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

May 4, 2016

Mr. Bryan C. Hanson
Senior Vice President, Exelon Generation Company, LLC
President and Chief Nuclear Officer (CNO), Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: R. E. GINNA NUCLEAR POWER PLANT - COMPONENT DESIGN BASES INSPECTION REPORT 05000244/2016007

Dear Mr. Hanson:

On April 7, 2016 the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the R. E. Ginna Nuclear Power Station. The enclosed inspection report documents the inspection results, which were discussed on April 7, 2016, with Mr. William Carsky, Plant General Manager, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. In conducting the inspection, the team examined the adequacy of selected components to mitigate postulated transients, initiating events, and design basis accidents. The inspection involved field walkdowns, examination of selected procedures, calculations and records, and interviews with station personnel.

No findings were identified.

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 available electronically for public inspection in the NRC Public Docket Room or from the Publicly Available Records component of NRC's document system, Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (Public Electronic Reading Room).

Sincerely,

/RA/

Brian W. Smith, Acting Deputy Director
Division of Reactor Safety

Docket No. 50-244
License No. DPR-18

Enclosure:
Inspection Report 05000244/2016007
w/Attachment Supplemental Information

cc w/encl Distribution via ListServ

Letter to Bryan C. Hanson from Brian W. Smith dated May 4, 2016

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	50-244
License No:	DPR-18
Report No:	05000244/2016007
Licensee:	Exelon Generation Company, LLC (Exelon)
Facility:	R.E. Ginna Nuclear Power Plant, LLC (Ginna)
Location:	Ontario, New York
Inspection Period:	March 7 through April 7, 2016
Inspectors:	K. Mangan, Senior Reactor Inspector, Division of Reactor Safety Team Leader, (DRS) S. Pindale, Senior Reactor Inspector, DRS D. Orr, Senior Reactor Inspector, DRS M. Orr, Reactor Inspector, DRS W. Sherbin, NRC Mechanical Contractor S. Gardner, NRC Electrical Contractor
Approved By:	Brian W. Smith, Acting Deputy Director Division of Reactor Safety

SUMMARY

IR 05000244/2016007; 3/7/2016 – 4/7/2016; R. E. Ginna Nuclear Power Plant; Engineering Team Inspection.

The report covers the Component Design Bases Inspection conducted by a team of four U.S. Nuclear Regulatory Commission (NRC) inspectors and two NRC contractors. No findings were identified. 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.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R21 Component Design Bases Inspection (IP 71111.21)

.1 Inspection Sample Selection Process

The team selected risk significant components for review using information contained in the R. E. Ginna Nuclear Power Plant (Ginna) Probabilistic Risk Assessment (PRA) and the U.S. Nuclear Regulatory Commission's (NRC) Standardized Plant Analysis Risk (SPAR) model for Ginna. Additionally, the team referenced the Risk-Informed Inspection Notebook for Ginna in the selection of potential components for review. In general, the selection process focused on components that had a risk achievement worth (RAW) factor greater than 1.3 or a risk reduction worth (RRW) factor greater than 1.005. The components selected were associated with both safety-related and non-safety related systems and included a variety of components such as pumps, transformers, operator actions, electrical busses, and valves.

The team initially compiled a list of components based on the risk factors previously mentioned. Additionally, the team reviewed the previous component design bases inspection (CDBI) reports (05000244/2007006, 05000244/2010009, and 05000244/2013007) and excluded those components previously inspected. The team then performed a margin assessment to narrow the focus of the inspection to 18 components and 2 operating experience (OE) items. The team selected two components, containment air recirculation fan and the excess letdown heat exchanger, based on large early release frequency (LERF) implications. The team's evaluation of possible low design margin included consideration of original design issues, margin reductions due to modifications, or margin reductions identified as a result of material condition/equipment reliability issues. The assessment also included items such as failed performance test results, corrective action history, repeated maintenance, Maintenance Rule (a)(1) status, operability reviews for degraded conditions, NRC resident inspector insights, system health reports, and industry OE. Finally, consideration was also given to the uniqueness and complexity of the design and the available defense-in-depth margins. The inspection performed by the team was conducted as outlined in NRC Inspection Procedure (IP) 71111.21. This inspection effort included walkdowns of selected components; interviews with operators, system engineers, and design engineers; and reviews of associated design documents and calculations to assess the adequacy of the components to meet design basis, licensing basis, and risk-informed beyond design basis requirements. Summaries of the reviews performed for each component and OE sample are discussed in the subsequent sections of this report. Documents reviewed for this inspection are listed in the Attachment.

.2 Results of Detailed Reviews

.2.1 Results of Detailed Component Reviews (18 samples)

.2.1.1 Power Operated Relief Valve (PORV 430)

a. Inspection Scope

The team inspected the power operated relief valve (PORV430), to determine whether the valve could respond to design basis events as assumed in the design basis documents and the Ginna PRA evaluation. The team reviewed the Updated Final Safety Analysis Report (UFSAR), technical specifications (TS), and applicable plant calculations to identify the design bases and operating requirements for the PORV. The team examined records of surveillance testing and maintenance activities, and applicable corrective actions to verify that potential degradation or low margin design issues were being monitored, prevented or corrected. Additionally, the team reviewed operating and off-normal response procedures to determine whether the design basis requirements and PRA assumptions had been adequately translated into procedures and instructions. The team also reviewed station emergency operating procedures for a postulated design event to verify that PORV use and operation would be consistent with accident analysis assumptions evaluated in the UFSAR. The team reviewed PORV pneumatic accumulator stress calculations and sizing calculations, along with accumulator leak rate testing, to verify that the support function provided to the PORV by the accumulator was consistent with design requirements. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Exelon's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.2 "C" Service Water Pump (PSW01C)

a. Inspection Scope

The team inspected the "C" service water (SW) pump, PSW01C, to evaluate if it was capable of performing its design basis functions. Specifically, the team evaluated whether the SW pump provided adequate flow so that the SW system was capable of transferring the maximum heat loads from plant primary and secondary heat sources to the environment. The team reviewed applicable portions of the UFSAR, and drawings to identify the design basis requirements for the pump in order to evaluate whether the pump capacity was sufficient to provide adequate flow to the safety-related components supplied by the SW system during design basis accidents. The team reviewed design calculations to assess available pump net positive suction head (NPSH), submergence requirements, worst case pump run-out conditions, and to evaluate the capability of the pump to provide required flow to supplied components under design basis conditions.

The team also reviewed the internal flooding analysis performed for the SW intake structure to evaluate if all potential flooding sources had been properly evaluated. The team reviewed the SW pump in-service test (IST) results and SW system flow verification tests to determine if adequate system flow was available. Specifically, the team reviewed pump data trends for vibration, pump differential pressure, and flow rate test results to verify acceptance criteria were met and acceptance limits were adequate. The team interviewed the system and design engineers as well as maintenance staff who supported walkdowns of the pump to evaluate its material condition and assess the pump's operating environment. The team reviewed the condition of SW pump motor supply cables from the emergency diesel generator and associated corrective actions taken by Exelon to address adverse conditions to determine whether the cable's operating conditions were acceptable and Exelon's cable monitoring program adequately monitored the cables for potential degradation. The team also reviewed the motor starting characteristics and electric bus breaker response characteristics under worst case conditions to ensure the "C" SW pump motor breaker would not inadvertently trip during accident mitigation. Additionally, recent pump bay inspections were reviewed to assess the material condition of the underwater intake area and pump column seismic supports. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Exelon's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.3 Air Operated Valve (LCV-112B)

a. Inspection Scope

The team inspected the reactor water storage tank (RWST) makeup air operated valve (AOV), LCV-112B, to determine whether the valve was capable of meeting its design basis function. Specifically, the team determined whether the valve would reposition as required to provide an emergency supply of water from the RWST to the charging pumps' suction. The team reviewed the UFSAR, PRA notebook, and the IST basis documents to identify the design basis and operating requirements for the valve. The team reviewed drawings, operating and maintenance procedures, and completed maintenance records to determine whether the valve function was being maintained. The team reviewed valve testing procedures and IST results, including stroke time, to verify acceptance criteria were adequate and that performance was not degrading. The team discussed design, operation, permanent modifications, and component history of the valves with engineering and operations staff to evaluate performance history and overall component health. The team also conducted a walkdown of the valve to assess its material condition and to verify the installed configuration was consistent with plant drawings, procedures, and the design basis. Finally, the team reviewed corrective action documents to verify Exelon was identifying and correcting issues with the valve, and to verify there were no adverse trends.

b. Findings

No findings were identified.

