



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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November 5, 2012

Mr. Michael J. Pacilio
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President and Chief Nuclear Officer, Exelon Nuclear
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Warrenville, IL 60555

**SUBJECT: CLINTON POWER STATION - NRC INTEGRATED INSPECTION REPORT
05000461/2012-004**

Dear Mr. Pacilio:

On September 30, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Clinton Power Station. The enclosed report documents the inspection results, which were discussed on October 11, 2012, with Mr. W. Noll and other members of your staff.

This 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.

Based on the results of this inspection, one NRC-identified finding and one self-revealed finding of very low safety significance were identified. One of these findings was determined to involve a violation of NRC requirements.

Because of the very low safety significance and because it was entered into your corrective action program, the NRC is treating the above self-revealed violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCV, 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 III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Clinton Power Station. In addition, if you disagree with a cross-cutting aspect assignment 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 III, and the NRC Resident Inspector at Clinton Power Station.

M. Pacilio

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

Sincerely,

/RA/

Mark A. Ring, Branch Chief
Branch 1
Division of Reactor Projects

Docket No. 50-461
License No. NPF-62

Enclosure: Inspection Report No. 05000305/2012004
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-461
License No: NPF-62

Report No: 05000461/2012-004

Licensee: Exelon Generation Company, LLC

Facility: Clinton Power Station, Unit 1

Location: Clinton, IL

Dates: July 1 through September 30, 2012

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Enclosure

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SUMMARY OF FINDINGS

IR 05000461/2012-004; 07/01/12 – 09/30/12; Clinton Power Station, Unit 1; Maintenance Effectiveness.

This report covers a three-month period of inspection by the resident inspectors and announced baseline inspections by regional inspectors. Two Green findings, one of which had an associated Non-Cited Violation, were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealed Findings

Cornerstone: Mitigating Systems

- Green. A finding of very low safety significance with an associated non-cited violation of 10 CFR 50, Appendix B, Criteria V, "Instructions, Procedures, and Drawings" was self-revealed on March 1, 2012 when the Division 1 diesel generator (DG) ventilation system supply damper was discovered failed closed with the ventilation supply fan running during a Division 1 DG surveillance test. The damper failure occurred due to the licensee's failure to establish an adequate procedure to perform maintenance. Specifically, the maintenance procedure did not contain an appropriate verification step to ensure that locknuts on the damper hydramotor coupling were tightly fastened. As a result, vibration of the coupling during operation over time caused the coupling to separate such that the damper would not open. The licensee entered this issue into its corrective action program for evaluation, repaired the damper, and initiated corrective actions to revise the maintenance procedure.

The finding was of more than minor significance since it was associated with the Procedure Quality attribute and adversely affected the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the damper failure rendered the Division 1 DG inoperable. Although the finding involved an actual loss of function of a single train for greater than its Technical Specification allowed outage time, it was determined to be of very low safety significance during a detailed quantitative Significance Determination Process review since the delta core damage frequency and delta large early release frequency were both determined to be negligible based upon crediting operator recovery actions to restore DG room ventilation. The inspectors concluded that this finding affected the cross-cutting area of human performance since adequate licensee resources involving personnel and procedures did not support successful human performance. Specifically, the maintenance procedure did not contain adequate instructions to ensure that locknuts on the damper hydramotor coupling were tightly fastened. (IMC 0310 H.2(c)) (Section 1R12.1.b.1)

- Green. The inspectors identified a finding of very low safety significance associated with the licensee's failure to correctly evaluate the past operability of two emergency core cooling system (ECCS) relief valves that failed bench testing following replacement during the C1R13 refueling outage. No violation of regulatory requirements was

identified because revised evaluations by the licensee determined that the valves would have satisfied their safety functions. The licensee entered this issue into its corrective action program for evaluation and initiated corrective actions to revise the past operability evaluations to correct gross errors in the original evaluations.

The finding was of more than minor significance since the failure to correctly evaluate a degraded/nonconforming condition potentially affecting the operability of structures, systems, and components (SSC) required to be operable by Technical Specifications (TS) would become a more significant safety concern, if left uncorrected, because it could reasonably result in an unrecognized condition of an SSC failing to fulfill a safety-related function. The finding was a licensee performance deficiency of very low safety significance because it: (1) was not a design or qualification deficiency; (2) did not represent an actual loss of function of a system; (3) did not represent an actual loss of function of a single train or two separate trains for greater than its TS allowed outage time; (4) did not represent an actual loss of function of one or more non-TS trains of equipment designated as high safety significant; and (5) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The inspectors concluded that this finding affected the cross-cutting area of human performance since licensee engineering staff failed to thoroughly and correctly evaluate past operability of the two ECCS relief valves due to inattention to detail. Human error prevention techniques were not appropriately employed to support human performance. The most significant concerns were that the independent technical reviewer did not independently validate information contained in the past operability evaluations by reviewing the valve test records and, that neither the independent technical reviewer nor the engineering supervisory reviewer challenged the unwarranted past operability conclusion reached for the 1E12-F025C test failure. (IMC 0310 H.4(a)) (Section 1R12.1.b.2)

B. Licensee-Identified Violations

No violations of significance were identified.

REPORT DETAILS

Summary of Plant Status

The unit was operated at or near full power during the inspection period with the following exceptions:

- On September 9, 2012, the licensee reduced power to about 75 percent to perform control rod sequence exchange, scram time testing of two control rods following maintenance on hydraulic control units, and main turbine control/stop/intermediate valve and main steam isolation valve testing. The unit was returned to full power the same day.

1. **REACTOR SAFETY**

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment (71111.04)

.1 Quarterly Partial System Walkdowns (71111.04Q)

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- Division 3 Diesel Generator (DG) (single train risk significant system);
- Residual Heat Removal (RHR) Train A during maintenance on RHR Train B; and
- Shutdown Service Water (SX) Train B during maintenance on SX Train A.

The inspectors selected these systems based on their risk significance relative to the Reactor Safety Cornerstones. The inspectors reviewed operating procedures, system diagrams, Technical Specification (TS) requirements, and the impact of ongoing work activities on redundant trains of equipment. The inspectors verified that conditions did not exist that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components were aligned correctly and available as necessary.

In addition, the inspectors verified that equipment alignment problems were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

This inspection constituted three partial system walkdown inspection samples as defined in Inspection Procedure (IP) 71111.04.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Complete System Walkdown (71111.04S)

a. Inspection Scope

The inspectors performed a complete system alignment inspection of the plant service water (WS) system to verify the functional capability of the system. This system was selected because it was considered safety significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment lineups, electrical power availability, system pressure and temperature indications, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that ancillary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding work orders was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the corrective action program database to ensure that system equipment alignment problems were being identified and appropriately resolved.

This inspection constituted one complete system walkdown inspection sample as defined in IP 71111.04.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

.1 Routine Resident Inspector Tours (71111.05Q)

a. Inspection Scope

The inspectors performed fire protection tours in the following plant areas:

- Fire Zone R-1m, Weld Shop and Storeroom – Elevation 737'0”;
- Fire Zone R-1s, Radwaste HVAC [Heating, Ventilation & Air Conditioning] Room – Elevation 762'0”;
- Fire Zone M-2c, Screen House and Tunnel – Elevations 657'6”, 678'0”, 699',0”;
- Fire Zone F-1g, Fuel Cask Area Pump Room – Elevation 712'0”;
- Fire Zone F-1b, High Pressure Core Spray (HPCS) Pump Room – Elevation 712'0”; and
- Fire Zone A-3c, Floor Drains and Hallway – Elevation 712'0”.

The inspectors verified that transient combustibles and ignition sources were appropriately controlled and assessed the material condition of fire suppression systems, manual firefighting equipment, smoke detection systems, fire barriers and emergency lighting units. The inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; that the licensee's fire plan was in alignment with actual conditions; and that fire doors, dampers, and penetration seals appeared to be in satisfactory condition.

In addition, the inspectors verified that fire protection related problems were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

This inspection constituted six quarterly fire protection inspection samples as defined in IP 71111.05AQ.

b. Findings

No findings of significance were identified.

.2 Fire Protection – Drill Observation (71111.05A)

a. Inspection Scope

During an unannounced drill on July 11, 2012, associated with the Auxiliary Building Control Rod Drive Rebuild Room, the inspectors assessed the timeliness of the fire brigade in arriving at the scene, the firefighting equipment brought to the scene, the donning of fire protective clothing, the effectiveness of communications, and the exercise of command and control by the fire brigade leader. The inspectors also assessed the acceptance criteria for the drill objectives; the rigor and thoroughness of the post-drill critique; and, verified that fire protection drill problems were being entered into the licensee's corrective action program with the appropriate characterization and significance.

This inspection constituted one annual fire protection drill inspection sample as defined in IP 71111.05AQ.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

.1 Resident Inspector Quarterly Review of Licensed Operator Requalification (71111.11Q)

a. Inspection Scope

The inspectors observed licensed operators during annual operator requalification simulator examinations on September 20, 2012. The inspectors assessed the operators' response to the simulated events focusing on alarm response, command and control of crew activities, communication practices, procedural adherence, and implementation of Emergency Plan requirements. The inspectors also observed the post-training critique to assess the ability of licensee evaluators and operating crews to self-identify performance deficiencies. The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements.

This inspection constituted one quarterly licensed operator requalification inspection simulator sample as defined in IP 71111.11 and satisfied the inspection program

expectation for the resident inspectors to observe annual operator requalification simulator testing during the training cycle in which it was not observed by the NRC during the biennial portion of this IP.

b. Findings

No findings of significance were identified.

.2 Resident Inspector Quarterly Observation of Heightened Activity or Risk (71111.11Q)

a. Inspection Scope

On September 9, 2012, the inspectors observed licensed operators in the Control Room perform a power reduction and control rod sequence exchange. This was an activity that required heightened awareness, additional detailed planning, and involved increased operational risk. The inspectors evaluated the following areas:

- Licensed operator performance;
- Crew's clarity and formality of communications;
- Ability to take timely actions in the conservative direction;
- Prioritization, interpretation, and verification of annunciators;
- Correct use and implementation of procedures;
- Control board manipulations;
- Oversight and direction from supervisors; and
- Ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications as applicable.

This inspection constituted one quarterly licensed operator heightened activity/risk inspection sample as defined in IP 71111.11.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12)

.1 Routine Quarterly Evaluations (71111.12Q)

a. Inspection Scope

The inspectors evaluated the licensee's handling of selected degraded performance issues involving the following risk-significant structures, systems, and components (SSC):

- DG Ventilation System Damper Hydramotor Coupling Disconnected, and
- Emergency Core Cooling System (ECCS) Relief Valve Set Pressure Test Failures.

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the SSC. Specifically, the inspectors independently verified the licensee's handling of SSC performance or condition problems in terms of:

- Appropriate work practices;
- Identifying and addressing common cause failures;
- Scoping of SSC in accordance with 10 CFR 50.65(b);
- Characterizing SSC reliability issues;
- Tracking SSC unavailability;
- Balancing reliability and unavailability;
- Trending key parameters (condition monitoring);
- 10 CFR 50.65(a)(1) or (a)(2) classification and reclassification; and
- Appropriateness of performance criteria for SSC functions classified (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSC functions classified (a)(1).

The inspectors also reviewed the licensee's Maintenance Rule Program (a)(3) Assessment Review for the previous operating cycle to verify that:

- The assessment was completed within the time constraints of 10 CFR 50.65(a)(3);
- The licensee reviewed its (a)(1) goals, (a)(2) performance criteria, monitoring, and preventive maintenance activities, and effectiveness of corrective actions;
- Industry operating experience was taken into account where practicable; and
- The licensee made appropriate adjustments as a result of the assessment.

