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~~SECURITY-SENSITIVE INFORMATION - WITHHOLD UNDER 10 CFR 2.390(d)(1)~~
UPON REMOVAL OF PAGE 8 of 42, THIS LETTER IS UNCONTROLLED

10 CFR 50.90

June 30, 2015
Serial: MNS-15-026

U.S. Nuclear Regulatory Commission
Washington, DC 20555-001

ATTENTION: Document Control Desk

Duke Energy Carolinas, LLC (Duke Energy)
McGuire Nuclear Station, Units 1 and 2
Docket Nos. 50-369 and 50-370
Renewed License Nos. NPF-9 and NPF-17

Subject: License Amendment Request for Temporary Changes to Technical Specifications for Correction of an 'A' Train Nuclear Service Water System (NSWS) Degraded Condition

Technical Specifications (TS) Sections:
3.5.2, Emergency Core Cooling System (ECCS) - Operating
3.6.6, Containment Spray System (CSS)
3.7.5, Auxiliary Feedwater (AFW) System
3.7.6, Component Cooling Water (CCW) System
3.7.7, Nuclear Service Water System (NSWS)
3.7.9, Control Room Area Ventilation System (CRAVS)
3.7.11, Auxiliary Building Filtered Ventilation Exhaust System (ABFVES)
3.8.1, AC Sources - Operating

In accordance with the provisions of 10 CFR 50.90, Duke Energy proposes a license amendment request (LAR) for the Renewed Facility Operating Licenses (FOL) and Technical Specifications (TS) for the McGuire Nuclear Station, Units 1 and 2, to allow temporary changes to TS 3.5.2, Emergency Core Cooling System (ECCS) - Operating;
TS 3.6.6, Containment Spray System (CSS); TS 3.7.5, Auxiliary Feedwater (AFW) System; TS 3.7.6, Component Cooling Water (CCW) System; TS 3.7.7, Nuclear Service Water System (NSWS); TS 3.7.9, Control Room Area Ventilation System (CRAVS); TS 3.7.11, Auxiliary Building Filtered Ventilation Exhaust System (ABFVES), and TS 3.8.1, AC Sources- Operating.

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The proposed amendment will permit the 'A' Train NSWS to be inoperable for a total of 14 days to allow for the correction of a degraded condition on the 'A' Train supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity, or by December 31, 2016, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS pumps will remain running and aligned to Lake Norman until the system is ready for post maintenance testing. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' NSWS piping from the SNSWP is not available will be limited to a 72 hour completion time. The latter will not count against the 14 day completion time.

Currently, the 'A' Train NSWS pumps are classified as Operable But Degraded Non-conforming (OBDN) with respect to the Updated Final Safety Analysis Report (UFSAR) specified conditions related to pump Net Positive Suction Head (NPSH) when aligned to the SNSWP.
The activities associated with the 'A' Train NSWS piping are necessary to address the OBDN condition.

Duke Energy submitted a similar LAR to the NRC dated November 09, 2011 (ADAMS Accession No ML11318A117) but withdrew the LAR in a letter dated December 20, 2011 (ADAMS Accession No. ML11362A398) based on feedback that the Duke Energy Seismic PRA model did not meet Regulatory Guide 1.200, Revision 2 requirements for a risk based LAR. This new LAR is being submitted using a deterministic approach that contains risk insights.

This approach was discussed with the NRC in a public meeting on May 13, 2015, and the LAR is based on the precedents provided in Attachment 1.

Attachment 1 provides Duke Energy's evaluation of the LAR which contains a description of the proposed changes, the technical evaluation, the regulatory evaluation, the determination that this LAR contains No Significant Hazards Considerations, the basis for the categorical exclusion from performing an Environmental Assessment/Impact Statement, and precedents for the LAR.

Attachment 2 provides a marked-up version of the affected TS. Reprinted (clean) TS pages will be provided to the NRC prior to issuance of the approved amendment.

Attachment 3 provides a marked-up copy of the TS Bases changes for information only.

Attachment 4 provides marked-up Nuclear Service Water System (NSWS) flow diagrams and piping diagrams to support information provided in Attachment 1.

Attachment 5 provides Copies of NSWS Plant Operating Diagrams

Attachment 6 provides the Regulatory Commitments made in support of this LAR

Duke requests NRC review and approval of this LAR by October 31, 2015, in order to support the activities on the 'A' Train NSWS suction piping from the SNSWP, currently scheduled for the fall of 2015.

In accordance with Duke internal procedures and the Quality Assurance Topical Report, the proposed amendment has been reviewed and approved by the McGuire Plant Operations Review Committee.

Pursuant to 10CFR50.91, a copy of this LAR has been forwarded to the appropriate North Carolina state officials.

Please direct any comments or questions regarding this submittal to George Murphy at (980) 875-5715.

I declare under penalty of perjury that the foregoing is true and correct. Executed on June 30, 2015.

Sincerely,

Steven D. Capps

Attachments:

1. Evaluation of Proposed Amendment
2. Marked-up McGuire Technical Specification Pages
3. Marked-up copy of the McGuire Technical Specification Bases Pages
4. Marked-up copy of the NSWS simplified flow diagrams and piping diagrams
5. Plant Operating Diagrams
6. Regulatory Commitments

cc w/ Attachments:

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ATTACHMENT 1

EVALUATION OF PROPOSED AMENDMENT

1.0 SUMMARY DESCRIPTION

The proposed amendment will permit the 'A' Train Nuclear Service Water System (NSWS) to be inoperable for a total of 14 days to allow for the correction of a degraded condition on the 'A' Train supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity, or by December 31, 2016, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS pumps will remain running and aligned to Lake Norman. After the system has been restored, post maintenance testing will require that the 'A' Train NSWS be aligned to the SNSWP to restore operability and exit the TS action. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the SNSWP supply to 'A' Train NSWS is not available will be limited to a 72 hour completion time. The latter will not count against the 14 day completion time. This approach was discussed with the NRC in a public meeting on May 13, 2015.

The alignment of 'A' Train NSWS to the Lake Norman water source during this activity is consistent with the normal plant operating alignment. The alignment is also consistent with the Engineering Safety Features Actuation System (ESFAS) response alignment (i.e. Safety Injection). The piping to be removed from service during this activity affects the assured water source for the 'A' Train NSWS. The assured water source for 'A' Train NSWS is the SNSWP. This water source is only necessary for a low probability seismic event that adversely impacts the Lake Norman dam or the Lake Norman water supply to the NSWS. See Figures 1-9 in Attachment 4 that depict the alignments and features described in this LAR.

The operability of 'B' Train NSWS is not affected by the proposed changes. For defense-in-depth, the 'B' Train NSWS will be placed in its ESFAS alignment to the SNSWP water source with the 'B' Train pumps in standby prior to starting the LAR activity and remain in this alignment until the 'A' Train NSWS SNSWP water source is restored and ready for post maintenance testing. The SNSWP water source and piping are seismically qualified for both 'A' and 'B' Train NSWS.

Procedures will be established and designated operators will be available to provide an additional defense in depth contingency that could be used in the event of an extremely low probability of a loss of the Lake Norman water source due to a seismic event. The contingency will provide guidance for a potential subsequent failure of a 'B' Train NSWS pump. (See Figure 7: "Contingency for Loss of 'B' NSWS pump After Response to Loss of Lake Norman" in Attachment 4).

