December 15, 2008

Mr. Keith J. Polson
Vice President
Nine Mile Point Nuclear Station, LLC
P.O. Box 63
Lycoming, NY 13093-0063

SUBJECT: NINE MILE POINT NUCLEAR STATION UNIT NOS. 1 AND 2 – NRC COMPONENT DESIGN BASES INSPECTION REPORT 05000220/2008008 AND 05000410/2008008

Dear Mr. Polson:

On October 31, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Nine Mile Point Nuclear Station, Units 1 and 2. The enclosed inspection report documents the results of the inspection, which were discussed on October 31, 2008, with Mr. Sam Belcher 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 and operator actions 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.

This report documents two NRC-identified findings which were of very low safety significance (Green). These findings were determined to involve violations of NRC requirements. However, because of the very low safety significance of the violations and because they were entered into your corrective action program, the NRC is treating the violations as non-cited violations (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, Region 1; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspectors at the Nine Mile Point Nuclear Station.

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 (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/

Lawrence T. Doerflein, Chief
Engineering Branch 2
Division of Reactor Safety

Docket Nos. 50-220; 50-410
License Nos. DPR-63; NPF-69

Enclosure: Inspection Report 05000220/2008008 and 05000410/2008008
w/Attachment: Supplemental Information

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U. S. NUCLEAR REGULATORY COMMISSION

REGION 1

Docket Nos:	50-220, 50-410
License Nos:	DPR-63, NPF-69
Report No:	05000220/2008008 and 05000410/2008008
Licensee:	Nine Mile Point Nuclear Station, LLC (NMPNS)
Facility:	Nine Mile Point, Units 1 and 2
Location:	Lake Road Oswego, NY
Dates:	October 6 to October 31, 2008
Inspectors:	F. Arner, Senior Reactor Inspector, Team Leader J. Schoppy, Senior Reactor Inspector L. Casey, Reactor Inspector M. Gotch, Reactor Engineer M. Patel, Reactor Engineer M. Shlyamberg, NRC Mechanical Contractor G. Skinner, NRC Electrical Contractor
Approved by:	Lawrence T. Doerflein, Chief Engineering Branch 2 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000220/2008008, 05000410/2008008; 10/06/2008 – 10/31/2008; Nine Mile Point Nuclear Station, Units 1 and 2; Component Design Bases Inspection.

The report covers the Component Design Bases Inspection conducted by a team of five NRC inspectors and two NRC contractors. Two findings of very low risk significance (Green) were identified, which were also considered to be non-cited violations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using NRC 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 Findings

Cornerstone: Mitigating Systems

- Green. The team identified a finding of very low safety significance (Green) involving a non-cited violation of 10 CFR 50, Appendix B, Criterion III, Design Control, in that Constellation had used non-conservative inputs in voltage drop calculations with respect to evaluating the adequacy of the voltage supplied to Unit 1 safety related motor control center (MCC) contactors. Specifically, Constellation's voltage drop calculation for the MCC control circuits did not recognize additional impacts to overall circuit voltage drops which resulted in reduced margin. Constellation entered the issue into their corrective action program and performed a review of the effect on the circuits with the lowest voltage margin. The calculated voltage at the contactor coil for the main steam isolation valve (MSIV), 01-01, was determined to be less than the 90 Vac minimum acceptance criterion and was therefore tested during the inspection at a lower voltage to ensure it remained operable.

  The finding is more than minor because the deficiency was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The team determined the finding was of very low safety significance (Green) because it was a design deficiency confirmed not to result in the loss of equipment operability. (1R21.2.1.6)

- Green. The team identified a finding of very low safety significance (Green) involving a non-cited violation of 10 CFR 50, Appendix B, Criterion III, Design Control, in that Constellation did not verify the adequacy of design with respect to ensuring the availability of offsite power during postulated events such as a loss-of-coolant accident (LOCA) or a unit trip. Specifically, Constellation did not perform a calculation or analyses to demonstrate that the allowable degraded voltage relay reset setpoint was adequate with respect to preventing spurious separation of offsite power for postulated events. Constellation entered the issue into their corrective action program for further review. They initiated administrative controls during the inspection period to prevent aligning a safety bus to the alternate source pending resolution of the issue. They also plan to review and revise, as appropriate, the allowable relay reset values in surveillance procedures to provide more margin.

The finding is more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The team determined the finding was of very low safety significance (Green) because it was a design deficiency confirmed not to result in the loss of operability of the normal power source for the onsite emergency power distribution system. The issue had a cross-cutting aspect in the area of Problem Identification and Resolution – Corrective Action, because Constellation had not thoroughly evaluated similar non-conservative issues with the associated calculation raised in a December 2007 vendor letter and again in a subsequent condition report. (IMC 0305, aspect P.1(c)) (1R21.2.1.8)

B. Licensee-Identified Violations

None

REPORT DETAILS

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, Barrier Integrity

1R21 Component Design Bases Inspection (IP 71111.21)

.1 Inspection Sample Selection Process

The team selected risk significant components and operator actions for review using information contained in the Nine Mile Point Nuclear Station (NMPNS) Probabilistic Risk Assessment (PRA) and the U. S. Nuclear Regulatory Commission's (NRC) Standardized Plant Analysis Risk (SPAR) model. Additionally, the NMPNS Significance Determination Process (SDP) Phase 2 Notebook, Revision 2, was referenced in the selection of potential components and operator actions for review. In general, the selection process focused on components and operator actions 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 located within both safety related and non-safety related systems, and included a variety of components such as pumps, motor control centers, heat exchangers, generators, transformers, and valves.

The team initially compiled a list of components and operator actions based on the risk factors previously mentioned. Additionally, the team reviewed the previous component design bases inspection report (05000220,05000410/2006008) and excluded those components previously inspected. The team then performed a margin assessment to narrow the focus of the inspection to 25 components, eight operator actions and five operating experience items. 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 operating experience. Finally, consideration was also given to the uniqueness and complexity of the design and the available defense-in-depth margins. The margin review of operator actions included complexity of the action, time to complete the action, and extent-of-training on the action.

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, operator action, operating experience sample, and the specific inspection findings identified 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 (25 samples)

.2.1.1 Unit 1 Emergency Diesel Generator (103)

a. Inspection Scope

The team inspected the electrical portions of the Unit 1 emergency diesel generator (EDG) 103 to verify the adequacy of the equipment to respond to design basis events. The team reviewed calculations, Technical Specification Surveillance Requirements (TS SRs) and associated procedures, and design basis event load profiles to verify that: 1) steady-state and transient loading were within design capabilities; and 2) operation at maximum allowed frequency would be within design capabilities. The team reviewed the station's EDG loading calculation to assess whether the calculation accounted for temperature de-rating and frequency variations. The team reviewed the station's rated load run and the procedure used to implement this SR. This was reviewed to verify that the required kilowatt (kW) and kilovolt-ampere reactive (kVAR) output was obtained. Additionally, the team reviewed system health reports and corrective action documents to identify any existing adverse equipment operating trends. Finally, the team performed a walk-down of the equipment, and interviewed system and design engineers to assess the installation configuration and material condition of the EDG.

b. Findings

No findings of significance were identified.

.2.1.2 Unit 2 Division 2 Emergency Diesel Generator (2 EGS*EG3)

a. Inspection Scope

The team reviewed the electrical portions of the Unit 2 Division 2 EDG to verify the adequacy of the equipment to respond to design basis events. The team reviewed calculations, the TSSRs and associated procedures, and design basis event load profiles to verify that: 1) steady-state and transient loading were within design capabilities; 2) adequate voltage would be present to start and operate connected loads; and, 3) operation at maximum allowed frequency would be within design capabilities. The team reviewed static loading calculations to determine whether the maximum loading under accident conditions was within the diesel ratings. The team reviewed the EDG loading calculation to assess whether the calculation accounted for temperature de-rating and frequency variations. The team reviewed the EDG endurance run TSSR and the procedure used to implement this SR. This test was reviewed to verify that the required TS power factor value and required kW and kVAR loading was obtained. The EDG protective scheme logic diagrams were reviewed to verify the EDG was adequately protected during emergency operation. Additionally, the team reviewed the system health report and corrective action documents to identify any existing adverse equipment operating trends. Finally, the team performed a walk-down of the equipment, and interviewed system and design engineers to assess the installation configuration and material condition of the EDG.

b. Findings

No findings of significance were identified.

.2.1.3 Unit 2 DC 'B' Battery (2 BYS*BAT B)

a. Inspection Scope

The team reviewed the design, testing and operation of the Unit 2 'B' 125 Vdc station battery to verify that it could perform its design function of providing a reliable source of direct current (DC) power to connected loads under operating, transient and accident conditions. The team reviewed design calculations to assess the adequacy of the battery sizing to ensure the battery could power the required equipment for a sufficient duration, and at a voltage above the minimum required for the equipment operation. The team reviewed the last performance of battery tests, including the battery discharge tests, to ensure the testing was sufficient and was in accordance with plant technical specifications; and that the results confirmed acceptable performance of the battery. The team interviewed design and system engineers regarding the design, operation, testing and maintenance of the battery. The team performed a walkdown of the 'B' battery, the battery chargers and associated distribution panels to assess the material condition of the battery cells and associated electrical equipment. Finally, a sample of condition reports (CR) were reviewed to ensure Constellation was identifying and properly correcting issues associated with the battery and associated DC system components.

b. Findings

No findings of significance were identified.

.2.1.4 Unit 2 RCIC Isolation Temperature Switch (2ICS*TS1602A)

a. Inspection Scope

The team reviewed the design, testing and operation of the temperature switch for the reactor core isolation cooling (RCIC) system to verify that it could perform its design function of isolating the RCIC steam isolation valves during high ambient temperature accident conditions. The team reviewed the setpoint calculations to assess the adequacy of the setpoint with respect to maintaining maximum allowable environment temperatures. The team reviewed the past surveillance and calibration testing of the temperature switch to ensure that the testing was in accordance with plant Technical Specifications. The team also reviewed the surveillance testing data to ensure that the as-left values were within desired instrument drift tolerance. The team performed a walkdown of the temperature switch to assess the material condition of the switch. Finally, a sample of condition reports (CR) were reviewed to ensure Constellation was identifying and properly correcting issues associated with the temperature switch and associated components.

b. Findings

No findings of significance were identified.

.2.1.5 Unit 1 Reserve Auxiliary Transformer, XF-101S

a. Inspection Scope

The team reviewed the alternating current (AC) load flow calculations to determine whether the reserve auxiliary transformer (RAT) had sufficient capacity to support its required loads under worst case accident loading and grid voltage conditions. The team reviewed the 2005 modification for the replacement of the RATs with models equipped with load tap changers to determine whether it was performed in accordance with the licensing and design bases of the station. The team assessed the sizing, loading, protection, and voltage taps for the transformer to ensure adequate voltage would be supplied to the downstream loads. The team reviewed load tap changer (LTC) parameters to determine whether they supported conclusions in grid availability calculations. Additionally, the team interviewed system and design engineers to assess the installation configuration and material condition.

b. Findings

No findings of significance were identified.