In addition, the inspectors verified that problems associated with the effectiveness of plant maintenance were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

This inspection constituted three maintenance effectiveness inspection samples as defined in IP 71111.12.

b. Findings

(1) Failure to Correctly Assemble DG Ventilation System Supply Damper Resulted in an Inoperable DG

Introduction

A finding of very low safety significance with an associated Non-Cited Violation of 10 CFR 50, Appendix B, Criteria V, "Instructions, Procedures, and Drawings" was self-revealed on March 1, 2012, when the Division 1 DG ventilation system supply damper (1VD01YA) was discovered failed closed with the ventilation supply fan running during a Division 1 DG surveillance test. The damper failure occurred due to the licensee's failure to establish an adequate procedure to perform maintenance. Specifically, the maintenance procedure did not contain an appropriate verification step to ensure that locknuts on the damper hydramotor coupling were tightly fastened. As a result, vibration during operation eventually caused the coupling to separate such that the damper would not open.

Discussion

On March 1, 2012, operators started the Division 1 DG for a monthly surveillance test and immediately noted a lack of expected air flow in the room from the ventilation supply fan and that the doors between the DG rooms did not have the usual high differential pressure between them. The Division 1 DG room supply fan (1VD01CA) automatically starts when the engine starts to maintain room temperature $\leq 130^{\circ}\text{F}$ during DG operation. This usually creates higher air flow in the room and a greater differential pressure between adjacent rooms. Operators also noted that the Division 1 DG room temperature was rising, indicating that the normal ventilation system was not working. Operators secured the Division 1 DG and 1VD01CA after the engine had been running for about 45 minutes. With the ventilation fan secured, the licensee discovered that the ventilation supply damper hydramotor coupling was disconnected, causing the damper not to open (or to fail closed) when the ventilation fan started. Operators declared the Division 1 DG inoperable upon discovering the failed damper. The ventilation damper was repaired and the Division 1 DG returned to an operable status on March 2nd.

The licensee completed an equipment apparent cause evaluation for the damper failure and concluded that maintenance craftsmen had failed to sufficiently tighten a locknut on the coupling when the hydramotor was replaced on September 29, 2010, due to inadequate guidance in the maintenance procedure. The maintenance procedure (CPS 8452.04, "AH91/NH91 Hydramotor Actuator Maintenance," Revision 12) did not contain an appropriate verification step to ensure that locknuts on the damper hydramotor coupling were tightly fastened. The procedure simply directed tightening the locknuts "snug tight" and did not have a specific torque value. Failure to take timely corrective action to repair a degraded output shaft connector was also identified as a contributing cause. Maintenance craftsmen found during the maintenance in September 2010 that the linear converter coupling to damper drive shaft connection that connects the hydramotor assembly to the damper appeared to have excessive slippage. Engineering staff evaluated the condition at the time and determined that the amount of slippage was minimal and would not affect system operation. The licensee's equipment apparent cause evaluation concluded that the combination of the insufficiently tightened locknut and the increased vibration due to excessive slippage in the damper connection was the most plausible explanation for the damper failure.

Near-term corrective actions included a revision to CPS 8452.04 to provide a supervisor hold for verification that the hydramotor coupling locknuts are snug tight and the application of Loctite® to the locknuts. The inspectors noted that this corrective action differed from the corrective action originally identified in the licensee's equipment apparent cause evaluation, which called for revising the procedure to include a specific torque value for the locknuts. The licensee initiated AR 01398169 based on comments by the Management Review Committee to incorporate a numerical torque value into the maintenance procedure for the coupling locknuts.

The inspectors noted that the licensee had not performed a detailed engineering evaluation of the damper failure to determine the potential risk significance of the performance issue or to support its past operability/reportability conclusion. In response to the inspectors' questions, the licensee determined that with the engine at full load, no room ventilation, and no operator action, there was no credible way to conclude that the Division 1 DG would support a 7-day mission time. The licensee subsequently completed a detailed risk evaluation (EC 390764, "Significance Determination of

1VD01YA Damper Failure,” Revision 0) crediting operator actions during an event to mitigate the effects of the damper failure and to provide cooling to the DG room. The inspectors reviewed the evaluation and concurred with the licensee’s conclusion. The inspectors’ questions regarding the licensee’s past operability/reportability conclusion are discussed in Section 1R15.b.1 of this inspection report.

Analysis

The inspectors determined that the licensee’s failure to establish an adequate procedure to perform maintenance on the Division 1 DG ventilation system supply damper and to sufficiently tighten locknuts on the hydramotor coupling was a performance deficiency warranting a significance evaluation. The inspectors reviewed the examples of minor issues in Inspection Manual Chapter (IMC) 0612, “Power Reactor Inspection Reports,” Appendix E, “Examples of Minor Issues,” and found no examples related to this issue. Consistent with the guidance in IMC 0612, Appendix B, “Issue Screening,” the inspectors determined that the finding was associated with the Procedure Quality attribute and adversely affected the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the damper failure rendered the Division 1 DG inoperable. The inspectors performed a significance screening of this finding using the guidance provided in IMC 0609, “Significance Determination Process,” Appendix A, “The SDP for Findings At-Power.” In accordance with Exhibit 2, “Mitigating Systems Screening Questions,” the inspectors determined that this finding would require a detailed risk evaluation because it represented an actual loss of function of a single train for greater than its TS allowed outage time.

The Region III Senior Reactor Analyst (SRA) evaluated the finding using the Clinton Station Standardized Plant Analysis Risk (SPAR) Model Version 8.17, Systems Analysis Programs for Hands-on Integrated Reliability Evaluations (SAPHIRE) Version 8.0.8.0. The DG was assumed failed starting after its last successful run on January 25th. The damper and the DG were restored to operable status on March 2nd following repairs. Therefore the exposure time was 36 days.

In the SPAR model the SRA modified the Division 1 DG support system fault tree to add basic events representing failure of the hydramotor damper and recovery of a room ventilation source. The SRA used the licensee’s value for random failure of the damper of $7.25E-4$, which was based on information in NUREG/CR-6928, “Industry-Average Performance for Components and Initiating Events at U.S. Commercial Nuclear Power Plants,” and Bayesian updating using Clinton-specific damper performance information.

For recovery of ventilation in the condition (degraded) case, the SRA used the SPAR-H human reliability analysis method. In its technical evaluation documented in EC 390764, the licensee had DG room heat-up calculations showing that, with the damper closed, the total time to the room temperature design limit of 140°F would be 109.6 minutes with a loaded diesel from a starting room temperature of 80°F . The total time to the high room temperature alarm setpoint of 120°F was 73.1 minutes. The SRA considered the time available to restore room ventilation prior to DG failure to be about 110 minutes.

The SRA evaluated this time against operator actions during a loss of offsite power (LOOP) event. The operator response timeline during a LOOP was also discussed in EC 390764, which referred to procedures CPS 4200.01, “Loss of AC Power,”

Revision 21 and CPS 3506.01, "Diesel Generator and Support Systems, Revision 35." In the event of an automatic DG start in response to a LOOP, a qualified operator would be dispatched to ensure proper operation of the DG. The timeline assumed that an operator would arrive at the DG room about 10 minutes after the event and would discover the failed ventilation system about 10 minutes after that. Discussions among shift personnel would result in the operator opening a room door to restore ventilation after 35 minutes from the start of the event. EC 390764 stated that an outside door is immediately adjacent to the failed damper and would provide an obvious ventilation flow path. Other doors could be opened to provide cooling as well. Based on easily performed, simple actions with adequate time to recognize the failed room ventilation, the SRA concluded that it is reasonable to assume operations personnel could have opened door(s) to provide airflow to the DG room well before DG failure. The SRA determined the human error probability for operators failing to restore room ventilation prior to failure of the DG to be $2.2E-2$ based on high stress as a performance driver for both diagnosis and action.

An events and condition assessment was performed using the SPAR model with the basic events representing failure of Division 1 DG ventilation set to "True" and recovery of ventilation set to $2.2E-2$. The result was a delta core damage frequency (Δ CDF) of $1.5E-7$ /yr. The dominant sequence involved a LOOP (weather-related) initiating event and station blackout (SBO), failure to recover either offsite power or emergency onsite power in 12 hours, failure of containment venting, and failure of late injection.

To estimate the risk impact due to fire, the SRA used the licensee's Individual Plant Examination for External Events (IPEEE) information and the SPAR model. An initiating events assessment was performed assuming that a plant-centered LOOP event occurred in conjunction with the failed ventilation and recovery credit. The result was a conditional core damage probability of $8.0E-5$. To obtain the necessary fire frequencies, the SRA used Table 5-1 of Attachment 1 to licensee letter U-603132, "Response to Additional Information Request Regarding Fire Questions for the Clinton Power Station." The table provided a listing of six fire zones where a fire could cause a LOOP to occur. The SRA also referred to Table 4.2 of the IPEEE report, which listed the frequencies of fires in those zones. The cumulative frequency of the six fire zones during the exposure period totaled $2.4E-3$ /yr. Using this information, the result was a Δ CDF due to fire of $1.9E-7$ /yr. The dominant sequence was an initiating fire in the main control room complex leading to a LOOP and SBO.

To estimate the risk impact due to seismic and flooding events, the SRA used Volume 2 of the NRC "Risk Assessment of Operational Events" handbook and IMC 0609, Appendix A, "The Significance Determination Process for Findings at-Power." Table 1 "Frequencies of Seismically-Induced LOOP Events," from the handbook shows the seismically-induced LOOP frequency for Clinton Power Station to be $5.81E-5$ /yr. This value is orders of magnitude lower than the LOOP frequency from internal events so seismic risk was insignificant. Internal flood risk contributions were reviewed using Table 3.1 of IMC 0609 Appendix A. This table lists equipment important to internal flooding and it does not contain the Division 1 DG. Therefore, the risk due to flooding was also insignificant.

The total Δ CDF risk was the sum of the fire and internal events risk, or $3.4E-7$ /yr.

To estimate the risk impact due to Large Early Release Frequency (LERF), the SRA used IMC 0609 Appendix H, "Containment Integrity Significance Determination Process." Clinton Power Station is a BWR-6, GE, with Mark III Containment. Table 5.1 of Appendix H, "Phase 1 Screening-Type A Findings at Full Power," requires a Phase 2 assessment when the dominant accident sequences involve SBO events. Table 5.2 of Appendix H, "Phase 2 Assessment Factors -Type A Findings at Full Power," lists a LERF factor of 0.2 that the SRA applied to the Clinton Station SBO sequences. Applying this factor to the SBO sequences resulted in a Δ LERF of 6.8E-8/yr.

Based on the above, the SRA concluded that the total risk increase to the plant due to this finding based on CDF and LERF is very low (Green).

Cross-cutting Aspects

The inspectors concluded that this finding affected the cross-cutting area of human performance since adequate licensee resources involving personnel and procedures did not support successful human performance. Specifically, CPS 8452.04 did not contain adequate instructions to ensure that locknuts on the damper hydramotor coupling were tightly fastened. (IMC 0310 H.2(c))

Enforcement

10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, maintenance procedure CPS 8452.04, "AH91/NH91 Hydramotor Actuator Maintenance," Revision 12, was not appropriate to the circumstances because it did not contain an appropriate verification step to ensure that locknuts on Division 1 DG ventilation supply damper 1VD01YA hydramotor coupling were tightly fastened during maintenance performed on September 29, 2010. This resulted in failure of the damper during operation of the Division 1 DG on March 1, 2012. Because of the very low safety significance, this violation is being treated as a non-cited violation consistent with Section 2.3.2 of the NRC Enforcement Policy (**NCV 05000461/2012004-01, Failure to Correctly Assemble Diesel Generator Ventilation System Damper Resulted in Inoperable Diesel Generator**). The licensee entered this violation into its corrective action program as AR 01334761.