Fukushima Response FLEX modifications will be installed and the FLEX strategies will be available for implementation as additional defense-in-depth on both units. It is expected that both units will remain in Mode 1 during the activity and no discretionary maintenance will be performed on the 'B' Train NSWS.

Currently the 'A' Train NSWS pumps are classified as Operable But Degraded Non-conforming (OBDN) with respect to the Updated Final Safety Analysis Report (UFSAR) due to reduced margin to Net Positive Suction Head (NPSH) when aligned to the SNSWP. The correction of the 'A' Train NSWS SNSWP supply piping degraded condition is necessary to address the OBDN condition.

2.0 DETAILED DESCRIPTION

The proposed LAR would revise TS Action 3.5.2 A.1, TS Action 3.6.6 A.1, TS Action 3.7.5 B.1, TS Action 3.7.6 A.1, TS Action 3.7.7 A.1, TS Action 3.7.9 A.1, TS Action 3.7.11 A.1, and TS Action 3.8.1 B.4 to add a note similar to the following that states:

> "[Applicable TS System] 'A' Train is allowed to be inoperable for a total of 14 days to allow for the correction of a degraded condition on the 'A' Train supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity, or by December 31, 2016, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-15-026."

The TS actions affected by this LAR are applicable in Modes 1-4 with the exception of TS 3.5.2 A.1 which is applicable in Modes 1-3 and TS 3.7.9 which is applicable in Modes 1-6. The activity described in this LAR is expected to be performed with both units in Mode 1.

The marked-up TS pages illustrating the proposed change are provided in Attachment 2.

3.0 TECHNICAL EVALUATION

Background:

The Ultimate Heat Sink (UHS) for McGuire is the Standby Nuclear Service Water Pond (SNSWP). Lake Norman, with an approximate volume of 1,093,600 acre-feet, provides the highest net positive suction head to the Nuclear Service Water (NSW) Pumps, and normally serves as the heat sink cooling water reservoir. As an Engineered Safety Feature (ESF), the Lake Norman Low Level Intake (LLI) source is automatically aligned to supply the NSW 'A' Trains of both units following a safety injection signal from either unit or the loss of offsite power (LOOP) on either unit. Cowan's Ford Dam, impounding Lake Norman, is qualified for an Operating Basis Earthquake (OBE), or approximately one-half Safe Shutdown (Design Basis) Earthquake (SSE). Due to the fact that the Lake Norman water supply is not qualified to a SSE this water supply is not credited for postulated seismic events.

While the Lake Norman water supply is only qualified to an OBE, a Seismic Fragility Assessment of the McGuire Low Level Intake Water Pipeline performed for Duke Energy in December of 2011 indicates that the dam and water supply would withstand a SSE. This is documented in Duke Energy calculation titled McGuire Low Level Intake Water Pipeline Seismic Fragility Assessment.

The SNSWP, which is qualified for an SSE, serves as the most severe natural phenomena heat sink cooling water reservoir. Two lines (Train 'A' and Train 'B') are provided from the SNSWP to meet single failure criteria should a seismic event cause loss of Cowan's Ford Dam and resulting loss of Lake Norman. All supply and discharge piping for the SNSWP is seismically qualified. As an Engineered Safety Feature, the Train 'B' SNSWP supply is automatically aligned to supply the 'B' Trains of both units following a safety injection signal from either unit or a LOOP on either unit.

Testing performed in 2009 indicates that the Unit 1 and 2 'A' Train NSWS pumps were close to or at the required net positive suction head (NPSH) when aligned to the SNSWP with both Unit 1 and 2 'A' Trains operating at approximately 10,000 gpm. Based on these testing results and further evaluation it was determined that 'A' Train NSWS pump suction pressure had been significantly lower than that of the 'B' Train since 1978. Vendor testing of the NSWS Pumps has determined that the pumps will continue to operate if available NPSH is less than the required NPSH. Testing has confirmed Unit 1 and 2 'B' Train NSWS operability is not impacted.

Visual inspections of the 'A' Train NSWS supply piping were limited to the first several hundred feet of the approximate 2,000 feet of the NSWS piping from the SNSWP based on the capabilities of commercial divers. The results of an Acoustic Reflectometry inspection of the 'A' Train NSWS piping from the SNSWP performed in 2011 indicated a sizable flow restriction located approximately 1,500 feet downstream of the suction point from the SNSWP. However, a subsequent remotely operated vehicle (ROV) video survey inspected the piping out to 1,800 feet and did not identify any conditions that would have restricted NSWS flow.

The last segment of piping could only be inspected in a safe and reliable manner after a deep well manway was installed closer to the area to be inspected. The well for the manway was recently installed and the 'A' NSWS piping was wet tapped to allow access into the pipe from the manway. The manway provides access to the last segment of piping and a means of using a diver to retrieve the ROV should it get stuck. See Figure 8: Nuclear Service Water System - Piping Diagram in Attachment 4. The manway also provides a means of providing personnel access for removal of the obstruction.

Additionally, if the repair evolution is such that diver access is not possible for removing the obstruction, then the affected pipe will be drained and a contingency pipe opening for personnel access will be created between the auxiliary building wall and the first isolation valve in the 'A' Train SNSWP supply piping for a personnel egress/ingress path. The new pipe opening will be designed and installed in accordance with the Engineering Change Process.

A new ROV video survey of the remaining 'A' Train NSWS piping is planned to confirm the location and size of this anomaly. The ROV inspection of the last section of piping will be conducted subject to existing TS 3.7.7 completion time.

'A' Train NSWS is normally aligned to Lake Norman and would not be subject to the NPSH condition described above. However, if the 'A' Train were to be manually aligned to the SNSWP, the flow rates could be high enough to challenge the 'A' Train NSWS pump required NPSH. Based on this condition, the 'A' Train NSWS pumps were determined to be Operable but Degraded Non-conforming (OBDN) with the Updated Final Safety Analysis Report (UFSAR) specified conditions related to NPSH when aligned to the SNSWP.

System modeling determined that general corrosion and differences between 'A' and 'B' Train NSWS pipe geometry were unlikely to be the primary cause of suction pressure differences observed on the 'A' Train NSWS pumps.

The pipe repair activity will require 'A' Train NSWS be aligned to be Lake Norman until the system is ready for post maintenance testing (see Figure 6: NSWS Alignment During 14 Day Out of Service Window, in Attachment 4). This is the normal and ESFAS alignment for 'A' Train NSWS. The 'A Train' NSWS supply from the SNSWP will be closed with power removed from the motor operated valve 0RN-7A (see Figure 5: Piping to Be Removed from Service during the Extended Completion Time, in Attachment 4). This will remove the capability to manually align the 'A' Train NSWS to the SNSWP in response to a seismic event that results in damage to the supply piping from Lake Norman or the highly improbable loss of Lake Norman. If such an event should occur during the activities in the proposed amendment, 'B' Train NSWS will supply all necessary needs to maintain the Ultimate Heat Sink Safety Function.

Station procedures require that the 'A' and 'B' Trains of the NSWS be aligned to the SNSWP for a loss of LLI or an earthquake equal to or greater than an OBE. This is the only time that 'A' Train NSWS is required to be aligned to the SNSWP except for testing and maintenance activities. In all other cases, 'A' Train NSWS is aligned to the Lake Norman water source.