.2.1.6 Unit 1 4kV Safety Bus, PB-102

a. Inspection Scope

The team reviewed AC load flow calculations to determine whether the 4160V system had sufficient capacity to support its required loads under worst case accident loading and grid voltage conditions. The team reviewed the degraded voltage protection scheme to determine whether the voltage setpoints were selected based on the voltage requirements for safety related loads at all distribution levels, and whether the degraded voltage relays could cause spurious separation of the offsite power supply. The team reviewed surveillance test results to determine whether equipment was performing as required by the design bases and Technical Specifications. The team reviewed system operating procedures to determine whether they were adequate to assure reliable sources of power to the buses, and to determine whether the results of design calculations and modifications had been properly incorporated. Finally, the team performed a walkdown of the safety bus and interviewed system and design engineers to assess the installation configuration and material condition.

b. Findings

Introduction: The team identified a finding of very low safety significance (Green) involving a non-cited violation of 10 CFR 50, Appendix B, Criterion III, Design Control, in that Constellation had not verified the adequacy of their design with respect to minimum voltage supplied to Unit 1 safety related motor control center (MCC) contactors. Specifically, calculations associated with the available voltage at the contactor coil terminals for MCC contactors were non-conservative and resulted in minimal or negative margin for several components.

Description: Unit 1 calculation ELMSAC-DEGVOLT-STUDY, Degraded Voltage Analysis, Revision 0, determined the available voltage at the contactor coil terminals for safety related MCC contactors during a degraded voltage condition. The study also determined the maximum circuit lengths for MCC control circuits based on an analysis of typical circuit configurations for various size contactors. The team determined that these calculations were non-conservative with respect to the following issues:

- The calculation did not use the limiting (most conservative) MCC voltage based on the voltage provided by the degraded voltage relay setpoint;
- The acceptance criterion for minimum contactor pickup voltage used as a design input was based on testing, in lieu of the manufacturer's rating. The voltage acceptance criterion for periodic tests was the same value used in the calculation with no margin or evaluation afforded for degradation between the tests, or for differences between service conditions and test conditions. For instance, the team noted the contactors were serviced immediately before the periodic testing had been performed which did not represent the as-found condition of the contactor. Constellation had also extended testing for safety related motor control centers from a four-year frequency to a ten-year frequency, and therefore, there could be 10 years between validation that the contactors worked at the established design input minimum voltage of 90 Vac;
- The calculation did not include the resistance of circuit elements including fuses and contacts;
- The calculation did not consider the effects of higher accident temperatures on conductor resistance;
- The calculation had not considered the loading associated with auxiliary devices such as relays.

In response to the team's concerns, Constellation performed preliminary calculations accounting for the items described above for circuits estimated to represent the limiting case based on circuit length, multiple contacts in series, and lowest voltage margin above the calculation acceptance criterion of 90 Vac. These circuits were modeled with the addition of fuse resistance, contact resistance, and potential accident temperature considerations. The result determined that the emergency condenser valves 39-09 and 39-10 (Emergency Condenser Isolation Valves), had minimal margin of less than one volt over the value historically used to test the contactors. Constellation's evaluation determined that the available voltage at the contactor for Main Steam Isolation Valve, MSIV 01-01, would be below the 90 Vac test value using conservative temperature assumptions. Constellation performed a field test during the inspection period to determine the actual as found pickup for this valve and confirmed that the contactor picked up with a voltage of 87 Vac. This testing was done without any maintenance or cycling of the breaker prior to this as-found test. The team determined that this field testing provided reasonable assurance that the other safety related control circuit contactors with minimal margin would pickup as required in a degraded voltage condition. Constellation entered the issue into their corrective action program as CR-NM-2008-8094 and CR-NM-2008-7977.

Analysis: The team determined that the failure to account for the worst case voltage drop for 600 Vac MCC contactor circuits was a performance deficiency because the adequacy of the design had not been appropriately verified. The finding was more than minor because it was similar to NRC Inspection Manual Chapter (IMC) 0612, Appendix E, Examples of Minor Issues, Example 3.j, in that the minimum calculated available voltage had been non-conservative, and the required contactor pickup voltage which was a key design input that had not been validated or verified to be conservative, resulting in a reasonable doubt of operability for the emergency condenser isolation valves and main steam isolation valve (MSIV) 01-01.

The finding is associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Traditional enforcement does not apply because the issue did not have any actual safety consequences or potential for impacting the NRC's regulatory function, and was not the result of any willful violation of NRC requirements. In accordance with NRC inspection Manual Chapter (MC) 0609, Attachment 4, Phase 1-Initial Screening and Characterization of Findings, a Phase 1 SDP screening was performed and determined the finding was of very low safety significance (Green) because it was a design deficiency that was confirmed not to result in a loss of equipment operability.

Enforcement: 10 CFR 50, Appendix B, Criterion III, Design Control, requires, in part, that design control measures provide for verifying or checking the adequacy of design. Contrary to the above, as of October 26, 2008, Constellation had not verified the adequacy of the design for safety related control equipment, in that the methodology and design inputs used in Constellation's calculations failed to include significant factors that adversely affected control circuit voltage. Specifically, the team identified that Constellation failed to use worst case MCC voltage, did not account for loading due to auxiliary equipment, did not consider increased cable resistance due to increased temperature in accident environments, and failed to account for resistance of some circuit elements. Constellation entered the finding into their corrective action program as CR-NM-2008-8094 and CR-NM-2008-7977. Because this violation was of very low safety significance and was entered into Constellation's corrective action program, this violation is being treated as a non-cited violation (NCV), consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000220/2008008-01, Inadequate Design Control for Unit 1 600V MCC Control Circuit Voltage Drop Calculations)**

Unresolved Item: The team identified an unresolved issue pertaining to the adequacy of the time delay setting for the Unit 1 degraded voltage relays. Specifically, the team questioned what Constellation's licensing bases requirement was with respect to a degraded voltage condition concurrent with a postulated loss-of-coolant-accident (LOCA). The team noted that the existing time delay of a nominal 21 seconds, from the detection of a sustained degraded voltage condition until vital bus transfer to the EDGs was longer than the time assumed by the 10 CFR 50.46 LOCA analysis sequential loading time following the receipt of a LOCA signal.

NRC letter dated June 2, 1977, sent to all operating plants at that time, stated in position B.1.c.1 that the allowable time delay for the degraded voltage protection scheme, including margin, shall not exceed the maximum time delay that is assumed in the UFSAR accident analysis. By letter dated July 14, 1977 to the NRC, NMP stated that the time delay associated with the degraded voltage protection scheme met this criterion. The NRC accepted the proposed modifications and Technical Specification changes based, in part, on the conclusion that changes satisfied the criteria stated in position B.1.c.1. By letter dated November 9, 1984, the NRC issued Amendment No. 67 to the NMP Unit 1 operating license. This included a revised Technical Specification Table 3.6.2.i, incorporating a degraded voltage relay setpoint of 3600V and a time delay of a nominal 18.5 seconds at 3580V. Subsequently by letter dated April 17, 1994, the NRC issued Amendment No. 148 to the NMP Unit 1 operating license. This included a revised Technical Specification Table 3.6.2.i incorporating a degraded voltage relay (DVR) setpoint of 3705V and a time delay of greater than 3.4 seconds but less than 60 seconds. The 3.4 second minimum time delay was described as the minimum time required to clear the voltage transients due to load sequencing to avoid separation from offsite power. The 60 second maximum time delay was described as the maximum time allowable to preclude load damage of the trip device actuation at voltages below the DVR setpoint of 3705V. These setpoints were still in place at the time of this inspection.

In 2005, calculation 4.16KVAC-PB102/103SETPT/27 disposition 002B changed the time dial setting to 5 in order to allow additional time (21 seconds) at the DVR setpoint of 3705V for the automatic load tap changers on the reserve auxiliary transformers to improve voltage and avoid spurious grid separation. Modification N1-02-029 concluded that the 21 second time delay was acceptable because it was less than the 60 second time delay allowed by the TS Table 3.6.2i. The team noted that the current Updated Final Safety Analysis Report (UFSAR) accident analysis assumes that the last core spray topping pump attains full speed within 35 seconds. Based on a 21 second time delay, the time before the last core spray topping pump attains full speed was estimated by Constellation to be approximately 56 seconds. Constellation initiated a condition report to evaluate this issue. They performed an operability review for the condition report associated with this issue (CR-NM-2008-7746). They concluded that the additional time delay would result in a peak cladding temperature of approximately 1950°F versus 1850°F with the original time delay. This provided a reasonable basis that they would remain bellow the 10 CFR50.46 limit of 2200°F assuming a postulated LOCA concurrent with a degraded voltage condition.

Constellation identified that the requirement for degraded voltage concurrent with a postulated LOCA was not well defined in their licensing bases and initiated the condition report for additional review. The team concluded that the existing allowable time delay for the NMP Unit 1 degraded voltage scheme was an issue requiring further NRC review to determine if NMP Unit 1 is in compliance with their licensing bases for degraded voltage protection. **(URI 05000220/2008008-02, Vital Bus Degraded Voltage Time Delay Licensing Bases)**

.2.1.7 Unit 1 600 Vac Safety Bus, PB-16B

a. Inspection Scope

The team inspected the 600Vac vital bus to verify the adequacy of its design for postulated transient and accident conditions. The team reviewed selected calculations for the electrical distribution system load flow/voltage drop, short circuit, and electrical protection and coordination. The adequacy and appropriateness of the design assumptions and calculations were reviewed to verify that bus capacity was not exceeded and bus voltages remained above minimum acceptable values under design basis conditions. The switchgear's protective device settings and breaker ratings were reviewed to ensure that selective coordination was adequate for protection of connected equipment during worst case short-circuit conditions. The team reviewed the voltage protection scheme and the adequacy of instrumentation/alarms available. Finally, the team performed a walkdown of portions of the safety related 600Vac switchgear and interviewed design engineers to assess the installation configuration and material condition.

b. Findings

No findings of significance were identified.

.2.1.8 Unit 2 4kV Safety Bus, 2ENS*SWG103

a. Inspection Scope

The team reviewed the AC load flow calculations to verify that the 4160Vac system had sufficient capacity to support its required loads under worst case accident loading and grid voltage conditions. The team reviewed the degraded voltage protection scheme to verify that the voltage setpoints were selected based on the voltage requirements for safety related loads at all distribution levels and to ensure that the degraded voltage relays would not cause spurious separation of the offsite power supply. The team reviewed surveillance test results to determine that equipment was performing as required by the design bases and Technical Specifications. The team reviewed system operating procedures to verify they were adequate to ensure reliable sources of power to the buses, and to verify that the results of design calculations had been properly incorporated.

b. Findings

Introduction: The team identified a finding of very low safety significance (Green) involving a non-cited violation of 10 CFR 50, Appendix B, Criterion III, Design Control, in that Constellation had not verified the adequacy of the design with respect to ensuring the availability of offsite power during postulated events such as a loss-of-coolant accident or a unit trip. Specifically, Constellation had not performed a calculation or analyses to demonstrate that their allowable degraded voltage relay reset setpoint was adequate with respect to preventing spurious separation of offsite power for postulated events.

