 on the Unit 2 high pressure coolant injection (HPCI) system suppression pool level transmitter LT-055-2N062F. This resulted in LT-055-2N062F, a TS required instrument, being in a degraded and unreliable condition. LGS entered the issue into their CAP as IRs 1646041, 1651480, and 1659171.

Description: On April 11, 2014, LGS personnel initiated IR 1646041 to document problems with Maintenance Rule Program functional failure reviews. Per Maintenance Rule procedures, an instrument found to be out-of-calibration outside of the "required limit" is defined as a functional failure even if the instrument can be recalibrated back to within that limit. The "required limit" of a surveillance test is the maximum or minimum value allowed by TS. LGS personnel identified that the site's general practice was to not generate an IR if an out-of-calibration instrument was able to be recalibrated within "acceptable limits" during the performance of the surveillance testing. Since Maintenance Rule reviews are performed off of an assignment in IRs, no Maintenance Rule reviews were being performed. LGS planned to perform a review of surveillance tests for the past two years where the as-found data was recorded as outside the "required limit" to determine if there were any Maintenance Rule impacts. The due date for the assignment was September 8, 2014.

On April 23, 2014, the inspectors questioned the timeliness of the assignment and whether past repetitive failures of instruments would represent a potential operability concern. Based on the inspectors' questioning, LGS performed 10-year review of surveillances tests when as-found instrument calibrations were found outside the "required limit" and successfully recalibrated back to within the "acceptable limits." As a result of the review, LGS personnel found three potential plant equipment issues. As-found calibration data were outside the "required limit" in consecutively performed surveillance tests. Two of the instances were determined to not involve current operability concerns. This was because they were either entered into the CAP and appropriate corrective actions were being taken or the as-found data was not a condition adverse to quality because the instrument setpoint (i.e., reactor enclosure cooling water radiation monitor) was based on background radiation levels which could vary.

The third failure involved repeat as-found calibration failures associated with the Unit 2 HPCI suppression pool level transmitter (LT-055-2F062F). This instrument performs the function to transfer the HPCI pump suction from the condensate storage tank to the suppression pool on high suppression pool level to protect primary containment integrity. Surveillance testing was normally performed every 18 months on the instrument. LGS personnel performing the review found that the instrument failed the prior three surveillance tests (in July 2010, in April 2012, and in February 2014). LGS personnel determined that the instrument's condition represented a degraded condition and entered the issue into the CAP as IR 1651480 on April 24, 2014. The inspectors noted that the instrument drifted progressively worse during each successive test versus the required high level "required limit" of 24' 3" suppression pool level based on as found data. The as found trip setpoint was 24' 4.93" in July 2010, 24' 7.67" in April 2012, and 25' 2.00" in February 2014. At the time of discovery the HPCI system was not required to be operable because Unit 2 was in OPCON 4 (Cold Shutdown) and in a maintenance outage 2M49 to inspect the low pressure main turbines for blade cracking. LGS personnel promptly replaced the instrumentation and returned the HPCI system to an operable status prior to the Unit 2 startup.

The inspectors performed a review of LGS' actions following the repeat test failures of LT-055-2F062F. Following the second consecutive failure in April 2012, instrumentation and controls technicians wrote IR 1353930. Technicians were to recalibrate the instrument to acceptable as-left readings. The IR was written to document the as-found out-of-tolerance condition and to recommend further reviews due to the repetitive failure. An assignment was made for Engineering to review the preventive maintenance interval

for the instrument and process a change to the interval if warranted. Engineering noted that the performance of LT-055-2F062F was not typical of similar instruments and that the surveillance test was performed 21 months after the prior test, which is outside of the surveillance frequency of 18 months, but within the allowed grace period. Engineering recommended performing the next test at its fixed test interval of 18 months and, if out of tolerance results were observed, the affected instrument was recommended to be replaced. No mechanism was created to neither ensure the next surveillance was performed at the specified 18 month interval nor assure that the associated instrument would be replaced if unacceptable results were obtained during the next surveillance test.

The next calibration performance of LT-055-2F062F was in February 2014, 22 months following the second failure. Unsatisfactory as-found test results were again obtained outside the "required limit." Again, the technicians successfully recalibrated the instrument to within acceptable as-left readings. Technicians wrote IR 1620444 to document the test failure and recommended replacing the instrument prior to the next scheduled test. Operations review of the IR requested assistance in considering increased frequency surveillance testing due to the request to change out the instrumentation. However, no further actions were created based on the request and the instrument was declared operable. The only action planned from the IR was to schedule replacement of the instrument in January 2015.

Analysis: The inspectors determined that the failure to adequately evaluate calibration test failures of LT-055-2N062F and correct the condition following repeat failures in April 2012 and February 2014 was a performance deficiency that was reasonably within the ability to foresee and correct, and should have been prevented. This resulted in LT-055-2N062F, a TS-required instrument, being in a degraded and unreliable condition. This NRC-identified finding is more than minor because it affected the Barrier Integrity cornerstone attribute of the reliability and availability of structures, systems, or components to maintain the functionality of containment and affected the cornerstone objective to provide reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events. The inspectors evaluated the finding using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," to IMC 0609, "Significance Determination Process." This finding was determined to be of very low safety significance (Green) because it was associated with the functionality of the reactor containment, but didn't represent an actual open pathway in the physical integrity of containment, the containment isolation system, the heat removal components, and the finding did not involve an actual reduction in function of hydrogen igniters. In addition, the logic for the HPCI pump suction transfer from the condensate storage tank to the suppression pool on high level in the suppression pool operates on a one-out-of-two logic. The inspectors determined that this function was available because the other channel which performs the function was not affected by the finding and was available during the time period in question with the exception of during brief testing periods.