Additionally, the McGuire earthquake response procedure requires that the operating units be shutdown and cooled down to Hot Standby (Mode 3) within six (6) hours following an OBE. If an SSE occurs, this procedure requires that the units be shutdown and cooled down to Cold Shutdown (Mode 5) within thirty (30) hours.

This amendment is proposed to avoid an unnecessary Unit 1 and 2 (dual unit) shutdown. Entry into and operation of shutdown cooling is not without risk as it involves significant plant manipulations and evolutions on both the plant primary and secondary systems by Operations personnel. This risk is averted by remaining at power. By performing this activity with both units on-line, the ability of plant personnel (Operations, Maintenance, and Plant Management) to focus on the NSWS activity will be enhanced which is expected to improve Nuclear Safety with minimal risk.

This is a one-time change in support of the repair activity. A permanent TS change is not being requested.

'A' Train NSWS Repair Evolution:

The location of the restriction appears to be in the 'A' Train NSWS piping under the station's Unit 2 Emergency Diesel Generator (EDG) building. Before starting the NSWS repair evolution an ROV survey is planned to confirm the location, size and characterization of the restriction. The ROV survey will be conducted under the existing TS 3.7.7 completion time of 72 hours. If the survey results conclude that the repair activity is needed and can be successfully completed, then the clock for the 14 day completion time authorized by this LAR will start.

The 14 day completion time extension is based on the most likely scenario for the OBDN condition which is that a fixed construction artifact in the 'A' NSWS piping is restricting flow to the suction of the 'A' NSWS pumps from the SNSWP. The scope of planning for this activity includes actions to extract the debris and complete any minor repairs associated with removal of the debris. The scope of the activity does not allow for major excavation or activities that would adversely affect other Safety Related SSCs or Functions. Identification of a condition in which repairs could impact the ability of an SSC to perform its Safety Function would result in termination of activities and restoration of 'A' Train NSWS to the current OBDN condition.

If the results of the planned ROV survey identify a condition that the station cannot resolve within the 14 day completion time, then the system will be restored to its current OBDN condition and the use of the 14 day completion time will be postponed until the necessary evaluation and planning can be completed to perform the evolution within the 14 day completion time. Delay of the object recovery activity would be acceptable as long as operability of the NSWS is not impacted. On the other hand, if the ROV survey presents any opportunities for a less intrusive or less time consuming solution for addressing the OBDN condition, then these opportunities will be pursued, as appropriate and use of the 14 day completion time to address the repair will be minimized.

If the obstruction cannot be removed by divers, then the 'A' Train NSWS piping to the SNSWP will be isolated and drained. The Lake Norman end of the 'A' Train NSWS piping will be isolated by 0RN-7A. In an activity planned to be performed this summer separate from the 14 day completion time repair activity, 0RN-7A will be tested for leakage and adjusted if necessary to minimize leakage.

The SNSWP end of the 'A' Train NSWS pipe will be isolated by the installation of a bolted blank flange on the end of the pipe suction. The flange is designed and constructed to meet ASME requirements. A plant drawing of the flange can be found in Figure 9: Personnel Access Manway and SNSWP Isolation Flange Detail in Attachment 4 of this submittal. Once isolated by 0RN-7A, the piping will be drained by pressurizing with air through a vent to push the water in

the pipe toward and out of the pipe at the SNSWP. Once the water from the piping has been evacuated, the flange will be installed. Once the flange is installed, the pipe will be vented for opening of the existing pre-installed access manway. In an activity planned to be performed this summer separate from the 14 day completion time repair activity the SNSWP isolation flange will be test fitted to the 'A' SNSWP pipe.

With 'B' Train NSWS aligned to the SNSWP, and because the Train 'A' and 'B' flowpaths are independent of each other, the operable 'B' Train is unaffected by the draining evolution.

'A' Train NSWS will be protected from air intrusion by the positive pressure provided by the Lake Norman elevation head of (6.5 to 7.5 psig) which will apply pressure on the back side of Valve 0RN-7A and prevent air from entering the system. Procedure guidance will establish controls to limit evacuation air pressure to less than a predetermined value in order to prevent air intrusion into the operating NSWS. As long as the air pressure used for evacuating water from the affected NSWS piping is maintained less than the effective system head upstream of 0RN-7A it is not possible for air intrusion into the operating portion of the NSWS system upstream of the isolation valve 0RN-7A. The NSWS alignment during the proposed 14 day completion time with 'B' Train NSWS aligned to the SNSWP and 'A' Train aligned to the LLI aids in the prevention of air intrusion by eliminating challenges to pressure due to the higher flows resulting from both NSWS Trains being aligned to the LLI.

Foreign Material Exclusion (FME) will be controlled during the proposed activities in accordance with AD-MN-ALL-0002, Foreign Material Exclusion (FME). Any debris resulting from the obstruction removal activity will be mechanically cleaned out before the system is closed for return to service per FME plan developed in accordance with the above procedure. The system will be video inspected and reversed flushed from the LLI to the SNSWP with isolation to downstream components to force any sediment back to the SNSWP.

During restoration of the 'A' Train NSWS piping, system openings will be closed and the system will be filled and vented.

Following 'A' Train NSWS restoration, testing will be performed to verify that the as left NSWS performance meets or exceeds pre-activity performance including 'A' Train NSW pump NPSH conditions.

Systems Affected by a NSW System Outage:

The impact of the proposed TS changes on the operation of the ECCS, CSS, AFW, CCW, NSWS, CRAVS, ABFVES, EDG and the Control Room Area Chilled Water (CRACWS) systems due to the NSW System repair activities during the requested 14 day period was evaluated. Although considered inoperable, the 'A' EDGs and 'A' Train NSWS and their supported systems will be technically capable of performing their intended functions barring the highly improbable loss of Lake Norman. The operation of 'B' Train NSWS is not affected by the proposed changes.

NSWS TS 3.7.7 requires additional entry into TS 3.8.1 for the associated EDG and TS 3.4.6, "Reactor Coolant System Loops - Mode 4" for the associated Residual Heat Removal (RHR) loop made inoperable by the inoperable NSWS Train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. During the NSW System Train 'A' repair, Units 1 and 2 will be in Mode 1; therefore, the requirement to enter TS 3.4.6 should not

3.1 System Description

Nuclear Service Water System (NSWS):

As discussed in Section 9.2.1 of the UFSAR, the NSW System provides an assured source of cooling water for various Auxiliary Building and Reactor Building heat exchangers during all phases of station operation. Each Unit has two redundant "essential-headers" serving two Trains of equipment necessary for safe station shutdown, and a "nonessential header" serving equipment not required for safe shutdown. In conjunction with the Ultimate Heat Sink [the Standby Nuclear Service Water Pond (SNSWP)], the NSW System is designed to meet design flow rates and heads for normal station operation and those required for normal safe station shutdown or shutdowns resulting from a postulated Loss of Coolant Accident (LOCA). The system is further designed to tolerate a single failure following a LOCA on one unit with a controlled shutdown on the alternate Unit concurrent with a loss-of-offsite power on both units, or a seismic event causing a loss of Lake Norman resulting in controlled shutdown on both Units concurrent with a LOOP on both Units.

