UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

April 12, 2018

Mr. Thomas D. (Tom) Ray
Site Vice President
Duke Energy Carolinas, LLC
McGuire Nuclear Station
MG01VP/12700 Hagers Ferry Road
Huntersville, NC 28078

SUBJECT: MCGUIRE NUCLEAR STATION – NRC DESIGN BASES ASSURANCE INSPECTION (TEAM) REPORT 05000369/2018010 AND 05000370/2018010

Dear Mr. Ray:

On March 2, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your McGuire Nuclear Station, Units 1 and 2, and the NRC inspectors discussed the results of this inspection with you and other members of your staff. Additional inspection results were discussed during a teleconference held on April 4, 2018, with Mr. Snider and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. One of these findings involved a violation of NRC requirements; this violation was determined to be Severity Level IV under the traditional enforcement process. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of the NCV, 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, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC resident inspector at the McGuire Nuclear Station.

If you disagree with the cross-cutting aspect assignment or the finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC resident inspector at the McGuire Nuclear Station.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Marvin D. Sykes, Chief
Engineering Branch 1
Division of Reactor Safety

Docket Nos. 50-369, 50-370
License Nos. NPF-9, NPF-17

Enclosure:
Inspection Report 05000369/2018010
and 05000370/2018010

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SUBJECT: MCGUIRE NUCLEAR STATION – NRC DESIGN BASES ASSURANCE INSPECTION (TEAM) REPORT 05000369/2018010 AND 05000370/2018010

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers:	50-369, 50-370
License Numbers:	NPF-9, NPF-17
Report Numbers:	05000369/2018010; and 05000370/2018010
Enterprise Identifier:	I-2018-010-0022
Licensee:	Duke Energy Carolinas, LLC
Facility:	McGuire Nuclear Station, Units 1 and 2
Location:	Huntersville, NC 28078
Inspection Dates:	February 12, 2018, to March 2, 2018
Inspectors:	G. Ottenberg, Senior Reactor Inspector (Lead) B. Davis, Senior Reactor Inspector M. Greenleaf, Reactor Inspector M. Schwieg, Reactor Inspector H. Leake, Contractor M. Yeminy, Contractor
Approved By:	M. Sykes, Chief Engineering Branch 1 Division of Reactor Safety

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring Duke's performance by conducting a Design Bases Assurance Inspection (Team) at McGuire Nuclear Station, Units 1 and 2, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to https://www.nrc.gov/reactors/operating/oversight.html for more information. NRC-identified findings and violations are summarized in the table below.

List of Findings and Violations

Failure to Update Offsite Circuit Operability Limit for Single Busline Alignment			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green FIN 05000369/2018010-01 Closed	[H.6] – Human Performance, Design Margins	71111.21M – Design Bases Assurance Inspection
The inspectors identified a Green finding for the licensee's failure to update calculations as required by procedure AD-EG-ALL-1117, "Design Analyses and Calculations," Rev. 5. Specifically, the licensee revised calculation MCC-1381.05-00-0258, "U1, 6.9kV, 4.16kV & 600V Auxiliary Power Systems Safety-Related Voltage Analysis," Rev. 6, to identify the effect of longer motor-driven auxiliary feedwater pump (CA pump) acceleration times on the switchyard voltage limits in place to ensure offsite power source operability. However, the licensee failed to update the previously analyzed condition of only one offsite circuit in service from the switchyard to the 4160V Class 1E buses via the unit step-up and unit auxiliary transformers (single busline alignment). As a result, there was no verification that the offsite circuit operability limit was adequate during single busline alignment.			

Failure to Update the FSAR With Pertinent Design Information			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green Severity Level IV NCV 05000369,370/2018010-02 Closed	None	71111.21M – Design Bases Assurance Inspection
The inspectors identified a Green finding and associated Severity Level IV Non-cited Violation (NCV) of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.71(e), for the licensee's failure to update the final safety analysis report (FSAR) to include the design function of manually opening the residual heat removal (ND) system shutdown cooling suction valves. Consequently, the licensee failed to consider the design capability of the valves, time impacts on dose consequence analyses, and the implication of pressure locking.			

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedure (IP) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, performed walk downs, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.21M - Design Bases Assurance Inspection (Team)

The inspectors evaluated the following components, permanent modifications, and operating experience during the weeks of February 12 to February 16, 2018, and February 26 to March 2, 2018.