The finding has a cross-cutting aspect in Problem Identification and Resolution, Evaluation, because LGS personnel did not thoroughly evaluate the issue to ensure that resolutions addressed the causes and extent of conditions commensurate with their safety significance (P.2).

Enforcement: 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, etc., are promptly identified and corrected. Contrary to the above, repeat as-found test results outside of the test's "required limits" were obtained on Unit 2 Suppression Pool Level Transmitter LT-055-2F062F. A condition adverse to quality existed on April 14, 2012 and February 12, 2014, and LGS personnel failed to promptly correct the condition. As a result, LT-055-2F062F, a TS required instrument, was in a degraded and unreliable condition from April 14, 2012 until the instrument was replaced on April 27, 2014. LGS personnel promptly replaced the instrumentation and returned the HPCI system to an operable status prior to the Unit 2 startup. LGS staff also entered the issue into the CAP as IRs 1646041, 1651480, and 1659171. Because this issue was of very low safety significance (Green) and LGS staff entered this issue into the CAP, this violation is being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000353/2014003-01, Inadequate Corrective Actions Following Repeat Test Failures of a High Pressure Coolant Injection System Level Instrument)**

1R18 Plant Modifications (71111.18 – 2 samples)

Permanent Modifications

a. Inspection Scope

The inspectors evaluated the two permanent plant modifications listed below to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors reviewed the 10 CFR 50.59 documentation and post-modification testing results, as applicable. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification.

- Engineering Change Request 13-00089, Evaluate Tornado Missile Impacts on Diesel Exhaust Stacks
- Engineering Change Request 13-00527, Replace and Re-orient Unit 1 RCIC Inboard Vacuum Breaker Primary Containment Isolation Valve (HV-049-1F084) due to Valve Guide Wear

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 7 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure was consistent with the information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also

witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- C0252387, Replace Unit 1 RCIC system lubrication oil filters on April 9, 2014
- C0252589, Replace Unit 2 HPCI system suppression pool level transmitter (LT-055-2N062F) on April 25, 2014
- R1283281, Preventative maintenance for Unit 1 'B' RHR pump motor on May 7, 2014
- R1109654, Preventative maintenance for Unit 1 'B' standby gas treatment system on May 20, 2014
- IR 01666789, Repair oil leak on EDG D23 governor air booster on June 3, 2014
- IR 1669790, Leading edge flow meter input to core thermal power calorimetric data locked up on June 10, 2014
- C0253038, Leak repair Unit 1 HPCI system steam line drain return line on June 29, 2014

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities

.1 Unit 1 Refueling Outage 1R15 (71111.20 – 1 sample)

a. Inspection Scope

At the beginning of the inspection period, Unit 1 was in OPCON 5 (Refueling) with the reactor cavity flooded for refueling outage 1R15. On April 6, Unit 1 entered OPCON 2 (Startup). Operators synchronized the main generator to the electrical grid on April 9 to complete the refueling outage. During the inspection period, the inspectors conducted several containment walkdowns and monitored plant startup, heatup, and power ascension activities. The inspectors reviewed LGS staff's controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Monitoring of decay heat removal operations
- Impact of outage work on the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of secondary containment as required by technical specifications

- Tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block the emergency core cooling system suction strainers, and startup and ascension to full power operation
- Identification and resolution of problems related to refueling outage activities

.2 Unit 2 Maintenance Outage 2M49 (71111.20 – 1 sample)

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 2 maintenance outage (2M49), which was conducted from April 23 through April 29, 2014. The main purpose of the outage was to inspect and repair the main low pressure turbine blades. Drywell activities included safety/relief valve replacements. The inspectors reviewed LGS' development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable technical specifications when taking equipment out of service
- Status and configuration of electrical systems and switchyard activities to ensure that technical specifications were met
- Monitoring of decay heat removal operations
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Fatigue management
- Tracking of startup prerequisites, walkdown of the drywell (primary containment) to verify that debris had not been left which could block the emergency core cooling system suction strainers, and startup and ascension to full power operation
- Identification and resolution of problems related to refueling outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 4 Routine, 1 In-Service Test)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied technical specifications, the UFSAR, and LGS procedure requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- ST-6-049-320-1, RCIC Operability Verification for Unit 1 during startup on April 8, 2014
- ST-1-103-300-1, 24-Month Snubber Functional Test Program performed on Unit 1 during refueling outage 1R15 on April 5, 2014
- ST-6-051-231-2, 'A' RHR Pump, Valve and Flow Test performed on Unit 2 on April 22, 2014 (In-Service Test)
- ST-2-072-107-2, Division II Reactor Enclosure Balance of Plant Isolation, Logic System Functional Test, Safety System Actuation, Reactor Enclosure Recirculation and Standby Gas Treatment Test performed on Unit 2 on April 22, 2014
- ST-6-048-230-2, Standby Liquid Control Pump, Valve, and Flow Test performed on Unit 2 on May 20, 2014

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 – 2 samples)

Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of two routine LGS simulator-based emergency exercises on June 9, and June 16, 2013, to identify any weaknesses and deficiencies in the classification, notification, and protective action recommendation development activities. The inspectors observed emergency response operations in the simulator, technical support center, and operations support center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the station drill critique to compare inspector observations with those identified by LGS staff in order to evaluate LGS' critique and to verify whether the LGS staff was properly identifying weaknesses and entering them into the corrective action program.

b. Findings

No findings were identified.