Description: Updated Final Safety Analysis Report (UFSAR) section 8.1.3 describes the Unit 2 offsite power system as providing power to permit functioning of the nuclear safety related systems and for plant startup and shutdown. Section 8.2.2 describes the offsite power sources as being normally connected to the plant onsite emergency power system via the 115 kV switchyard and, therefore, they are readily available to the plant onsite emergency power distribution system. The offsite power system will furnish power required for the operation of emergency systems and emergency safeguard features (ESFs), and for the safe shutdown of the plant in case of a design basis accident (DBA).

The team determined that Constellation was not able to provide a formal analysis to confirm the availability of offsite power to safety buses during normal and abnormal operating conditions. This type of analysis typically requires evaluating safety bus voltages with respect to the degraded voltage relay reset setpoint, to ensure that spurious operation of the degraded voltage scheme will not occur for postulated transients with conditions where offsite voltage remains within its expected range. The team reviewed AC load flow calculation EC-151, Auxiliary System Performance Using ELMS-AC, Revision 1, in order to assess the availability of offsite power. EC-151 analyzed the NMP Unit 2 auxiliary power system to determine safety bus voltage for the expected range of 115kV system voltages, allowable onsite electrical system alignments, and various plant modes of operation, including normal and postulated accident conditions. The normal electrical system alignment is where all three 4160V safety buses are supplied by the reserve station service transformers (RSSTs), and the alternate or off normal alignment is where one of the safety buses is supplied from the auxiliary boiler transformer (ABT), 2ABS-X1. The team noted that the purpose of EC-151 was not intended to directly assess the availability of offsite power and therefore the acceptance criteria bases of the calculation had not included criteria for verifying the safety bus voltages would remain above the reset setpoint of the degraded voltage relays. Therefore, the team independently evaluated the bus voltage relative to available data for the relay reset, including the relay reset setpoint determined within calculation EC-196, Degraded Grid Relay, Undervoltage Relay and Associated Timer Relay Setpoint Calculation, Rev. 1, the reset setpoint allowed in field calibration procedures, and finally, the actual field setpoints.

The team determined that a few cases for bus voltage results in calculation EC-151 were non-conservative because the calculation had not accounted for the grid voltage decrease which could occur following the trip of the main generator. The team noted this was estimated to be approximately 2.1% based on a recent grid stability study. Additionally, the team determined that the calculation did not correctly model the tap position of the RSSTs resulting in an error of approximately 0.2%. The team made appropriate adjustments for these items when re-evaluating the results of EC-151.

The team noted that the maximum degraded voltage relay reset setpoint documented in calculation EC-196 was 4066V. The team concluded that based on this setpoint, grid separation of all safety buses would be likely at the onset of a postulated loss-of-coolant accident (LOCA) for both the normal and alternate electrical system alignments, and that grid separation could also occur during normal power operation for a bus connected to the alternate source (auxiliary boiler transformer). However, the allowable as-left reset setpoint in calibration procedure N1-RSCP-GEN-334 was more restrictive than the setpoint determined in EC-196, with a maximum value including tolerances of approximately 4000V. The team concluded that if this setpoint was applied in the field, grid separation of two of the three safety buses could occur at the onset of a LOCA for the normal alignment and that grid separation could also occur for all three safety buses following the onset of an accident for the alternate alignment. The team therefore reviewed the actual field setpoints documented in maintenance records and concluded that they were generally adequate to prevent grid separation except for the alternative alignment. For this case, the bus connected to the alternate source could be separated during either normal power operation or accidents, if grid voltage declined to the lower end of its normal range (5% below 115Kv). The team reviewed historical switchyard voltage data for periods during which the alternate alignment had been used and concluded that adequate voltage margin had been available to prevent separation of the connected bus. Constellation entered this issue into their corrective action program as condition reports CR-NM-2008-7915, CR-NM-2008-7916, CR-NM-2008-7994, and CR-NM-2008-8029. They initiated administrative controls during the inspection period to prevent aligning a safety bus to the alternate source, pending resolution of the issue. The condition reports stated an initial plan to review and revise, as appropriate, the allowable relay reset values in surveillance procedures to provide more margin to the emergency bus voltage results from EC-151.

Analysis: The team determined that the failure to properly evaluate and assure that the offsite power supply would remain available to the emergency buses following a unit trip or LOCA was a performance deficiency. Specifically, Constellation had not verified the adequacy of the design with respect to allowable electrical plant lineups, existing degraded voltage relay reset setpoints and expected voltage drops with respect to maintaining the offsite power system supply to safety buses following postulated transients or accident conditions.

The finding was more than minor because it was similar to NRC Inspection Manual Chapter 0612, Appendix E, Examples of Minor Issues, Example 3.j, in that the team had a reasonable doubt with the operability of the normal source of power to the onsite emergency power distribution system. The finding was associated with the design control attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Traditional enforcement does not apply because the issue did not have any actual safety consequences or potential for impacting the NRC's regulatory function, and was not the result of any willful violation of NRC requirements. In accordance with NRC IMC 0609, Attachment 4, Phase 1 – Initial Screening and Characterization of Findings, a Phase 1 SDP screening was performed and determined the finding was of very low safety significance (Green) because it was a design deficiency confirmed not to result in a loss of the power supply to the onsite emergency power distribution system.

The finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action, because Constellation had not thoroughly evaluated similar concerns with the Unit 2 EC-151 calculation being non-conservative with respect to safeguards bus voltage and degraded voltage protection. This had been identified in a vendor letter in December 2007 and again in a subsequent condition report CR-NM-2008-4602. (IMC 0305, Aspect P.1(c)).

Enforcement: 10 CFR, Appendix B, Criterion III, Design Control, requires, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. Contrary to the above, as of October 21, 2008, measures had not been established to verify the adequacy of the design. Specifically, calculations or analyses had not demonstrated the adequacy of allowable electrical system lineups, expected voltage drops and allowable degraded grid relay reset setpoints, with respect to ensuring the availability of offsite power to the onsite emergency power distribution system during expected transients and postulated accidents. Constellation entered the issue into the corrective action program as CR-NM-200-8-7915, CR-NM-2008-7916, CR-NM-2008-7994, and CR-NM-2008-8029. Because this violation was of very low safety significance and was entered into Constellation's corrective action program, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000410/2008008-03**, **Inadequate Design Control Regarding Adequacy of Safety Bus Allowable Degraded Voltage Relay Reset Setpoint and Impact on Offsite Power Supply)**

.2.1.9 Unit 2 345Kv-115Kv Transformer, TB2

a. Inspection Scope

The team reviewed grid operating specifications to verify that the Scriba switchyard transformer TB2 automatic load tap changers were operated in accordance with the assumptions used in the AC load flow calculations. In addition, the team reviewed system health reports and maintenance history to determine if there were any adverse equipment operating trends. The team also interviewed system and design engineers to assess component reliability.

b. Findings

No findings of significance were identified.

.2.1.10 Unit 2 Reserve Station Service Transformer, 2RTX-XSR1B

a. Inspection Scope

The team reviewed the AC load flow calculations to verify that the reserve station service transformer (RSST) had sufficient capacity to support its required loads under worst case accident loading and grid voltage conditions. The team assessed the sizing, loading, protection, and voltage taps for the transformer to ensure adequate voltage would be supplied to the downstream loads. The team reviewed LTC parameters to determine that they supported conclusions in grid availability calculations. In addition, the team reviewed completed work orders, and system health reports and interviewed system and design engineers to assess the reliability of the transformer.

b. Findings

No findings of significance were identified.

.2.1.11 Unit 2 600 Vac Safety Bus, 2EJS*US3

a. Inspection Scope

The team inspected the 600Vac vital bus to verify the adequacy of its design for postulated transient and accident conditions. The team reviewed selected calculations for the electrical distribution system load flow/voltage drop, short circuit, and electrical protection and coordination. The adequacy and appropriateness of design assumptions and calculations were reviewed to verify that bus capacity was not exceeded and bus voltages remained above minimum acceptable values under design basis conditions. The switchgear protective device settings and breaker ratings were reviewed to ensure that selective coordination was adequate for protection of connected equipment during worst case short-circuit conditions. The team reviewed the voltage protection scheme and the adequacy of instrumentation/alarms available. Additionally, the team performed a walkdown of portions of the safety related 600Vac switchgear and interviewed design engineers to assess the installation configuration and material condition.

b. Findings

No findings of significance were identified.

.2.1.12 Unit 2 Low Pressure Coolant Injection (LPCI) Check Valve, 2RHS*V16A

a. Inspection Scope

The team inspected the Unit 2 LPCI injection check valve, 2RHS*V16A, to ensure the valve was capable of meeting its design function. This swing check valve is normally closed and is required to open upon LPCI initiation. The review included system calculations and check valve calculations to verify that the valve would operate as designed. Inservice testing results were reviewed to verify the capability of the valve to actuate and isolate. Additionally, condition reports related to the valve were reviewed to ensure conditions did not exist which would invalidate design assumptions for the capability of the valve. Design engineers were also interviewed with respect to the key design inputs utilized in the associated calculations to verify they were conservative with respect to actual field conditions.

b. Findings

No findings of significance were identified.

.2.1.13 Unit 2 Service Water Header Isolation Valve, 2SWP*MOV50A

a. Inspection Scope

The team inspected the Unit 2 service water header isolation valve, 2SWP*MOV50A, to verify that it was capable of meeting its design basis requirements. This alternating current (AC) motor-operated valve (MOV) is a normally open butterfly valve that has a closed safety function to provide separation of the A and B service water loops during a loss-of-offsite power (LOOP) event. The review included system and motor operated valve calculations to verify that the thrust and torque limits and actuator settings were correct and based on appropriate design conditions such as maximum expected differential pressures. Inservice test results were reviewed to verify that the valve would automatically isolate in response to an actual or simulated initiation signal, and to verify that the stroke time acceptance criteria were in accordance with accident analysis assumptions. Condition reports related to the valve were reviewed to ensure conditions did not exist which would invalidate design assumptions for the capability of the valve. In addition, walkdowns of accessible areas were performed to assess the current condition of the valve, and interviews with engineering personnel were performed to discuss the historical performance of the valve.

b. Findings

No findings of significance were identified.

.2.1.14 Unit 2 Residual Heat Removal (RHR) Heat Exchanger, A, Inlet Valve, 2SWP*MOV90A

a. Inspection Scope

The team inspected the Unit 2 RHR heat exchanger A inlet valve, 2SWP*MOV90A, to verify that it was capable of meeting its design basis requirements. This AC MOV is a normally closed butterfly valve which is required to open to provide cooling water to the RHR system heat exchanger following a loss-of-coolant-accident (LOCA). The review included system and motor operated valve calculations to verify that the thrust and torque limits and actuator settings were correct. Inservice tests were reviewed to verify that the stroke time acceptance criteria were in accordance with accident analysis assumptions. Condition reports related to the valve were reviewed to ensure conditions did not exist which would invalidate design assumptions for the capability of the valve. In addition, walkdowns of accessible areas were performed to assess the current condition of the valve.

b. Findings

No findings of significance were identified.