.2.1.4 Auxiliary Feedwater Suction Source Alignment (Operator Action)

a. Inspection Scope

The team inspected the manual operator actions to establish alternate sources of suction water to the auxiliary feedwater (AFW) and standby AFW (SAFW) pumps in response to a loss of the normal (preferred) condensate supply. Specifically, the team reviewed Exelon's actions to align either the fire water, city water, service water, and demineralized water systems to supply water to the AFW/SAFW pump suctions; and reviewed the capability of these systems to supply required water inventory and required pressures. The team reviewed Ginna's PRA and human reliability analysis (HRA) studies to determine when and how quickly operator actions were needed to provide the alternate AFW/SAFW supply to meet PRA success assumptions. The team interviewed station personnel, reviewed associated operating and alarm response procedures, walked down applicable portions of the affected systems in the plant, performed a table-top review using procedures and drawings, and reviewed documentation of evaluated (timed) evolutions to assess the ability of the operators to perform the required actions. The team also reviewed associated system design documents to determine whether design bases were appropriately evaluated and incorporated into these system alignments. The team evaluated the available process margins based on fluid pressures and flow rates, component design values, and limiting operational parameters established in engineering analyses and calculations. The team compared the available margins to the predicted or assumed margins in engineering analysis and calculations to verify the reasonableness of the design and operating values. Finally, the team reviewed corrective action documents to determine whether there were any adverse operating trends and to assess Exelon's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.5 Control Room Emergency Air Treatment System (CREATS Train B)

a. Inspection Scope

The team inspected the control room emergency air treatment system, "B" CREATS, to determine whether the system was capable of meeting design basis requirements. The team reviewed the UFSAR, TSs, drawings, supporting calculations and procedures to identify the design basis requirements of the system. The team reviewed recently completed charcoal adsorber sample tests to ensure the capability of the filtration equipment had been maintained. The team discussed the design, operation, and maintenance of the CREATS with the engineering staff to gain an understanding of the performance history, maintenance and overall health of the fan and other system components.

The team also evaluated the design analyses and testing of the CREATS fresh air damper isolation controls credited to isolate the influx of fresh air in case of a toxic gas release. Specifically, the team evaluated the available time margins to perform the damper isolation actions to determine whether Exelon's damper stroke time test procedure acceptance criteria were adequate. Additionally, the electrical data for the "B" CREATS components, degraded voltage conditions, and voltage drop calculation results were reviewed to confirm that "B" CREATS would have sufficient voltage and power available to perform its safety function at degraded voltage conditions and the associated electrical breakers would not inadvertently trip during accident mitigation. The team interviewed licensed operators, observed a walkthrough of the procedure and reviewed associated alarm response procedures to assess the likelihood of cognitive or execution errors. The team also reviewed control room heat-up calculations to determine heat-up rates while in each CREATS alignment to ensure adequate ventilation to supplied equipment. The team performed field walkdowns to independently assess the material condition of the system and to verify that the system configuration was consistent with the design basis assumptions, system operating procedures, and plant drawings. Finally, the team reviewed corrective action documents to determine if there were any adverse trends associated with the system components and to assess Exelon's capability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.6 "A" Containment Recirculation Fan Cooler Unit

a. Inspection Scope

The team inspected the "A" containment recirculation fan cooler (CRFC) unit and associated cooler to determine whether the system was capable of meeting the design basis function. Specifically, the team evaluated if the unit was capable of removing heat from the containment during certain design basis events. The team reviewed drawings, calculations, hydraulic analyses, and containment analysis to determine the CRFC fan design and licensing bases requirements. The team evaluated if Exelon ensured, through testing and flow balance measurements of the SW system, the cooling water flow needed to meet accident heat removal requirements were being met for the CRFC unit. The team also reviewed fan flow test results to determine whether the fan was capable of meeting air flow requirements assumed in the containment analysis. The team verified that the CRFC fan surveillance testing was performed consistent with TS requirements. The team reviewed piping and instrument diagrams associated with containment ventilation and the service water system to ensure all components of the CRFC unit were appropriately included in a test or maintenance program. Finally, the team reviewed corrective action documents and system health reports and interviewed system and design engineers to determine whether there were any adverse operating trends or existing issues affecting CRFC unit reliability and to assess Exelon's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.7 Diesel Driven Fire Pump (PFP01)

a. Inspection Scope

The team inspected the diesel-driven fire pump (DDFP), PFP01, to determine whether it was capable of meeting the design basis requirements. The team reviewed applicable portions of the UFSAR, vendor documents, the system notebook, PRA risk notebook, and drawings to identify the credited risk mitigation requirements and the design basis requirements for the fire pumps. The team's review determined the pump is credited for use as an alternate supply for SW system cooled components. The team reviewed fire pump test procedures and data to verify that the pumps were capable of achieving credited head/flow requirements during the various system lineups used to cool the components. The team reviewed system health reports, preventive and corrective maintenance work orders, test results, and corrective action reports to identify failures or nonconforming issues, and to determine if Exelon appropriately identified, evaluated, and corrected deficiencies. Finally, the team conducted walkdowns of the DDFP and associated support systems to assess Exelon's configuration control, the material condition, the operating environment, and potential vulnerability of the fire pumps to external hazards.

b. Findings

No findings were identified.

.2.1.8 Technical Support Center Battery Charger (BYCTSC)

a. Inspection Scope

The team inspected the technical support center battery charger, BYCTSC, to determine if it could perform its design function of providing direct current power to connected loads during normal, transient, and postulated off-normal conditions. The team reviewed design calculations, drawings, and vendor specifications to evaluate battery charger capability and compared those values with required operating conditions assumed in the PRA. Additionally, the team reviewed the Ginna risk evaluation model to determine when the equipment was credit to mitigate plant events. The team interviewed system and design engineers and walked down the battery charger to independently assess the material condition and to evaluate whether the system alignment and operating environment were consistent with design assumptions. Finally, the team reviewed corrective action documents and system health reports to determine if there were any adverse trends associated with the charger, and to assess Exelon's capability to identify, evaluate, and correct problems.

b. Findings

No findings were identified.