Cornerstone: Public Radiation Safety

2. RADIATION SAFETY

2RS5 Radiation Monitoring Instrumentation (71124.05)

a. Inspection Scope

During the period June 2-6, 2014, the inspectors reviewed LGS's performance in assuring the accuracy and operability of radiation monitoring instruments used for effluent monitoring and analyses. The inspectors used the requirements in 10 CFR

Part 20; 10 CFR 50, Appendix I; TSs; Offsite Dose Calculation Manual (ODCM); applicable industry standards; and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors conducted in-office preparation and review: LGS submitted 2012 and 2013 effluent and environmental annual reports; UFSAR; and ODCM.

Walkdowns and Observations

The inspectors reviewed the following:

- Walkdowns of the effluent radiation monitoring systems (Unit 1 and Unit 2 North and South Stacks, Service Water Monitor, Unit 2 Off-gas sampler)
- Assessed whether the effluent/process monitor configurations align with those described in the ODCM and the UFSAR
- Observed collection of weekly Unit 1 and 2 stack particulate and iodine effluent samples and a Unit 2 Off gas sample

Process and Effluent Monitors

The inspectors reviewed the following:

- Selected effluent monitoring instruments (North Stack, South Stack) and evaluated whether channel calibration and functional tests were performed consistent with station TSs/ODCM

Laboratory Instrumentation

The inspectors reviewed the following:

- Selected laboratory analytical instruments (gamma spectroscopy, alpha/beta counter, liquid scintillation) and reviewed performance and calibration checks
- Appropriate corrective actions were implemented in response to indications of degraded performance

Post-Accident Monitoring Instrumentation

The inspectors reviewed LGS's capabilities to collect post-accident effluent samples.

b. Findings

No findings were identified.

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

a. Inspection Scope

During the period June 2-6, 2014, the inspectors reviewed LGS's performance in treatment, monitoring and control of effluent releases including adequacy of public dose calculations and projections. The inspectors used the requirements in 10 CFR Part 20; 10 CFR 50, Appendix I; TSs; ODCM; applicable industry standards; and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors conducted in-office preparation and review of LGS submitted effluent and environmental program documents and reviewed associated Updated Final Safety Analysis Report including ODCM.

Event Report and Effluent Report Reviews

The inspectors reviewed the following:

- Annual radiological effluent and environmental reports for 2012 and 2013, including unexpected trends or abnormal releases
- Reported effluent monitor operability issues

ODCM and Final Safety Analysis Report Reviews

The inspectors reviewed the following:

- UFSAR changes associated with effluent monitoring and control
- Changes to ODCM including technical justifications
- Identification of any contaminated non-radioactive system and associated 10 CFR 50.59 evaluations

Ground Water Protection Initiative (GPI)

The inspectors reviewed the following:

- Reported groundwater monitoring results and changes to the written program for identifying and controlling contaminated spills/leaks to groundwater
- Changes to the program since last inspection to identify changes

Procedures, Special Reports, and Other Documents

The inspectors reviewed the following:

- Licensee Event Reports and special reports related to the effluent program
- Effluent program implementing procedures, including those associated with effluent sampling, effluent monitor set-point determinations, and dose calculations
- Evaluation reports of the effluent monitoring program since the last inspection

Walkdowns and Observations

The inspectors reviewed the following:

- Walked down selected components of the gaseous monitoring systems
- Potential unmonitored release points, building alterations, which could impact airborne, liquid, effluent controls, and ventilation system leakage
- Material condition surveillance records
- Changes to effluent release paths
- Routine processing and discharge of liquid waste
- 10 CFR 50.59 reviews for changes to effluent release points

Sampling and Analyses

The inspectors reviewed the following:

- Effluent sampling activities to ensure representative samples were obtained
- Effluent discharges made with inoperable effluent radiation
- Use of compensatory effluent sampling
- Results of the inter-laboratory and intra-laboratory comparison program to verify the quality of the radioactive effluent sample analyses
- Intra and inter-laboratory comparison program including for hard-to-detect isotopes

Dose Calculations

The inspectors reviewed the following:

- Significant changes in reported dose values compared to the previous radioactive effluent release reports
- Liquid and gaseous waste discharge permits
- Methods used to determine the isotopes included in the source term to ensure hard-to-detect radionuclides were included in the effluent releases
- Changes in the methodology for offsite dose calculations since the last inspection
- Meteorological dispersion and deposition factors
- Latest Land Use Census to verify that changes in the local land use had been factored into public dose projections and environmental sampling/analysis program, as applicable
- Dose calculations (monthly, quarterly, annual)
- Records of any abnormal gaseous or liquid
- Discharges made with inoperable effluent radiation monitors, or unmonitored leakage were reviewed to ensure that an evaluation was made of the discharge to account for the effluent release and were included in the calculated doses to the public

GPI Implementation

The inspectors reviewed the following:

- Monitoring results of the GPI including reporting
- Changes made to the GPI program

- Anomalous results or missed samples
- Leakage or spill events and entries made into the decommissioning files (10 CFR 50.75(g))
- Onsite contamination events involving contamination of groundwater
- Discharges from onsite surface water bodies, as applicable, that contain or potentially contain radioactivity
- Updates to the ODCM to include the dose calculation method for any the new release point.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with the effluent monitoring and control program were being identified at an appropriate threshold and were properly addressed for resolution in the licensee corrective action program.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