.2.1.15 Unit 1 Emergency Diesel Generator (EDG) 103 Cooling Water Pump, PMP-79-54

a. Inspection Scope

The team inspected the Unit 1 EDG 103 cooling water pump PMP-79-54, to verify its capability to perform as required during design basis accident conditions for emergency diesel generator operation. This vertical line shaft pump provides raw water to cool the EDG raw water heat exchangers which cool the diesel engine. The review consisted of various design basis documents including diesel raw water cooling system calculations, system operating procedures, pump test procedures, summaries of pump test results, and system drawings. The team verified the capability of the Unit 1 raw water diesel cooling pump to provide its design flowrate. In addition, the team verified the basis for the pump inservice testing acceptance criteria, and the availability of adequate net positive suction head (NPSH) during pump operation. The team performed a walkdown of accessible areas to assess the material condition of the pump. In addition, the team reviewed condition reports, work orders and system health reports to determine the overall health of the system, and to determine if issues entered into the corrective action program were appropriately addressed.

b. Findings

No findings of significance were identified.

.2.1.16 Unit 1 Emergency Cooling Condensate Return Valves for Loop 11 and 12, IV-39-05(06)

a. Inspection Scope

The team inspected the Unit 1 emergency cooling condensate return valves, IV-39-05 and IV-39-06, to verify that they were capable of meeting design basis requirements. These normally closed air-operated isolation valves have an open safety function to automatically open to initiate emergency cooling on a high reactor pressure vessel (RPV) pressure signal or on a low-low RPV water level, and also have a closed safety function to isolate the primary containment. The review included system and air-operated valve calculations, system drawings, and design specifications to verify design inputs and assumptions were validated and verified. Inservice tests were reviewed to verify that the stroke time acceptance criteria were in accordance with accident analysis assumptions. Condition reports related to the valves were reviewed to ensure conditions did not exist which would invalidate design assumptions for the capability of the valve. In addition, the team performed a walkdown of accessible areas to assess the current condition of the valves.

b. Findings

No findings of significance were identified.

.2.1.17 Unit 1 11 Reactor Building Closed Loop Cooling (RBCLC) Pump, PMP-70-01

a. Inspection Scope

The team inspected the Unit 1 11 RBCLC pump, PMP-70-01, to verify its capability to perform as required during design basis accident conditions. RBCLC serves as an intermediate cooling loop between the reactor systems and the service water system to prevent the release of radioactive fluids to the environment. The 11 RBCLC pump is a centrifugal pump which provides the motive force to circulate RBCLC water. The team reviewed design basis documents, including drawings, system calculations, procedures, and tests to evaluate the functional requirements of the 11 RBCLC pump. The team also reviewed these documents to ensure the pump was capable of meeting design basis requirements with consideration of allowable pump degradation and net positive suction head margin. The team interviewed the system engineer, and reviewed system health and related condition reports to assess the current condition of the pump. The team performed a walkdown of accessible areas to assess the material condition of the pump. The team reviewed surveillance test results to verify that the pump performance margin was sufficient to assure design basis assumptions could be achieved.

b. Findings

No findings of significance were identified.

.2.1.18 Unit 1 12 RBCLC Heat Exchanger, HTX-70-14R

a. Inspection Scope

The team inspected the Unit 1 12 RBCLC heat exchanger, HTX-70-14R, to verify its capability to perform as required during design basis accident conditions. The 12 RBCLC heat exchanger is a horizontally-mounted, counter-flow, tube and shell type heat exchanger that rejects thermal energy from RBCLC to the service water system (SWS). The team reviewed design basis documents, including drawings, system calculations, procedures, and tests to evaluate the functional requirements of the 12 RBCLC heat exchanger. The team also reviewed thermal performance tests, heat exchanger cleaning records, and the licensee’s Generic Letter 89-13 response to ensure the heat exchanger was capable of meeting design basis requirements. The team interviewed the system engineer, and reviewed system health and related condition reports to assess the current condition of the heat exchanger. The team performed a walkdown of accessible areas to assess the material condition of the heat exchanger. Surveillance test results were reviewed to verify that heat exchanger thermal performance margin was sufficient to assure design basis assumptions could be achieved.

b. Findings

No findings of significance were identified.

.2.1.19 Unit 1 Torus Vent and Purge Isolation Valve, IV-201-16

a. Inspection Scope

The team inspected the Unit 1 torus vent and purge isolation valve, IV-201-16, to verify the capability of the valve to perform as required during both design and beyond design bases accident conditions. The valve has an active safety function in the closed position to isolate primary containment and has a risk significant function in the open position to support primary containment pressure control as directed in station Emergency Operating Procedures (EOPs). The team reviewed piping and instrumentation diagrams, component calculations, system calculations and design specifications. The team reviewed the maintenance and functional history of the valve by sampling corrective action reports, work orders, system health reports, and inservice testing results. The team also interviewed the air operated valve engineer to gain an understanding of the overall reliability of the valve.

b. Findings

No findings of significance were identified.

.2.1.20 Unit 1 Emergency Service Water Pumps, PMP-72-03 and PMP-72-04

a. Inspection Scope

The team inspected the performance of emergency service water (ESW) pumps PMP-72-03 and PMP-72-04 to verify they were capable of meeting their design basis requirement. Specifically, these pumps remove heat from the reactor building closed loop cooling (RBCLC) system to the ultimate heat sink (UHS) – Lake Ontario, under all design basis conditions when the normal cooling provided by the service water (SW) system is not available. The team reviewed design basis documents, including hydraulic calculations, the Technical Specifications, accident analyses and drawings to verify that the ESW pumps were capable of meeting system functional and design basis requirements. The heat transfer calculations for the associated RBCLC heat exchangers 70-13R, 70-14R, and 70-15R were reviewed to verify that the design flow rate used in hydraulic calculations was sufficient to remove the design heat load. The team also reviewed ESW pump surveillance test results, system health reports, and corrective action documents to determine whether ESW pump design margins were adequately maintained. Additionally, the team evaluated pump curves, and inservice test data. The review assessed whether Technical Specification and design basis requirements could be achieved; NPSH, vortex limits, and minimum flow requirements were met; and inservice acceptance criteria were appropriate. To assess the general condition of the pumps, the team performed walkdowns of the ESW pump area. Finally, the team reviewed condition reports and system health reports to determine the overall health of the system.

b. Findings

No findings of significance were identified.

.2.1.21 Unit 1 Containment Spray Raw Water Pumps, PMP-93-01, PMP-93-02, PMP-93-03, and PMP-93-04

a. Inspection Scope

The team inspected the performance of containment spray raw water (CSRW) pumps PMP-93-01, PMP-93-02, PMP-93-03, and PMP-93-04 to verify they were capable of meeting the design basis requirement of removal of heat from the containment spray (CS) system to the ultimate heat sink (UHS) – Lake Ontario under all design basis conditions. The team reviewed design basis documents, including hydraulic calculations, the Technical Specifications, accident analyses and drawings to verify that the CSRW pumps were capable of meeting system functional and design basis requirements. The team also reviewed CSRW pump surveillance test results, system health reports, and corrective action documents to determine whether CSRW pump design margins were adequately maintained. Additionally, the team evaluated technical evaluations, pump curves, and inservice test data. The review assessed whether technical specification and design basis requirements could be achieved; NPSH, vortex limits, and minimum flow requirements were met; and inservice acceptance criteria were appropriate. To assess the general condition of the pumps, the team performed walkdowns of the CSRW pump area. Finally, the team reviewed condition reports and system health reports to determine the overall health of the system.

b. Findings

No findings of significance were identified.

.2.1.22 Unit 1 Containment Spray Drywell Isolation Valves, IV-80-15, IV-80-16, IV-80-35, and IV-80-36

a. Inspection Scope

The team inspected the containment spray drywell isolation valves, IV-80-15, IV-80-16, IV-80-35 and IV 80-36, to verify the valves were capable of meeting design basis requirements. The team reviewed system and air-operated valve calculations to verify the valve and actuators were appropriately sized for this application, and that the in-field settings provided for an appropriate amount of margin under design basis accident conditions. Periodic diagnostic testing was reviewed to ensure control switch settings were appropriately set and not drifting. Inservice test results were reviewed to verify that the stroke time acceptance criteria were in accordance with the design basis and accident analysis assumptions and that any degradation was being identified during testing.

The team also reviewed valve control logic and associated modifications to verify the safety function was not negatively impacted by the modifications. Walkdowns of the valves, actuators, and air supply were performed to assess the material condition of the valves and associated equipment. Finally, the team reviewed condition reports and maintenance history to determine the overall health of the system.

b. Findings

No findings of significance were identified.

.2.1.23 Unit 2 Service Water Pumps, 2SWP*P1A, 2SWP*P1B, 2SWP*P1C, 2SWP*P1D, 2SWP*P1E, and 2SWP*P1F

a. Inspection Scope

The team inspected the performance of service water pumps 2SWP*P1A, 2SWP*P1B, 2SWP*P1C, 2SWP*P1D, 2SWP*P1E, and 2SWP*P1F to verify they were capable of meeting their design basis requirement. Specifically these pumps provide a reliable supply of cooling water during and following a design basis loss-of-coolant accident (LOCA) for all essential components and systems that require water cooling to the ultimate heat sink (UHS) – Lake Ontario. The team reviewed design basis documents, including hydraulic calculations, the Technical Specifications, accident analyses and drawings to verify that the pumps were capable of meeting system functional and design basis requirements. The team also reviewed pump surveillance test results, system health reports, and corrective action documents to determine whether SWP pump design margins were adequately maintained. Additionally, the team evaluated technical evaluations, pump curves, and inservice test data. The review assessed whether the Technical Specification and design basis requirements could be achieved; NPSH, and minimum flow requirements were met; and inservice acceptance criteria were appropriate. To assess the general condition of the pumps, the team performed walkdowns of the pump area. Finally, the team reviewed condition reports and system health reports to determine the overall health of the system.

b. Findings

No findings of significance were identified.

.2.1.24 Unit 2 High Pressure Core Spray Pump, 2CSH*P1

a. Inspection Scope

The team inspected the performance of high pressure core spray (HPCS) pump 2CSH*P1 to verify it was capable of meeting its design basis requirement of maintaining reactor vessel coolant inventory after small breaks which do not depressurize the reactor vessel. HPCS also provides spray cooling heat transfer during breaks in which core uncovery is calculated. The team reviewed design basis documents, including hydraulic calculations, the Technical Specifications, accident analyses and drawings to verify that the HPCS pump was capable of meeting system functional and design basis requirements. The team also reviewed HPCS pump surveillance test results, system health reports, and corrective action documents to determine whether HPCS pump design margins were adequately maintained. Additionally, the team evaluated technical evaluations, pump curves, and inservice test data. The review assessed whether the Technical Specification and design basis requirements could be achieved; NPSH, vortex limits, and minimum flow requirements were met; and inservice acceptance criteria were appropriate. To assess the general condition of the pumps, the team performed walkdowns of the HPCS pump area. Finally, the team reviewed condition reports and system health reports to determine the overall health of the system.

b. Findings

No findings of significance were identified.

.2.1.25 Unit 2 Residual Heat Removal Heat Exchangers, 2RHS*E1A and 2RHS*E1B

a. Inspection Scope

The team reviewed the residual heat removal heat exchangers to verify that they were capable of handling the heat loads during design basis events. The team reviewed design basis documents, including hydraulic calculations, the Technical Specifications, accident analyses and drawings to verify that the heat exchangers were capable of meeting system functional and design basis requirements. The team also reviewed results of heat exchanger surveillance trend data, system health reports, and corrective action documents to determine whether residual heat removal system (RHS) design margins were adequately maintained. The review assessed whether the Technical Specification and design basis requirements could be achieved and assumed heat loads were met. To assess the general condition of the heat exchangers, the team performed walkdowns of the RHS area. Finally, the team reviewed condition reports and system health reports to determine the overall health of the system.

b. Findings

No findings of significance were identified.