(2) Failure to Perform Adequate Past Operability Evaluations for ECCS Relief Valves

Introduction

The inspectors identified a finding of very low safety significance (Green) associated with the licensee's failure to correctly evaluate the past operability of two ECCS relief valves that failed bench testing following replacement during the C1R13 refueling outage. No violation of regulatory requirements was identified because revised evaluations by the licensee determined that the valves would have satisfied their safety functions.

Discussion

The licensee replaced a number of ECCS relief valves during the C1R13 refueling outage and subsequently bench tested the valves removed from the system in accordance with the American Society of Mechanical Engineers / American National Standards Institute (ASME/ANSI) Code Inservice Testing (IST) requirements. The inspectors reviewed the results of the licensee's cause and effect failure evaluations and past operability evaluations for five of the relief valves that failed to meet acceptance criteria for set pressure and/or seat leakage when they were tested. The inspectors identified that two of the five past operability evaluations completed by engineers contained gross errors and that these errors were then carried forward into the cause and effect failure evaluations.

The inspectors reviewed EC 387433, "Evaluate Past Operability of 1E12-F005 Relief Valve Test Failure," Revision 0. 1E12-F005 is the RHR Pump A Suction Relief Valve. The inspectors identified that the relief valve had failed the as-found set pressure test as documented in the test record (WO 1345597-05); however, EC 387433 evaluated the relief valve for a seat leakage test failure instead. The evaluation stated that 1E12-F005 failed seat leakage testing and could not be fully pressurized and that due to the seat leakage, set pressure verification was not performed. However, the test record reflected that the valve lifted at 188.9 pounds per square inch gauge (psig), which was 7.3 psig above the upper acceptance limit of 181.6 psig. In response to the inspectors' questions, the licensee determined that the engineer who performed the past operability evaluation and the engineer who performed the independent technical review did not properly validate the information that was used. The inspectors noted that the incorrect information was then carried forward into the cause and effect failure evaluation report by other engineers who did not recognize that the information was incorrect. The licensee wrote AR 01395971 to enter this issue into the corrective action program and revised EC 387433 to correctly evaluate the test failure. The inspectors reviewed the revised past operability evaluation and concurred with the conclusion that 1E12-F005 would have been able to perform its safety function. An action to revise the cause and effect failure evaluation report was pending at the end of the inspection period.

The inspectors reviewed EC 387423, "Evaluate Past Operability of 1E12-F025C Relief Valve Test Failure," Revision 0. 1E12-F025C is the RHR Pump C Discharge Relief Valve. The relief valve failed the as-found set pressure test as documented in the test record (WO 750263-06). The inspectors noted that EC 387423 stated that the relief valve had failed to lift within the allowable range and appeared to be stuck; however, the test record reflected that it lifted at 502 psig, 4 psig above the upper acceptance limit of 498 psig, and did not state that the valve failed to lift. In response to the inspectors' questions, the licensee determined that the engineer who performed the past operability evaluation and the engineer who performed the independent technical review did not review the test record when preparing the evaluation and that the sources of input the engineers used did not contain enough information to accurately complete the evaluation. The independent technical reviewer used information provided from the engineer who prepared the evaluation for his review, and did not independently evaluate the supporting documents. The inspectors noted that the incorrect information was then carried forward into the cause and effect failure evaluation report by other engineers who did not recognize that the information was incorrect. The licensee wrote AR 01396723 to enter this issue into its corrective action program and revised EC 387423 to correctly evaluate the test failure. The inspectors reviewed the revised past operability evaluation

and concurred with the conclusion that 1E12-F025C would have been able to perform its safety function. An action to revise the cause and effect failure evaluation report was pending at the end of the inspection period.

Notwithstanding the incorrect premise in Revision 0 of the past operability evaluation, the inspectors concluded that EC 387423 had reached a non sequitur conclusion. The evaluation stated that: "By failing to lift this valve would not have maintained the ability to perform its safety function to prevent system over-pressurization." Therefore, assuming that the relief valve was stuck closed; the correct conclusion should have been that the valve and associated piping system had been inoperable during the previous operating cycle. However, the engineers concluded that the piping system integrity was not challenged by the inoperable relief valve based on crediting manual operator actions to monitor system pressure and vent the piping system to prevent an over-pressure condition and piping failure. The design test pressure of the RHR piping system is relatively low compared to reactor coolant system pressure at full power. The engineers assumed that an over-pressure condition would only happen slowly due to leakage past an isolation valve, such that operators would have time to identify the problem and vent the piping. The engineers did not consider that an over-pressure condition could happen suddenly during an event such that operators would not have sufficient time to respond before the piping system could fail. The inspectors concluded that crediting manual operator actions to prevent system over-pressurization for an inoperable Code relief valve assumed to be stuck closed was not adequately justified in the licensee's past operability evaluation and would not be consistent with the guidance contained in NRC Regulatory Issue Summary 2005-20, "Revision to NRC Inspection Manual Part 9900 Guidance, 'Operability Determination & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety,'" Revision 1. The inspectors were further concerned that neither the independent technical reviewer nor the engineering supervisory reviewer challenged this unwarranted conclusion.

Analysis

The inspectors determined that the licensee's failure to adequately evaluate the past operability of the two ECCS relief valves was a performance deficiency warranting a significance evaluation. The inspectors reviewed the examples of minor issues in IMC 0612, "Power Reactor Inspection Reports," Appendix E, "Examples of Minor Issues," and found two examples related to this issue. Examples 3j and 3k concluded that issues are generally not considered to be of minor significance when evaluation errors result in a reasonable doubt about the operability of a system or component, or when significant programmatic deficiencies are identified that could lead to worse errors if uncorrected. Consistent with the guidance in 0612, Appendix B, "Issue Screening," the inspectors determined that the failure to correctly evaluate a degraded/nonconforming condition potentially affecting the operability of an SSC required to be operable by TS would become a more significant safety concern, if left uncorrected, and was therefore more than a minor concern, because it could reasonably result in an unrecognized condition of an SSC failing to fulfill a safety-related function. Because the ECCS is designed to respond to initiating events to prevent undesirable consequences (i.e., core damage), the inspectors concluded that this issue was associated with the Mitigating Systems Cornerstone. The inspectors performed a significance screening of this finding using the guidance provided in IMC 0609, "Significance Determination Process," Appendix A, "The SDP for Findings At-Power." In accordance with Exhibit 2, "Mitigating

Systems Screening Questions,” the inspectors determined that that this finding was a licensee performance deficiency of very low safety significance (Green) because the finding: (1) was not a design or qualification deficiency; (2) did not represent an actual loss of function of a system; (3) did not represent an actual loss of function of a single train or two separate trains for greater than its TS allowed outage time; (4) did not represent an actual loss of function of one or more non-TS trains of equipment designated as high safety significant; and (5) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

Cross-Cutting Aspects

The inspectors concluded that this finding affected the cross-cutting area of human performance. Specifically, licensee engineering staff failed to thoroughly and correctly evaluate past operability of the two ECCS relief valves due to inattention to detail. Human error prevention techniques were not appropriately employed to support human performance. The most significant concerns were that the independent technical reviewer did not independently validate information contained in the past operability evaluations by reviewing the valve test records; and, that neither the independent technical reviewer nor the engineering supervisory reviewer challenged the unwarranted past operability conclusion reached for the 1E12-F025C test failure. (IMC 0310 H.4(a)).

Enforcement

No violation of regulatory requirements was identified. This issue is considered to be a finding. **(FIN 05000461/2012004-02, Failure to Perform Adequate Past Operability Evaluations for Emergency Core Cooling System Relief Valves)**. The licensee entered this finding into its corrective action program as AR 01395971 and AR 01396723.

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

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Emergent maintenance activities during the week of July 16-20 to repair Plant Chilled Water Chillers C and E and Essential Switchgear Area Chiller Supply Valve 1SX025A;
- Planned and emergent maintenance activities during the week of August 6-10 affecting Fuel Pool Cooling Train B, Standby Gas Treatment System damper 1VG01YB, Division 2 ADS relief valve 1IA128A, and Fire Protection Carbon Dioxide System actuation;
- Emergent maintenance on September 3 -4 to troubleshoot and repair the Emergency Reserve Auxiliary Transformer; and
- Planned maintenance activities during the week of September 24 - 28 on the Division 1 DG and SX Systems.

These activities were selected based on their potential risk significance relative to the Reactor Safety Cornerstones. As applicable for each of the above activities, the inspectors reviewed the scope of maintenance work in the plant's daily schedule, reviewed Control Room logs, verified that plant risk assessments were completed as required by 10 CFR 50.65(a)(4) prior to commencing maintenance activities, discussed the results of the assessment with the licensee's Probabilistic Risk Analyst and/or Shift Technical Advisor, and verified that plant conditions were consistent with the risk assessment assumptions. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify that risk analysis assumptions were valid, that redundant safety-related plant equipment necessary to minimize risk was available for use, and that applicable requirements were met.

In addition, the inspectors verified that maintenance risk related problems were entered into the licensee's corrective action program with the appropriate significance characterization. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

This inspection constituted four maintenance risk assessment inspection samples as defined in IP 71111.13.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- AR 1384974 (EC 389727), "Part 21 on Moore 535 Controllers for Nonconforming SRAM Chip;"
- AR 01380555, "HPCS [High Pressure Core Spray] Test Return Line Hanger Damaged;"
- AR 01334761, "1VD01YA Hydramotor Coupling Disconnected;"
- AR 01311558 (EC 387423), "Evaluate Past Operability of 1E12-F025C Relief Valve Test Failure;" and
- AR 01360537, "1E22F035 HPCS Injection Line Relief Valve Leaking 1-2 dpm."

The inspectors selected these potential operability/functionality issues based on the risk significance of the associated components and systems. The inspectors verified that the conditions did not render the associated equipment inoperable or result in an unrecognized increase in plant risk. When applicable, the inspectors verified that the licensee appropriately applied TS limitations, appropriately returned the affected equipment to an operable status, and reviewed the licensee's evaluation of the issue with respect to the regulatory reporting requirements. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluation. When applicable, the inspectors also verified that the licensee appropriately assessed the functionality of SSCs that perform specified functions described in the

Updated Final Safety Analysis Report (UFSAR), Operations Requirements Manual, Emergency Plan, Fire Protection Plan, regulatory commitments, or other elements of the current licensing basis when degraded or nonconforming conditions were identified.

In addition, the inspectors verified that problems related to the operability or functionality of safety-related plant equipment were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

This inspection constituted five operability evaluation inspection samples as defined in IP 71111.15.

b. Findings

(1) Past Operability/Reportability Determination for Inoperable Division 1 DG Due to Ventilation System Damper Failure

Introduction

The inspectors opened an Unresolved Item (URI) pending determination of whether an event that rendered the Division 1 DG inoperable on March 1, 2012, was reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition which was prohibited by the plant's TS.

Discussion

On March 1, 2012, operators started the Division 1 DG for a monthly surveillance test and immediately noted a lack of expected air flow in the room from the ventilation supply fan and that the doors between the DG rooms did not have the usual high differential pressure between them. Operators secured the Division 1 DG and DG room supply fan (1VD01CA) after the engine had been running for about 45 minutes. With the ventilation fan secured, the licensee discovered that the ventilation supply damper hydramotor coupling was disconnected, causing the damper not to open (or to fail closed) when the ventilation fan started. Operators declared the Division 1 DG inoperable upon discovering the failed damper.