.1 Safety System Functional Failures (71151 - 2 samples)

a. Inspection Scope

The inspectors sampled LGS' submittals for the Safety System Functional Failures performance indicator for both Unit 1 and Unit 2 for the period of April 1, 2013, through March 31, 2014. To determine the accuracy of the performance indicator data reported during those periods, inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73." The inspectors reviewed LGS' operator narrative logs, operability assessments, maintenance rule records, maintenance work orders, condition reports, event reports and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index (71151 - 2 samples)

a. Inspection Scope

The inspectors reviewed LGS' submittal of the Mitigating Systems Performance Index for the following systems for the period of April 1, 2013, through March 31, 2014:

- Unit 1 Emergency AC Power System
- Unit 2 Emergency AC Power System

To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7. The inspectors also reviewed LGS' operator narrative logs, condition reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports to validate the accuracy of the submittals.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that LGS staff entered issues into the corrective action program at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the corrective action program and periodically attended screening and Management Review Committee meetings.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review (71152 – 1 sample)

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by Inspection Procedure 71152, "Problem Identification and Resolution," to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by LGS outside of the corrective action program, such as trend reports, performance indicators, major equipment problem lists, system health reports, maintenance rule assessments, and maintenance or corrective action program backlogs. The inspectors also reviewed LGS' corrective action program database for the first and second quarters of 2014 to assess IRs written in various subject areas (equipment problems, human performance issues, etc.), as well as individual issues identified during the NRCs daily condition report review (Section 4OA2.1). The inspectors reviewed LGS' quarterly trend meeting information report for the first quarter of 2014, conducted under PI-AA-125-1005, "Coding and Analysis Manual," Revision 0, to verify that LGS personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings and Observations

No findings were identified.

The review did not reveal any new trends that could indicate a more significant safety issue. The inspectors assessed that LGS personnel were identifying issues at a low threshold and entering issues and into the CAP for resolution and, with a few exceptions, appropriately prioritizing investigation reviews. The inspectors noted minor adverse trends identified by LGS staff in the areas of procedure use and adherence, human performance in certain site organizations (e.g., Security), Operations log and turnover documentation, and some long-standing deficiencies in lower priority plant equipment. There were no adverse safety consequences as a result of these low level trend issues. The inspectors also noted that the site's Nuclear Oversight organization continued to identify negative trends at an appropriate level and elevated issues when necessary. Based on the overall results of the semi-annual trend review, the inspectors determined that LGS was properly identifying adverse trends before they became more safety significant problems.

.3 Annual Sample: Unit 1 Manual Scram due to Electro-Hydraulic System Failure (71152 – 1 sample)

a. Inspection Scope

The inspectors performed an in-depth reviewed of LGS' root cause analysis and corrective actions associated with IR 1629288 written in response to the Unit 1 manual reactor scram on March 4, 2014. The manual scram was in response to closure of the main turbine intercept valves caused by the failure of a power supply in the electro-hydraulic control system.

The inspectors assessed LGS' problem identification threshold, the causal analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of corrective actions to determine whether LGS was appropriately identifying, characterizing, and correcting problems associated with the issue. The inspectors compared the actions taken to the requirements of the LGS corrective action program and 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action."

b. Findings

No findings were identified.

The LGS staff conducted a thorough technical review of cause of the scram. LGS personnel determined the scram resulted from the closure of the intercept valve that was caused by a degraded electro-hydraulic control (EHC) system power supply. The power supply was tested and found with lower than acceptable output voltage and with higher than acceptable output voltage ripple. The degraded power supply actuated the intercept valve mismatch overspeed protection circuit and initiated fast-closure of all six intercept valves. In response to previously identified obsolescence and reliability issues with the existing EHC system, LGS had previously planned corrective actions to replace the original EHC system with a digital EHC system.

Following the March 4, 2014, manual scram, Unit 1 immediately entered a main low pressure turbine inspection outage. On March 17, 2014, LGS started refueling outage 1R15 ahead of the previously scheduled start date of March 24, 2014. During the outages, the new digital electro-hydraulic control system modification was installed. The inspectors reviewed the maintenance history of the power supply and concluded that all proper preventive maintenance and testing had been performed.

The inspectors reviewed LGS' corrective actions to address the extent of condition of the previously identified obsolescence and reliability issues with the existing EHC system. The inspectors observed that LGS instrument mechanics performed calibration checks on the EHC power supplies during the Unit 2 main low pressure turbine outage (2M49) that commenced on April 23, 2014. The inspectors concluded that this action was reasonable given that the installation of the new digital EHC system modification is planned for implementation on Unit 2 during the spring 2015 refueling outage (2R13).

The inspectors concluded that LGS' overall response to the degraded EHC system power supply was commensurate with the safety significance, was timely, and included appropriate compensatory measures.

4OA3 Follow-up of Events and Notices of Enforcement Discretion (71153 – 2 samples)

.1 (Closed) Licensee Event Report (LER) 05000353/2014-005-00: High Pressure Coolant Injection System Inoperability due to ECCS Actuation Instrument Channel Setpoint Drift.

LGS reported the issue because the Unit 2 HPCI suppression pool level instrument, which is a TS required instrument, was inoperable for a period of time that exceeded TS Allowed Outage times. This was based on the as-found setpoint exceeding the required TS limit during 3 consecutive 18-month calibration surveillances. The inspectors could not establish specifically when the instrument became inoperable, during the time periods in question, following recalibrations of the instrument during surveillance testing.