.2.2 Detailed Operator Action Reviews (8 samples)

The team assessed manual operator actions and selected a sample of eight operator actions for detailed review based upon risk significance, time urgency, and factors affecting the likelihood of human error. The operator actions were selected from a probabilistic risk assessment (PRA) ranking of operator action importance based on risk reduction worth (RAW) and risk achievement worth (RRW) values. The non-PRA considerations in the selection process included the following factors:

- Margin between the time needed to complete the actions and the time available prior to adverse reactor consequences;
- Complexity of the actions;
- Reliability and/or redundancy of components associated with the actions;
- Extent of actions to be performed outside of the control room;

- Procedural guidance to the operators; and,
- Amount of relevant operator training conducted.

.2.2.1 Unit 1 Operators Response to a Loss of Instrument Air Event

a. Inspection Scope

The team selected the manual operator actions to respond to a loss of instrument air (IA) and the mitigation actions required if initial recovery actions fail to restore IA pressure. The team reviewed control room operator actions and auxiliary operator (AO) actions required to be performed in the plant. The team selected this sample because of the complexity of the actions, low margin between the time required and the time available to perform certain actions, and equipment reliability concerns (installed un-annealed red brass piping).

The team reviewed Constellation's PRA and Human Reliability Analysis (HRA) studies to assess critical operator action times for PRA success. The team interviewed licensed operators and training staff personnel, and reviewed procedures and simulator scenarios to independently evaluate the operator response time associated with a loss of IA. The team also interviewed AOs, reviewed associated operating and alarm response procedures, walked down accessible IA system components throughout the plant, reviewed functional test results, and observed operators simulate portions of the procedure to evaluate the ability of the operators to perform the required actions. In addition, the team independently assessed Constellation's configuration control and the material condition of the associated valves, piping, instrumentation, panels, and operating equipment.

b. Findings

No findings of significance were identified.

.2.2.2 Unit 1 Operators Implement DC Load Shedding Following a Loss of AC Power

a. Inspection Scope

The team selected the manual operator actions to implement DC load shedding following a loss of all AC power needed to prolong DC battery availability. Specifically, the actions reviewed were to perform the station battery load reductions directed under station blackout (SBO) conditions (N1-SOP-33A.2 Attachment 4). The team selected this sample because of the low margin between the time required and the time available to perform the load shed actions.

The team reviewed Constellation's PRA and HRA studies to assess critical operator action times for PRA success. The team interviewed licensed operators and AOs, reviewed associated operating and alarm response procedures, and observed an AO simulate the in-field portions of the procedure to evaluate the ability of the operators to perform the required actions within the credited time. In addition, the team independently assessed Constellation's configuration control and the material condition of the associated batteries, power supply control cabinets, and power boards.

b. Findings

No findings of significance were identified.

.2.2.3 Unit 1 Operators Align Alternate 115kV Power Supply

a. Inspection Scope

The team selected the manual operator actions to align an alternate 115kV power supply following the loss of the normal 115kV source. Specifically, upon loss of the North or South reserve transformer (T101N or T101S), operators can align the opposite reserve transformer to power board 101 to regain functionality of this power source. The team selected this sample because of the required coordination and proper prioritization of the operator actions contained in multiple procedures for response to this electrical transient.

The team reviewed Constellation's PRA and HRA studies to assess critical operator action times for PRA success. The team interviewed licensed operators and AOs, reviewed associated operating and alarm response procedures, and observed a control room operator simulate the required actions of the procedure to evaluate the ability of the operators to perform the required actions. In addition, the team independently assessed Constellation's configuration control and the material condition of the associated control room instrumentation panels, reserve transformers, and power boards.

b. Findings

No findings of significance were identified.

.2.2.4 Unit 2 Operators Respond to a Loss of Service Water

a. Inspection Scope

The team selected the manual operator actions to respond to a loss of service water (SW) or to degraded SW system performance. Specifically, the team reviewed operator actions for lowering intake level, SW pump trips or degraded performance, internal and external flood concerns, flow divergence, and SW piping integrity issues. The team selected this sample because of the associated RAW, normal cross-connected configuration of the two safety-related divisions, and SW system reliability challenges.

The team reviewed Constellation's PRA and HRA studies to assess critical operator action times for PRA success. The team interviewed licensed operators and AOs, reviewed associated operating and alarm response procedures, walked down SW system components (including the accessible SW pipe trenches), reviewed functional test results, and observed an applicable simulator training scenario to evaluate the ability of the operators to perform actions necessary to ensure that the SW system can perform its design basis function under postulated conditions. In addition, the team performed numerous walkdowns to independently assess Constellation's configuration control and the material condition of the associated valves, piping, instrumentation, pumps, drainage system, and other support equipment (trash racks, screens, strainers).

b. Findings

No findings of significance were identified.

.2.2.5 Unit 2 Operators Respond to a Loss of Instrument Air Event

a. Inspection Scope

The team selected the manual operator actions to respond to a loss of IA and the mitigation actions required if initial recovery actions fail to restore IA pressure. The team reviewed control room operator actions and AO actions in the plant. The team selected this sample because of the required coordination of multiple operators in different field locations and recent IA equipment reliability challenges (un-annealed red brass piping ruptures and IA compressor discharge check valve single point vulnerability).

The team reviewed Constellation's PRA and HRA studies to assess critical operator action times for PRA success. The team interviewed licensed operators and AOs, reviewed associated operating and alarm response procedures, walked down accessible IA system components throughout the plant, reviewed functional test results, and observed operators simulate portions of the procedure to evaluate the ability of the operators to perform the required actions. In addition, the team independently assessed Constellation's configuration control and the material condition of the associated valves, piping, instrumentation, panels, and operating equipment.

b. Findings

No findings of significance were identified.

.2.2.6 Unit 2 Operators Implement DC Load Shedding Following a Loss of AC Power

a. Inspection Scope

The team selected the manual operator actions to implement DC load shedding following a loss of all AC power needed to prolong DC battery availability. Specifically, the actions reviewed were to perform the station battery load reductions directed under SBO conditions (N2-SOP-02 Attachment 3). The team selected this sample because of the extent of actions performed outside of the control room and the low margin calculated for one of the safety-related batteries.

The team reviewed Constellation's PRA and HRA studies to assess critical operator action times for PRA success. The team interviewed licensed operators and AOs, reviewed associated operating and alarm response procedures, and observed an AO simulate in-field portions of the procedure to evaluate the ability of the operators to perform the required actions within the credited time. In addition, the team independently assessed Constellation's configuration control and the material condition of the associated batteries, distribution panels, and circuit breakers.

b. Findings

No findings of significance were identified.

.2.2.7 Unit 2 Operators Crosstie 115kV AC Supply to Restore Power to Vital 4kV Buses

a. Inspection Scope

The team selected the manual operator actions to align an alternate 115kV power supply to a 4kV vital bus following the loss of the normal 115kV source. Specifically, operators can recover offsite power to the Division I (II) 4kV bus following a loss of Line 5 (6) or reserve transformer A (B). The team selected this sample because of the complexity of the actions, extent of actions performed outside of the control room, and the required coordination of multiple operators in different field locations.

The team reviewed Constellation's PRA and HRA studies to assess critical operator action times for PRA success. The team interviewed licensed operators and AOs, reviewed associated operating and alarm response procedures, and observed a control room operator and AO simulate the required actions of the procedure to evaluate the ability of the operators to perform the required actions. In addition, the team independently assessed Constellation's configuration control and the material condition of the associated control room instrumentation panels, emergency switchgear, and accessible circuit breaker cubicles.

b. Findings

No findings of significance were identified.

.2.2.8 Unit 2 Operators Align the Division III Emergency Diesel Generator to the Division I or Division II 4kV Bus

a. Inspection Scope

The team selected the manual operator actions to align the Division 3 emergency diesel generator (EDG) to the Division I or Division II 4kV bus following the loss of the offsite power and a failure of the Division I and Division II EDGs. Specifically, operators can restore power to one of the vital 4kV buses following a SBO given that the Division III EDG was the only EDG to start. The team selected this sample because of the complexity of the actions, extent of actions performed outside of the control room, and the required coordination of multiple operators in different field locations.

The team reviewed Constellation's PRA and HRA studies to assess critical operator action times for PRA success. The team interviewed licensed operators and AOs, reviewed associated operating and alarm response procedures, and observed a control room operator and AO simulate the required actions of the procedure to evaluate the ability of the operators to perform the required actions. In addition, the team independently assessed Constellation's configuration control and the material condition of the associated control room instrumentation panels, emergency switchgear, EDGs, and accessible circuit breaker cubicles.

b. Findings

No findings of significance were identified.

.2.3 Review of Industry Operating Experience and Generic Issues (5 samples)

a. Inspection Scope

The team reviewed selected operating experience issues for applicability at the Nine Mile Point Nuclear Station. The team performed a detailed review of the operating experience issues listed below to verify that NMP had appropriately assessed potential applicability to site equipment and initiated corrective actions when necessary.

.2.3.1 NRC Information Notice (IN) 2007-05, Vertical Deep Draft Pump Shaft and Coupling Failures

The team evaluated Constellation's applicability review and disposition of NRC IN 2007-05. The NRC issued this IN to alert licensees to vertical deep draft pump shaft and coupling failures from intergranular stress corrosion cracking (IGSCC). The areas reviewed included corrective action documents to determine whether the vertical deep draft pump shafts and couplings at Nine Mile Point were susceptible to the specific degradation in the information notice.

.2.3.2 NRC Information Notice 2007-27, Recurring Events Involving Emergency Diesel Generator Operability

The team reviewed Constellation's evaluation of IN 2007-27 and the associated corrective actions. The team reviewed Constellation's emergency diesel generator system health reports, EDG CRs and work orders, and surveillance test results to verify that Constellation appropriately dispositioned EDG concerns. Additionally, the team independently walked down the Unit 1 '103' EDG and the Unit 2 Division I and II EDGs on several occasions to inspect for indications of vibration-induced degradation on EDG piping and tubing and for any type of leakage (e.g., air, fuel, lube oil, jacket water).

.2.3.3 NRC Information Notice 2007-36, Emergency Diesel Generator Voltage Regulator Problems

The team reviewed the station's response to IN 2007-36 and the associated corrective actions. The team reviewed Constellation's emergency diesel generator system health reports, EDG CRs and work orders, and surveillance test results to verify that Constellation appropriately dispositioned EDG concerns pertaining to the voltage regulators. Additionally, the team reviewed preventive maintenance tasks, procedures, schedules, and records to determine whether adequate routine maintenance was performed. The team reviewed corrective maintenance and corrective action documents for the voltage regulator K1 relay to determine whether planned preventive maintenance procedures were appropriate.

.2.3.4 Generic Letter (GL) 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power

The team reviewed Constellation Generation Group's response to GL 2006-002 to assess its thoroughness and accuracy. The team compared the response to grid studies, operating procedures, interface agreements, and electrical distribution system calculations to determine whether the responses to the NRC were complete and consistent with station practices.