Portions of the NSW System are shared between the two McGuire Units (See Figure 1: Nuclear Service Water System in Attachment 4). The shared valves (designated by the prefix "0") associated with the main supply and discharge sections of the NSWS may be powered and controlled from either Unit 1 or 2. The motor control centers (MCCs) supplying these valves are safety related and are shared between both Units. Normally, the MCCs receive power from their respective Unit's 600 volt load center. However, if this normal source of power is lost then the operator can manually transfer the MCCs incoming power to the opposite Unit's 600 volt load center through the use of a kirk key interlock.

Normal Operation:

The NSW System is made up of five sections which, when put together in series, provide an assured source of water for all the station safety related water demands and some non-safety related demands. These sections are, in order of flow: the main supply section, the NSW strainer/pump section, the NSW heat exchanger section, and the NSW main discharge section.

The NSW System is designed to meet single failure criteria, with two redundant trains per unit to serve components essential for safe station shutdown. Train 'B' components and piping provide 100% backup to Train 'A' components. Engineered Safety Features provide for automatic valving and component actuation for both trains of the unit affected, while non-safety related components are isolated and shut off. Train 'A' and 'B' Main Supply and Discharge Crossover double valving is also closed by an Engineered Safety Feature assuring train integrity.

The four basic sections of the NSW System are discussed in the following paragraphs:

1. **Main Supply Section**:

   The main supply section of the NSW System includes the Low Level Intake (LLI) Cooling Water System, the Condenser Circulating Water System (RC), the Standby Nuclear Service Water Pond (SNSWP) and all piping and valves up to and including the train supply isolation valves preceding the NSWS strainers.

a. As the normal source of water from Lake Norman, the single line from the LLI Cooling Water system, the inlet of which is located at approximately 650 foot elevation, provides water to both trains of NSWS pumps. Covering the inlet is a macro-fouling barrier comprised of a stainless steel mesh with a wire size of 0.105 inch diameter, 3/4 inch center to center measurement in a square pattern. These panels are inspected periodically. Should any of the Train 'A' redundant safety-related components malfunction, the corresponding Unit's 'A' NSWS pump is shut down and the "B' NSWS pump started, supplying the Unit's Train 'B' heat exchangers. As an Engineered Safety Feature, this LLI supply is automatically aligned to supply the 'A' Trains of both Units following a Safety Injection signal from either unit or a LOOP on either unit.

   Alewife fish have tended to concentrate at elevations similar to the LLI structure during very brief periods in summer. Since velocities at the LLI are low, the intake structure macro-fouling barrier acts as a "fence" to prevent movement of Alewife into the LLI structure.

b. A secondary source of water is available from the RC supply cross-over. However, this alignment is not normally used.

c. Two lines are provided from the SNSWP to meet single failure criteria should a seismic event cause loss of Cowan's Ford Dam and resulting loss of Lake Norman. As an Engineered Safety Feature, the Train 'B' SNSWP supply is automatically aligned to supply the 'B' Trains of both Units following a Safety Injection signal from either unit or a LOOP on either unit. The Train 'A' SNSWP supply then acts as a 100% backup should any Train 'B' component fail to function property. Each Train is of sufficient size to provide total station flow for a Unit LOCA and a Unit cooldown. For accidents or design events where Lake Norman remains available, it is highly probable that Train 'B' would be realigned to Lake Norman since it would provide the highest system performance.

   The corrective actions taken to eliminate macro-fouling of the NSWS strainers from the SNSWP are discussed in Duke Energy's letter of April 1, 2011 (ADAMS Accession ML111020305). These include a semi-annual activity to prevent the development of a fish population, periodic hydro acoustic surveys and the installation of a macro-fouling barrier at the NSWS intake pipes in the SNSWP in 2011.

2. **NSW Strainer and Pump Section**:

   a. Strainers are of the automatic backwash type, and backwash discharge is automatically in service when the respective Nuclear Service Water pump is started. The normal backwash discharge pump flow path returns to the NSW return header, thus preventing any unnecessary loss of water from the SNSWP for all design basis events that require the use of the UHS. Backwash Supply is provided by NSW from the NSW pump discharge when a pressure drop across the strainer reaches a predetermined value. Safety related assured air supply is available to the strainer supply isolation valve to permit operation in the event of a Safety Injection Signal or a Loss of Instrument Air. The strainer drum motors and strainer backwash discharge pumps are powered by normal and emergency sources. The strainer function is in service during normal and accident

conditions.

b. Normally, only one NSWS pump per unit is in operation, as each pump meets system maximum flow requirements, but as an Engineered Safety Feature, all available pumps are automatically started upon a Safety Injection signal or loss of station and offsite power. Only one train is necessary, so the redundant train is maintained in standby. Each NSWS pump is supplied with power from separate normal and emergency sources. Emergency power is provided to each NSWS pump from its corresponding train EDG, thereby assuring a continuous flow of water under all conditions. Each NSWS pump motor receives cooling water from its corresponding NSWS pump discharge at all times while that pump is in operation.

3. **Heat Exchanger Section**:

a. The following components and emergency water supplies are essential for safe plant shutdown, therefore they are redundant for each Unit and served by corresponding redundant trains of the Nuclear Service Water System. The following are also designed for operation during and after seismic conditions:

i. Coolers for:
    1. Component Cooling Pump Motors
    2. Centrifugal Charging Pump Motors
    3. Safety Injection Pump Motors
    4. Residual Heat Removal Pump Motors
    5. Containment Spray Pump Motors
    6. Nuclear Service Water Pump Motors
    7. Auxiliary Feedwater Pump Motors
    8. Fuel Pool Cooling Pump Motors

ii. Containment Spray Heat Exchangers
iii. Diesel Generator Heat Exchangers
iv. Component Cooling Heat Exchangers
v. Centrifugal Charging Pump Bearing Oil Coolers
vi. Centrifugal Charging Pump Gear Oil Coolers
vii. Assured Auxiliary Feedwater Supplies
viii. Assured Diesel Generator Cooling Supplies
ix. Assured Fuel Pool Makeup Supplies (normal makeup from FWST)
x. Assured Component Cooling Supplies
xi. Safety Injection Pump Bearing Oil Coolers
xii. Control Room Area Chilled Water System Chiller Condensers

b. Each Train of the NSWS provides assured auxiliary feedwater to the Auxiliary Feedwater System. Each motor driven AFW pump motor is cooled and supplied with suction from its corresponding train of the NSW System. The steam turbine driven AFW Pump (suction) is supplied from whichever train of the NSW System is in operation. Nuclear Service Water is used for feedwater only when the normal condensate supplies for the Auxiliary Feedwater System are unavailable.

c. The following components are not redundant since they are not essential for safe shutdown. Water is supplied to these components during normal operation, but

are automatically isolated from the Nuclear Service Water supply and return on receipt of a Safety Injection Signal:

i. Reciprocating Charging Pump Bearing Oil Cooler
ii. Reciprocating Charging Pump Fluid Drive Oil Cooler
iii. The Upper Containment Ventilation Units
iv. The Lower Containment Ventilation Units
v. The Auxiliary Building Ventilation Units

The Reactor Coolant Pump motor air coolers are not essential for safe shutdown, but are set up to receive cooling water flow until the Containment high/high pressure setpoint of 3 psig is received.