The inspectors reviewed the issues involved in the LER and determined that a NCV of 10CFR 50, Appendix B, Criterion XVI, "Corrective Action," had occurred. The NCV is discussed in detail in Section 1R15 of this report. No additional issues were noted. This LER is closed.

.2 (Closed) LER 05000352/2014-004-00: Valid Manual Actuation of the Reactor Protection System with the Reactor Critical due to Closure of Turbine Valves.

On March 4, 2014 while operating at full power, operators initiated a manual reactor scram on Unit 1, in accordance with plant procedures, in response to the closure of all main turbine intercept valves. The cause of the closure of the valves was due to a degraded electro-hydraulic control power supply. Modifications were implemented on Unit 1 during refueling outage 1R15, which replaced the existing electro-hydraulic control system with a digital system. Extent of condition reviews were completed on Unit 2 during a planned maintenance outage in the spring of 2014. The inspectors performed a detailed review of the problem identification threshold, the causal analyses, extent of condition reviews, compensatory actions, as well as the prioritization and timeliness of corrective actions involving the event. The review is documented in Section 4OA2.3 of this report. No findings or violations of NRC requirements were identified. This LER is closed.

4OA5 Other Activities

.1 NRC Office of Investigations Report 1-2013-018:

In April 2013, NRC inspectors discovered that in the process of performing a surveillance test in OPCON 4, Limerick Unit 2 received a full scram signal and a reactor protection system (RPS) actuation. Additionally, it was discovered that, in the processes of resetting the reactor scram signal, licensed operators at LGS removed and discarded quality assurance records. Specifically, licensed operators were directed to reset the scram signal which required, in part, step 4.9.1 of ST-6-001-660-2, “Main Turbine CIV, Stop Valve RPS & EOC-RPT Channel Functional Test,” be completed to return the plant configuration to normal. Since ST-6-001-660-2 was in progress at the time of the scram, the procedure steps had been filled out by the previous reactor operator. In order to facilitate place-keeping, pages 64 through 67, containing steps 4.9.1 through 4.9.4, were removed and clean copies were inserted in the surveillance test package. The original marked up copies were discarded and irretrievable. In response, the Region I Field Office, NRC OI, initiated an investigation on May 30, 2013, to determine whether employees, to include NRC licensed operators at LGS, deliberately failed to follow surveillance procedures and deliberately failed to retain quality assurance records.

Based on testimonial and documentary evidence gathered during the investigation, the investigators concluded that while violations of TS requirements had occurred, human error and momentary lapse of judgment were identified as the cause and operators did not deliberately violate station procedures and/or their NRC license nor conclude that the original copies of the procedure (i.e., considered by the NRC to be Quality Assurance Records required by 10 CFR Part 50, Appendix B) were deliberately discarded.

The safety significance of the finding was previously evaluated by the NRC and documented in NRC Inspection Report 05000353/2013003, dated August 6, 2013, as a Green finding (FIN 05000353/2013003-03; Failure to Follow Partial Procedure Change Process). The enforcement aspects of that finding were held open pending the completion of the NRC OI Investigation. While this finding involved a violation of NRC requirements, the NRC has determined that this issue is an NCV in accordance with the Enforcement Policy since it was of very low safety significance, LGS entered the issue into the CAP, it was not repetitive or willful, and compliance was restored in a reasonable period of time. The finding and associated violation, although dispositioned separately, will be counted as one input into the plant assessment process. The enforcement section of the original finding is amended as follows.

Enforcement: Limerick Technical Specification 6.8.1, "Administrative Controls-Procedures," states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures as recommended in NRC Regulatory Guide 1.33, Appendix A, Revision 2, February 1978. NRC RG 1.33, Appendix A, Section 1, requires administrative procedures for procedure adherence. Exelon procedure HU-AA-1 04-101, "Procedure Use and Adherence," Revision 4, Section 4.6, contains requirements for partial performance of procedures. Step 4.6.1.3 requires the Work Planner or Job Supervisor will “ensure the component/system is returned to a condition ready to perform the next evolution or returned to a condition normal/expected for plant conditions at that time.” Contrary to the above, on April 16, 2013, the Unit 2 Control Room Supervisor performed an inadequate technical review of the partial

performance of Surveillance Test ST-6-001-660-2, "Main Turbine CIV, Stop Valve RPS & EOC-RPT Channel Functional Test" and did not ensure that simulated turbine load was in a condition ready to perform turbine stop valve closure. This resulted in an automatic reactor scram and the tripping of both recirculation pumps because the turbine stop valve closure scram signal was not bypassed with simulated turbine load. LGS staff entered this issue into the CAP as IRs 1503749 and 1525552. **(NCV 05000353/2013003-03, Failure to Follow Partial Procedure Change Process)**

.2 (Discussed) FIN 05000353/2013005-01:

By Letter LG-14-079, "Review of Cross-Cutting Aspect for Finding 05000353/2013005-001," dated June 6, 2014, Vice President, LGS requested an NRC re-evaluation of the cross-cutting aspect for FIN 05000353/2013005-01, "Failure to Properly Plan Work for Failed Airlock Door Magnetic Switch." In accordance with IMC 310, "Aspects Within Cross Cutting Areas," dated October 28, 2011, the finding was initially assigned aspect H.2(a). IMC 0310 was revised on December 19, 2013, which, in part, revised the cross-cutting aspects. As part of the implementation, a conversion table for cross-cutting aspects was provided in the revised IMC 0310. In accordance with the table, the cross-cutting aspect for the finding was converted from H.2(a) to H.6. However, recognizing there might be exceptions, all licensees were asked to review the conversion of any findings from the second half of 2013. As documented in LG-14-079, LGS proposed that the more appropriate aspect for the finding should be H.3, Change Management.