Component (3 Samples)

(1) Shutdown Cooling Suction Valves, [1(2)ND-1B and 1(2)ND-2AC]
(2) 1B2 Component Cooling Pump [1B2 KC Pump]
(3) Battery Charger [EVCA]

Component Large Early Release Frequency (LERF) (1 Sample)

(1) Essential 600 Volt Motor Control Center [1EMXA]

Permanent Modification (4 Samples)

(1) EC 102373, NV Charging Pump 1A Rotating Assembly Upgrade MOD
(2) EC 102477, RN Strainer Backwash Pump - 1A MOD
(3) EC 104503, Replace 1A EDG Voltage Regulator U1 (MOD)
(4) EC 405274, Revise Unit 1 CA Pump Motor Time Overcurrent Relay 51 Setting

Operating Experience (2 Samples)

(1) NRC Information Notice 2013-05: Battery Expected Life and Impact on Surveillance Requirements
(2) NRC Information Notice 2017-06: Battery and Battery Charger Short-circuit Current Contributions to a Fault on the Direct Current Distribution System

INSPECTION RESULTS

Failure to Update Offsite Circuit Operability Limit for Single Busline Alignment			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green FIN 05000369/2018010-01 Closed	[H.6] – Human Performance, Design Margins	71111.21M – Design Bases Assurance Inspection

The inspectors identified a Green finding for the licensee's failure to update calculations as required by procedure AD-EG-ALL-1117, "Design Analyses and Calculations," Rev. 5. Specifically, the licensee revised calculation MCC-1381.05-00-0258, "U1, 6.9kV, 4.16kV & 600V Auxiliary Power Systems Safety-Related Voltage Analysis," Rev. 6, to identify the effect of longer motor-driven auxiliary feedwater pump (CA pump) acceleration times on the switchyard voltage limits in place to ensure offsite power source operability. However, the licensee failed to update the previously analyzed condition of only one offsite circuit in service from the switchyard to the 4160 volt (V) Class 1E buses via the unit step-up and unit auxiliary transformers (single busline alignment). As a result, there was no verification that the offsite circuit operability limit was adequate during single busline alignment.

Description: While reviewing permanent modification engineering change (EC) 405274, which revised the CA pump motor time-overcurrent relay setting due to an increase in the calculated acceleration time, the inspectors observed that calculation MCC-1381.05-00-0258, Rev. 6, had not been updated to address the effect of the longer acceleration time on the post-contingency minimum switchyard voltage operability limit for single busline alignment. Post-contingency is the steady-state condition following a main generator trip and automatic sequencing of accident loads onto the plant electrical buses.

On February 7, 2014, the licensee issued corrective action document nuclear condition report (NCR) 01901517, which identified that the brake horsepower of the CA pump could be higher than previously analyzed when the pump is aligned to a depressurized steam generator. On August 4, 2016, the licensee issued NCR 02051245, which identified that the torque developed by the Unit 1 CA pump motors was lower than previously documented. These NCRs recognized that the respective conditions would result in longer acceleration times than previously analyzed and initiated actions to re-analyze the effects of the longer acceleration times.

Motor acceleration time is also affected by the voltage at the motor terminals during starting. Lower voltage results in lower motor torque and longer acceleration time. On August 14, 2016, the licensee issued calculation MCC-1381.05-00-0374, "CA Terminal Voltage Calculation for CA OBDN [operable but degraded/non-conforming]," Rev. 0. On August 15, 2016, the licensee issued calculation MCC-1223.42-00-0074, "Prompt Determination of Operability for PIP M-14-01114 (CA Pump Motor Loads Under Adverse Conditions)," Rev. 2. These calculations addressed the need to maintain adequate switchyard voltage during events involving automatic load sequencing onto offsite power to ensure that the CA pump acceleration time was less than the degraded voltage relay minimum time delay.

In their March 30, 2006, letter to the NRC, "Response to NRC Generic Letter 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power," the licensee stated, "The minimum switchyard voltage that is required to ensure minimum NPP [nuclear

power plant] voltage recovery, following start of post-loss of coolant accident (LOCA) loads and degraded voltage dropout and reset setpoints, are determined and documented by NPP calculations…. The TSO's [transmission system operator's] pre- and post- contingency NPP switchyard bus voltage alarms are developed by a bounding analysis study, which is performed by a collaborated effort between the TSO and NPP engineering staff…. Duke Power's TSO makes use of grid analysis tools to predict grid conditions that would identify potential offsite power system inadequacies, which are communicated to the NPP operators so that they can determine NPP offsite power supply OPERABILITY."