As discussed in Section 1R12.1.b.1 of this inspection report, the licensee completed an equipment apparent cause evaluation for the damper failure and concluded that maintenance craftsmen had failed to sufficiently tighten a locknut on the coupling when the hydramotor was replaced on September 29, 2010, due to inadequate guidance in the maintenance procedure. The Division 1 DG and DG room supply fan had last operated satisfactorily during monthly testing on January 25, 2012.

The inspectors noted that the licensee had not considered this to be a demand or run failure for the DG and had not reported the event in accordance with 10 CFR 50.73, "Licensee Event Report System," Paragraph (a)(2)(i)(B), as a condition which was prohibited by the plant's TS for an inoperable DG longer than the TS completion time for restoration. The inspectors reviewed the guidance in NUREG 1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73," Revision 2 and questioned the licensee's conclusion that the event was not reportable based on the time of discovery.

NUREG 1022, Section 3.2.2, states in part: "Generally, an operation or condition prohibited by the technical specifications existed and is reportable if surveillance testing indicates that equipment (e.g., one train of a multiple train system) was not capable of performing its specified safety functions (and thus was inoperable) for a period of time longer than allowed by technical specifications (i.e., LCO [limiting condition for operation] allowed outage time, or completion time for restoration of equipment in ISTS [Improved Standard Technical Specifications])." The guidance further states: "For the purposes of evaluating the reportability of a discrepancy found during surveillance testing that is required by the technical specifications... it should be assumed that the discrepancy occurred at the time of its discovery unless there is firm evidence, based on a review of relevant information such as the equipment history and the cause of failure, to indicate that the discrepancy existed previously." Based on the known cause of failure, it appeared to the inspectors that had there been an event involving a LOOP with a demand for the Division 1 DG to run at any time after it was last successfully tested on January 25th, the damper would have failed at that time; and, therefore the DG had been inoperable since it was last demonstrated to be operable on January 25th.

The inspectors discussed this issue with the licensee and in response to the inspectors' questions, the licensee initiated AR 01401926 to further review its past operability/reportability conclusion. This issue is considered to be an unresolved item (**URI 05000461/2012004-3, Past Operability/Reportability Determination for Inoperable Division 1 DG Due to Ventilation System Damper Failure**) pending additional review to determine whether this issue was reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition which was prohibited by the plant's TS.

(2) Evaluation of HPCS Test Return Line Pipe Support Failure

Introduction

The inspectors opened an Unresolved Item to determine whether the design basis structural analysis for primary containment penetration 1PC0033 is in conformance with ASME Section III requirements. Specifically, the design basis calculation for containment penetration 1PC0033 shows a current overstress condition (i.e., applied stress > allowable stress) for the Level D load condition. As a result, the inspectors were not able to determine if the design basis calculation was sufficient to ensure conformance with ASME Section III requirements.

Description

The inspectors reviewed operability evaluation AR 1380555, "HPCS Test Return Line Hanger Damaged," related to the licensee's reevaluation of HPCS test return line (1HP18C-12) without HPCS test return line pipe support 1HP06003G, which had failed and pieces were found by operators at the bottom of the suppression pool. The inspectors also reviewed the licensing basis analysis for containment penetration 1PC0033 (also termed 1MC0033). This penetration is a restraint for HPCS test return line (1HP18C-12) and was evaluated for the removal of pipe support 1HP06003G as well.

As described in UFSAR Section 3.8.1.5.3, the licensing basis Code of record for containment penetration 1MC0033 is ASME Section III, 1974 Edition, Subsection NE. The ASME Design Specification for piping penetration assemblies (including

containment penetrations) is DS-ME-09-CP, "Piping Penetration Assemblies Design Specification," Revision 15. ASME Design Specification DS-ME-09-CP does not define a jurisdictional boundary for the piping portion that is considered part of the containment penetration. The jurisdictional boundary of the piping that is part of the containment penetration is defined by ASME Section III, Subsection NE, which states in Section NE-1131, Part C: "All piping attached to containment vessel nozzles or to penetration assemblies out to and including the valve or valves required to isolate the system and provide a pressure boundary for the containment function. Such piping shall be designed for the intended service function and the containment function considered either independently or in combination as required by the Design Specification (NA-3250)."

The inspectors reviewed an original construction calculation (CQD-4536-IPC0033, "Penetration Stress Analysis Report for Primary Containment Penetration 1PC0033," Revision 1) that was referenced by the licensee in the operability evaluation. The calculation shows a current overstress condition (i.e., applied stress > allowable stress) for the Level D faulted load condition. The applied stresses due to the level D faulted load condition are due to pipe rupture/jet impingement plus the normal operating system pressure. The design calculation for the containment penetration was identified as nuclear safety-related (Q). UFSAR Section 3.8.1.1.3 describes the safety function of the containment penetration and UFSAR Table 3.8-5 shows the location and size of the containment penetration.

In response to the inspectors' questions regarding the current overstress condition for the containment penetration the licensee initiated AR 01418577. The licensee also initiated AR 01417729 to address the inspectors' question regarding conformance of design requirements with the ASME Code and design specification. Near the end of the inspection period, the licensee provided the inspectors additional information relevant to the containment penetration calculation determination of applied stresses due to Level D load conditions that will require additional review. Therefore, this issue is considered to be an unresolved item (**URI 05000461/2012004-4, Evaluation of High Pressure Core Spray Test Return Line Pipe Support Failure**) pending additional evaluation by the licensee and completion of inspector review to determine whether a nonconformance exists.

1R18 Plant Modifications (71111.18)

.1 Temporary Modifications

a. Inspection Scope

The inspectors reviewed the following temporary plant modification:

- EC 390386, "Isolate Sudden Pressure Relay 0AP03E-63SP to Remove Relay Function from ERAT (Emergency Reserve Auxiliary Transformer)."

The inspectors reviewed the temporary modification and the associated 10 CFR 50.59 screening/evaluation against applicable system design basis documents, including the UFSAR and the TS to verify whether applicable design basis requirements were satisfied. The inspectors reviewed the Control Room logs and interviewed engineering

and operations department personnel to understand the impact that implementation of the temporary modification had on operability and availability of the transformer.

The inspectors also reviewed a sample of action requests pertaining to temporary modifications to verify that problems were entered into the licensee's corrective action program with the appropriate significance characterization and that corrective actions were appropriate.

This inspection constituted one temporary modification inspection sample as defined in IP 71111.18.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed post-maintenance testing for the following activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- WO 1375449-01, "Coupling Replacement – 1VD01YA;"
- WO 1375928-01, "Test Bus 1A1 Main Feed Breaker Synch-Check Relay/Burnish Contact;"
- WO 1375927-03, "Operations Post Maintenance Test Parallel ERAT Source to Bus 1A1"
- WO 1564670-13, "Replace Transmitter 1LTCP364B at 1PL95JBA;" and
- Division 1 DG Maintenance Outage Window (multiple WOs).

The inspectors reviewed the scope of the work performed and evaluated the adequacy of the specified post-maintenance testing. The inspectors verified that the post-maintenance testing was performed in accordance with approved procedures; that the procedures contained clear acceptance criteria, which demonstrated operational readiness and that the acceptance criteria was met; that appropriate test instrumentation was used; that the equipment was returned to its operational status following testing; and, that the test documentation was properly evaluated.

In addition, the inspectors reviewed corrective action program documents associated with post-maintenance testing to verify that identified problems were entered into the licensee's corrective action program with the appropriate characterization. Selected action requests were reviewed to verify that the corrective actions were appropriate and implemented as scheduled.

This inspection constituted five post-maintenance testing inspection samples as defined in IP 71111.19.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the test results for the following surveillance testing activities to determine whether risk-significant systems and equipment were capable of performing their intended safety function and to verify that the testing was conducted in accordance with applicable procedural and TS requirements:

- CPS 9058.02, "RCIC [Reactor Core Isolation Cooling] /ECCS Water Leg Pump Comprehensive Test;" (LPCS/RHR A Pump) (Inservice Test)
- CPS 9080.01, "Diesel Generator 1A Operability – Manual and Quick Start Operability;" (Routine Test)
- CPS 9812.01, "Reactivity Anomaly;" and (Routine Test)
- CPS 9061.10, "Fuel Pool Cooling Valve Operability." (Inservice Test)

The inspectors observed selected portions of the test activities to verify that the testing was accomplished in accordance with plant procedures. The inspectors reviewed the test methodology and documentation to verify that equipment performance was consistent with safety analysis and design basis assumptions, and that testing acceptance criteria were satisfied.

In addition, the inspectors verified that surveillance testing problems were entered into the licensee's corrective action program with the appropriate characterization and significance. Selected action requests were reviewed to verify that corrective actions were appropriate and implemented as scheduled.

This inspection constituted two in-service tests and two routine surveillance tests for a total of four surveillance testing inspection samples as defined in IP 71111.22.

b. Findings

No findings of significance were identified.

CORNERSTONE: EMERGENCY PREPAREDNESS

1EP2 Alert and Notification System Evaluation (71114.02)

.1 Alert and Notification System Evaluation

a. Inspection Scope

The inspectors held discussions with Emergency Preparedness (EP) staff regarding the operation, maintenance, and periodic testing of the primary and backup Alert and Notification System (ANS) in the plume pathway Emergency Planning Zone. The inspectors reviewed monthly trend reports and siren test failure records from April 2010 through August 2012. Information gathered during document reviews and interviews was used to determine whether the ANS equipment was maintained and tested in accordance with Emergency Plan commitments and procedures. Documents reviewed are listed in the Attachment to this report.

The ANS evaluation inspection constituted one inspection sample as defined in IP 71114.02.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization Staffing and Augmentation System (71114.03)

.1 Emergency Response Organization Staffing and Augmentation System

a. Inspection Scope

The inspectors reviewed and discussed with plant EP staff the Emergency Plan commitments and procedures for Emergency Response Organization (ERO) on-shift and augmentation staffing levels. A sample of the EP training records, approximately 15 ERO personnel assigned to key and support positions, were reviewed to determine the status of their training as it related to their assigned ERO positions. The inspectors reviewed the ERO augmentation system and activation process, the primary and alternate methods of initiating ERO activation, unannounced off-hour augmentation tests from April 2010 through August 2012, and the provisions for maintaining the plant's ERO roster.

The inspectors reviewed a sample of corrective actions related to the facility's ERO staffing and augmentation system program and activities from April 2010 through August 2012 to determine whether corrective actions were completed in accordance with the licensee's corrective action program. Documents reviewed are listed in the Attachment to this report.

This ERO staffing and augmentation system inspection constituted one inspection sample as defined in IP 71114.03.

b. Findings

No findings of significance were identified.

1EP5 Maintenance of Emergency Preparedness (71114.05)

.1 Maintenance of Emergency Preparedness

a. Inspection Scope

The inspectors evaluated the efficacy of licensee efforts to maintain its EP programs by verifying accurate and appropriate identification of and correction of EP weaknesses during actual event critiques, drill and exercise critiques, program assessment activities including independent assessments meeting the requirements of 10 CFR 50.54(t). The inspectors also reviewed a sample of Letters of Agreement and/or Memorandums of Understanding, 10 CFR 50.54(q) plan change process and practice, licensee maintenance of equipment important to EP, records of evacuation time estimate evaluation, and Emergency Plan provisions for and maintenance of primary, backup and alternate emergency response facilities.