.2.1.9 4160 kva Supply Breaker (52/11B)

a. Inspection Scope

The team inspected the 4160 Vac supply breaker, 52/11B, to determine if it was capable of performing its design basis functions. Specifically, the team evaluated whether the breaker was capable of transferring supplied power to downstream loads following a postulated accident and isolating downstream faults as required. The team reviewed electrical distribution calculations including load flow, voltage drop, short-circuit, and electrical protection coordination to evaluate the adequacy and appropriateness of design assumptions. The team also evaluated whether breaker capacity and voltages remained within acceptable values under design basis conditions. Additionally, the team evaluated the interlock scheme with other 4160 Vac supply breakers during postulated grid/station transients. The team reviewed the electrical overcurrent protective relay settings breaker to determine whether the trip setpoints would ensure the ability of the supplied equipment to perform both its design basis safety function and also provide adequate system protection during fault conditions. Additionally, the team reviewed system maintenance test results, interviewed system and design engineers, and conducted field walkdowns of the breaker to evaluate whether the equipment alignment, nameplate data, and breaker position were consistent with design drawings and to assess the material condition and operating environment of the breaker. Finally, the team reviewed corrective action documents and system health reports to evaluate whether there were any adverse operating trends and to assess Exelon's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.10 120 Vac Inverter B (INVTCVTB)

a. Inspection Scope

The team inspected the 120 Vac vital inverter, INVTCVTB, to determine whether it was capable of performing its design basis function. The team reviewed the system loading profile to determine the design basis maximum load and evaluated if the inverter ratings were adequate to meet the design basis requirements. The team also reviewed calculations to evaluate whether the inverter provided the 120 Vac system loads with adequate voltage during design basis conditions. The team reviewed the operating and surveillance procedures to verify 120 Vac system voltage limits were correctly incorporated into the procedure acceptance criteria. Additionally, the team reviewed the inverter qualification testing to evaluate if breakers integral to the inverter provided for adequate clearing for the 120 Vac system branch circuits during fault conditions.

The team completed a walkdown to assess the inverter's material condition, environment, and to evaluate if the installation was in accordance with manufacturer instructions. Finally, the team reviewed corrective action documents and system health reports, and interviewed system and design engineers to determine whether there were any adverse operating trends or deficiencies and to assess Exelon's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.11 Motor-Driven Auxiliary Feedwater Pump 1A Motor-Operated Discharge Valve (4007)

a. Inspection Scope

The team inspected the motor-driven AFW pump 1A motor-operated discharge valve (MOV), MOV-4007, to determine if the valve was capable of performing its design basis function. Specifically, the team determined if the valve was capable of throttling and isolating flow as required upon start and operation of the associated motor-driven AFW pump during design basis events. The team reviewed the UFSAR, TSs, TS Bases, and the IST basis document to identify the design basis requirements of the valve. The team also reviewed MOV diagnostic test results and stroke-timing test data to verify acceptance criteria were met. The team evaluated whether the MOV safety functions, performance capability, and design margins were adequately monitored and maintained in accordance with NRC Generic Letter 96-05 guidance. The team also reviewed the MOV weak link calculation to ensure the ability of the valve to remain structurally functional while stroking under design basis conditions. The team verified that the valve analysis used the maximum differential pressure expected across the valve during worst case operating conditions. Additionally, the team reviewed motor data, degraded voltage conditions, and voltage drop calculation results to confirm that the MOV would have sufficient voltage and power available to perform its safety function at degraded voltage conditions. The team discussed the design, operation, and component history of the valve with engineering and operations staff and conducted a walkdown of MOV-4007 to assess its material condition and determine if the installed configuration was consistent with plant drawings, procedures, and the design bases. Finally, the team reviewed corrective action documents associated with the valve to determine whether there were any adverse operating trends and to assess Exelon's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.12 Battery “B’ Main Fuse Cabinet (DCPDPCB02B)

a. Inspection Scope

The team inspected the battery “B” main fuse cabinet, DCPDPCB02B, to evaluate whether it was capable of meeting its design basis requirements. The team reviewed bus loading calculations to evaluate whether the associated 125Vdc fuses had sufficient capacity to supply their required loads under worst case accident loading conditions. The team reviewed cable sizing calculations to ensure that cables were adequately sized for load and service conditions. The team also reviewed 125 Vdc short circuit calculations to verify that the fuses were adequately sized and to verify that the short circuit interrupting ratings exceeded the maximum calculated short circuit currents. Additionally, the team reviewed direct current (DC) coordination studies to evaluate whether downstream equipment was protected and protective devices provided adequate selective coordination. The team reviewed completed maintenance procedures for DCPDPCB02B to evaluate whether the equipment was being maintained in accordance with approved preventive maintenance schedules. Additionally, the team performed a visual inspection of DCPDPCB02B to assess the material condition of the cabinet and associated equipment. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Exelon's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.13 Standby Auxiliary Feedwater Pump (SAFWP1D)

a. Inspection Scope

The team inspected the motor-driven standby auxiliary feedwater pump, SAFWP1D, to determine if it was capable of meeting its design basis functions. Specifically, the team evaluated whether the pump was capable of providing adequate flow to the steam generators during postulated design basis scenarios. The team reviewed the SAFW system hydraulic model and the design basis hydraulic analysis/calculations to determine whether the required total developed head, NPSH, and pump run-out conditions had been properly evaluated under all applicable design basis conditions. The team reviewed system operating and emergency procedures to ensure they were consistent with the design requirements. The team also reviewed pump IST procedures, test results, and trends in test data to determine whether pump performance was consistent with design basis assumptions and verified IST acceptance criteria were appropriately correlated to accident analyses requirements. Design basis event dynamic loading design documentation evaluations and associated operator response actions were reviewed to evaluate whether SAFW system design and operation was consistent with assumed operating and transient conditions. The team reviewed the motor starting characteristics and electric bus breaker response characteristics under worst case conditions to ensure SAFWP1D motor breaker would not inadvertently trip during accident mitigation.

Additionally, the team reviewed motor data, degraded voltage conditions, and voltage drop calculation results to confirm that the pump motor would have sufficient voltage and power available to perform the intended safety function at degraded voltage conditions. The team conducted a detailed walkdown of the pump and support systems to determine the material condition of the components and to ensure adequate configuration control. Finally, the team reviewed corrective action documents to evaluate whether there were any adverse operating trends and to assess Exelon's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.14 Non-Regenerative Heat Exchanger (ECH05)

a. Inspection Scope

The team inspected the chemical volume and control system non-regenerative heat exchanger, ECH05, to verify that it was capable of performing its design basis function. The UFSAR, the TSs, and design basis documents were reviewed to determine the design and licensing bases for the heat exchanger and associated piping. The team reviewed operating, abnormal and emergency procedures for to determine whether the integrity of the heat exchanger would be maintained in accordance with design assumptions. The team reviewed component inspection and testing activities, including non-destructive test results, to verify the component was being adequately maintained. The team also reviewed Exelon's response to relevant operating experience to determine whether the design of the heat exchanger and connected systems were properly maintained. Finally, the team interviewed system and design engineers to discuss recent condition reports, and reviewed pictures of the system and maintenance history of the heat exchanger in order to determine the overall condition of the system, and to verify deficiencies were appropriately identified and resolved.

b. Findings

No findings were identified.

.2.1.15 Main DC Distribution Panel "B" (DCPDPCB03B)

a. Inspection Scope

The team inspected the "B" main DC distribution panel, DCPDPCB03B, to evaluate whether it was capable of meeting its design basis requirements. Specifically, the team reviewed the design and operation of the distribution panel to evaluate whether the loading of the panel was within equipment ratings and whether the panel could perform its design basis function to supply reliable power to associated loads under worst case conditions. The team reviewed calculations and drawings including voltage drop calculations, short circuit analyses, and load study profiles to evaluate the adequacy and appropriateness of design assumptions.