In NRC Letter, "Review of Cross-Cutting Aspect for Finding 05000353/2013005-01," dated July 9, 2014, from Mr. Ho K. Nieh to Mr. Thomas J. Dougherty, Vice President, LGS, Region I documented agreement that H.3, Change Management, was the most representative of the most significant contributing cause of the inspection finding. As such, we are recoding inspection finding 05000353/2013005-01 to reflect a cross-cutting aspect of H.3.

4OA6 Meetings, Including Exit

On July 10, 2014, the inspectors presented the inspection results to Mr. D. Lewis, Plant Manager, and other members of the LGS staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

T. Dougherty, Site Vice President
D. Lewis, Plant Manager
R. Kreider, Director of Operations
D. Doran, Director of Engineering
F. Sturniolo, Director of Maintenance
J. Hunter, Director of Work Management
K. Kemper, Security Manager
R. Dickinson, Manager, Regulatory Assurance
J. Karkoska, Manager, Nuclear Oversight
R. Ruffe, Training Director
M. Gillin, Shift Operations Superintendent. Manager, Engineering Systems
J. Broillet, Emergency Preparedness Manager
G. Budock, Regulatory Assurance Engineer
D. Molteni, Licensed Operator Requalification Training Supervisor
M. DiRado, Manager, Engineering Programs
D. Merchant, Radiation Protection Manager
C. Gerdes, Manager, Chemistry, Environmental and Radioactive Waste
B. Bielecki, Engineering
C. Boyle, Radiochemist
T. Davis, Chemistry
T. Fritz, System Manager, Rad Monitors
T. Mscisz, Radiation Protection
R. Nealis, Senior Chemist
D. Palena, Work Management

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATED

Opened/Closed

05000353/2014003-01	NCV	Inadequate Corrective Actions Following Repeat Test Failures of a High Pressure Coolant Injection System Level Instrument (1R15)
05000353/2014005-00	LER	High Pressure Coolant Injection System Inoperable due to ECCS Actuation Instrument Channel Drift (Section 4OA3.1)
05000352/2014004-00	LER	Valid Manual Actuation of the Reactor Protection System with the Reactor Critical Due to Closure of the Turbine Valves (Section 4OA3.2)

Discussed

05000353/2013003-03	NCV	Failure to Follow Partial Procedure Change Process (Section 4OA5.1)
05000353/201300501	FIN	Failure to Properly Plan Work for Failed Airlock Door Magnetic Switch (Section 4OA5.2)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures
E-5, Grid Emergency, Revision 20
WC-AA-8000, Interface Procedure Between (CCOMED/PECO) and Exelon Generation (Nuclear Power) for Construction and Maintenance, Revision 6
OP-AA-108-107, Switchyard Control, Revision 3
OP-AA-108-107-1001, Station Response to Grid Capacity Conditions, Revision 4
OP-AA-108-107-1002, Interface Procedure Between COMED/PECO and Exelon Generation (Nuclear Power) for Transmission Operations, Revision 7
WC-AA-107, Seasonal Readiness, Revision 14
GP-7.1, Summer Weather Preparation and Operation, Revision 31

Section 1R04: Equipment Alignment

Procedures
8031-M-56, P&ID HPCI Pump/Turbine (Unit 1), Revision 40
8031-M-55, P&ID High Pressure Coolant Injection (Unit 1), Revision 58
1S55.1.A (COL), “Equipment Alignment for Automatic Operation of HPCI System”
S55.1.A, Normal HPCI Line-up for Automatic Operation, Revision 35
2S52.1.A (COL-2), Equipment Alignment for CS Loop ‘B’ Operation, Revision 8
S52.9.A Routine Inspection of the Core Spray System, Revision 18
S55.1.A, Normal HPCI Line-Up for Automatic Operation
8031-M-49, Sheet 2, “P&ID Reactor Core Isolation Cooling (Unit 2), Revision 48
8031-M-50, Sheet 2, “P&ID RCIC Pump/Turbine (Unit 2), Revision 12
S49.9.A, Routine Inspection of RCIC System, Revision 29
S49.1.A, Normal RCIC Line-Up for Automatic Operation, Revision 25

Section 1R04S: Full System Walkdown

Issue Reports
01658296 and A1954766 for D21 Starting Air Compressor 2A2 Fail to Start

Procedures
1S92.1.N, Equipment Alignment for 1A EDG Operation, Revision 31
S92.9.N, Routine Inspection of the Diesel Generators, Revision 64
2S92.1.N (COL – 2) – Equipment alignment for
2S92.1.N (COL-4), Equipment Alignment for 2D Diesel Generator Operation, Revision 16
1S92.1.N (COL-4), Equipment Alignment for 1D Diesel Generator Operation, Revision 28
1S92.1.N (COL-3), Equipment Alignment for 1C Diesel Generator Operation, Revision 28

1S92.1.N (COL-2), Equipment Alignment for 1B Diesel Generator Operation, Revision 27
1S92.1.N (COL-1), Equipment Alignment for 1A Diesel Generator Operation, Revision 30
1S92.1.N (COL-1), Equipment Alignment for 1A Diesel Generator Operation, Revision 31
S92.9.N, Routine Inspection of the Diesel Generators, Revision 64
2S11.1.A (COL-1), Equipment Alignment of Emergency Service Water Loop 'A' System, Revision 38
2S11.1.A (COL-2), Equipment Alignment of Emergency Service Water Loop 'B' System, Revision 36
1S11.1.A (COL-2), Equipment Alignment of Emergency Service Water Loop 'B' System, Revision 50
2S92.1.N (COL-3), Equipment Alignment for 2C Diesel Generator Operation, Revision 29
2S92.1.N (COL-1), Equipment Alignment for 2A Diesel Generator Operation, Revision 2