.2.3.5 Regulatory Issue Summary 2000-024, Concerns about Offsite Power Voltage Inadequacies and Grid Reliability Challenges Due to Industry Deregulation

The team reviewed the licensee's actions relative to assuring the availability of offsite power. This review included the actions taken by Constellation to assure the availability of acceptable post trip voltage, including the establishment of voltage limits for both Units 1 and 2 based on analyses of the onsite electrical distribution systems. The team reviewed procedures and protocols for communications with National Grid that are used to implement voltage limits and assure timely notification when acceptable limits may be exceeded.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems (IP 71152)

The team reviewed a sample of problems that Constellation had previously identified and entered into their corrective action program. The team focused the review of these issues on selected components identified for inspection. The review was performed to verify an appropriate threshold for identifying issues and to evaluate the effectiveness of corrective actions. In addition, condition reports 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 of significance were identified.

4OA6 Meetings, including Exit

The team presented the inspection results to Mr. Sam Belcher and other members of Constellation's staff at an exit meeting on October 31, 2008. The inspectors verified that there is no proprietary information in this report.

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

P. Bartolini, Mechanical & Structural Engineer
S. Belcher, Plant Manager
K. Engelmann, Licensing
J. Laughlin, Manager, Engineering Services
T. Lee, Mechanical & Structural Engineer
B. Shanahan, Electrical - I&C Engineer
T. Syrell, Director, Licensing

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

NCV	05000220/2008008-01	Inadequate Design Control for Unit 1 600V MCC Control Circuit Voltage Drop Calculations (Section 1R21.2.1.6)
NCV	05000410/2008008-03	Inadequate Design Control Regarding Adequacy of Safety Bus Allowable Degraded Voltage Relay Reset Setpoint and Impact on Offsite Power Supply (Section 1R21.2.1.8)

Opened

URI	05000220/2008008-02	Vital Bus Degraded Voltage Relay Time Delay Licensing Bases (Section 1R21.2.1.6)

LIST OF DOCUMENTS REVIEWED

Calculations:

A10.1-AE-002, LOCA Analysis Input Parameters (Form OPL 4 & 5), Rev. 0
A10.1-G-11, NPSHA for High Pressure Core Spray System, Rev. 2E
A10.1-G-50, High Pressure Core Spray (HPCS) System Hydraulic Calculation, Rev. 1A
A10.1-H-066, Anchor Darling Swing Check Valve Closing Force and Torque Evaluation, Rev. 0
A10.1-H-074, Allowable Torque on Actuator Shaft for 12" Class 900 Swing Check Valves with Air Actuator, Rev. 0
A10.1-N-104, Determining Flow Rates and EGK in the SWP System Case 1a, Rev. 1A
A10.1-N-105, Determining Flow Rates and EGK in the SWP System Case 1b, Rev. 2
A10.1-N-107, LOCTV Input Data, Rev. 2
A10.1-N-131, Available Net Positive Suction, Rev. 1A
A10.1-N-135, Service Water Hydraulic Transient, Rev. 0

A10.1-N-251, Service Water Steady State Analysis, Rev. 1
A10.1-N-279, MOV Sizing Calculation for 2SWP*MOV50A, Rev. 3
A10.1-N-293, MOV Sizing Calculation for 2SWP*MOV90A, Rev. 5
A10.1-N-317, Max Operating Conditions and Safety Functions for SR MOVs, Rev. 0
A10.1-N-339, NMP2 Service Water System Proto-Flow Model, Rev. 0C
A10.1-N-340, Proto-Flow SWP Base Hydraulic Model – Normal Operation, Rev. 0B
A10.1-N-341, 3 SWP Pumps – LOCA under Degraded Conditions, Rev. 0K
DRIFT-RILEY86, Drift Evaluation of Riley Model 86 Temperature Switches, Rev. 0
EC-130-1, Cable Verification of 'L' Power Cables for 600VAC and Below Systems, Rev. 1
EC-131, Cable Verification of 'K' Level Power Cables for 600 VAC and Below Systems, Rev. 2
EC-136, Degraded Voltage Relay Setpoint, Rev. 4
EC-151, Auxiliary System Performance Using ELMS-AC, Rev. 1
EC-196, Degraded Grid Relay, Undervoltage Relay and Associated Timer Relay Setpoint Calculation, Rev. 1
EC-57-4, Total Cable Lengths for Size 1, 2, & 3 (3Pole) Starters/Contactors (MCC), Rev. 3
EC-59, 600 Volt AC Power Cable Sizing, Rev. 6
ELMSAC-DEGVOLT-STUDY, Degraded Voltage Analysis, Rev. 0
EC-032, Unit 2 Emergency Diesel Generators Static Loading Calculation, Rev. 12
EC-043, Verification of Adequacy of Division 1 Battery 2BYS*BAT2B and Battery Chargers 2BYS*BAT2B1 & 2B2, Rev. 9
EC-100, DC Cable Sizing, Rev. 6
EC-129, Plant Emergency Battery Capability during SBO, Rev. 2
EC-156, Unit 2 Emergency Diesel Generator Transient Analysis, Rev. 1
MDC-11, Pump Curves and Acceptance Criteria, Rev. 15
ONTO-EDS-001, Design Basis Review for Safety-Related Motor Operated Valves, Rev. 1
N1-RSCP-GEN-334, Operating Cycle Calibration for Loss and Degraded Voltage Relays on Emergency Switchgear, Rev. 00
N2-ESP-ENS-R734, Operating Cycle Calibration for Loss and Degraded Voltage Relays on Emergency Switchgear 2ENS*SWG103, Rev. 7
NER-1E-015, NMP1 & NMP2 Offsite Grid Voltage Regulation Study, Rev. 05
S13.4-70-HX03, RBCLC Hx Thermal Performance Evaluation, Rev. 3
S13.4-70HX06, RBCLC TCV-70-137 Minimum Position and Wintertime Supply Temperature Evaluation, Rev. 2
S13.4-70HX014, Mechanical Design Assessment of RBCLC Heat Exchanger Duty Performance With Higher than Expected Tube Side Resistance, Rev. 0
S13.4-70-HX015, RBCLC System Thermal Performance for 10-Hour Shutdown with Increased Lake Temperature, Rev. 0
S13.4-70-F002, IST Approved Pump Curves for Reactor Building Closed Loop Cooling Pumps, Rev. 3
S13.4-70-F007, RBCLC System Thermal Hydraulic Analysis, Rev. 1
S13.4-79-HX09, RBCLC Heat Exchanger Thermal Performance Evaluation, Rev. 1
S14-39-V06, Yoke and P.O.S. Bracket and SOL Bracket Seismic Check, Rev. 0
S14-39VLVGAG01, IV-39-05 Gagging Device, Rev. 0
S14-39-V017, Emergency Cooling Air Operated Isolation Valve Maximum Stroke Times, Rev. 0
S14-39V15, Attwood and Morrill Design Calculations for Emergency Cooling Valves 39-05 and 39-06, Rev. 0
S15-72-F003, IST Approved Pump Curves- Emergency Diesel Generator Cooling Water, Rev. 8
S15-79-F002, Emergency Diesel Generator Cooling Water Flow, Rev. 3

S20.1-39AOV002, Component Level Assessment for Emergency Condenser Return Loop Valves IV-39-05 and IV-39-06, Rev. 0
S22.4-201AOV001, Component Level Assessment for the Torus Air Vent and Purge Isolation Valve IV-201-16, Rev. 1
S22.4-201-V16, Yoke and P.O.S. Bracket Seismic Design, Rev. 1
00156-C-005, Attachment B Group 2 IV-201-16 andIV-201-32 Functional Analyses and MEDP Calculation, Rev. 2
00156-C-006, Attachment A Group 1 IV-39-05 and IV-39-06 Functional Analysis and MEDP Calculation, Rev. 0
00156-C-040, Containment Spray System AOVs Functional and MEDP, Rev. 1
2NER-2E-039, NMP-T0614A Grid Stability Study for NMP2 Extended Power Uprate License Amendment, Rev. 0
4.16KVAC-PB102/103SETPT/27, Degraded Voltage Relay Setpoint, Rev. 2
4.16KVAC-PB102/103SETPT/27, Degraded Voltage Relay Setpoint, Rev. 2 Disp. 02B
4.16KVACT101N/SLTCSP, RAT Tap Setting Analysis with Simplified ETAP Model, Rev. 2
4.16KVACDGES, Unit 1 EDG Loading Calculation, Rev. 6

Completed Surveillances:

LCR No. TL2DFM-023, Service Water Pump Bay A Level 2DFM*LS136 Loop Calibration Report (6/01/07)
LCR No. TL2DFM-024, Service Water Pump Bay B Level 2DFM*LS137 Loop Calibration Report (8/01/07)
N1-MFT-074, ESW Flow Verification Test (4/22/01)
N1-PM-V2, Pump Curve Validation Test (8/22/08)
N1-ST-DO, Daily Checks (9/15/08)
N1-ST-M4A, Emergency Diesel Generator 102 and PB 102 Operability Test (8/20/08)
N1-ST-M4B, Emergency Diesel Generator 103 and PB 103 Operability Test (10/06/08, and 7/07/08)
N1-ST-Q5, Primary Containment Isolation Valves Operability Test (5/04/08, and 8/02/08)
N1-ST-Q6B, Containment Spray System Loop 121 Quarterly Operability Test (5/15/08, and 8/13/08)
N1-ST-Q6D, Containment Spray System Loop 122 Quarterly Operability Test (4/08/08, and 7/08/08)
N1-ST-Q13, Emergency Service Water Pump Operability Test (7/31/08, and 5/01/08)
N1-ST-Q14, Reactor Building Closed Loop Cooling System Pump and Valve Operability Test (8/16/08)
N1-ST-Q16B, Emergency Diesel Generator 103 Quarterly Test (8/08/08)
N1-ST-Q21, Instrument Air Valves Quarterly Operability Test (8/14/08)
N1-ST-Q25, Emergency Diesel Generator Cooling Water Quarterly Test (03/06/08, 5/30/08, 8/19/08 and 8/22/08)
N1-ST-V8, MS, FW/HPCI, SDC, EC, RX Head Vent Valve Cold S/D Operability Test (4/12/07)
N1-ST-V14, Service Water Check Valve and Emergency Service Water Pump and Check Valve Test (4/25/08, and 5/02/08)
N1-ST-V19, Emergency Cooling System Heat Removal Capability Test at High Power (1/21/04, and 1/23/04)
N1-ST-Q14, Reactor Building Closed Loop Cooling System Pump and Valve Operability Test (5/14/08, and 8/16/08)
N1-TTP-DGE-R01, Diesel Generator Load Testing (3/29/07)