The inspectors reviewed a sample of EP items and corrective actions related to the licensee's EP program and activities from April 2010 through August 2012 to determine whether corrective actions were completed in accordance with the licensee's corrective action program. Documents reviewed are listed in the Attachment to this report.

This maintenance of EP inspection constituted one inspection sample as defined in IP 71114.05.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

.1 Emergency Preparedness Drill Observation

a. Inspection Scope

The inspectors evaluated the conduct of a full scale EP drill on August 21, 2012, to identify any weaknesses and deficiencies in classification, notification, and protective action recommendation development activities. This drill was planned to be evaluated and was included in performance indicator data regarding drill and exercise performance. The inspectors observed emergency response operations in the Operations Simulator and Technical Support Center to determine whether the event classification, notifications, and protective action recommendations were performed in accordance with procedures. The inspectors also attended the licensee's drill critique to compare any inspector-observed weaknesses with those identified by the licensee's staff in order to evaluate the critique and to verify whether the licensee's staff was properly identifying weaknesses and entering them into the corrective action program.

This inspection constituted one EP drill evaluation inspection sample as defined in IP 71114.06.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Drill/Exercise Performance

a. Inspection Scope

The inspectors sampled licensee submittals for the Drill/Exercise Performance Performance Indicator (PI) from the fourth quarter 2011 through second quarter 2012. The inspectors used PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, to determine the accuracy of the data reported during the period. The inspectors reviewed the licensee's records and processes including procedural guidance on assessing opportunities for the PI; assessments of PI opportunities during predesignated control

room simulator training sessions, performance during the 2011 biennial exercise, and performance during other drills associated with the PI to validate the accuracy of the submittals. The inspectors also reviewed the licensee's corrective action program database to determine if any problems had been identified with the data collected or transmitted for this PI and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one Drill/Exercise Performance PI inspection sample as defined in IP 71151.

b. Findings

No findings of significance were identified.

.2 Emergency Response Organization Readiness

a. Inspection Scope

The inspectors sampled licensee submittals for the ERO Readiness PI from the fourth quarter 2011 through second quarter 2012. The inspectors used PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, to determine the accuracy of the data reported during the period. The inspectors reviewed the licensee's records and processes including procedural guidance on assessing opportunities for the PI, performance during the 2011 biennial exercise and other drills, and revisions of the roster of personnel assigned to key ERO positions to validate the accuracy of the submittals. The inspectors also reviewed the licensee's corrective action program database to determine if any problems had been identified with the data collected or transmitted for this PI and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one ERO Readiness PI inspection sample as defined in IP 71151.

b. Findings

No findings of significance were identified.

.3 Alert and Notification System Reliability

a. Inspection Scope

The inspectors sampled licensee submittals for the ANS Reliability PI from the fourth quarter 2011 through second quarter 2012. The inspectors used PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, to determine the accuracy of the data reported during the period. The inspectors reviewed the licensee's records and processes including procedural guidance on assessing opportunities for the PI and results of periodic ANS operability tests to validate the accuracy of the submittals. The inspectors also reviewed the licensee's corrective action program database to determine if any problems had been identified with the data collected or transmitted for this PI and none were identified. Documents reviewed are listed in the Attachment to this report.

This inspection constituted one ANS Reliability PI inspection sample as defined in IP 71151.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Some minor issues were entered into the licensee's corrective action program as a result of the inspectors' observations; however, they are not discussed in this report.

This inspection was not considered to be an inspection sample as defined in IP 71152.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors reviewed repetitive or closely related issues documented in the licensee's corrective action program to look for trends not previously identified. The inspectors also reviewed action requests regarding licensee-identified potential trends to verify that corrective actions were effective in addressing the trends and implemented in a timely manner commensurate with the significance.

This inspection constituted one semi-annual trend review inspection sample as defined in IP 71152.

b. Assessment and Observations

No findings of significance were identified.

(1) Overall Effectiveness of Trending Program

The inspectors determined that the licensee's trending program was generally effective at identifying, monitoring, and correcting adverse performance trends. The inspectors reviewed several common cause and operational and technical decision making evaluations performed by the licensee to evaluate potential adverse performance and equipment trends. In general, these evaluations were performed well and identified appropriate corrective actions to address adverse trends that were identified. The

inspectors did not identify any new adverse trends that were not already identified by the inspectors or the licensee and entered into the licensee's corrective action program.

(2) Continuing Adverse Trend in Evaluating Degraded/Nonconforming Plant Conditions for Operability, Functionality and/or Reportability

The inspectors noted that an adverse trend has continued involving the licensee's evaluation of degraded/nonconforming plant conditions for operability, functionality and/or reportability. The inspectors first identified and documented this adverse trend four years ago and have since documented several findings related to this adverse performance trend. In addition, past semi-annual trend reviews documented in inspection reports in 2009, 2010, 2011 and 2012 discussed examples of deficiencies with the licensee's evaluations when degraded or nonconforming conditions were discovered. The licensee's Nuclear Oversight organization has also noted this adverse performance trend in the past and documented examples of it.

The inspectors identified several examples of poor quality evaluations as well as the absence of evaluations for degraded/nonconforming conditions during this semi-annual review period. Some of these examples were not documented because the individual issues were determined to be of minor safety significance. Examples the inspectors identified during this review period included:

- AR 01396723 – The inspectors identified that the licensee's past operability evaluation stated that relief valve 1E12-F025C had failed to lift within the allowable range and appeared to be stuck; however, the test record reflected that it lifted at 502 psig. The independent technical reviewer did not independently validate information contained in the past operability evaluation by reviewing the valve test records and neither the independent technical reviewer nor the engineering supervisory reviewer challenged the unwarranted past operability conclusion reached for the 1E12-F025C test failure. This issue was documented as a finding of very low safety significance. Refer to Section 1R12.b.2 of this inspection report.
- AR 01395971 – The inspectors identified that the past operability evaluation associated with a relief valve test failure of 1E12-F005C was performed for a different failure mode than what had actually occurred. The valve failed to lift at the correct setpoint; however, engineers incorrectly evaluated it for a failed seat leakage test. The setpoint failure was documented in AR 01314711, which contained the action to evaluate the relief valve for past operability. Refer to Section 1R12.b.2 of this inspection report.
- AR 01401926 – The inspectors identified that a detailed engineering evaluation of the Division 1 DG ventilation damper failure was not performed to determine the potential risk significance or to support the licensee's past operability / reportability conclusion. Refer to Sections 1R12.b.1 and 1R15.b.1 of this inspection report.
- AR 01394948 – The inspectors identified that the operability evaluation associated with Moore Controller Cards (EC 389727) required revision. The specified safety function as described in the TSs was not fully described and evaluated for one of the controllers.
- AR 01358080 – The inspectors identified that compensatory tornado missile shielding installed during the removal of a permanent missile barrier to support

maintenance was not performed in accordance with the approved engineering evaluation (ECR 400563). EC 388873 was then performed to address past functionality of the missile barrier until it was brought into compliance. The conclusion reached in the evaluation was that the evolution was in full compliance with ECR 400563. Later, the licensee concluded that ECR 400563 was internally inconsistent and contained a conclusion that contradicted the body of the ECR, which complicated the licensee's functionality assessment. This issue was documented as a non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," in NRC Inspection Report 05000461/2012003.

The station recently completed Common Cause Analysis (CCA) 1396921, "Perform a CCA to Analyze Technical Human Performance Issues in Engineering;" and CCA 1275199, "Trend Identified in Operability and Functionality Reviews." The licensee has implemented corrective actions to address the adverse trend based on these CCAs. The inspectors noted that while some improvements have been seen, corrective actions previously implemented by the licensee to address this adverse performance trend have not been fully effective based on the recurrence of issues and that more recent corrective actions have not been in place long enough for their full effect to be observed.

Due to the fact that examples of this adverse performance trend continue to be identified and they have been entered into the licensee's corrective action program, and that separate findings have been documented when an inadequate evaluation has risen to a more than minor significance threshold, no additional finding of significance was identified at this time.

(3) Adverse Trend in the Closure of Corrective Actions

During the review of adverse trends during this inspection period, the inspectors noted that the licensee has appropriately identified an adverse trend in the closure of corrective actions. The licensee recently performed CCA 1338428, "CA [Corrective Actions] and CAPR [Corrective Actions to Prevent Recurrence] Resolution and Closure." The evaluation completed in April of this year reviewed a population of 30 action requests that identified improper CA or CAPR closure. The evaluation concluded that two common causes existed for these issues, (i.e., lack of use of procedures and inattention to detail).

The inspectors did not observe that any significant issues were neglected in the licensee's evaluation. However, the inspectors noted that this trend was related to issues identified during the 2011 Bi-annual Problem Identification & Resolution Inspection. At the conclusion of that inspection the licensee developed and implemented a Corrective Action Program Improvement Plan with the intent to avoid consequences of procedural non-compliances and to improve the quality of corrective action program products and actions. It would appear that the consequences have not been completely avoided; however, the licensee appeared to be improving in self-identifying issues.

Examples of self identification include:

- AR 01405035 – An equipment operator identified that a control room ventilation chiller action request (AR 1369523) had been incorrectly closed to a drywell cooling system work order (WO 1509524).

- AR 01377354 – The Management Review Committee rejected closure of CA 1309522-23 due to no activity identified or documented in the closure. The committee also noted that the closure needed to identify procedural conflicts.
- AR 01347334 – Nuclear Oversight identified that CAPR 1307531-29 was closed without implementing all required specific actions.
- AR 01407405 – Nuclear Oversight identified that for over a week operators had been turning over that the procedure they were using referenced a procedure that had been replaced. No action request had been initiated to drive any corrective action for the procedure.
- AR 01416161 – Corrective work orders necessary to resolve unsafe conditions for leaking condensate polisher valves need to be completed before performing preventive maintenance tasks that continue to be scheduled.

Examples of NRC identified issues include:

- AR 01266430 – Apparent Cause Evaluation 1095413 created a CA that was ineffectively implemented. The CA had been closed to an informal document that was intended to provide clear guidance to work management on coding work orders as CAs. Work management personnel were not familiar with the guidance and the document itself could not be located without an extensive search. The original problem was documented as a finding of very low safety significance in NRC Inspection Report 05000461/ 2011004.
- AR 01197998 – On April 5, 2011, it was identified during an Exelon fleet response to the earthquake in Japan (NER 1187702) that the floor hatch for the Division 2 SX Pump Room should be staged with gasket or sealing material and located in a seismically qualified area of the Lake Screen House. The issue was closed to a work order on April 7, 2011. On September 22, 2012, during the performance of TI-187, it was identified that the hatch was not stored in an appropriate manner and the gasket was severely damaged. The inspectors noted that the work order from April 2011 was never actually scheduled nor did it describe what work was to be performed.

.3 Annual In-Depth Review Sample

a. Inspection Scope

The inspectors selected the following action request for in-depth review:

- AR 01399374, “NRC Questions CPS [Clinton Power Station] Applicability to BY [Byron] & BW [Braidwood] Issue.”

The inspectors verified the following attributes during their review of the licensee's corrective actions for the above action requests and other related action requests:

- Complete and accurate identification of the problem in a timely manner commensurate with its safety significance and ease of discovery;
- Consideration of the extent of condition, generic implications, common cause and previous occurrences;
- Evaluation and disposition of operability/reportability issues;

- Classification and prioritization of the resolution of the problem, commensurate with safety significance;
- Identification of the root and contributing causes of the problem; and
- Identification of corrective actions, which were appropriately focused to correct the problem.