4. **Main Discharge Section**:

   a. During normal operation with supply from the LLI at Lake Norman, water returns to Lake Norman via the NSW system return line to the RC return crossover header in the Turbine Building.

   When NSWS requirements are being supplied by 'B' Train NSWS supply line from the SNSWP, NSWS flow return to the pond is accomplished by the 'B' Train NSWS return line. Complete, 100% redundancy of safety related components and piping is provided by Train 'A' component heat exchangers, supply, and return piping to the SNSWP.

5. **Crossover Valving**:
   At the interface of each section of the Nuclear Service Water System with the next section, there are crossover lines with double isolation valves. These are identified as follows:

   a. Main Supply Crossover valves

   b. Pump Discharge Header Crossover valves

   c. Main Discharge Crossover valves

   These valves give the system added flexibility to operate should more than one malfunction occur. As an Engineered Safety Feature, the Main Supply and Main Discharge Crossover valves have electric motor actuators that close upon a Safety Injection signal. This assures Train isolation and properly aligned supply and return to the RC crossover and SNSWP as outlined previously.

Normal NSWS Response to a Safety Signal:

Upon receipt of a Safety Injection signal, the following will occur:

1. Both NSWS pumps start (respective strainer backwash discharge pumps start on signal from its main NSWS pump start).

2. The safety related valves associated with 'A' Train NSWS automatically align to Lake Norman via the LLI.

3. The safety related valves associated with NSW Train 'B' automatically align to the SNSWP.

4. The Main Supply and Discharge Crossover valves close.

5. Isolation valves for all heat exchangers which are needed open automatically.

6. All loads on the non-essential header are isolated with the following exceptions:

    a. The containment ventilation units

    b. The Reactor Coolant Pump motor air coolers

Lake Norman/Low Level Intake (LLI):

As an Engineered Safety Feature, the Lake Norman/LLI source is automatically aligned to supply the 'A' Train NSWS for both units following a Safety Injection signal from either unit or the LOOP on either unit.

The Cowan's Ford Dam, impounding Lake Norman, and the LLI are qualified for an Operating Basis Earthquake (0.08g), or approximately one-half Safe Shutdown (Design Basis) Earthquake (0.15g).

From the McGuire plant seismicity curves, the 'mean' ground acceleration curve indicates a 0.08g level earthquake has a probability of exceedance of approximately 5E-4/year. Although this is the estimated probability of exceedance, it is conservative in that it is only the value of exceedance and not the value for causing failure of Cowan's Ford Dam.

Duke Energy performed a Seismic Fragility Assessment of the McGuire Low Level Intake Water Pipeline in December of 2011. Although not credited in the Current Licensing Basis (CLB) the Fragility Assessment demonstrates that the LLI piping and the associated dam are capable of withstanding the Safe Shutdown Earthquake (SSE).

The Cowan's Ford Dam is inspected on an annual frequency by the Federal Energy Regulatory Commission (FERC). In a letter to Duke Energy, dated May 21, 2015, the following conclusion was documented for the annual inspection completed on April 22, 2015:

> "Based on our site inspection and document review, the development (Cowan's Ford) has been properly operated and maintained since the previous dam safety inspection. The Cowan's Ford development meets Commission engineering dam safety standards and criteria based on site inspection, review of the files, documentation provided by Duke Energy, and discussions with employees on site."

Standby Nuclear Service Water Pond (SNSWP):

The UHS for McGuire is the SNSWP, with an approximate volume of 550 acre-feet. Lake Norman, with an approximate volume of 1,093,600 acre-feet, provides the highest net positive suction head to the NSWS Pumps, and normally serves as the heat sink/cooling water reservoir.

The Standby Nuclear Service Water Pond (SNSWP), which is qualified for a Safe Shutdown Earthquake (SSE), serves as the most severe natural phenomena heat sink/cooling water reservoir. Two lines (Train 'A' and Train 'B') are provided from the SNSWP to meet single failure criteria should a seismic event cause loss of Cowan's Ford Dam and result in loss of Lake Norman. All supply and discharge piping for the SNSWP is seismically qualified. As an Engineered Safety Feature, the Train 'B' SNSWP supply is automatically aligned to supply the 'B' Trains of both units following a Safety Injection signal from either unit or a LOOP on either unit.

SNSWP thermal performance (heat dissipation and flow rate capacity) is verified in calculations showing that the NSW System can adequately handle a large break LOCA on one unit and a controlled shutdown on the other unit with both units aligned to the SNSWP.

The system design meets or exceeds the regulatory position requirements as detailed in NRC Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Power Plants,' Revision 1, dated March 1974, along with the requirements of 10 CFR Part 100 and GDC 2. The SNSWP is the assured source of water for the NSWS.

Emergency Core Cooling System (ECCS):

The ECCS consists of three separate subsystems: Centrifugal Charging (high head) pumps, Safety Injection (SI) (intermediate head) pumps, and RHR (low head) pumps. Each subsystem consists of two redundant, 100% capacity trains. The ECCS flow paths consist of piping, valves, heat exchangers, and pumps such that water from the Refueling Water Storage Tank (RWST) can be injected into the Reactor Coolant System (RCS) following a Loss of Coolant Accident (LOCA), RCS Coolant leakage greater than the capability of the normal charging system; a Rod Ejection Accident; a Loss of Secondary Coolant Accident, including uncontrolled steam or feedwater release; or Steam Generator Tube Rupture (SGTR). The major components of each subsystem are the Centrifugal Charging pumps, the RHR pumps, heat exchangers, and the Safety Injection pumps. Each of the three subsystems consists of two 100% capacity trains that are interconnected and redundant such that either train is capable of supplying 100% of the flow required to mitigate the accident consequences. This interconnecting and redundant subsystem design provides the operators with the ability to utilize components from opposite trains to achieve the required 100% flow to the core.

Containment Spray System (CSS):

The Containment Spray System provides containment atmosphere cooling to limit post-accident pressure and temperature in containment to less than the design values, in the event of a Design Basis Accident (DBA). The Containment Spray System also removes fission product iodine from the post-accident containment atmosphere.

The Containment Spray System consists of two separate trains of equal capacity, each capable of meeting the system design basis spray coverage. Each train includes one containment spray pump, one containment spray heat exchanger, spray headers, nozzles, valves, and piping. Each train is powered from a separate Engineered Safety Feature (ESF) bus.

Auxiliary Feedwater System (AFW):

The AFW System assures required feedwater flow to the steam generators for reactor coolant thermal energy dissipation when the normal feedwater system is not available through loss of power or other malfunctions. The AFW System is required to operate until normal feedwater flow is restored or until the reactor coolant temperature is lowered to the point where the Residual Heat Removal System can be utilized. The AFW System flow and emergency water supply capacity is sufficient to remove core decay heat, Reactor Coolant Pump heat, and sensible heat during the plant shutdown. The AFW System also serves as an alternate feedwater system during hot standby and shutdown operations whenever conditions are such that shutting down the normal feedwater system appears advantageous. The AFW System can also be used to adjust steam generator water levels to establish wet layup conditions in the steam generators prior to and during plant startup.

The AFW System consists of two motor driven AFW pumps and a turbine driven pump configured into three trains.