The team also reviewed the DC overcurrent protective coordination studies to evaluate whether there was adequate protection for postulated faults in the DC system. The team also reviewed completed maintenance procedures for DCPDPCB03B to evaluate whether the equipment was being maintained in accordance with approved preventive maintenance schedules. Additionally, the team interviewed system and design engineers and walked down the 125 Vdc distribution panel to independently assess its material condition and to determine whether the system alignment and operating environment was consistent with design basis assumptions. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Exelon's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.16 “B” Safety Injection Pump (PSIO1B)

a. Inspection Scope

The team inspected the “B” high head safety injection (SI) pump, PSIO1B, to determine if it was capable of performing its design basis function. Specifically, the team assessed the ability of the pump to provide required system head and flow requirements for injection into the reactor coolant system during design basis events. The team reviewed the UFSAR, drawings, design basis documents, and procedures to determine the design requirements and operating condition for the pump. The team also determined whether design inputs were properly translated into system procedures and tests and reviewed completed surveillance tests to determine if the results adequately demonstrated pump operability. The team reviewed the motor starting characteristics and electric bus breaker response characteristics under worst case conditions to ensure the “B” safety injection pump motor breaker would not inadvertently trip during accident mitigation. Additionally, the motor data, degraded voltage conditions, and voltage drop calculation results were reviewed to confirm that the pump motor would have sufficient voltage and power available to perform its safety function at degraded voltage conditions. The team also reviewed the adequacy of water supply sources to the pump, including an assessment of the potential for vortex conditions during operation. The team performed field walkdowns and interviewed system engineers and operators to assess the material condition of the pump and supporting equipment as well as the capability to implement design basis event procedures. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Exelon's ability to evaluate and correct problems.

b. Findings

No findings identified.

.2.1.17 480 Vac Motor Control Center "D" (MCC1D)

a. Inspection Scope

The team inspected the class 1E vital 480 Vac motor control center "D", MCC1D, to determine whether it was capable of performing its design basis function. The team reviewed the UFSAR, design basis documents, and electrical distribution calculations, including load flow, voltage drop, short-circuit, and electrical protection coordination. This review evaluated the adequacy and appropriateness of design assumptions; whether bus capacity was exceeded and whether bus voltages remained above minimum acceptable values under design basis conditions. The team reviewed the electrical overcurrent protective relay settings for the electrical supply and selected distribution breakers at the load center to verify that the trip set points would not interfere with the ability of supplied equipment to perform their safety function yet ensuring the trip set points provided for adequate load center protection. The control logic design drawings of the 480 Vac supply breaker to MCC were reviewed to verify adequate breaker closing and opening circuit interlocks. Additionally, the team reviewed system preventive maintenance records, thermography reports, and internal inspection results; interviewed system engineers; and conducted field walkdowns to assess the material condition of MCC1D and to verify that equipment alignment, nameplate data, and breaker positions were consistent with design drawings. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Exelon's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.18 Technical Support Center Diesel Generator (KED03)

a. Inspection Scope

The team inspected the technical support center diesel generator (TSC D/G), KED03, to determine whether it was capable of meeting credited functions to mitigate risk. The team reviewed applicable portions of the UFSAR, vendor documents, the system notebook, PRA risk notebook, and drawings to identify the credited risk mitigation requirements and the design basis requirements for the TSC D/G. The team reviewed calculations for both static and transient loading to determine whether the TSC D/G had sufficient capacity and capability to supply the required accident loads. The team reviewed one-line diagrams for the TSC D/G, the vendor manuals, nameplate rating data, and the TSC D/G load study to ensure that the TSC D/G was operated consistent with its rating and capable of operating under the worst case design basis loading conditions. The team also reviewed the generator electrical protective relaying scheme including drawings, calculations, calibration records, and procedures to determine whether the generator was adequately protected and whether its output breaker was subject to spurious tripping.

Additionally, the team reviewed maintenance schedules, procedures, and completed work records to determine whether the TSC D/G was being properly maintained and tested. The team reviewed emergency procedures to confirm the emergency loading of the TSC D/G was within the TSC D/G rating. The team also interviewed station engineers and performed walkdowns of the TSC D/G to assess the material condition of equipment. Finally, the team reviewed corrective action documents and system health reports to determine whether there were any adverse operating trends and to assess Exelon's ability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.2 Review of Industry Operating Experience and Generic Issues (2 samples)

The team reviewed selected OE issues for applicability at the Ginna. The team performed a detailed review of the OE issues listed below to verify that Exelon had appropriately assessed potential applicability to site equipment and initiated corrective actions when necessary.

.2.2.1 NRC Information Notice 98-25, Loss of Inventory from Safety Related Closed-Loop Cooling Water Systems

a. Inspection Scope

The team assessed Exelon’s applicability review and disposition of NRC Information Notice (IN) 98-25. This IN discussed industry OE regarding leakage and make-up for closed-loop cooling water systems, as well as other closed-loop system performance issues including protection from high energy line breaks (HELB) and seismic events. The team reviewed the Ginna component cooling water (CCW) operating, fill and vent, and alarm response procedures to verify that procedures adequately addressed the concerns identified in the IN. In addition, the team performed several walkdowns of accessible piping and head tanks; reviewed system corrective action reports; reviewed the system design basis and modification history; and interviewed design engineers to independently verify that the CCW system was adequately designed to ensure protection from the design basis events postulated in the IN. Finally, the team reviewed procedures developed to respond to a loss of CCW inventory event, interviewed operators, and conducted a walkthrough of time-critical CCW emergency makeup strategies to determine if the procedures and actions were adequate to mitigate the postulated loss of inventory and were consistent with licensing basis documents.

b. Findings

No findings were identified.

.2.2.2 NRC Information Notice 2004-01, Auxiliary Feedwater Pump Recirculation Line Orifice Fouling - Potential Common Cause Failure

a. Inspection Scope

The team assessed Exelon's applicability review and disposition of NRC IN 2004-01. This IN discussed industry OE regarding the potential for a common cause failure of the auxiliary feedwater systems due to fouling of flow restrictors that employed very small channels and holes as part of a multiple stage flow orifice design. The team reviewed Exelon's evaluations of the IN to determine whether they appropriately considered the applicable details of the IN and whether potential vulnerabilities were identified and corrected. Additionally, the team reviewed the Ginna AFW and SAFW system orifice design with respect to the configuration and operating history of the recirculation flow lines and associated orifice assemblies to evaluate whether they were vulnerable to the concerns identified in the IN. The team also performed several walkdowns of accessible components and piping; reviewed system corrective action reports; reviewed maintenance and inspection records of the potentially vulnerable portions of the service water system; reviewed operating and maintenance procedures; and interviewed design engineers to independently evaluate the relevant aspects of the design and configuration of Ginna's AFW and SAFW systems.

b. Findings

No findings were identified

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems (IP 71152)

a. Inspection Scope

The team reviewed a sample of problems that Exelon had previously identified and entered into the corrective action program. The team reviewed these issues to verify an appropriate threshold for identifying issues and to evaluate the effectiveness of corrective actions. In addition, condition reports (CR) written on issues identified during the inspection, were reviewed to verify adequate problem identification and incorporation of the problem into the corrective action system. The specific corrective action documents that were sampled and reviewed by the team are listed in the Attachment.

b. Findings

No findings were identified.

4OA6 Meetings, including Exit

On April 7, 2016, the team presented the inspection results to Mr. William Carsky, Plant General Manager, and other members of the Ginna staff. The team reviewed proprietary information, which was returned to Exelon at the end of the inspection. The team verified that no proprietary information was documented in the report.