The inspectors discussed the corrective actions and associated action request evaluations with licensee personnel.

This inspection constituted one annual in-depth review inspection sample as defined in IP 71152.

b. Findings and Observations

No findings of significance were identified.

.4 Annual Review of Operator Workarounds

a. Inspection Scope

The inspectors performed an in-depth review of operator workarounds and assessed the cumulative effect of existing workarounds and other operator burdens. The inspectors reviewed operator workarounds, control room deficiencies, temporary modifications and lit annunciators. The inspectors verified that operator workarounds were being identified at an appropriate threshold; that the workarounds did not adversely impact operators' ability to implement abnormal and emergency operating procedures; and, that the cumulative effect of operator burdens did not adversely impact mitigating system functions. The inspectors also reviewed action requests to verify that appropriate corrective actions were proposed or implemented in a timely manner commensurate with the significance of the issue.

This inspection constituted one annual operator workaround review inspection sample as defined in IP 71152.

b. Findings and Observations

No findings of significance were identified.

4OA5 Other Activities

.1 (Discussed) Temporary Instruction 2515/187 – Inspection of Near-Term Task Force Recommendation 2.3 – Flooding Walkdowns

On August 20, 2012, the inspectors commenced activities to verify that Clinton Power Station conducted external flood protection walkdown activities using an NRC-endorsed walkdown methodology. These flooding walkdowns are being performed at all sites in response to Enclosure 4 of a letter from the NRC to licensees entitled, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 12, 2012 (ADAMS Accession No.

ML12053A340). The results of this temporary instruction will be documented in a future inspection report.

.2 (Discussed) Temporary Instruction 2515/188 – Inspection of Near-Term Task Force Recommendation 2.3 – Seismic Walkdowns

On September 10, 2012, the inspectors commenced activities to verify that Clinton Power Station conducted seismic walkdown activities using an NRC-endorsed seismic walkdown methodology. These seismic walkdowns are being performed at all sites in response to Enclosure 3 of a letter from the NRC to licensees entitled, "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 12, 2012 (ADAMS Accession No. ML12053A340). The results of this temporary instruction will be documented in a future inspection report.

4OA6 Management Meetings

.1 Resident Inspectors' Exit Meeting

The inspectors presented the inspection results to Mr. W. Noll and other members of the licensee's staff at the conclusion of the inspection on October 11, 2012. The licensee acknowledged the findings presented. Proprietary information was examined during this inspection, but is not specifically discussed in this report.

The inspectors discussed the final significance determination for the diesel generator ventilation system damper issue with Mr. D. Kemper and other members of the licensee's staff on November 1, 2012. The licensee acknowledged the finding and significance characterization as presented.

.2 Interim Exit Meetings

Interim exit meetings were conducted for:

- The results of the EP Program inspection were discussed with Mr. W. Noll and other members of the licensee's staff at the conclusion of the inspection on September 21, 2012. No proprietary information was examined during this inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

R. Bair, Shift Operations Superintendent
K. Baker, Regulatory Assurance Manager
J. Cunningham, Operations Director
A. Darelus, Emergency Preparedness
C. Dunn, Training Director
R. Frantz, Regulatory Assurance
N. Hightower, Radiation Protection Operations Manager
M. Hintz, Nuclear Oversight
K. Leffel, Operations Support Manager
D. Kemper, Engineering Director
S. Kowalski, Senior Manager Design Engineering
S. Mohundro, Engineering Programs Manager
W. Noll, Site Vice President
S. O'Riley, Emergency Preparedness
T. Parrent, Fire Protection & IST Program Engineer
J. Peterson, Regulatory Assurance
C. Rocha, Nuclear Oversight Manager
R. Schenck, Work Management Director
D. Shelton, Operations Services Manager
J. Smith, Senior Manager Plant Engineering
T. Stoner, Maintenance Director
J. Stovall, Chemistry, Environmental & Radwaste Manager
B. Taber, Plant Manager
J. Ufert, Fire Marshall
R. Zacholski, Nuclear Oversight Lead Assessor

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000461/2012-004-01	NCV	Failure to Correctly Assemble Diesel Generator Ventilation System Damper Resulted in Inoperable Diesel Generator (Section 1R12.b.1)
05000461/2012-004-02	FIN	Failure to Perform Adequate Past Operability Evaluations for Emergency Core Cooling System Relief Valves (Section 1R12.b.2)
05000461/2012-004-03	URI	Past Operability/Reportability Determination for Inoperable Division 1 Diesel Generator Due to Ventilation System Damper Failure (Section 1R15.b.1)
05000461/2012-004-04	URI	Evaluation of High Pressure Core Spray Test Return Line Pipe Support Failure (Section 1R15.b.2)

Closed

05000461/2012-004-01	NCV	Failure to Correctly Assemble Diesel Generator Ventilation System Damper Resulted in Inoperable Diesel Generator (Section 1R12.b.1)
05000461/2012-004-02	FIN	Failure to Perform Adequate Past Operability Evaluations for Emergency Core Cooling System Relief Valves (Section 1R12.b.2)

Discussed

05000461/2012-004-02	FIN	Failure to Perform Adequate Past Operability Evaluations for Emergency Core Cooling System Relief Valves (Section 4OA2.2.b.2)
05000461/2012-004-03	URI	Past Operability/Reportability Determination for Inoperable Division 1 Diesel Generator Due to Ventilation System Damper Failure (Section 4OA2.2.b.2)
05000461/2012003-01	NCV	Failure to Ensure Tornado Missile Protection for Safety Related Components (Section 4OA2.2.b.2)
05000461/2011004-03	FIN	Failure to Correct a Condition Adverse to Quality for Improperly Implemented Engineering Corrective Actions (Section 4OA2.2.b.3)
2515/187	TI	Inspection of Near-Term Task Force Recommendation 2.3 – Flooding Walkdowns (Section 4OA5.1)
2515/188	TI	Inspection of Near-Term Task Force Recommendation 2.3 – Seismic Walkdowns (Section 4OA5.2)

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather, that selected sections of portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

1R04 Equipment Alignment

- M05-1056, "P&ID Plant Service Water (WS)," Sheet 1, Revision AS
- M05-1056, "P&ID Plant Service Water (WS)," Sheet 2, Revision AJ
- M05-1056, "P&ID Plant Service Water (WS)," Sheet 3, Revision AB
- M05-1056, "P&ID Plant Service Water (WS)," Sheet 4, Revision W
- M05-1056, "P&ID Plant Service Water (WS)," Sheet 5, Revision P
- System Health Report – Plant Service Water System, 2nd Quarter 2012, July 23, 2012
- AR 01305804, "1E42-F305 Found Partially Open With Water Leaking From Cap"
- AR 01349345, "1EH01PA: Main EHC A Compensator Locknut Loosened"
- AR 01360490, "Annunciator Switch for Jack J223 in Bay A of P850 Found Off"
- AR 01379214, "ACE 01335348 Proposed Change That May Challenge RD Design"
- AR 01251234, "Deferred FP Valve Lineup Has No Trigger to Perform in Future"
- CPS 3312.01, "Residual Heat Removal (RHR)," Revision 41
- CPS 3312.01E001, "Residual Heat Removal Electrical Lineup," Revision 17
- CPS 3312.01V001, "Residual Heat Removal Valve Lineup," Revision 17a
- M05-1075, "Residual Heat Removal," Sheet 1, Revision AW
- M05-1075, "Residual Heat Removal," Sheet 2, Revision AM
- M05-1075, "Residual Heat Removal," Sheet 3, Revision AG
- M05-1075, "Residual Heat Removal," Sheet 4, Revision AT
- CPS 3211.01, "Shutdown Service Water Valve Lineup," Revision 26e
- CPS 3211.01E001, "Shutdown Service Water Electrical Lineup," Revision 17d
- CPS 9069.03, "Shutdown Service Water Flow Path Verification," Revision 26
- M05-1052, "Shutdown Service Water (SX)," Sheet 1, Revision AW

1R05 Fire Protection

- AR 1412005, "Observation by NRC Inspector During Pre-Fire Plan Walkdown"
- CPS 1893.04M801, "M-2(a, b), 657' – 699' Screen House Div 2 & 3 SX Pump Rooms & Tunnel," Revision 6
- CPS 1893.04M003, "Pre-Fire Plan Legend," Revision 1
- CPS 1893.04M620, "737' Radwaste Building Shops & Storeroom North," Revision 8a
- CPS 1893.04M804, "699' Screen House: General Area," Revision 4
- CPS/USAR E3.7.2.3, "Fire Zone M-2c: Elevations 657' – 0" & 699' – 0" Screen House and Tunnel," Revision 13
- CPS 9601.06, "Fire Door and Secondary Containment Doors Inspections," Revision 29
- Clinton Power Station Updated Final Safety Analysis Report, Appendix E, "Fire Protection Evaluation Report – Clinton Power Station Unit 1," Revision 14
- Clinton Power Station Updated Final Safety Analysis Report, Appendix F, "Fire Protection Safe Shutdown Analysis – Clinton Power Station Unit 1," Revision 14
- OP-AA-201-009, "Control of Transient Combustible Material," Revision 11
- CPS 1893.04M106, "712 Auxiliary: Floor Drain Pump Rooms Prefire Plan," Revision 5
- CPS 1893.04M400, "712 Fuel: Basement Prefire Plan," Revision 5

1R11 Licensed Operator Regualification Program

- AR 01410414, "1GS042 Indicates Open With 1GS001 and 1GS002 Open"
- AR 01410489, "'36' Button Broken on 1H13-P680"
- AR 01410566, "During 9031.06 IV-4 Fact Closed Last 5% Instead of 10%"
- AR 01410578, "4.0 Critique of Down Power, TSV, CIV, MSIV, CV, RFPT Testing"
- AR 01410662, "4.0 Critique of Operating Crew E for Down Power Sept. 9, 2012"
- AR 01411124, "SYS MGR ID: EH 'A' Pump Discharge Relief Valve Chattering"

1R12 Maintenance Effectiveness

- Nuclear Regulatory Commission Enforcement Manual, Revision 7, October 1, 2010
- Clinton Power Station Updated Safety Analysis Report, Revision 14
- Clinton Power Station Individual Plant Examination for External Events Final Report, September 1995
- Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2 March 1997
- NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2
- NUREG/CR-6928, "Industry-Average Performance for Components and Initiating Events at U.S. Commercial Nuclear Power Plants," February 2007
- ER-AA-310, "Implementation of Maintenance Rule," Revision 8
- ER-AA-310-1001, "Maintenance Rule Scoping," Revision 4
- IST RV Failure Cause and Effect Determination Evaluation for RHR Pump C Discharge Relief Valve to Suppression Pool 1E12-F025C, June 29, 2012
- IST RV Failure Cause and Effect Determination Evaluation for Shutdown Cooling Suction Relief Valve to Suppression Pool 1E12-F005, June 28, 2012
- IST RV Failure Cause and Effect Determination Evaluation for LP Injection Header Relief Valve 1E21-F018, June 29, 2012
- IST RV Failure Cause and Effect Determination Evaluation for LPCS Pump Suction Header Relief Valve 1E21-F031, June 29, 2012
- IST RV Failure Cause and Effect Determination Evaluation for HPCS Pump Suction Header Relief Valve 1E22-F014, June 29, 2012
- EC 387323, "Evaluate Past Operability of 1E21-F031 Relief Valve Test Failure," Revisions 0
- EC 387423, "Evaluate Past Operability of 1E12-F025C Relief Valve Test Failure," Revisions 0 & 1
- EC 387433, "Evaluate Past Operability of 1E12-F005 Relief Valve Test Failure," Revisions 0 & 1
- EC 387413, "Evaluate Past Operability of 1E21-F018 Relief Valve Test Failure," Revisions 0
- EC 387329, "Evaluate Past Operability of 1E22-F014 Relief Valve Test Failure," Revisions 0
- EC 390764, "Significance Determination of 1VD01YA Damper Failure," Revision 0
- Equipment Apparent Cause Evaluation AR 01334761, "1VD01YA Hydramotor Coupling Disconnected (Division 1 DG Run)," Revision 0
- WO 01220488-01, "Rebuild/Replacement of Hydramotor 1VD01YA"
- WO 01375449-02, "1VD01YA Slippage in Linkage Coupling"
- CPS 4200.01, "Loss of AC Power," Revision 21
- CPS 3506.01, "Diesel Generator and Support Systems," Revision 35
- CPS 8452.04, "AH91/NH91 Hydramotor Actuator Maintenance," Revision 13
- Control Room Logs, March 1, 2012
- AR 01311558, "1E12F025C: Relief Valve Valve Failed Testing"
- AR 01314711, "1E12F005: Valve Failed Set Pressure"