Calculation MCC-1223.42-00-0074 identified the need to maintain the CA pump motor terminal voltage at 3586V during starting to ensure an acceleration time of no more than 9.08 seconds. This 9.08 second acceleration time was considered acceptable, because it provided margin to the 9.33 second minimum time delay of the degraded voltage relays under accident conditions. Calculation MCC-1381.05-00-0374 identified the need to maintain the Unit 1 post-contingency switchyard voltage at 224.82 kilovolts (kV) to ensure a CA pump motor terminal starting voltage of 3586V for dual busline alignment. However, the analysis did not establish a corresponding post-contingency switchyard voltage limit for the single busline alignment condition.

On September 12, 2016, the licensee issued calculation MCC-1381.05-00-0258, "U1, 6.9kV, 4.16kV & 600V Auxiliary Power Systems Safety-Related Voltage Analysis," Rev. 5. This revision was to, "support the CA OBDN calculation results requiring the 230kV Switchyard voltages to be raised to support operability." This calculation revision also failed to address the effect of the longer CA pump acceleration time on single busline alignment. The calculation was reissued as revision 6 on April 25, 2017, to incorporate some unrelated changes, and specified a minimum grid voltage of 232.0kV for the single busline alignment condition. This result was a carry-over from the old analysis prior to discovery of the increased CA pump acceleration time.

On November 30, 2017, the licensee issued a memorandum, "Minimum Grid Voltage Requirements For Catawba, McGuire, and Oconee Nuclear Plants," for use by transmission operations. It specified a "Minimum Grid Voltage with One Bus Line and GSU in Service," for McGuire Unit 1 of 232.00 kV, again not reflecting the need for a higher post-contingency voltage because of the increased CA pump acceleration time. Based on this obsolete information, the transmission operator specified 232.00 kV as the real-time contingency analyzer alarm setpoint to be used if the plant entered the single busline alignment condition. The licensee provided a printout of the transmission operator's computerized voltage schedule that indicated that this value had been adopted. At the time that this voltage schedule was put in place, there was no analysis that quantified the higher required post-contingency switchyard voltage needed for the single busline alignment condition because of the longer CA pump acceleration time.

Procedure AD-EG-ALL-1117, Rev. 5, section 5.4.1, Calculation Revision Overview, stated, "If revising a Calculation, then the Originator should determine whether the revision being made affects or invalidates the previous work, including ICCs [interim calculation changes]. If so, then the Originator revises the previous work as required." To the contrary, the Originator failed to revise the previous work to address the effect of the longer CA pump acceleration time on the operability limit for post-contingency switchyard voltage for the single busline alignment.

McGuire failed to update the analysis that demonstrated that the statements in Updated Final Safety Analysis Report (UFSAR) section 8.3.1.1.3, and Table 8-2 were met. Specifically, UFSAR section 8.3.1.1.3, stated, “In the event of the loss of one of the unit auxiliary transformers, the two 6900V switchgear assemblies that are normally energized from that transformer will automatically transfer to the alternate unit auxiliary transformer, which will then furnish power to the four switchgear assemblies.” Additionally, Table 8-2, “Single Failure Analysis for the Offsite Power Systems,” states that after the loss of one switchyard power circuit breaker to the step-up transformer, circuit from the switchyard to either main transformer, or a main transformer, “one of the two independent offsite circuits to each unit is available.” While the ability of the single busline to adequately furnish power without actuating the degraded voltage relays was not shown through analysis, the inspectors determined that the licensee had not operated the unit in the single busline alignment since the non-updated post-contingency switchyard voltage value had been provided to the TSO.

Corrective Actions: The licensee performed preliminary analyses to support an immediate determination of operability for this issue, using the existing models of the AC distribution system and associated ETAP software within calculations MCC-1381.05-00-0258, “U1 6.9KV, 4.16KV & 600V Auxiliary Power Systems Safety-Related Voltage Analysis,” and MCC-1381.05-00-0263, “U2 6.9KV, 4.16KV & 600V Auxiliary Power System Safety-Related Voltage Analysis.” Based on the preliminary analysis, the required minimum post-contingency switchyard voltage level for Unit 1 during single busline alignment, considering the longer AFWP starting time, was 233.18kV. This was higher than the real time contingency analyzer alarm setpoint that was specified in the transmission operator’s voltage schedule of 232kV. The licensee notified the transmission operator that the alarm setpoint for this condition needed to be increased to 235.25kV.