4OA7 Other

a. Unresolved Issue 2013-007-02 – Adequacy of Ginna's Licensing Basis for Offsite Power Calculation and Degraded Voltage Relay Time Delays

The team reviewed actions taken by Exelon to address portions of NRC URI 2013-007-02, "Adequacy of Ginna's Licensing Bases for Offsite Power Calculation and Degraded Voltage Relay Time Delays". The team first reviewed the unresolved issue (URI) identified in inspection report 05000244/2013007. The URI documented two issues identified during the inspection related to Exelon crediting the onsite turbine generator to support offsite power voltage following an event and the adequacy of the degraded grid relay trip setpoints for voltages and times that exceeded 10 second. The team's review was limited to the actions taken by Exelon to address the URI related to the degraded grid relay portion of the URI. Specifically, inspectors on the 2013 team found Constellation (licensee of facility at time of the inspection) did not have adequate supporting calculations to show that assumptions in the design basis analysis would be met with the allowed degraded grid relay inverse time delay settings. The URI stated in part:

> *The team determined that additional NRC review and evaluation is required to determine whether Ginna's licensing and design bases, relative to the design of the degraded voltage relay time delays and offsite power design calculations, were adequate and met all NRC requirements and regulations. During the inspection, the team reviewed the recent guidance issued in NRC Regulatory Issue Summary (RIS) 2011-12, Revision 1, "Adequacy of Station Electric Distribution System Voltages." The team determined that Ginna's design analyses and calculations may not be consistent with the guidance contained in the RIS.*
>
> *The team determined that Constellation had not performed dynamic motor starting calculations to evaluate the terminal voltages to SR (Safety* Related) *equipment while connected to the onsite main generator or offsite power during accident initiated load sequencing to ensure and demonstrate that the voltage requirements of all plant SR systems and components are satisfied. These calculations had not been performed…. As a result, there are no calculations that show the voltage profile of the 480V SR buses, the terminal voltage of SR motors during motor starting and sequencing.*

<u>*Degraded Voltage Relay (DVR) Scheme*</u>

Constellation uses an inverse-time delay (TD) ITE 27 undervoltage relay for the degraded voltage relays. The time delay as specified in TS SR 3.3.4.2 is 68-125 seconds at 420V. The team noted that the DVR time delay exceeds the TD for GINNA assumed in the UFSAR accident analyses, which is a nominal 10 seconds. The team also determined that Constellation had not performed an analysis to verify that all SR equipment would not become unavailable due to protective device actuation for a degraded voltage within the bandwidth of the DVR and loss-of-voltage (LOV) setpoints for the existing time delay prior to re-sequencing onto the EDGs (Emergency Diesel Generators).

Following identification of the URI, Exelon performed additional calculations to evaluate the impact lower voltages would have on running equipment. Inspectors, on the 2016 team, reviewed these dynamic load calculations for safety related motors to evaluate if the motors would continue to operate as assumed in the design calculations for the time period and voltage levels allowed by the degraded grid relay inverse time delay relay. The team also reviewed overcurrent breaker trip setpoints at degraded voltage and the associated amperage to evaluate if the breakers would trip at the increased amperages. Finally, the team evaluated if any electrical equipment required during the design basis event would stall or be damaged during the extended time at the low voltage conditions.

b. <u>Findings</u>

The URI will remain open, one minor violation was identified. The team determined that Exelon's calculations showed that the current degraded grid relay design was adequate and the underlying design basis requirements could be met. The team determined that all equipment would perform as required at the voltages afforded by the relay until the relay timed out. Exelon's evaluation also showed that following relay actuation and vital bus transfer to the emergency diesel generators all required safety related equipment would remain available. The team identified a violation of *10 CFR 50, Appendix B, Design Control*, which states, in part, measures shall be established to assure that applicable regulatory requirements and the design basis … for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions. The design control measures shall provide for verifying or checking the adequacy of design…. Contrary to this, the team found that Exelon did not verify the adequacy of the degraded grid relay design because all aspects of the design had not been checked with calculation or testing. The violation was determined to be minor because there was not a reasonable doubt of operability and the Mitigating System cornerstones objective was not adversely affected. Specifically, the relay time limits had been approved as TS limits in an NRC SER; subsequent calculations showed the design was adequate; all safety functions were maintained with acceptable margins; and no changes to the plant were required. The URI will remain open pending resolution of the acceptability of crediting the voltage support from the main turbine generator to ensure operability of offsite power system.

ATTACHMENT
SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT

<u>Exelon Personnel</u>

W. Carsky	Plant Manager
R. Everett	Engineering Director
A. Culotta	BOP System Engineer
A. Freedman	System Engineer
B. Raczkiewicz	Electrical Design Engineer
C. Johnson	Electrical Design Engineer
D. Crowley	EDG System Manager
M. Amos	RHR/SI System Manager
M. Kubisa	Electrical Design Engineering
P. Shipp	Electrical Design Engineering Manager
R. Hellems	CCW System Manager

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

<u>Discussed</u>

URI	05000244/2013007-002	Adequacy of Ginna's Licensing Bases for Offsite Power Calculation and Degraded Voltage Relay Time Delays

LIST OF DOCUMENTS REVIEWED

<u>Calculations & Engineering Evaluations</u>

07-060, CCW and ECCS Model Conversion from KY Pipe to PROTO-FLO and System Analysis, Revision B
36725, Stress Analysis-Nitrogen Accumulators V-801 A & B, Revision 0
CN-SCS-04-83, Pressurizer Pressure Control Sizing Analysis for Ginna-19.5% Power Uprate, Revision 1
DA-EE-99-066, DC System Fuse Coordination, Revision 2
DA-EE-14-003, Offsite Power Dynamic Analysis, Revision 0
DA-EE-2001-047, Instrument Bus Electrical System Evaluation, Revision 3
DA-EE-2003-062, PCR 2003-0037 Electrical Factors Analysis, Revision 2
DA-EE-92-010-06, Containment Fan Brake Horsepower Requirements, Revision 0
DA-EE-92-011-07, Class 1E Motor Control Center Loading, Revision 8
DA-EE-92-098-01, Diesel Generator A Steady State Loading Analysis, Revision 6
DA-EE-92-111-01, Diesel Generator A Dynamic Loading Analysis, Revision 2
DA-EE-92-120-01, Diesel Generator B Steady State Loading Analysis, Revision 6
DA-EE-92-131-06, Load Flow Study, Revision 6