- AR 01311553, "1E21F018: Relief Valve Failed Seat Leakage"
- AR 01309821, "1E21F031: Failed Seat Leakage Test"
- AR 01309829, "1E22F014: Valve Failed Lift Set Pressure"
- AR 01344843, "Work Order Needed for Relief Valve Failure Analysis"
- AR 01395971, "1E12F005: NRC ID: EC Evaluated Wrong Problem Statement"
- AR 01396723, "NRC Questions EC 387423 for Relief Valve 1E12-F025C"
- AR 01334761, "1VD01YA Hydramotor Coupling Disconnected (Division 1 DG Run)"
- AR 01398169, "Procedure Enhancement to 8452.04 and 8452.05"
- AR 01392581, "1VD01YA Damper Shaft Keyway Minor Slippage"
- AR 01120226, "1VD01YA: Slippage in Linkage Coupling"
- AR 01335005, "Linear Converter Pinion Gear Showing Possible Signs of Wear"
- AR 01417127, "Informal Benchmarking Request: Hydramotor Failures"
- Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2 March 1997
- NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 2
- ER-AA-310, "Implementation of Maintenance Rule," Revision 8
- ER-AA-310-1001, "Maintenance Rule Scoping," Revision 4
- ER-AA-310-1003, "Maintenance Rule Performance Criteria Selection," Revision 3
- ER-AA-310-1005, "Maintenance Rule – Dispositioning Between A(1) and A(2)," Revision 5
- ER-AA-310-1007, "Maintenance Rule – Periodic (a)(3) Assessment," Revision 4
- 10CFR 50.65 (a)(3) Periodic Assessment of Maintenance Rule Program, March 1, 2008 – March 1, 2010; May 27, 2010
- 10CFR 50.65 (a)(3) Periodic Assessment of Maintenance Rule Program, March 1, 2010 – March 1, 2012; August 16, 2012
- AR 00805836, "NOS ID'D Maintenance Rule (a)(3) Periodic Assessment Overdue"
- AR 00831349, "Clinton MRule A(3) Not Completed Within Allowable Timeframe"
- AR 01254499, "SY System Exceeds Maintenance Rule Reliability Criteria"
- AR 01375937, "NOS ID: Declining Performance Trend in Programs Engineering"
- AR 01401405, "2012 (a)(3) Maintenance Rule Assessment Report Approval Overdue"

1R13 Maintenance Risk Assessments and Emergent Work Control

- ER-AA-600, "Risk Management," Revision 6
- ER-AA-600-1012, "Risk Management Documentation," Revision 9
- ER-AA-600-1042, "On-Line Risk Management," Revision 7
- WC-AA-101, "On-Line Work Control Process," Revision 18
- WC-AA-104, "Integrated Risk Management," Revision 18
- CPS 3506.01C007, "Checklist to Extend 72 Hour LCO Action to 14 Day LCO for Diesel Generators (ITS 3.8.1.B.4 Bases)," Revision 0
- Coordination Plan for Division 1 EDG/SX System Outage Window (SOW), September 24, 2012
- Clinton Power Station Technical Specifications
- ODM 01408282, "Emergency Reserve Auxiliary Transformer (ERAT) Tripped During Troubleshooting of a Ground on DC MCC 1F"
- Control Room Logs, September 2-3, 2012
- Event Notification 48269, "Transfer of Emergency Reserve Auxiliary Transformer Isolating Fuel Pool Cooling and Cleanup System, and Fuel Building Ventilation System," September 3, 2012
- AR 01409380, "Board Level Thermal Affects Noted on Qualitrol Card for ERAT"
- AR 01408952, "ERAT Single Point Vulnerability"

- AR 01408547, "VCB 302 Failed to Remain Closed"
- AR 01408472, "ERAT (0AP03E) Latent Design Error Identified"
- AR 01408332, "ERAT Circuit Switcher B018 Phases Remain Closed After Trip"
- AR 01408282, "ERAT and ERAT SVC Tripped"
- AR 01408186, "1DC17E: 5012-8B Ground 125V DC MCC 1F"
- AR 01408098, "1DC16E: 115V Ground on DC MCC 1E"
- AR 01417737, "Look-ahead on Use of Mixing Compressor with Division 1 DG System Outage Window"
- OP-AA-102-104, "Pertinent Information Program," Revision 1
- WC-CL-201, "Contingency Planning," Revision 1
- Work Week 1233 Contingency Plan, "FC 'B'," August 2, 2012
- CPS 9071.13, "Fire Protection Diesel Generator Bay 1B CO2 System Auto Actuation Test," Revision 2e
- Work Order 01364181-01, "9071.13R20 Op Fire Protection CO2 System Auto Actuation (Div II DG)," August 9, 2012

1R15 Operability Evaluations

- AR 1360537, "1E22F035 HPCS Inj. Line Relief Valve Leaking Externally 1-2 DPM"
- CPS/USAR 6.3.2.2.1, "High Pressure Core Spray (HPCS) System," Revision 11
- ER-AA-2003, "System Walkdown of High Pressure Core Spray – HPCS," 6/4/2012
- IR 1360537, "Rework Investigation of 1E22F035 HPCS Inj. Line relief Valve Leaking 1-2 DPM"
- GE 762E454, "High Pressure Core Spray," Revision F
- M05-1074, "P&ID High Pressure Core Spray (HP)," Revision AH
- Clinton Power Station Technical Specifications
- Clinton Power Station Updated Final Safety Analysis Report, Revision 14
- NRC Regulatory Issue Summary 2005-20, "Revision to NRC Inspection Manual Part 9900 Technical Guidance, 'Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety,'" Revision 1
- NUREG 1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73," Revision 2
- American Society of Mechanical Engineers (ASME) Boiler & Pressure Vessel Code, Section III, 1974 Edition, Subsection NE
- EC 389727, "Part 21 on Moore 535 Controllers for Nonconforming SRAM Chip," Revisions 0 and 1
- CQD-4536-IPC0033, "Penetration Stress Analysis Report for Primary Containment Penetration 1PC0033," Revision 1
- DS-ME-09-CP, "Piping Penetration Assemblies Design Specification," Revision 15
- AR 01384974, "Update to Moore Controller Part 21"
- AR 01394948, "NRC ID: Update to Operability Evaluation EC 389727"
- AR 01401926, "Questions Regarding Past Operability of EDG Ventilation System"
- AR 01334761, "1VD01YA Hydramotor Coupling Disconnected (Division 1 DG Run)"
- AR 1380555, "HPCS Test Return Line Hanger Damaged"
- AR 01417591, "Questions Re: Division 1 DG Ventilation Damper 1VD01YA Failure"
- AR 01417729, "NRC Containment Penetration Design Question"
- AR 01418557, "NRC Penetration Calculation Question"
- AR 01418472, "Calculation SDQ10-94DG05-1RH28001G Shows Member IC of 1.04"
- Operability Evaluation 1380555-02, "HPCS Test Return Line Hanger Damaged," Revision 0
- ASME Code Section III, Division 1- Article F-1000 Subsection NA, 1974
- AR 01380555, "HPCS Test Return Line Hanger Damaged"

1R18 Plant Modifications

- Event Notification #48269, "ERAT Trip and Lockout," September 22, 2012
- CC-AA-112, "Temporary Configuration Changes," Revision 17
- Operational Decision Maker 1408282, "ERAT and ERAT SVC Tripped," September 3, 2012
- Adverse Condition Monitoring Plan 1408282-08, "Monitor LED Trip Indicator on 63SPX," September 14, 2012
- EC 390386, "Isolate Sudden Pressure Relay 0AP03E-63SP to Remove Relay Function from ERAT," Revision 0
- 10 CFR 50.59 Screening Number CL-2012-S-030, Revision 0
- Work Order 01570010-03, "Install Temporary Modification to Isolate Sudden Pressure Relay 63SP," September 3, 2012
- AR 01408282, "ERAT and ERAT SVC Tripped"
- AR 01408332, "ERAT Circuit Switcher B018 Phases Remain Closed After Trip"

1R19 Post-Maintenance Testing

- WO 1375928, "Test Bus 1A1 Main Feed Breaker Synch-Check Relay/Burnish Contact"
- CPS 9080.27, "Unit Power Supply Manual Transfer Operability," Revision 1
- AR 01376343, "Scheduled Work Impacts Response to Byron Event Comp Actions"
- OP-AA-102-104, "Pertinent Information Program," Revision 2
- Standing Order 2012-05, "Byron Identified Single Open Phase Issue"
- EC 387664, "Byron Open-phase Issue Operability Evaluation," Revision 0
- WO 01564670-12, "Bench Test New SMART Transmitter 1LTCP364B"
- WO 01564670-13, "Replace Transmitter 1LTCP364B at 1PL95JBA"
- WO 01572392-01, "9080.01A22 DG 1A Operability – Monthly Test"
- WO 01425860-01, "Clean and Inspect Division 1 Generator and Exciter"
- WO 01539002-01, "Install EC 383490 Division 1 EDG Control Enhancements"
- WO 01426777-01, "Calibrate Time Delay Relays"
- WO 01429183-01, "9080.30A20 DG 1A Overspeed Trip Test"
- WO 01320157-01, "Replace K3, K4, K10, K13, K16, K18, K22, K25, K43 & K44"
- AR 01415458, "New SMART Transmitter Would Not Calibrate"
- AR 01416169, "1CP005B Would Not Open on Demand Signal"
- AR 01418898, "1DG01KA16: Cold Oil Leak Around Coolant Pipe"
- AR 01419127, "EOID Division 1 DG Lockout Relays Failed to Trip on Overcrank"
- AR 01419059, "Fuel Oil Weeping from 16 Cylinder Fuel Oil Strainer"
- AR 01419482, "Bad Bearing in Governor to Control Rod Lever Assembly"
- AR 01419468, "Engine 1 Fuel Filter Restricted Alarmed Momentarily"
- CPS 9080.27, "Unit Power Supply Manual Transfer Operability," Revision 1
- WO 01375927-03, "OP PMT Parallel ERAT Source to 1A1," September 14, 2012
- AR 01413157, "Synch Check Relay As Found Testing Unsat"
- AR 01413213, "1AP07EH 225-221A1 Synch Check Relay AF Test Time Unsat"

1R22 Surveillance Testing

- Clinton Power Station Technical Specifications
- Clinton Power Station Updated Final Safety Analysis Report, Revision 14
- Clinton Nuclear Power Station Unit 1, "Inservice Testing Program Plan – Third Ten Year Interval," Revision 3