Corrective Action Reference: NCR 02185267

Performance Assessment:

Performance Deficiency: The inspectors determined that the failure to revise the previously-analyzed single busline alignment condition when updating the calculated allowable value of post-contingency switchyard voltage, as required by procedure AD-EG-ALL-1117, “Design Analyses and Calculations,” was a performance deficiency.

Screening: The performance deficiency was more than minor because, if left uncorrected, it could have resulted in a more significant safety concern. Specifically, the result of the failure to update the calculation for single busline alignment resulted in the station providing a non-conservative value of minimum acceptable post-contingency switchyard voltage to the transmission operator. If the plant had gone to the single busline alignment condition, the transmission operator would not notify the site that offsite power was inoperable until the non-conservative value (setpoint) was reached (232kV for Unit 1). If the station was in single busline alignment, post contingency switchyard voltage from transmission’s real time contingency analyzer could have shown that McGuire’s offsite line was operable and no action would be taken when it was inoperable.

Significance: The team evaluated the finding in accordance with NRC Inspection Manual Chapter (IMC) 0609, Attachment 4, “Initial Characterization of Findings,” issued October 7, 2016, for Mitigating Systems, and IMC 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” issued June 19, 2012, and determined the finding to be

of very low safety significance (Green) because the finding was a deficiency affecting the design of a mitigating structure, system, or component (SSC), and the SSC maintained its operability or functionality. Specifically, the offsite power source had not been inoperable since the time at which the calculation should have been revised, because they had not been in the single busline alignment.

Cross Cutting Aspect: The finding had a cross-cutting aspect in the Design Margins component of the Human Performance cross-cutting area, which required that the margins are carefully guarded and changed only through a systematic and rigorous process. In this case, the licensee identified conditions that could result in longer CA pump acceleration times than previously analyzed and recognized that this would result in an increase in the post-contingency switchyard voltage operability limits to ensure margin prior to the degraded voltage relay timeout during design basis events with offsite power available. However, the licensee only assessed the effect of the condition during dual busline alignment and failed to address the effect on design margins during single busline alignment.

Enforcement: The inspectors did not identify a violation of regulatory requirements associated with this finding.

Failure to Update the FSAR With Pertinent Design Information			
Cornerstone	Significance/Severity	Cross-cutting Aspect	Report Section
Mitigating Systems	Green Severity Level IV NCV 05000369,370/2018010-02 Closed	None	71111.21M – Design Bases Assurance Inspection

The inspectors identified a Green finding and associated Severity Level IV Non-cited Violation (NCV) of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.71(e), for the licensee's failure to update the final safety analysis report (FSAR) to include the design function of manually opening the residual heat removal (ND) system shutdown cooling suction valves. Consequently, the licensee failed to consider the design capability of the valves, time impacts on dose consequence analyses, and the implication of pressure locking.

Description: The inspectors reviewed NCR 01613287 which evaluated the need for an operator work around to vent the pressure from the piping between the ND-1B and ND-2AC valves prior to opening, to ensure trapped pressure between the valves does not cause the motor operated valve (MOV) loads to exceed the actuator design ratings. The shutdown cooling suction MOVs, ND-1B and ND-2AC, are located in series on a suction pipe coming from the reactor coolant system loop 3 hot leg, are located inside containment, and serve as the ND system suction valves during plant cool down. While reviewing the NCR, the inspectors identified that the design function to open these valves was not described in the UFSAR as it was presented in docketed correspondence. Prior to issuance of the McGuire operating license, the NRC's Safety Evaluation Report (SER) Supplement 4, dated January 1981, discussed the NRC's acceptance of McGuire's ND shutdown cooling suction line design. It discussed that MOVs ND-1B and ND-2AC have a design function to open and that the potential for one of the valves in series to fail to open was acceptable because the valves

could be manually opened to establish the ND system alignment to cool the plant down. The FSAR was not subsequently updated to reflect this required function or capability.