N1-TTP-033, Reactor Building Closed Loop Cooling Heat Exchanger Performance Test (4/25/08, and 5/02/08)
N2-ESP-BYS-R677, DIV I/II/III Battery Intercell Resistance Test (4/04/08)
N2-ESP-BYS-R685, DIV I/II/III Battery Modified Profile Test (4/6/04, 3/25/06, 3/31/08, and 4/5/08)
N2-ISP-LDS-Q005, Quarterly Functional Test of RCIC Equipment Area and RCIC Steam Tunnel Temperature Instrument Channels (4/18/08, 7/8/08)
N2-ISP-LDS-R105, RCIC Equipment Area and RCIC Steam Tunnel Temperature Instrument Channel Calibration (1/1/08)
N2-OSP-CSH-Q@002, HPCS Pump and Valve Operability and System Integrity Test (7/24/08)
N2-OSP-CSH-R001, High Pressure Core Spray Pump System Functional and Response Time Test (4/11/08)
N2-OSP-EGS-M@001, Diesel Generator and Diesel Air Start Valve Operability Test – Division I and II (8/26/08)
N2-OSP-EGS-M@001, Diesel Generator and Diesel Air Start Valve Operability Test- Division I and II (4/9/08)
N2-OSP-EGS-R001, Diesel Generator ECCS Start Division I/II (4/9/08)
N2-OSP-EGS-R002, Operating Cycle Diesel Generator 24 Hour Run and Load Rejection Division I and II (4/9/08)
N2-OPS-EGS-R003, Diesel Generator Loss of Offsite Power with No ECCS Division I and II (4/5/08)
N2-OSP-ENS-R002, Functional Test of Emergency Diesel Generator Load Shedding Circuit – DIV I/II/III (5/15/08, and 3/4/08)
N2-OSP- RHS-M001, RHR Discharge Piping Fill (LPCI) and Valve Lineup Verification (6/09/08)
N2-OSP- RHS-Q004, RHR System Loop A Pump and Valve Operability Test and System Integrity Test and ASME XI Pressure Test (1/17/08)
N2-OSP- RHS-R001, RHS Loop A Pressure Isolation Valve Leakage Test (3/26/08)
N2-OSP-SWP-001, Service Water Pump Curve Validation Test (6/6/07)
N2-OSP-SWP-M001, Service Water Valve Position Verification (9/21/08)
N2-OSP-SWP-Q001, Division I Service Water Operability Test (5/18/08, and 8/17/08)
N2-OSP-SWP-Q002, Service Water Pump and Valve Operability Test (3/07/08, 6/06/08, and 8/25/08)
N2-OSP-SWP-R001, Service Water Actuation Test (3/28/08, and 4/14/08)
N2-OSP-SWP-R002, Service Water Position Indication Operability Test (9/01/08)
N2-PM-Q008, Quarterly Audit of EOP Support Equipment (9/15/08)
N2-TTP-RHS-4Y003, Residual Heat Removal System Heat Exchanger (2RHS*E1A) Performance Monitoring (Suppression Pool Cooling Mode) (2/15/07)
S-TPD-REL-O102, Service Water Heat Exchanger and Component Inspection Guide; (4/15/07, 12/22/07(RBCLC HX #11); 03/15/08 (RBCLC HX #12); and 05/06/08 (RBCLC HX #13))
SWP-Q001, Division 1 Service Water Operability Test (5/18/08, and 8/17/08)

Corrective Action Documents:

2004-0419
2004-1143
2004-1272
2004-1368
2004-1510
2004-1959
2004-2008
2004-2624
2004-3089
2004-3320
2004-3729
2004-3959
2004-4538
2004-4773
2004-4860
2004-5228
2004-5229
2005-0482
2005-0859
2005-0889
2005-1177
2005-1630
2005-2031
2005-2087
2005-2828
2005-3223
2005-3238
2005-3416
2005-3555
2005-3943
2005-4145
2005-4298
2005-4954
2005-5112
2006-0547
2006-0663
2006-0838
2006-0853
2006-3106
2006-3135
2006-3917
2006-4601
2006-4672
2006-5460
2007-1148
2007-1172
2007-1474
2007-1504
2007-1602
2007-3504
2007-4568
2007-4958
2007-5232
2007-5984
2007-6033
2008-3346
2008-3399
2008-3766
2008-3772
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2008-8098*
2008-8108*
2008-8110*
2008-8115*
2008-8118*
2008-8121*
2008-8142*
2008-8143*
2008-8144*
2008-8155*
2008-8172*
2008-8189*
2008-8190*
2008-8193*
2008-8207*
2008-8229*
2008-8231*

* Condition Reports written as a result of inspection effort

Design Basis Documents:

SDBD-202, Containment Systems Design Basis Document, Rev. 6
SDBD-203, Containment Spray System, Rev. 5
SDBD-502, Service Water System, Rev. 7
SDBD-503, Reactor Building Closed Loop Cooling System Design Basis Document, Rev. 5
SDBD-804, Emergency Diesel Generator System, Rev. 11

Drawings:

C-18006-C, Sh. 3, P & I Diagram Drywell & Torus Isolation Valves, Rev. 32
C-18011-C, Sh. 3, P & I Diagram Instrument Air System, Rev. 5
C-18012-C, Sh. 1, P & I Diagram Spray Raw Water System, Rev. 25
C-18012-C, Sh. 2, P & I Diagram Spray Raw Water System, Rev. 47
C-18014-C, Reactor Containment Inert Purge and Fill Drywell Cooling System, Sht. 1 and 3
C-18017-C, Emergency Cooling System, Sht. 1 and 2
C-18022-C, Sh. 1, P & I Diagram Service Water Reactor & Turbine Bldgs, Rev. 62

C-18026-C, Emergency Diesel Generator #103 Starting Air, Cooling Water, Lube Oil & Fuel, Sht. 2 and Sht. 8
C-18041-C, Sh. 3, P & I Diagram Sampling Points Closed Loop Cooling Emergency Cooling System, Rev. 62
C-19408-C Sht. 2, One Line Diagram Main and Secondary Connections, Rev. 32
C-19408-C Sht. 3, One Line Diagram Main and Secondary Connections, Rev. 8
C-19409-C Sht. 1, One Line Diagram Auxiliary System (Power Boards), Rev. 10
C-19409-C Sht. 2, One Line Diagram 4160 Volt Auxiliary System Power Boards 11, 12 & 101, Rev. 32
C-19409-C Sht. 8, One Line Diagram Auxiliary System 600 Volt Power Boards 16, 16A & 16B, Rev. 48
C-19409-C Sht. 9, One Line Diagram Auxiliary System 600 Volt Power Boards 17, 171A & 171B, Rev. 48
C-19409-C Sht. 10, One Line Diagram Auxiliary System 600 Volt Power Boards 167 & 176, Rev. 39
C-19859-C, Elementary Wiring Diagram Reactor Protection System Containment Isolation, Sht. 13
EE-M01A, Plant Master One Line Diagram Normal Power Distribution, Rev. 17
EE-M01B, Plant Master One Line Diagram Emergency Power Distribution, Rev. 08
EE-MO1C, Plant Master One Line Diagram Normal 600V & 120VAC, Rev. 7
EE-MO1D, Plant Master One Line Diagram Normal 600V & 120VAC, Rev. 14
EE-MO1E, Plant Master One Line Diagram Emergency 600V & 120VAC, Rev. 8
ESK-6SWP08, A.C. Elementary Diagram 600V MCC Circuit SWP to Reactor Building Heat
ESK-6SWP17, 600V MCC Circuit SWP MOV from Diesel Generator 2EGS*EG1 Cooler, Rev. 17
ESK-6SWP14, 600C MCC Circuit Service Water Header Isolation MOV's, Rev. 15
ESK-7SWP17, D.C. Elementary Diagram Miscellaneous DC Circuits Service Water Loss of Off Site Power Control, Rev. 12
PID-11A. Piping & Instrumentation Diagram Service Water System, Rev. 18
PID-11P-27. Piping & Instrumentation Diagram Service Water System, Rev. 27
PID-13E-16. Piping & Instrumentation Diagram Reactor Building Closed Loop Cooling Water, Rev. 14
PID-19A-15, Piping & Instrumentation Diagram Instrument & Service Air, Rev. 15
PID-31E-20. Piping & Instrumentation Diagram Residual Heat Removal, Rev. 20
PID-33A-17. Piping & Instrumentation Diagram High Pressure Core Spray System, Rev. 17
PID-33B-14. Piping & Instrumentation Diagram High Pressure Core Spray System, Rev. 14
PID-66D-13, Piping & Instrumentation Diagram Miscellaneous Drains, Rev. 13
TL2ICS-034, Test Loop Diagram – RCIC Pipe Chase Temperature 2ICS*TE10A, Rev. 2
TL2ICS-044, Test Loop Diagram – RCIC Pump Room Temperature 2ICS*TE16A, Rev. 2
0001.040209-014, Control Schematic Staring Sequence, Rev. 4
0001.040209-015, Control Schematic Staring Sequence, Rev. 4
0001.040209-016, Control Schematic Staring Sequence, Rev. 4
0005360170413, 12"-900# Swing Check Valve, Rev. 0
12177-ESK-5ENS05, DC ELEM DIAG – 4.16KV SWGR CKT ACB 101-10 Control, Rev. 20
12177-ESK-5ENS08, D.C. ELEM DIAG – 4.16KV SWGR CONT Bus 2ENS*SWG101 NORM Supply ACB 101-13, Rev. 19

Miscellaneous:

Constellation Energy U2 Forced Outage Critical Path, dated 10/15/08
Constellation Generation Group Letter to NRC, Response to Generic Letter 2006-002 Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power, dated 7/26/07
Detailed Evaluation of Human Error Probabilities for Nine Mile Point Unit 2 IPE, dated 7/20/92
DRF A61-00049-Tab 14, Core Spray and Containment Spray Motors Cooling GE Proposal No. 523-1H77D-EA1, dated 12/01/98
E.D.C No. 4, Criteria for Sizing Power, Control, and DC Cables, Rev. 5
EPIP-EPP-02, Emergency Action Level Matrix / Unit 2, Rev. 16
NER-1M-095, NMP1 Emergency Operating Procedures and Severe Accident Procedures (EOP/SAP) Basis Document, Rev. 2
NER-2M-039, NMP2 Emergency Operating Procedures (EOP) Basis Document, Rev. 6
Niagara Mohawk Letter to NRC, Request for Additional Information Concerning Degraded Voltage Protection, dated 7/14/77
Niagara Mohawk Letter to NRC, Request for Additional Information on Adequacy of Adequacy of Electrical Distribution System Voltage, dated 1/28/83
Niagara Mohawk Letter to NRC, Request for Additional Information on Adequacy of Electrical Distribution System Voltage, dated 9/27/82
Nine Mile Point Master Equipment List (MEL2) – 2EGS*EG3
Nine Mile Point Unit 1 Human Reliability Analysis (HRA), dated 12/23/07
Nine Mile Point 2 Probabilistic Risk Assessment (PRA), dated 2002
NMPNS-IST-001, Section IIE Relief Request PMP-RR-1, Rev. 0
NRC Generic Letter 2006-002, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power, dated 2/01/06
NRC Letter to Niagara Mohawk, Safety Evaluation and Staff Positions Relative to the Emergency Power Systems for Operating Reactors, dated 6/02/77
NRC Letter to G.K. Rhode Niagara Mohawk, Safety Evaluation Adequacy of Electrical Distribution System Voltage, dated 12/20/83
NRC Letter to B.G. Hooten Niagara Mohawk, Amendment to Facility Operating License, dated 11/09/84
NRC Letter to G.K. Rhode Niagara Mohawk, Safety Evaluation Report Proposed Design Modifications to Reduce Susceptibility to Grid Voltage Degradation, dated 4/17/84
NRC Letter to R. Silva Niagara Mohawk, Issuance of Amendment for Nine Mile Point Nuclear Station Unit No. 1, dated 4/07/84
Operability Determination CR 2007-7390, Rev. 0
Operability Determination CR 2008-7390, Rev. 1
Reactor Building Closed Loop Cooling Water System Health Report Second Quarter 2008
Regulatory Issue Summary 2000-024, Concerns about Offsite Power Voltage Inadequacies and Grid Reliability Challenges Due to Industry Deregulation, dated 12/21/04
Risk-Informed Inspection Notebook for Nine Mile Point Nuclear Station Unit 1, Rev. 2.1a
Risk-Informed Inspection Notebook for Nine Mile Point Nuclear Station Unit 2, Rev. 2.1a
SAS-06-04, Unit 1 Station Blackout DC Load Shedding – 125VDC Battery 11 PRA Margin Assessment, dated 11/20/06
Screenwell and Intake Structure Underwater and Cleaning, Unit 1, dated 3/07
SE 98-097, ECCS Pump Performance Reconciliation, dated 12/09/99
SY.01a, Nine Mile Point Unit 1 PRA System Notebook – 345kV/115kV, Rev. 0
SY.01b, Nine Mile Point Unit 1 PRA System Notebook – 4.16kV/600V/480V, Rev. 0
SY.02, Nine Mile Point Unit 1 PRA System Notebook – 125VDC Power, Rev. 0
SY.04, Nine Mile Point Unit 1 PRA System Notebook – Service Water System, Rev. 0