DA-EE-93-006-08, Instrument Performance Evaluation and Setpoint Verification Undervoltage Relays and Voltmeters on 480V Safeguards Busses, Revision 7
DA-EE-93-104-07, 480 Volt Coordination and Circuit Protection Study, Revision 00
DA-EE-96-005-07, Motor Control Center Coordination Analysis, Revision 14
DA-EE-96-030-06, Service Water Pump Motor Replacement Electrical Evaluation, Revision 0
DA-EE-96-068-03, Offsite Power Load Flow Study, Revision 6
DA-EE-97-069, Sizing of Vital Batteries A and B, Revision 007
DA-EE-98-131, TSC Battery Coordination Analysis, Revision 2
DA-EE-99-013, DC Class 1E System Fault Current Analysis, Revision 2
DA-EE-99-047, 125 VDC System Loads and Voltages, Revision 002
DA-EE-99-066, DC System Fuse Coordination, Revision 2
DA-EE-99-082, TSC Battery Sizing, Revision 2
DA-ME-08-10, Service Water Pump Submergence and NPSH Requirements, Revision 1
DA-ME-12-005, SAFW Hydraulic Model, Revision 0
DA-ME-2000-001, City Yard Loop Capability to Supply Cooling Water to EDG, SAFW, and to Fight Screen House Fire with a Loss of SW, Revision 006
DA-ME-2000-038, Control Room Heat Generation and Winter Heat Load, Revision 0
DA-ME-2000-040, City Water Yard Loop X-tie to Fire Yard Loop Hydraulic Calc., Revision 3
DA-ME-2001-15, Control Room Air Outside Intake Duct Sizing and Transit Time, Revision 0
DA-ME-2002-061, Resolution of Generic Letter 96-06 Waterhammer Issues Using EPRI Technical Basis Reports, Revision 0
DA-ME-2005-073, Evaluation of AFW Pump NPSH Requirements, Revision 001
DA-ME-2005-085, NPSH and ECCS Pumps During Injection and Sump Recirculation, Revision 2
DA-ME-95-068-03, Offsite Power Load Flow Study, Revision 6
DA-ME-96-070, Hydraulic Sprinkler Calculations for Fire Protection Systems off the Diesel and Motor Driven Fire Pumps, Revision 1
DA-ME-97-045, Service Water System Hydraulic Model, Revision 1
DA-ME-97-081, Engineering Evaluation of Fire Protection System Inspection and Testing Performance, Revision 1
DA-ME-97-102, Weak Link Assessment, MOVs 4007 and 4008, Revision 2
DA-ME-98-042, MOV Thrust Limit Calculation for MOV 4007, Revision 6
DA-ME-98-145, CRFC Performance During LOCA and Recirculation Phase, Revision 1
DA-ME-99-081, STP-O-R-25 Test Acceptance Criteria Development, Revision 1
DA-NS-92-104, RCS Overpressure Protection System Nitrogen Tanks Low Pressure Limit, Revision 0
DA-NS-98-088, GOTHIC Thermal Model of Control Building, Revision 0
DBCOR 2004-2009, Minimum Screenhouse Level for Fire Pump Operability, March 30, 2004
DBCOR 2007-0001, Evaluation of the Potential for Vortex Formation in the RWST, dated 1/12/07
ECP-10-000073, Updated Equivalent Change for TE-99-0040, Revision 000
ECP-11-000104, Technical Evaluation, De-Ionized Water Tank Capacity, Revision 0
ECP-14-000299, Seismic Wall Calculation for Non-Regenerative HX Shell Side, Revision 0
ECP-16-000103, Technical Evaluation, SAFW Building for Limiting SBO and FLEX Temperatures, Revision 0

EWR 1657A, HELB Design Analysis-CREATS Outside Air Duct, Revision 1
EWR-3692, Integrated System Assessment, Standby Auxiliary Feedwater Piping, Revision 2
ME-326, Control Room Emergency Air Treatment System (CREATS) and Emergency Cooling System Design, Fabrication, & Installation Specification, Revision 2
OE-2010-003422, Evaluation of IN2010-26 Submerged Electrical Cables, dated 1/3/11
PCR-99-064, DC Fuse Replacements, Revision 0
RWA-1433-001, Standby Feedwater Room Heat-up Analysis, Revision 0
Screening Evaluation Worksheet (SEWS), Low Voltage Switchgear (Bus 17), Revision 0
Screening Evaluation Worksheet (SEWS), Overpressure Protection Nitrogen Accumulator A, Revision 0
Screening Evaluation Worksheet (SEWS), Service Water Pump 1C, Revision 0
TE-2005-0057, Spare Service Water Motor for Extended Power Uprate, Revision 1
TE-99-0040, Replacement of Obsolescent Westinghouse Molded Case Circuit Breakers with Cutler-Hammer Series C Type HFD and HMCP Molded Case Circuit Brkrs, Revision 1
TSR 97-109, Evaluation of 120VAC instrument bus breakers testing and maintenance, dated 1/17/98

<u>Corrective Action Condition Reports</u>

AR01704140	AR02566814	AR02648512*	CR 2012-005100
AR01932509	AR02567726	AR02650368*	CR 2012-007714
AR01932803	AR02580032	AR02651532*	CR 2012-008372
AR01944957	AR02581437	AR02651836*	CR 2013-000086
AR01945089	AR02589731	AR02652373*	CR 2013-001321
AR01947095	AR02599186	CAI #R03411	CR 2013-003327
AR01949892	AR02612275	CR 1996-000943	CR 2013-004019
AR01953115	AR02616791*	CR 2000-000862	CR 2013-004274
AR01954703	AR02636117	CR 2002-000688	CR 2013-005709
AR01963065	AR02636553	CR 2003-000827	CR 2014-002470
AR01963097	AR02637455*	CR 2004-001108	CR 2014-002519
AR01963275	AR02638086*	CR 2007-004122	CR 2014-002632
AR02409551	AR02644193*	CR 2008-005701	CR 2014-002907
AR02442809	AR02644197*	CR 2010-004026	CR 2014-003018
AR02465060	AR02644477*	CR 2010-004030	CR 2014-004233
AR02474059	AR02644753*	CR 2010-007062	
AR02477037	AR02648428*	CR 2012-000159	
AR02490111	AR02648502*	CR 2012-003847	

*****CR generated as a result of this inspection

Design and Licensing Basis Documents

Letter, NRC to RG&E, Safety Evaluation Report on the Structural Upgrade Program, dated 3/24/87
Letter, RG&E to NRC, Structural Upgrade Program SEP Topics, II-2.a, III-2, III-4.A and III-7.B, R.E. Ginna Nuclear Power Plant, dated 7/13/84
Letter, Westinghouse Electric Corporation to RG&E, Component Cooling Water System Potential Overpressurization Notification, dated 7/19/84
RE Ginna Technical Specifications, through Amendment 105
RE Ginna Updated Final Safety Analysis Report, Revision 25
Technical Requirements Manual for the R. E. Ginna Nuclear Power Plant, Revision 60

Drawings

03200-0102, AC Panel Distribution Panels, One-Line Diagram, Revision 33
03202-0102, 125 VDC Power Distribution System, One-Line Diagram, Revision 22
10904-0167, 480 Volt Motor Control Center D Schedule, Revision 28
10904-0168, 480 Volt Motor Control Center D Schedule, Revision 22
10904-0169, 480 Volt Motor Control Center D Schedule, Revision 22
10904-0705, 480 Volt Motor Control Center N Schedule, Revision 6
10904-0706, 480 Volt Motor Control Center P Schedule, Revision 6
10905-0021, Sht. 1, Bus 12B to Bus 11B Tie Elementary 52/BTB-B, Revision 6
10905-0022, Sht. 1, Bus 11B to Bus 11A Tie Elementary 52/BTA-B, Revision 6
10905-0024, Sht. 1, Bus 11B Supply from Xfmr 11 52/11B Elementary, Revision 3
10905-0073B, Sht. 1, Safety Injection Pump B Elementary Wiring Diagram, Revision 5
10905-0098B, Motor Control Center D MCCD (52/MCC1D) Elementary Wiring Diagram, Revision 1
10905-0098B, Motor Control Center D MCCD (52/MCC1D) Elementary Wiring Diagram, Revision 1
10905-0118, MCC C & D Non-Vital Load Shed, MCCC – 15C & MCCD – 4 Elementary Wiring Diagram, Revision 11
10905-0121, Sht. 1, Boric Acid Transfer Pump A Elementary Wiring Diagram, Revision 0
10905-0121, Sht. 2, Boric Acid Transfer Pump B Elementary Wiring Diagram, Revision 0
10905-0131, Reactor Makeup Wtr Pumps A&B Elementary Wiring Diagram, Revision 5
10905-0139, Reactor Coolant Drain Pumps A&B Elementary Wiring Diagram, Revision 9
10905-0327, Fire Control Panel Elementary Wiring Diagram, Revision 14
10905-0570, Sht. 1, Bus 12B Alternate Power Source, Revision 2
10905-0659, MDAFW Pump Discharge Valve MOV-4007 Elementary, Revision 5
10905-210, Cnmt Penet Clg Fans A&B Elementary Wiring Diagram, Revision 6
10905-226, Rx Compt Clg Fans A&B Elementary Wiring Diagram, Revision 9
10905-551, SI Bypass System (MCC C), Revision 5
10905-572, Sht. 1, 52/12BX 4160V PPS Swgr, Revision 2
10907-0211, Fire Pump Auto-Start Fire Signaling System, Revision 3
10910-0012A, Breaker Response Characteristics, Feed to Safety Injection Pump B, Revision 3
10910-0016C, Breaker Response Characteristics, Feed to Motor Control Center D, Revision 4
10910-0017C, Breaker Response Characteristics, Feed to Standby Auxiliary Feedwater Pump D, Revision 1