Miscellaneous
8031-M-11, "P&D Emergency Service Water (Unit 1, Unit 2 and Common)" Sheet 1, Revision 74
A1884555 A1328163 A1539343
01663804 00352231 00595277 01667455 01667461 01667463
EACE on D24 (I507365)

Section 1R05: Fire Protection

Issue Reports
01642127

Procedures
F-R-108, "Unit 1, RCIC Pump Room 108 (Elevation 177)," Revision 10
F-R-109, "Unit 1, HPCI Pump Room 109 (Elevation 177), "Revision 10
F-R-202, "Common, Service Water Pipe Tunnel Room 202 (Elevation 198), Revision 7
F-A-540, "Common, Remote Shutdown Room 540 (Elevation 289)," Revision 10

Section 1R05: Observe Plant Fire Drill

Procedures
F-W-469, Pre-Fire Plan, Common Centrifuge Rooms, Solid Radwaste Equipment Rooms, Ventilation Filter Compartments and Supply and Exhaust Fan Area Rooms, Revision 3
Fire Drill Scenario Number F-W-469, Centrifuge Rooms, Solid Radwaste Equipment Rooms, Ventilation Filter Compartments, and Supply and Exhaust Fan Area Rooms
OP-AA-201-003, Fire Drill Performance, Revision 12

Section 1R06: Flood Protection Measures

Issue Reports
01599535 01620990 01649345 *01650362 (NRC ID) 1654172 1624093

Procedures
SE-4, Flood, Revision 7
SE-4-1, Reactor Enclosure Flooding, Revision 8
ARC-MCR-115 G5, IB-D RHR Pump Room Flood, Revision 1
T-103 Common, Secondary Containment Control, Sheet 1, Revision 20
T-103, Secondary containment control – bases, Revision 22

Section 1R07: Heat Sink Performance

Procedures
EA-AA-340, G-L84-13 Program Implementing Procedure, Revision 7
ER-AA-340-1002, Service Water Heat Exchanger Inspection Guide, Revision 6

Miscellaneous
Functional Area Self-Assessment, 1605358, May 14, 2014
Limerick Generating Station Program Basis Document for NRC Generic Letter 89-13, Revision 7

Section 1R12: Maintenance Effectiveness

Issue Reports
135390 1651480 1646041

Procedures
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Design Basis Document L-S-25A, Primary Containment Pressure Suppression System, Revision 6
ST-2-055-404-2, ECCS Suppression Pool Water Level – High: Division 2 (HPCI) Calibration/Functional Test, Revision 20
ER-AA-310, Implementation of the Maintenance Rule, Revision 9
ER-AA-310-1005, Maintenance Rule – Dispositioning Between (A)(1) and (A)(2), Revision 6
ER-AA-310-1007, Maintenance Rule – Periodic (a)(3) Assessment, Revision 4

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Issue Reports
01650706 01653318 01653324 1636025

Procedures
WC-AA-101, On-line Work Control Process, Revision 21
WC-AA-104, Integrated Risk Management, Revision 20
E-5, Grid Emergency, Revision 21
SE-9, Preparation for Severe Weather, Revision 32

Section 1R15: Operability Determinations and Functionality Assessments

Issue Reports
01645732 1650035 01666325 A1957879 1645482

Procedures
ON-104, “Control Rod Problems,” Revision 53
ST-6-049-320-1, “RCIC Operability Verification”, Revision 26
S49.1.A, “Normal RCIC Line-up for Automatic Operation”

Miscellaneous
Technical Specification Log Entry – 1-TS-14-1493
Technical Specification Log Entry – 3.2.3

Section 1R18: Plant Modifications

Procedures
ST-4-LLR-991-1, RCIC Vacuum Relief, Revision 6
CC-AA-102, Design Input and Configuration Change Impact Screening, Revision 27
CC-AA-103, Configuration Change Control for Permanent Physical Plant Changes, Revision 25

Miscellaneous
LM-0690, Structural Evaluation of DG Exhaust Stacks for Tornado Missile
WO#C0242449
DWG, P-102-A-00130 Sheet 1 "Incorporated per LG ECR 08-00038", Revision 0

Section 1R19: Post-Maintenance Testing

Issue Reports
01666789

Procedures
ST-6-051-232-1, "'B' RHR Pump, Valve and Flow Test", Revision 80
ST-6-076-250-1, 5GTS and RERS Flow Test, Revision 47
S92.1.0, "Remote Manual Startup of Diesel Generator"; S92.2N "Shutdown of the Diesel Generator"

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A1957619, Log entries on 6/2/14 for operability/availability/technical specification entry

Section 1R20: Refueling and Other Outage Activities

Procedures
NF-AA-330-1001, Core Verification Guideline, Revision 9
GP-2, Normal Plant Startup, Revision 153
GP-2, Appendix 1, Reactor Startup and Heat-up, Revision 49
OU-AA-103, Shutdown Safety Management Program, Revision 14
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Section 1R22: Surveillance Testing

Issue Reports
1639451 1640174 1639451 1640898 1641422 1641949
1641813 1642647 1641015 *1651358 (NRC ID)