The inspectors determined that failure to update the FSAR with a description of the function of the ND valves to be opened manually, resulted in the following:

1. The licensee failed to develop an analysis or perform testing that demonstrated the ND-1B and ND-2AC valves could be manually opened under design conditions.
2. In view of the design functional requirement for manual opening capability, the ND-1B and ND-2AC valves for Unit 1 were improperly excluded from the scope of valves evaluated for bonnet pressure locking (Generic Letter (GL) 95-07). It was determined that the Unit 2 valves contained a hole drilled in the upstream discs that would eliminate the pressure locking phenomena and thus would not need be included in the scope.
3. The licensee failed to recognize the adverse impact of cooldown restrictions when WCAP-16632, "Inactive Loop Flow Stagnation During Natural Circulation Cooldown," was issued. To address the restrictions in the document, changes were incorporated into McGuire's emergency procedures (EP), EP/1(2)/A/5000/ES-0.2, Rev. 13(16). However, when updating the emergency procedures, the licensee failed to recognize that the updates could affect their radiological consequence calculations. The updated procedures could allow the duration of the radiological release during the accident to extend beyond the time frame assumed in the dose consequence analysis for a main steam line break. Since the analyzed release of radioactive material wasn't assumed to be stopped until after the licensee establishes the shutdown cooling alignment, the dose released by the accident could be greater than that currently analyzed.
4. The licensee failed to ensure dose consequence analyses for several UFSAR chapter 15 accidents accounted for the potential effect of ND system operation being delayed by local manual opening of valves ND-1B and ND-2AC. Local manual operation of the valves may be required for cases involving single failure. It was determined that the analyses didn't explicitly account for various holds in the cooldown EP nor the time required for local manual opening of ND-1B and ND-2AC.

Corrective Actions: The licensee developed corrective actions to update the UFSAR with the design function of the ND-1B and ND-2AC valves to be opened manually and evaluate whether documented correspondence to GL 95-07 and GL 89-10 needs to be updated. Calculations were developed to demonstrate that the valves could be opened manually and that dose consequences would have remained within required limits based on actual prior plant conditions. In addition, the licensee placed an administrative limit on the maximum dose equivalent iodine (DEI) to ensure accident doses remain within limits. The licensee also took measures to ensure that containment would remain accessible to operators following applicable design basis events.

Corrective Action References: NCRs 02185195, 02187791, 02188028, 02188216

Performance Assessment:

Performance Deficiency: The inspectors determined that the licensee's failure to update the final safety analysis report (FSAR) to include the design function of manually opening the residual heat removal (ND) system shutdown cooling suction valves as required by 10 CFR 50.71(e) was a performance deficiency.

Screening: The performance deficiency was determined to be more than minor because, if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, the lack of detail in the FSAR could lead the licensee to fail to account for the design function appropriately, such as not confirming the ability to operate the valves manually, or not appropriately considering the effect of delayed operation due to manual operation.

Significance: The team evaluated the finding in accordance with NRC Inspection Manual Chapter (IMC) 0609, Attachment 4, "Initial Characterization of Findings," issued October 7, 2016, for Mitigating Systems, and IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued June 19, 2012, and determined the finding to be of very low safety significance (Green) because the finding was a deficiency affecting the design of a mitigating SSC, and the SSC had maintained its operability. Specifically, the licensee demonstrated the ability to operate the valves manually, and confirmed that prior plant parameters would not have led to exceeding required dose limits.

Cross Cutting Aspect: No cross cutting aspect was assigned because the team determined the finding did not reflect present licensee performance.

Enforcement:

Severity: The ROP's significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it is necessary to address this violation which impedes the NRC's ability to regulate using traditional enforcement to adequately deter non-compliance. This finding was determined to be a Severity Level IV violation using Section 6.1.d of the NRC's Enforcement Policy, dated November 1, 2016, because the licensee failed to update the final safety analysis report (FSAR) to include the design function of manually opening the residual heat removal (ND) system shutdown cooling suction valves and the lack of up-to-date information had a material impact on safety or licensed activities.

Violation: 10 CFR 50.71(e) required, in part, "Each person licensed to operate a nuclear power reactor under the provisions of 50.21 or 50.22… shall update periodically, as provided in paragraphs (e)(3) and (4) of this section, the final safety analysis report (FSAR) originally submitted as part of the application for the license, to assure that the information contains the latest information developed."

Contrary to the above, from July 1983 to present, the licensee did not update their FSAR originally submitted as part of the application for the license, as provided in paragraph (e)(3), to assure that the information contained the latest information developed. Specifically, the licensee had not updated the FSAR within 24 months of the date of issuance of the operating license to assure that the information contained the latest information developed. New information regarding the design of the ND system was developed and accepted in SER Supplement 4, and the licensee failed to update the FSAR to include the manual open design function of the ND shutdown cooling suction valves, ND-1B and ND-2AC.