10910-0023C, Breaker Response Characteristics, Feed to Containment Recirculation Fan A, Revision 1
10910-029D, Breaker Response Characteristics, Feed to Service Water Pump C, Revision 2
10911-0283, MCCD – Pos. 4B, Non Vital Load Shed Relay 86/MCCD Connection Diagram, Revision 2
175180-000-SP-01-00010, De-Ionized Water Storage Tank #TCD05, Revision A
21489-0657, Containment Recirculation Fan Cooler Enclosure Layout, Revision 4
21946-0073B, Sht. 1, Safety Injection Pump B Control Schematic, Revision 4
21946-0659, Shts. 1 and 2, MDAFW Pump Discharge Vlv MOV-4007 Control, Revision 6 and 7
33013-1237, Auxiliary Feedwater, Revision 70
33013-1245, Sht. 1, Auxiliary Coolant Component Cooling Water, Revision 34
33013-1246, Shts. 1 and 2, Auxiliary Coolant Component Cooling Water, Revisions 17 and 13
33013-1250, Shts. 1, 2 and 3, Station Service Cooling Water, Revisions 66, 39, and 48
33013-1264, Chemical and Volume Control Letdown, Revision 28
33013-1265, Sht. 2, Aux. Building, Chemical and Volume Control System-Charging, Revision 27
33013-1863, Containment Recirculation and Cooling System, Post Accident Charcoal Filters, Revision 22
33013-1867, Shts. 1 and 2, Control Room Emergency Zone and Control Room Air Treatment System, Revisions 4 and 1
33013-1935, DC System Fuse Reference Train ‘B’ DC Fuses, One-Line Diagram, Revision 12
33013-1974, Sht. 1 and 8, TSC Power Distribution One Line Diagram, Revision 30 and 3
33013-2539, AC System Plant Load Distribution, Revision 28
33013-2733, Globe Stop Valve Pressure Seal Bonnet General Assembly, Revision 2
33014-1238, Standby Auxiliary Feedwater, Revision 39
5-162-05-024-025, 05024 SSCF-C Exchanger – 4 Pass, Revision 10
C-200D438WX4, Orifice Assembly, Revision 1
N0775, SAFW Pump ‘D’ Curve, Revision 0
RY-86935 Multiple Pressure Reducing Orifice, Revision D
SK-106283, Multiple Pressure Reducing Orifice, Revision A
SK-142822, Multiple Pressure Reducing Orifice, dated 8/14/82

Functional, Surveillance and Modification Acceptance Testing

CME-32-02-DCPDPCB03B, Westinghouse DC Power Distribution Panel Maintenance for Main DC Distribution Panel B, performed 5/11/11
CME-32-02-IBPDPCBCB Revision401, Westinghouse 120VAC Power Panel Instrument Bus Panel C Maintenance, performed 5/20/11
CPI-PI-3021, Calibration of Diesel Driven Fire Pump Discharge Pressure Instrumentation, performed 3/23/15
GME-50-02-DBSETUP, Westinghouse DB Breaker Setup, C90676054, performed 3/16/11
GME-50-02-DBSETUP, Westinghouse DB Breaker Setup, C91301724, performed 7/11/12
GME-50-02-DBSETUP, Westinghouse DB Breaker Setup, C91824591, performed 1/01/13
GME-50-02-DBSETUP, Westinghouse DB Breaker Setup, C92453734, performed 10/23/14
GME-50-02-DBSETUP, Westinghouse DB Breaker Setup, C92493193, performed 12/12/14
GME-50-02-SE/2, Westinghouse 300Amp, 4160V Air Circuit Breaker, performed 9/28/09
M-11.30.1, Motor Driven or Diesel Driven Fire Pump Minor Maintenance, performed 1/15/02 and 3/23/15

M-11.30.2, Diesel Fire Pump Right Angle Drive Minor Maintenance, performed 3/26/15
M-17, Technical Support Center Diesel Generator Mechanical Maintenance and Inspection, performed 1/19/16
M-39, Predictive Maintenance Thermography Monitoring, performed 7/13/15
ME-32-02-DCPDPCB03B, Westinghouse DC Power Distribution Panel Maintenance for Main DC Distribution Panel B, performed 5/11/11
MG-39 Revision00200, Thermography Monitoring, Instrument Bus C, performed 11/25/15
MMP-GM055-00001, Underwater Inspection/Cleaning Of Mechanical Equipment, Structures in the Screenhouse, and Discharge Canal, performed 10/30/15
PCR-15-04562, Temp Change to Safety Injection Pump B Quarterly Test to Flush Voids and Perform Leak Inspection, performed 12/18/15
S-29-2, Charging Reactor Vessel Over-Protection System, performed 6/22/15
SAFW Pump ‘D’ Quarterly Test Results, performed April 2008 – February 2016
STP-E-11.4 Revision 201, Technical Support Center 60 Cell Battery Bank, performed 2/26/16
STP-E-12.5, Technical Support Center Diesel Test, performed 6/23/15, 1/13/16, 1/19/16, and 1/25/16
STP-E-19 Revision 4, Infrared Thermography of Electrical Components, performed 10/23/15
STP-E-47.3C, CREATS Tracer Gas Inleakage Test, performed 3/21/12
STP-E-60.13B , Control Room Emergency Air Treatment System (CREATS) Heating & Cooling System Performance Test, Train B, performed 9/28/15
STP-M-38.1, Diesel Fire Pump Engine Maintenance and Inspection, performed 3/26/15
STP-O-13, Fire Pump Operation and System Alignment, performed 12/29/15 and 1/17/16
STP-O-13.1, Annual Fire Pump Insurance Surveillance Test, performed 7/8/15
STP-O-13.2, Diesel Fire Pump Standard Protection Test, performed 9/25/15
STP-O-16.3A, AFW Pump ‘A’ Discharge MOV Test, performed 11/3/15
STP-O-16QA, Auxiliary Feedwater Pump ‘A’ – Quarterly, performed 10/13/15
STP-O-17.4, Control Room Rad Monitors R-45 and R-46 Operability Test, performed 1/19/14
STP-O-2.1-COMP-B, Safety Injection Pump B Comprehensive Test, performed 12/17/14
STP-O-2.1QB, Safety Injection Pump B Quarterly Test, performed 12/18/15
STP-O-2.1S, Service Water Flow from SI Pump Oil Cooler Determination, performed 12/17/14
STP-O-2.5.2, Air Operated Valves Surveillance (Shutdown), performed 10/21/15 and 10/28/15
STP-O-2.7.1A, Loop A Service Water Pump Test, performed 2/22/16
STP-O-2.8Q, Component Cooling Water Pump Quarterly Test, performed 12/15/15 and 3/3/16
STP-O-30.4, AFW System Valve and Breaker Position Verification, performed 11/4/15
STP-O-36-COMP-D, SAFW Pump ‘D’ – Comprehensive Test, performed 10/7/15
STP-O-36Q-D, SAFW Pump ‘D’ – Quarterly, performed 7/30/15 and 2/1/16
STP-O-8.2, Overpressure Protection Accumulator Nitrogen Fill Line Check Valves Leak Test, performed 10/23/15
STP-O-R-25, Service Water System Flow Test, performed 5/03/14