The AFW Pumps can take suction from three different sources. In order of preference, they are the auxiliary feedwater storage tank, the NSW System and the RC System via the NSW System. The auxiliary feedwater storage tank provides the AFW System with condensate grade water and is considered non-safety related. The NSW System provides the safety-related source of water and is considered the assured water source under design basis accident scenarios.

The auxiliary feedwater storage tank (one 300,000 gallon tank per unit) is the normally aligned non-safety related condensate quality water source available to the AFW System. The auxiliary feedwater storage tank is continuously kept full with water discharged by the hotwell pumps. Overflow from the auxiliary feedwater storage tank is routed to the auxiliary feedwater condensate storage tanks.

The SNSWP serves as the ultimate long-term safety related source of water for the AFW System. The automatic detection and transfer controls of the AFW System will detect and transfer the pump suctions to Nuclear Service Water when suction pressure drops below an acceptable limit. The instrumentation and controls utilized in the switchover logic are safety grade.

Component Cooling Water System (CCW):

The CCW System provides a heat sink for the removal of process and operating heat from safety related components during a DBA or transient. During normal operation the CCW System also provides this function for various nonessential components, as well as the spent fuel storage pool. The CCW System serves as a barrier to the release of radioactive byproducts between potentially radioactive systems and the NSWS, and thus to the environment. The CCW System is arranged as two independent, full capacity cooling loops, and has isolable nonsafety related components. Each safety related train includes two pumps, surge tank, heat exchanger, piping, valves and instrumentation. Each safety related train is powered from a separate ESF bus.

Control Room Area Ventilation System (CRAVS):

The CRAVS consists of two independent, redundant trains that draw in filtered outside air and mix this air with conditioned air recirculating through the Control Room Envelope (CRE). Each outside air pressure filter train consists of a prefilter, a high efficiency particulate air (HEPA) filter, an activated charcoal absorber section for removal of gaseous activity (principally iodides), and a fan. The CRAVS is shared between the two units. The system must be operable for each unit when that unit is in the Mode of Applicability. Additionally, both normal and emergency power must also be operable because the system is shared. If a CRAVS component becomes inoperable, or normal or emergency power to a CRAVS component becomes inoperable, then the required actions of the Technical Specifications must be entered independently for each unit that is in the Mode of applicability.

Control Room Area Chilled Water System (CRACWS):

The CRACWS consists of two independent and redundant trains that provide cooling water to cool recirculated control room air. Each train consists of cooling coils, chillers, instrumentation and controls to provide chilled water for control room temperature control. The CRACWS is a subsystem of the CRAVS and provides air temperature control for the control room.

The CRACWS is shared between the two units. The system must be operable for each Unit when that unit is in the Mode of Applicability. Additionally, both normal and emergency power must also be operable because the system is shared. If a CRACWS component becomes inoperable, or normal or emergency power to a CRACWS component becomes inoperable, then the required actions of the Technical Specifications must be entered independently for each unit that is in the Mode of applicability.

TS 3.7.10, "Control Room Area Chilled Water System (CRACWS)," Condition A Completion Time allows one Train of CRACWS to be inoperable for a 30 day period. Therefore, regulatory relief is not required.

Auxiliary Building Filtered Ventilation Exhaust System (ABFVES):

The ABFVES filters air from the area of the active ECCS components during the recirculation phase of a LOCA. The ABFVES, in conjunction with other normally operating systems (NSWS), also provides environmental control of temperature and humidity in the ECCS pump room area and the auxiliary building. The ABFVES consists of a system, made up of prefilter, a HEPA filter, a carbon absorber section for removal of gaseous activity (principally iodides), and two fans.

Upon receipt of the actuating Engineered Safety Feature Actuation System signal(s), air is pulled from the mechanical penetration area and the ECCS pump rooms, and the stream of ventilation air discharges through the system filters. The prefilters remove any large particles in the air, and any entrained water droplets present, to prevent excessive loading of the HEPA filters and carbon absorbers.

The ABFVES is shared between the two units. The system must be operable for each unit when that unit is in the Mode of Applicability. Additionally, both normal and emergency power must also be operable because the system is shared. If an ABFVES component becomes inoperable, or normal or emergency power to an ABFVES component becomes inoperable, then the required actions of the Technical Specifications must be entered independently for each unit that is in the Mode of applicability.

Emergency Diesel Generators (EDG):

Each train of the 4.16 kV Essential Auxiliary Power System is provided with a separate and independent EDG to supply the Class 1E electrical loads required to safely shut down the unit following a DBA.

Each EDG must be capable of starting, accelerating to rated speed and voltage, and connecting to its respective ESF bus on detection of bus under voltage. Each EDG must also be capable of accepting required loads within the assumed loading sequence intervals, and continue to operate until offsite power can be restored to the ESF buses. These capabilities are required to be met from a variety of initial conditions.

The Diesel Generator Engine Cooling Water System for each diesel includes a jacket water-intercooler water heat exchanger located within the Diesel Room, which is supplied with cooling water from the Nuclear Service Water System. The Diesel Generator Engine Cooling Water System is designed to maintain the temperature of the diesel generator engine within an optimum operating range. The system is also designed to supply cooling water to the engine lube oil cooler, the turbocharger and the governor lube oil cooler.

Additional Plant Systems

Standby Shutdown System (SSS):

The SSS is designed to mitigate the consequences of certain postulated fire incidents, sabotage, or station blackout events by providing capability to achieve and maintain hot standby conditions by controlling and monitoring vital systems from locations external to the main control room. This capability is consistent with the requirements of
10 CFR Part 50, Appendix R and 10 CFR 50.63. By design, the SSS is intended to respond to those low probability events which render both the control room and automatic safety systems inoperable. The SSS is not seismically designed. As such, the seismic capability of the system is not credited.

The SSS power supply consists of an independent, diesel-electric generating unit located in the Standby Shutdown Facility (SSF). The auxiliaries required to assure proper operation of the diesel-generator unit are supplied with power from the appropriate buses of the SSF Power System. This unit has a starting 24V battery system with storage to provide at least two starts. Following loss of normal power, the diesel-electric generating unit shall be manually started and connected to the 600V SSF Power System load center bus. By manually closing the 600V generator breaker, the entire SSF Power System is provided with its backup source of power.

The Standby Makeup Pump (SMP) functions as part of the SSS to provide makeup capacity to the reactor coolant system and cooling flow to the reactor coolant pump (RCP) seals. During normal operation the RCP seals are supplied from the Centrifugal Charging Pump (CCP) drawing from the Volume Control Tank (VCT). During the SSS event, the SMP draws water from the Spent Fuel Pool (SFP). The turbine driven AFW pump can be controlled from the SSF and is utilized during an SSS event to maintain adequate secondary side heat removal.

NSWS TS 3.7.7 only requires additional entry into TS 3.8.1 for the associated EDG and TS 3.4.6, "Reactor Coolant System Loops- Mode 4." for the associated RHR loop made inoperable by the inoperable NSWS Train. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. During the NSW System Train 'A' activities, Units 1 and 2 will be in Mode 1; therefore, the requirement to enter TS 3.4.6 should not be necessary. If entry into TS 3.4.6 becomes necessary, the associated Limiting Condition for Operation will be met. No other TS are required by TS 3.7.7 to be directly entered.