Enforcement Actions: This violation is being treated as a Non-Cited Violation, consistent with Section 2.3.2 of the Enforcement Policy.

EXIT MEETINGS AND DEBRIEFS

The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

On March 2, 2018, the inspectors presented the design bases assurance (team) inspection results to Mr. T. Ray, Site Vice President, and other members of the licensee staff. On April 4, 2018, additional inspection results were presented to Mr. Snider and other members of the licensee's staff.

DOCUMENTS REVIEWED

Calculations

DPC-1381.06-00-001, Nuclear Switchyard Minimum Grid Voltage Requirements, Rev. 25
MCC-1201.05-00-0006, Rerate Qualification Report for 3x4x9E MSD 9 Stage Auxiliary Feedwater Pump, Rev. 1
MCC-1205.06-00-0046, Rim Pull Requirements for Time critical Valves, Rev. 5
MCC-1211.00-00-0004, McGuire Nuclear Station Unit 1&2 Diesel Generator Ventilation Calculation, Rev. 32
MCC-1223.23-00-0003, Documentation for Component Cooling Surge Tank, Rev. 1
MCC-1223.23-00-0022, KC Surge Tank Level Instrument, Rev. 14
MCC-1223.23-00-0022, KC Surge Tank Level Instrumentation, Rev. 0
MCC-1223.23-00-0027, KC Pump NPSH, Rev. 0
MCC-1223.42-00-0066, Hydraulic Evaluations for EC 101080 and Determination of CA Flow Limits, Rev. 3
MCC-1229.00-00-0019, Post Accident Shielding Calculation, Rev. 19
MCC-1281.05-00-0200, U1/2, 125VDC Vital I&C Power System (EPL) Battery Sizing and Battery Charger Sizing, Rev. 10
MCC-1381.05.00-0260, ETAP DG Dynamic Analysis, Rev. 7
MCC-1381.05-00-0007, Cable Ampacities and Impedances to be Used in Cable Sizing for the McGuire 575 volt, 4000 volt, and 6600 volt Motors, Rev. 13
MCC-1381.05-00-0008, Design Calculations for Cable Sizing for the McGuire Auxiliary Feed Water Pump Motor, Rev. 0
MCC-1381.05-00-0094, Protective Relay Setting Calculation for Essential Switchgear, Rev. 26
MCC-1381.05-00-0147, Maximum Allowable Cable Lengths for Size 1 and 2 Starters at McGuire, Rev. 9
MCC-1381.05-00-0187, Summary of Analysis of Current Diesel Generator Loads, Rev. 10
MCC-1381.05-00-0200, U1/2, 125VDC Vital I&C Power System (EPL) Battery Sizing and Battery Charger Sizing, Rev. 8
MCC-1381.05-00-0214, U1/2, 125 VDC Vital I&C Power System (EPL) Short Circuit Analysis, Rev. 8
MCC-1381.05-00-0230, U1/2, 125 VDC Vital I&C Power System (EPL) Voltage Drop Analysis, Rev. 7
MCC-1381.05-00-0257, U1/2 AC Auxiliary Power System ETAP Model Base File, Rev. 17
MCC-1381.05-00-0264, U1/2 Spare Auxiliary Feedwater Pump Starting Times, Rev. 1
MCC-1381.05-00-0276, Auxiliary Feedwater Pump (CA) Motor Torque and Acceleration Characteristics, Rev. 0
MCC-1381.05-00-0281, Control Power Transformer Qualified Life Analysis, Rev. 0
MCC-1381.05-00-0301, Unit 1, 6.9KV and 600V Auxiliary Power System Short Circuit Analysis, Rev. 8

MCC-1381.05-00-0335, Unit 1/2 NFPA 805 Circuit Breaker and Fuse Coordination Study, Rev. 21
MCM 1201.05-0510.001, Technical Justification of the hydroaire Pump Rotor Element for the NV Charging Pump, Rev. 4

Drawings

2KC-351, sht. 4, MCSRD – KC System Auxiliary Building, Rev. 3
2KC-351, sht. 6, MCSRD – KC System Auxiliary Building, Rev. 3
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1469034	1624199	1903793	2048902	2103324
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1567286	1685491	1976674	2053829	2154511
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