SY.07, Nine Mile Point Unit 1 PRA System Notebook – Instrument Air System, Rev. 0
002181GG, Instrument Air System Final Report For Nine Mile Point Unit 2 (G.L. 88-14) For Phase II, dated 12/91
6722G, Niagara Mohawk Power Corporation Response to NRC Generic Letter #88-14 (Air Systems Anomalies) Relative to Nine Mile Point Nuclear Power Station Unit 1, dated 3/89

Modifications & 10 CFR 50.59 Reviews:

DCP N1-02-029, NMP1 115kV Voltage Regulation, dated 5/07/04

Operating Experience:

Generic Service Water System Risk-Based Inspection Guide, NUREG/CR-5865 EGG-2674
NRC Generic Letter 89-04: Guidance on Developing Acceptable Inservice Testing Programs, dated 4/3/89
NRC Information Notice 97-78: Crediting of Operator Actions in Place of Automatic Actions and Modifications of Operator Actions, Including Response Times, dated 10/23/97
NRC Information Notice 2002-15, Supplement 1: Potential Hydrogen Combustion Events in BWR Piping, dated 5/06/03
NRC Information Notice 2006-17: Recent Operating Experience of Service Water Systems Due to External Conditions, dated 7/31/06
NRC Information Notice 2007-06: Potential Common Cause Vulnerabilities in Essential Service Water Systems, dated 2/09/07
Operating Experience Feedback Report - Air System Problems, NUREG-1275 Vol. 2
Operating Experience Feedback Report - Service Water System Failures and Degradations, NUREG-1275 Vol. 3

Procedures:

ARS 21004, CRP 9-6 Alarm Response Sheets, Rev. 3
CNO Policy #10, Issue Response Communication, Power Planning and Grid Demand Monitoring, Rev. 4
GAP-SAT-02 Attachment 1, Pre/Post – Maintenance Test Guidelines, Rev. 27
N1-ARP-A5, Power BD 101 R1014 Trip Alarm Response Procedure, Rev. 6
N1-ARP-K1, Control Room Panel K1 Alarm Response Procedure, Rev. 6
N1-ARP-L1, Control Room Panel L1 Alarm Response Procedure, Rev. 7
N1-EMP-GEN-182, Motor Control Center (7700 Line) Inspection, Rev. 09
N1-EOP-1, NMP1 EOP Support Procedure, Rev. 7
N1-EOP-2, RPV Control, Rev. 14
N1-EOP-4.1, Primary Containment Venting, Rev. 5
N1-EOP-1, Attachment 10 Venting Primary Containment thru RBEVS, Rev. 7
N1-MMP-072-247, Service Water Temperature Control Valve TCV-72-146 (RBCLC) and (TBCLC) Maintenance, Rev. 05
N1-OP-9, Nitrogen Inertion, Rev. 31
N1-OP-11, Reactor Building Closed Loop Cooling System, Rev. 22
N1-OP-16, Feedwater System Booster Pump to Reactor, Rev. 34
N1-OP-20, Service, Instrument and Breathing Air Systems, Rev. 26
N1-SOP-11.1, RBCLC Failure, Rev. 3
N1-SOP-20.1, Instrument Air Failure, Rev. 2
N1-SOP-30.1, Loss of Power Board 11, Rev. 1

N1-SOP-30.2, Loss of Power Board 12, Rev. 1
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N1-SOP-33A.2, Station Blackout, Rev. 0
N1-SOP-33A.3, Major 115 KV Grid Disturbances, Rev. 1
N2-ARP-01, Alarm Response Procedures, Rev. 0
N2-EOP-RPV, RPV Control, Rev. 1
N2-ISP-SWP-R104, Operating Cycle Calibration of the Service water Pump Suction level Low Instrument Channels, Rev. 4
N2-OP-11, Service Water System, Rev. 8
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N2-OP-31, Residual Heat Removal System, Rev. 18
N2-MPM-IAS-V606, Instrument Air Compressor P.M. 2IAS-C3A, 2IAS-C3B, and 2IAS-C3C, Rev. 7
N2-MSP-EGS-R001, Diesel Generator Inspection Division 1 and 2, Rev. 11
N2-OP-66, Miscellaneous Drains, Rev. 3
N2-PM-Q008 Attachment 1, Quarterly Audit of EOP Support Equipment, Rev. 2
N2-PM-S014, Building Rounds, Rev. 4
N2-PM-W001 Attachment 1, Control Rod Drive, Rev. 5
N2-SOP-01, Station Blackout, Rev. 9
N2-SOP-02, Station Blackout Support Procedure, Rev. 2
N2-SOP-03, Loss of AC Power, Rev. 8
N2-SOP-11, Loss or Degraded Service Water System, Rev. 2
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Unit 1 DC Electric Power & UPS System Health Report, 3rd Qtr 2008
Unit 1 EDG System Health Report, 3rd Qtr 2008
Unit 1 Emergency Diesel Generator System Health Report, 3rd Qtr 2008
Unit 1 Instrument Air System Health Report, 3rd Qtr 2008
Unit 2 DC Electric Power & UPS System Health Report, 3rd Qtr 2008
Unit 2 EDG System Health Report, 3rd Qtr 2008
Unit 2 Emergency Diesel Generator System Health Report, 3rd Qtr 2008
Unit 2 Instrument Air System Health Report, 3rd Qtr 2008
Unit 2 Service Water System Health Report, 3rd Qtr 2008

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01-OPS-009-TRA-1-48, Station Blackout, Rev. 7
01-OPS-009-TRA-1-72, Loss-Restore 115KV & Circ Failure, Rev. 5
01-OPS-009-TRA-1-75, TBCLC, Feedwater, and Instrument Air Malfunctions, Rev. 5
02-LOT-009-1DY-2-37, Remove Line 6 from Service, Rev. 0
02-OPS-009-1DY-2-27, Seismic Event / LOCA / Loss of Line 5, Rev. 1

02-OPS-009-1DY-2-37, SWP Pump Trip / RCS FCV Failure / RFP MTR OVLD & Trip / Partial RCS FCV Runback / Loss of HP Feed / Small Steam Leak, Rev. 2
02-OPS-009-1DY-2-38, CSH INOP / SWP Pump Trip / Control Rod Drift / Steam Leak / RHR Suction Strainer Clog, Rev. 2
02-OPS-009-1ST-2-12, Loss of Instrument Air, Rev. 0
02-OPS-009-TRA-2-36, LDS Failure / Recirc Pump High Vibration / Loss of IAS Compressor / Natural Circulation / ATWS, Rev. 3
02-OPS-009-TRA-2-38, CRD Trip / Loss of Line 5 / SW System Stable, Rev. 1
02-OPS-009-TRA-2-62, Simulator Training for SOP-01, 02, and 03, Rev. 0
02-OPS-009-TRA-2-73, Loss of Off-Site Power (SOP -3), Rev. 3
02-OPS-009-TRA-2-87, Fire in Normal Switchgear / Loss of IAS / ATWS, Rev. 1
02-OPS-009-TRA-2-89, SBO Training Scenario, Rev. 3
02-OPS-009-TRA-2-C4, Simulator Review of Northeast Blackout Event, Rev. 0
02-OPS-009-TRA-2-C8, Loss of L6 / Loss of GMC / Generator Runback / Scram, Rev. 0
02-OPS-009-TRA-2-G1, Loss of Off-Site 115 KV Line 5 / Degraded Grid Voltage Causes Loss of ENS*SWG103, Rev. 0
02-OPS-009-TRA-2-G2, Severe Weather Causes Degraded Grid Conditions / Fire in Norma Station Service Transformer, Rev. 0
02-OPS-009-TRA-2-G4, Loss of Off-Site 115 KV Line 5 / Seismic Event Causes CRD-P1A Trip / Loss of NJS-US1 / EHC Failure Causes Reactor Scram, Rev. 0
02-REQ-009-TRA-2-35, Service Water Pump Trip / Recirc Flow Control Failure / Condensate Pump Trip / Loss of Div. I Battery – Natural Circulation, Rev. 0
02-REQ-009-TRA-2-67, Reserve Transformer Fault with Associated Emergency Diesel Sequencer Failure and Recovery, Rev. 0
1101-SJEOPC02, N1-OP-30 Shift Source of Power for PB101 from R1014 to R1011, Rev. 0
2000040501, Restore Division One Power following Loss of 115KV and Diesel, Rev. 2
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2101-TSESOPC09, Loss of Degraded Service Water System, N2-SOP-11 Use, Rev. 0
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95-03571-00	04-00904-01	06-07918-01
00-00672-00	05-23688-00	06-16112-00
04-00358-00	06-07918-00	06-16372-00

LIST OF ACRONYMS

AC	Alternating Current
CFR	Code of Federal Regulations
DBE	Design Basis Event
DC	Direct Current
ECCS	Emergency Core Cooling Systems
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedure
ESW	Emergency Service Water
GL	Generic Letter
GPM	Gallons per Minute
HRA	Human Reliability Analysis
IMC	Inspection Manual Chapter
IN	Information Notice
IST	Inservice Test
kV	Kilo-volts
kVAR	kilovolt-ampere reactive
kW	Kilowatt
LOCA	Loss-of-Coolant Accident
LTC	Load Tap Changer
MCC	Motor Control Center
MOV	Motor Operated Valve
NPSH	Net Positive Suction Head
NRC	Nuclear Regulatory Commission
PRA	Probabilistic Risk Assessment
RAW	Risk Achievement Worth
RBCLC	Reactor Building Closed Loop Cooling
RHR	Residual Heat Removal
RRW	Risk Reduction Worth
SDP	Significance Determination Process
SPAR	Standardized Plant Analysis Risk
SW	Service Water
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
Vac	Volts, Alternating Current
Vdc	Volts, Direct Current