- American Society of Mechanical Engineers / American National Standards Institute (ASME/ANSI) Code for Operation and Maintenance of Nuclear Power Plants (OM), 2004 Edition
- NUREG 1482, "Guidelines for Inservice Testing at Nuclear Power Plants," Revision 1
- EC 388342, "Develop/Provide Comprehensive Pump Test Criteria to Operations ECCS Water Leg Pumps (AR 01131937)," Revision 2
- IST-CPS-BDOC-V-14, "Clinton Inservice Testing Program Bases Document - Low Pressure Core Spray System Third Interval," Revision 5
- IS-1073-C, "Inservice Inspection Schematic Low Pressure Core Spray (LP) System," Revision D
- CPS 9061.10, "Fuel Pool Cooling Valve Operability," Revision 46
- CPS 9061.10D001, "Fuel Pool Cooling Valve Operability," Revision 40d
- CPS 9812.01, "Reactivity Anomaly," Revision 30
- CPS 9812.01C001, "Reactivity Anomaly Checklist," Revision 28a
- CPS 9058.02, "RCIC/ECCS Water Leg Pump Comprehensive Testing," Revision 1
- CPS 9058.02D001, "RCIC/ECCS Water Leg Pump Comprehensive Testing Datasheet," Revision 0
- CPS 9058.02, "RCIC/ECCS Water Leg Pump Comprehensive Testing," Revision 1
- CPS 9058.02D001, "RCIC/ECCS Water Leg Pump Comprehensive Testing Datasheet," Revision 0
- CPS 9069.01D001, "SX System Operability Data Sheet," Revision 45a
- WO 01412589-01, "1E21-C002 LPCS/RHR A Water Leg Comprehensive Pump Test"
- WO 01421679-03, "9069.01C20 Operations SX Pump Operability Test (SX Pump C)," July 18, 2011
- WO 01490874-01, "Reactor Engineering 9812.01 Verify Reactivity Anomaly"
- WO 01518373-01, "Reactor Engineering 9812.01 Verify Reactivity Anomaly"
- WO 01550079-01, "Reactor Engineering 9812.01 Verify Reactivity Anomaly"
- WO 01553524, "Fuel Pool Cooling Pump 1A and 1B Valve Testing," September 25, 2012
- AR 00924603, "1FC004A: FC Surge Tank High Level"
- AR 01253235, "NRC Question WO Extension of 1FC004B Replacement"
- AR 01408944, "NRC Question Re: Gauge Calibration"
- AR 01418153, "1FC02PA: FC A Flow Test 9061.10 was Delayed"

1EP2 Alert and Notification System Testing (71114.02)

- Off-Site Emergency Plan Alert and Notification System Addendum for the Clinton Power Station; November 2009
- Siren Testing and Maintenance Data; April 2010 through August 2012
- Emergency Planning for the Clinton Area 2012/2013 Mailer
- Emergency Planning for the Clinton Area 2011/2012 Mailer

1EP3 Emergency Response Organization Staffing and Augmentation System (71114.03)

- EP-AA-112-100-F-06; Midwest ERO Notification or Augmentation; Revision 0
- EP-AA-112-200-F-02; TSC Director Checklist; Revision N
- EP-AA-112-300-F-01; OSC Director Checklist; Revision J
- TQ-AA-113; ERO Training and Qualification; Revision 20
- March 3, 2012, Call-In Augmentation Drill Results
- May 31, 2012, Call-In Augmentation Drill Results
- November 22, 2011, Call-In Augmentation Drill Results
- September 26, 2011, Call-In Augmentation Drill Results

- June 27, 2011, Call-In Augmentation Drill Results
- March 16, 2011, Call-In Augmentation Drill Results
- EP Newsletter #5-12s Alternate ERO Staging Area; May, 2012
- License Agreement to Use Property of Maroa Fire Department for Exelon Emergency Response Staging Area; February 8, 2011

1EP5 Maintenance of Emergency Preparedness (71114.05)

- EP-AA-1000; Standardized Radiological Emergency Plan; Revision 21
- EP-AA-1003; Radiological Emergency Plan Annex for Clinton Power Station; Revision 20
- EP-AA-112-F-09; Emergency Public Address Announcements; Revision C
- EP-AA-113; Personnel Protective Actions; Revision 11
- LS-AA-120; Issue Identification and Screening Process; Revision 14
- LS-AA-125; Corrective Action Program Procedure; Revision 17
- Emergency Preparedness New Rule Project Update; January 23, 2012
- Clinton 2011 NRC Graded Exercise Evaluation Report; November 2, 2011
- Clinton 2011 Pre-Exercise Evaluation Report; October 5, 2011
- Clinton 2012 Off-Year Exercise Evaluation Report; May 16, 2012
- Clinton Unusual Event Declaration Report; January 20, 2012
- P2I-1; Offsite Agency Interface; 2010
- P2I-1; Offsite Agency Interface; 2011
- AR 01192334; Admin Building Gaitronics Speakers Not Included In Surveillance
- AR 01234030; TSC Ventilation Testing
- AR 01273293; Air Samplers Missing From Field Team Storage
- AR 01287809; Drill, Scenario Flawed With Expected EAL Classification
- AR 01298768; Loss Of Off-Site Voice And Data Communications
- AR 01307258; NOUE, ENS Notification Of NRC Timeliness Issue
- AR 01319648; Primary MET Tower Erratic
- AR 01367462; Drill, Gaitronics Volume Low Affecting On-Site Worker Notification
- AR 01367704; Drill, Public Address System Issue And Required Announcements Not Made
- AR 01370400; Drill, Core Damage Assessment Issue
- AR 01380731; Extreme Damage Event Response Issue
- AR 01414975; ANS Commitment Disagreement Between Emergency Plan and FEMA Design Report

4OA1 Performance Indicator Verification (71151)

- EP-AA-125-1001; EP Performance Indicator Guidance; Revision 7
- EP-AA-125-1002; ERO Performance - Performance Indicators Guidance; Revision 8
- EP-AA-125-1003; ERO Readiness - Performance Indicators Guidance; Revision 7
- DEP Opportunities; Fourth Quarter 2011 through Second Quarter 2012
- ERO Personnel Participation; Fourth Quarter 2011 through Second Quarter 2012
- Siren System Availability Test Records; Fourth Quarter 2011 through Second Quarter 2012

4OA2 Identification and Resolution of Problems

- Common Cause Analysis #1275199, "Trend Identified in Operability and Functionality Reviews," November 8, 2011
- Common Cause Analysis #1332716, "CCA on NRC Findings and Violations," March 28, 2012
- Common Cause Analysis #1338428, "CA and CAPR Resolution and Closure," April 2, 2012

- Common Cause Analysis AR 01396921-02, "Perform a Common Cause Analysis to Analyze Technical Human Performance Issues in Engineering"
- Clinton Site Engineering Policy Statement #25, "Technical Product Pre-Job Brief Supplement," May 15, 2012
- LS-AA-125, "Corrective Action Program (CAP) Procedure," Revision 15
- LS-AA-125-1005, "Coding and Analysis Manual," Revision 8
- OP-AA-102-103, "Operator Work-Around Program," Revision 3
- OP-AA-102-103-1001, "Operator Burden and Plant Significant Decisions Impact Assessment Program," Revision 4
- OP-AA-102-106, "Operator Response Time Program," Revision 0
- FirstQuarter 2012 Coding and Analysis Report
- Second Quarter 2012 Coding and Analysis Report
- Standing Order 2012-001, "Downpower Actions for Main EHC," January 5, 2012
- Work Order 00801131-01, "Replace Packing 1FC004B," August 15, 2006
- AR 01309050, "MCR Deficiency Performance Indicator In Variance"
- AR 01310807, "New Standing Order Requires Operator Work Around/Challenge"
- AR 01352184, "WO Taken to Completed Without Repairs Completed"
- AR 01388807, "MCR Received Unexpected Alarms 5065-8A, D2 Safety Assoc ATM"
- AR 01214229, "NRC Observation From UHS and Gas Void Inspection on Technical Rigor"
- AR 01228501, "EFR For IR 1025446-41 Rejected During Engineering Collegial Review"
- AR 01232770, "Clinton Power Station Dissatisfied With CAP Performance"
- AR 01266034, "EFR Cancelled Incorrectly"
- AR 01290950, "Employee Not Writing IRs with Enough Frequency"
- AR 01292317, "NOS ID: Deficiencies Not Entered in CAP"
- AR 01324420, "Gaps in Engineering Technical Evaluations"
- AR 01336705, "Effectiveness Reviews Found Ineffective Corrective Action"
- AR 01338428, "MRC Identified Trend"
- AR 01347334, "NOS ID: CAPR Resolution Does Not Implement All CAPR Actions"
- AR 01368946, "NRC Report 2012002: Trend in Degraded/Nonconforming Evals"
- AR 01374718, "Root Cause CAPR Determined Not To Be Effective"
- AR 01371145, "CPS Work Management System Ineffective on Repeat Issues"
- AR 01377354, "Closure of CA 1309522-23 Rejected by MRC"
- AR 01382882, "NOS ID CCA Needed for Aggregate OPS Outage Performance"
- AR 01394948, "NRC ID: Update to Op Eval/EC 389727"
- AR 01395971, "1E12F005: NRC ID: EC Evaluated Wrong Problem Statement"
- AR 01396723, "NRC Questions EC 387423 for Relief Valve 1E12-F025C"
- AR 01396921, "Perform a CCA to Analyze THU Issues in Engineering"
- AR 01405035, "EOID: VC IR #1369523 Incorrectly Closed to VP WO #1509524"
- AR 01407405, "NOS ID: OPS Not Using CAP to Drive Needed Procedure Change"
- AR 01416161, "Ineffective Corrective Actions – 1CPCEV5 Work"

LIST OF ACRONYMS USED

ADAMS	Agency-wide Documents and Management System
ANS	Alert and Notification System
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
AR	Action Request
BW	Braidwood
BWR	Boiling Water Reactor
BY	Byron
CA	Corrective Action
CAP	Corrective Action Program
CAPR	Corrective Actions to Prevent Recurrence
CCA	Common Cause Analysis
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CNO	Chief Nuclear Officer
CPS	Clinton Power Station
Δ	Delta
DEP	Drill/Exercise Performance
DG	Diesel Generator
EC	Engineering Change
ECR	Engineering Change Request
ECCS	Emergency Core Cooling System
EP	Emergency Preparedness
ERAT	Emergency Reserve Auxiliary Transformer
ERO	Emergency Response Organization
GE	General Electric
HVAC	Heating, Ventilation and Air Conditioning
HPCS	High Pressure Core Spray
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IPEEE	Individual Plant Examination for External Events
IST	Inservice Testing
ISTS	Improved Standard Technical Specifications
LCO	Limiting Condition for Operation
LERF	Large Early Release Frequency
LOOP	Loss of Offsite Power
LP	Low Pressure
LPCS	Low Pressure Core Spray
MRC	Management Review Committee
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
PARS	Publicly Available Records
PI	Performance Indicator
PSIG	Pounds per Square Inch Gauge
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
SBO	Station Blackout
SDP	Significant Determination Process

SOW	System Outage Window
SPAR	Standardized Plant Analysis Risk
SRA	Senior Reactor Analyst
SSCs	Systems, Structures, and Components
SX	Shutdown Service Water
TBD	To Be Determined
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
WO	Work Order
WS	Plant Service Water

M. Pacilio

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Sincerely,

/RA/

Mark A. Ring, Branch Chief
Branch 1
Division of Reactor Projects

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