Miscellaneous
125VDC Electrical System Health Report, 4th Quarter 2015
480VAC Electrical System Health Report, 1st Quarter 2016
Bechtel PO5807-F-1245, BOM cable purchase, dated 9/11/68
Constellation P.O. 6615534, Westinghouse Failure Report DB-25, dated 10/18/12
DDFP Curve Tracking Data, 1/3/08 through 1/17/16
ECAD Testing, report from CM Technologies Corporation, dated October 2014
ECP2008-0004, Replacement of TSC Diesel Generator, Revision 01400

E-mail-Eaton to J Guider, re:MCCB testing, dated 4/6/15
EP-UT-102, (ECH 05) Outlet and Inlet Piping and Shell Thickness Readings, dated 5/10/14
EP-VT-105, (ECH 05) Outlet and Inlet Piping and Shell Visual Exam, performed 5/9/14
Fire Protection System Health Report, 4th 2015
G1-SY-0061, PRA AC Power System Notebook, Revision 0
Leaflet 15547E, Eaton GHB/GDB Molded Case Circuit Breakers, dated May 2014
Letter File number 86-1234820-03, Subject: Approval of Vendor Technical Document “Low Temperature Overpressure Analyses for RG&E Ginna Plant, dated 9/23/97
License Renewal Aging Management Checklist – TSC Diesel, Revision 0
Maintenance Rule Scope Form, Auxiliary Feedwater System, dated 3/19/15
MOV Program Scope Evaluation, Valve Data Package, MOV-4007, Revision 2
MR System Basis Document, 125VDC Electrical, dated 2/23/16
NEMA AB4, Guidelines for Inspection and Preventive Maintenance of MCCBs, dated 2009
NRC Bulletin 88-04: Potential Safety-Related Pump Loss, dated 5/5/88
NRC Docket No. 50-244, Integrated Plant Safety Assessment Report, dated 8/22/83
NRC Information Notice 2004-001, Auxiliary Feedwater Pump Recirculation Line Orifice Fouling - Potential Common Cause Failure, dated 1/21/04
PCR2001-0008, Instrument Buses A, B and C Replacement, dated 9/12/01
PSIO1B, SI Pump B Quarterly Data, 1/4/12 through 12/4/15
Safety Injection System Health Report, 4th Quarter 2015
Service Water System Reliability Optimization Program, Revision 13
Structural Reanalysis Program for the Robert E. Ginna Nuclear Power Plant, April 1983
Tech Support Center HVAC System Health Report, 4th Quarter 2015
Westinghouse Failure Analysis, DB-25 breaker serial #212.078-1, dated 10/18/12

<u>Operating Procedures</u>
AP-CCW.1, Leakage into the Component Cooling Loop, Revision 01901
AP-CCW.2, Loss of CCW during Power Operation, Revision 02300
AP-CCW.3, Loss of CCW – Plant Shutdown, Revision 01902
AP-ELEC.2, Safeguard Busses Low Voltage or System Abnormal Frequency, Revision 01503
AR-A-13, CCW Surge Tank Lo Level 41.2%, Revision 01101
AR-A-21, Comp Cooling HX Out Hi Temp 100F, Revision 01000
AR-A-5, CCW Surge Tank Hi Level 58.8%, Revision 8
AR-RMS-17, R-17 Component Cooling, Revision 5
ATT-5.1, SAFW from SW, Revision 01200
ATT-5.4, SAFW with Suction from DI Water Storage Tank, Bus 14 and/or 16, Revision 00100
ATT-5.5, SAFW with Suction from DI Water Storage Tank, During SBO, Revision 00300
CPI-LVL-618, Calibration of Component Cooling Surge Tank Level Loop 618, Revision 01700
E-0, Reactor Trip or Safety Injection, Revision 04602
E-1, Loss of Reactor or Secondary Coolant, Revision 04100
ECA-0.0, Loss of All AC Power, Revision 041
ER-ELEC.4, TSC D/G Feed to Bus 16 to Supply Charging Pumps, Instrument Bus D, and Battery D, Revision 00803
ES-1.2, Post LOCA Cooldown and Depressurization, Revision 0361
O-1.1, Plant Heat-up from Cold Shutdown to Hot Shutdown, Revision 16900
P-15.7, Rack In/Out 480 Volt Breakers, Revision 00301

Procedures
A-601.10, Time Critical Action Management Program, Revision 00302
AP-ELEC.2, Safeguard Busses Low Voltage or System Abnormal Frequency, Revision 01503
CC-AA-206, Fuse Control, Revision 10
CME-38-01-BYCTSC, Solidstate Controls 500A Battery Charger Maintenance for BYCTSC, Revision 01100
CME-38-01-INVTCVTB, Solidstate Controls 7.5KVA Single Phase Inverter/CVT 120VAC, Revision 01502
CME-44-0-MCCD/B, Westinghouse Motor Control Center D Unit Molded Case Circuit Breaker Maintenance for MCCD/B, Revision 0400
CME-48-02-Bus11B, Westinghouse 4160V Swgr 11B Maintenance, Revision 00302
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C92597689	C20101166	C92549737	20102847
C92597837	C90214880	C92594831	20702304
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LIST OF ACRONYMS

AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
AFW	Auxiliary Feedwater
AOV	Air Operated Valve
CCW	Component Cooling Water
CDBI	Component Design Bases Inspection
CFR	Code of Federal Regulations
CR	Condition Report
CRFC	Containment Recirculation Fan Cooler
D/G	Diesel Generator
DC	Direct Current
DRS	Division of Reactor Safety
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
HRA	Human Reliability Assessment
IMC	Inspection Manual Chapter
IN	Information Notice
IP	Inspection Procedure
IST	In-Service Test
kva	Kilovolt
LERF	Large Early Release Frequency
MDAFW	Motor Driven Auxiliary Feedwater
MOV	Motor Operator Valve
NCV	Non-cited Violation
NPSH	Net Positive Suction Head
NRC	Nuclear Regulatory Commission
OE	Operating Experience
PRA	Probabilistic Risk Assessment
RAW	Risk Achievement Worth
RRW	Risk Reduction Worth
RWST	Reactor Water Storage Tank
SAFW	Standby Auxiliary Feedwater
SDP	Significance Determination Process
SI	Safety Injection
SPAR	Standardized Plant Analysis Report
SW	Service Water
TS	Technical Specification
TSC	Technical Support Center
UFSAR	Updated Final Safety Analysis Report
Vac	Volts, Alternating Current
Vdc	Volts, Direct Current