The NSW System is the safety-related source of water supply to the AFW system. During the 'A' Train NSWS outage, this source-will be inoperable (but available) for the AFW 'A' Train up to a total of 14 days. This will affect the safety related water supply to the AFW motor driven pumps that are aligned to the 'A' Train NSWS. The normal water sources for the 'A' Train AFW motor driven pumps will remain functional, as will the water source from the Standby Shutdown System. The opposite Train motor driven AFW pumps and the turbine AFW pump on each unit will still have a safety-related source of water supply from the operable Train of NSW System.

FLEX Strategy

MNS transmitted a notification of full compliance with Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events" and with Order EA-12-051, "Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation" for McGuire Unit 1 in a letter dated November 18, 2014. Full compliance with the Order will be achieved on Unit 2 in October 2015 before commencing activities described in this LAR. The FLEX strategy for MNS was developed in accordance with NEI 12-06 which was endorsed by the NRC in JLD-ISG-2012-01, Interim Staff Guidance (ISG) Japan Lessons-Learned Project Directorate (JLD), Compliance with Order EA 12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events, ADAMS Accession No. ML12229A174. The key aspects of the strategy are as follows:

- A large seismically robust reservoir of water that is automatically aligned to the Turbine Driven Auxiliary Feedwater Pump (TDAFWP) if the normal supply is lost due to a severe seismic event and emergency supplies are lost due to a loss of all power event.
- FLEX Support Guidelines that can be used by operations to cool down and de-pressurize the Reactor Coolant System and minimize Reactor Coolant Pump (RCP) seal leakage within the assumptions evaluated in the strategy for preservation of the core cooling function.
- An array of portable water supply equipment and electrical equipment that can be aligned to provide a source of reactor makeup and reactivity control, restore power to vital batteries and provide an even longer term source of secondary heat removal from the UHS.
- Staffing and communications and associated training to support all near term and long term actions that are part of the strategy.
- Additional equipment and procedures from a Regional Response center within a few days of event initiation that can re-establish some electrical power needs and containment cooling.

3.2 Degraded Condition

The 'A' and 'B' Train NSWS suction piping configuration to the SNSWP and layout is essentially the same. However, testing indicates that the pressure drop across 'A' train SNSWP suction path is significantly higher than the pressure drop across the 'B' train SNSWP suction path.

Additional testing indicates that the Unit 1 and 2 'A' Train NSWS pumps are close to or at the required net positive suction head (NPSH) when both the Unit 1 and 2 'A' Trains are operated at maximum accident flowrate conditions.

A comparison of data from the most recent flush tests on the 'A' and 'B' NSWS Trains indicates a difference of approximately 3 psig for conditions with similar flows on each train. The 'A' Train performance test (PT) was completed on 5/09/15 with an approximate total flow of 22,000 gpm and an inlet pressure of +0.31 psig. The 'B' Train PT was completed on 3/18/15 with an approximate total flow of 19,000 gpm and an inlet pressure of +3.50 psig.

Historical records indicate that a noticeable difference in pressure drop between the two headers has existed since 1978. The 'A' suction path has been flushed numerous times since the discovery of this anomaly. Numerous high flow rate flushes support the conclusion that the degraded condition causing this pressure drop is stable.

The goal of the activities to be performed during the 14 day TS completion time requested by this submittal is to eliminate the OBDN condition by removing the material causing the reduction in flow and thereby restoring NPSH margin. Achievement of the goal will be determined following the removal of the material from the piping and restoration of the system by measuring the 'A' Train NSWS inlet pressure and NPSH during the performance of a flush test.

3.3 Description of Activities

The length of time needed to correct the 'A' Train NSWS piping degraded condition will exceed the 72 hour Completion Time that one NSWS Train can be inoperable as defined in TS 3.7.7. The significant work tasks for removing the obstruction are grouped below under three major activities with duration estimates.

ACTIVITY	TIME REQUIRED
Tagout and Prestaging	**40 hours**
• Tag out and remove 'A' NSWS Header from service • Evacuate water from the affected piping • Install flange at SNSWP • Remove Manway flange/top hat • Install Work Platform • Establish controls for auxiliary ventilation • Establish FME controls and access enclosures • If required for personnel access install auxiliary building piping penetration • Establish Confined space controls	
Extract Blockage	**172 hours**
• Establish lighting, air lines, welding cables and if required leakage control Detail • Confirm/validate conclusions from video inspection • Disassemble, cut as required to transport obstruction material out of the pipe (limited stay time, multiple entries) • After removal of obstruction material perform inspection of piping affected piping surfaces and evaluate for repair • Remove obstruction recovery material • Clean affected piping • Complete necessary repairs (welding/fairing of piping surfaces as determined by engineering). • Complete final inspection/acceptance of repairs • Remove all debris and foreign material • Inspect (video) of entire pipe (manway to 0RN-7A) to ensure no remaining foreign material • Verify pipe is ready for restoration	
Recovery and Restoration	**40 hours**
• Demobilize internal recovery equipment • Restore system boundary • Fill and vent system • Remove tag out • System Flush • System testing • Documentation review and approval	
25% Contingency for repair scope unknown	**84 hours**
Requested Allowed Outage Time (AOT)	**336 hours**

The results of a separately planned ROV survey may indicate that a less intrusive, less time consuming set of activities is required than that outlined above. These opportunities will be

pursued, as appropriate. As stated the ROV survey will be performed outside of the 14 day completion time requested by this submittal.

The 14 day completion time extension is based on the most likely scenario for the OBDN condition which is that some type of construction artifact is restricting system flow in the 'A' Train NSWS suction piping from the SNSWP. Planning for this activity includes actions to locate the restriction, dislodge and extract the debris and complete any minor repairs associated with removal of the debris.

Based on evaluation results to date, it is believed that the restriction is located in the NSWS piping under the Unit 2 EDG building. The scope of work covered under this LAR does not include major excavation, or activities affecting SSCs not described in this request. Identification of a condition in which repairs could impact the ability SSC to perform their function would result in suspending activities in order to plan for the unexpected finding.

This activity will be controlled under the Infrequently Performed Test or Evolution (IPTE) process defined in Fleet Directive AD-OP-ALL-106, "Conduct of Infrequently Performed Tests or Evolutions", and Duke Energy's Work Management and Execution procedures. The IPTE process establishes controls and processes such as IPTE Manager, IPTE, Coordinator, considers Just in Time Training (JITT), formal briefings, evolution termination criteria, clear roles and responsibilities including the role of Operations and the Shift Manager.

3.4 Defense in Depth Considerations

Prior to removing the 'A' Train NSWS from service for correction of the degraded condition, the following defense-in-depth items will be established for both units 1 and 2:

1. The 'B' NSWS pumps will remain in standby with suctions aligned to the SNSWP. This alignment eliminates potential failures should there be a demand (ESFAS signal) for auto transfer of 'B' NSWS pump suction from the LLI to the SNSWP.

2. Dedicated personnel with procedure guidance will be provided to close the pathway from the auxiliary building on the affected 'A' Train NSWS piping from the SNSWP in the event of any of the following:
    - An Engineered Safety Feature (ESF) actuation
    - Entry into RP/0/A/5700/006 Natural Disasters
    - Entry into RP/0/A/5700/007 Earthquake

3. Dedicated personnel will be available for monitoring and immediate response to unanticipated leakage. Procedural actions will provide guidance to stop the leakage. If the leakage cannot be stopped, then dedicated personnel will establish NSWS flow from the 'B' Train NSWS, shutdown the 'A' Train NSWS pumps and close 0RN-12AC to stop the leakage.