Procedures
M-200-053, Snubber Functional Test, Revision 1
ST-6-049-320-1, "RCIC Operability Verification," Revision 26
ST-6-051-231-2, "'A' RHR Pump, Valve and Flow Test", Revision 70
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ST-2-072-107-2, "Division II Reactor Enclosure BOP isolation LSF/SAA and RERs, SGTs Test", Revision 12
ST-6-048-230-2, "SLC Pump, Valve, and Flow Test", Revision 45

Miscellaneous
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R1281668

Section 1EP6: Drill Evaluation

Issue Reports
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Miscellaneous
Exelon Nuclear Emergency Preparedness Limerick Generating Station Guidelines and Conduct, Revision 0

Section 2RS05: Radiation Monitoring Instrumentation

Procedures
CY-AA-110-1000, Site Chemistry Department Organization and Responsibilities, Revision 2
CY-AA-170-0100, Personnel Familiarization Guide for REMP, MET, RGPP, REC Programs, Revision 3
CY-AA-130-200, Instrument Standardization and Performance Check Quality Control Schedule, Revision 6
CY-LG-130-102, Operation of the ISOLO Alpha/Beta Counting System, Revision 1
CY-LG-1320, Packard 2900 TR Liquid Scintillation Counter, Revision 0
RM-AA-101, Records management program, Revision 9
CY-AA-130-200, Quality Control, Revision 12
CY-AA-130-201, Radiochemistry Quality Control, Revision 2
CY-AA-130-201-F-02, Rev. 0, Regulatory Position for Regulatory Guide 4.15, Revision 1
RT-5-000-573-0, Radiochemistry Duplicate Sampling, Revision 1
CY-LG-130-400, Chemistry Sampling and Analysis Team, Revision 8
CY-LG-170-202, Sampling of Noble Gas, Tritium, Iodine and Particulate at the GA Gaseous Effluent Radiation Monitors, Revision 17
CY-AA-130-100, Inline Instrument Quality Control, Revision. 3
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ST-5-076-815-2, Unit 2 South Stack Weekly Iodine and Particulate Analysis
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Documents
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Calibration and check records
Sample analysis results (various)
Release permits (various)
Public dose calculations (various)
Corrective Action Documents (various)
Chemistry Audit NOSA-LIM-12-04, May 21, 2012

Section 2RSO6: Radioactive Gaseous and Liquid Effluent Treatment

Procedures
CY-AA-170-200, Radioactive Effluent Control Program, Revision 2
CY-AA-170-1000, radiological Environmental Monitoring Program and meteorological program Implementation, Revision 8
CY-AA-2000, Annual Radioactive Effluent Release Report, Revision 6
RT-5-000-572-0, Reactor Water Decay Counting and Stratification Test
CY-AA-110-1000, Site Chemistry Department Organization and Responsibilities, Revision 2
CY-AA-170-0100, Personnel Familiarization Guide for REMP, MET, RGPP, REC Programs, Revision 3
CY-AA-130-200, Instrument Standardization and Performance Check Quality Control Schedule, Revision 6
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CY-LG-1320, Packard 2900 TR Liquid Scintillation Counter, Revision 0
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CY-LG-130-400, Chemistry Sampling and Analysis Team, Revision 8
CY-LG-170-202, Sampling of Noble Gas, Tritium, Iodine and Particulate at the GA Gaseous Effluent Radiation Monitors, Revision 17
EN-LG-408-4160, RGPP Reference material, Revision 4
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CY-AA-110-200, Sampling, Revision 9
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CY-LG-130-100, Sampling of Offgas from Recombiner After Condenser Discharge, Revision 23
CY-LG-130-101, Analysis of Offgas Sample from Nobel Gas Activity and Fuel Performance Calculation, Revision 4
ST-5-076-826-0, Monthly Gaseous and Liquid Release Dose Calculation
ST-5-061-570-0, Radioactive Discharge Permit
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Documents
2012 and 2013 Annual Effluents and Environmental Reports
Murray and Trettel Inc., 2013 Annual Meteorological Report
Offsite Dose Calculation Manual, Revision 26
Focused Area Self-Assessment Radiological Gaseous and Liquid Effluents (AR1624183)
Meteorological Data
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General Source Term Data
Sample Analysis Results (various)
Ground Water Sample Results (various)
Release Permits (various)
Land Use Census
Public Dose Calculations (various)
Corrective Action Documents including Apparent Cause Reports (various)

Section 4OA1: Performance Indicator Verification

Issue Reports
01553563

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Reactor Oversight Program MSP1 Basis Document Limerick Generating Station, Revision 5
OP-LG-108-104-1000, ST/RT Status Log (Short Duration Time Clock Log), Revision 1

Miscellaneous

LER 2013-001-00	LER 2013-003-00	LER 2014-002-00	LER 2013-002-00
LER 2014-001-00	LER 2014-002-00	LER 2013-002-00	LER 2014-001-00

Operator Logs

LIST OF ACRONYMS

AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
CAP	Corrective Action Program
CFR	*Code of Federal Regulations*
EDG	Emergency Diesel Generator
FOIA	Freedom of Information Act
GPI	Ground Water Protection Initiative
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
IR	Inspection Report
LER	licensee event report
LGS	Limerick Generating Station
NCV	Non-Cited Violation
ODCM	Offsite Dose Calculation Manual
OI	Office of Investigations
OPCON	Operational Condition
NRC	Nuclear Regulatory Commission
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RPS	Reactor Protection System
SSC	Structure, System, or Component
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report