4. Procedures and designated operators will be available to align the 'B' SNSWP suction path to the 'A' Train NSWS pump will be available should a 'B' Train NSWS become unavailable following a seismic event that damages the Cowan's Ford Dam or LLI.

5. The NRC Order EA 12-049 FLEX strategy (modifications, portable equipment, FLEX Support Guidelines, training, etc.) will be available for both units.

Pre-Alignment of the 'B' NSWS pump suction to the SNSWP

During normal operation both 'A' and 'B' Train NSWSs are aligned to the LLI. Upon the actuation of an ESFAS the 'A' Train NSWS will remain aligned to the LLI as previously discussed but the 'B' Train NSWS automatically aligns to the SNSWP. The 'B' Train NSWS for both units will be aligned to the SNSWP prior to the start of activities described in this LAR. This defense in depth action will eliminate the potential failure of several motor operated valves during a demanded (ESFAS) transfer to the SNSWP. An ESFAS signal opens valve 0RN-9B providing suction to both unit 'B' Train NSWS pumps and closes valves 0RN-10AC and 0RN-11B, which isolates the LLI supply to both units 'B' Train NSWS pumps.(see Figure 6: NSWS Alignment During 14 Day Out of Service Window in Attachment 4).

Dedicated Personnel to Close NSWS Personnel Access Openings and Restore Auxiliary Building Ventilation Boundary

Dedicated personnel with procedure guidance will be provided to close the pathway from the auxiliary building on the affected 'A' Train NSWS piping from the SNSWP in the event of any of the following:

- An Engineered Safety Feature (ESF) actuation
- Entry into RP/0/A/5700/006 Natural Disasters
- Entry into RP/0/A/5700/007 Earthquake

Dedicated Personnel to Isolate NSWS Leakage into the Auxiliary Building

As previously discussed it may be necessary to design and install a personnel access opening in the auxiliary building to support removal of the obstruction in the NSWS piping. The opening in the pipe for personnel access establishes the potential for system leakage into the auxiliary building.

- To ensure against the potential for significant leakage, the SNSWP water source will be isolated by the installation of a bolted flange. The Lake Norman water source will be isolated by closure of 0RN-7A. Prior to the start of activities covered by the 14 day completion time the following activities will be performed as described in commitments 8 and 9 to ensure high confidence in the integrity of the isolation boundaries and prevention of leakage. In addition if the second personnel access opening is necessary, then prior to the opening of the system an evaluation of leakage will be performed to validate proper isolation and that leakage is within expected limits.

Any significant change in leakage emanating from the SNSWP is not expected because the flange to be installed at the SNSWP for isolation is a passive device and is designed to meet all applicable ASME requirements. 0RN-7A is a butterfly valve manufactured by BIF. A review of operating experience for this type of valve did not identify any generic failure modes. This valve is programmatically monitored in accordance with GL 89-10 and as such is diagnostically tested. Because of the pre-activity leak evaluation and adjustment of 0RN-7A, significant leakage from this pathway is not expected.

Dedicated personnel will be available for monitoring and immediate response to unanticipated leakage. Procedural actions will provide guidance to stop the leakage. If the leakage cannot be stopped, then dedicated personnel will establish NSWS flow from the 'B' Train NSWS, shutdown the 'A' Train NSWS pumps and close 0RN-12AC to stop the leakage.

Procedures and Designated Operators will be available to align 'B' SNSWP suction path to the 'A' Train NSWS pump suction

Following an earthquake that exceeds OBE, or causes visible damage to the Cowan's Ford Dam or LLI piping the 'A' Train NSWS pumps will be stopped prior to loss of suction from the lake in accordance with existing abnormal operating procedures. These pumps will not be transferred to the SNSWP due to the unavailability of the 'A' Train NSWS suction piping to the SNSWP.

If a failure of a 'B' Train NSWS pump occurs subsequent to the initiating conditions described above, an additional defense in depth contingency will be available. Procedures and designated operators will be available to align the affected unit 'A' NSWS pump to the SNSWP via the shared 'B' NSWS piping to restore NSW flow to the affected unit. This contingency will utilize the main supply crossover line and open valves 0RN-14A and 0RN-15B. The example shown in Figure 7 of Attachment 4 depicts the alignment for a loss of 1B NSWS pump. A similar alignment would be used as a contingency for a failure of 2B NSWS pump.

Prior to opening the main supply crossover, the procedure will ensure that NSWS conditions are maintained within design limits. The NSWS supply lines from the SNSWP are only designed to supply a maximum of two NSWS pumps; therefore, the procedure will provide actions to ensure only one NSWS pump is running on each unit when the main supply crossover flowpath is used.

System configuration will ensure that the failed pump and equipment are isolated from the NSWS main supply crossover to preserve the integrity and independence of the equipment providing NSW flow to each unit. For example, the discharge valve closed on the affected pump to ensure that full flow will be delivered to the applicable unit and prevent losses due to bypass flow on the failed train or components. Further, the breaker will be opened to ensure that the design requirement that only two NSWS pumps running on a train is maintained. This alignment will result in the 'B' train SNSWP supply feeding the 'B' Train NSWS pump on one unit and the 'A' train NSWS pump on the affected unit.

As stated above, one of the 'B' Train NSW pumps will be running and one of the 'A' Train NSW pumps will be running with both pump suctions aligned to the SNSWP through the "B" NSWS supply pipe. The specific pumps will be dependent on which 'B' Train NSWS pump fails (See Figure 7: "Contingency for Loss of 'B' NSWS pump After Response to Loss of Lake Norman" which shows the alignment for a failure of 1B NSWS pump).

The 'A' Train NSW pump will be aligned to the 'B' Train using the NSWS cross-over supply line. With the Lake Norman water supply isolated the NSWS would experience lower pressure at 0RN-7A due to the loss of the elevation head of the lake (approximately 6.5 to 7.5 psig). The effect of higher NSWS flow rates were evaluated under this condition for the defense in depth contingency and it was concluded that the NSWS pressure at 0RN-7A will remain positive and therefore no air will pass from service piping into the 'A' Train NSWS supply to the running pumps.

Testing data during the 'B' Train NSW flow balance alignment resulted in 18,000 to 19,000 gpm total flow to two pumps with a pressure at the respective SNSWP supply isolation valve of more than 3 psig. The NSW computer flow model was modified to add the main supply crossover between 'A' and 'B' NSWS Trains with the flow split between the two trains. The results the evaluation indicated that the pressure at 0RN-7A remains positive when total flow is less than 22,000 gpm. Flows of approximately 18,000 gpm result in a pressure of 3 psig at 0RN-7A. The computer model is supporting the flow balance data that gives reasonable assurance that any leakage at 0RN-7A will be outward (toward the SNSWP) and no air will be drawn into the suction of the running 'A' Train NSW pump.

The main supply crossover piping is normally isolated by motor operated isolation valves 0RN-14A ('A' Train) and 0RN-15B ('B' Train). Each valve receives an ESFAS signal from both units to close even though the valves are normally maintained closed. See Figure 6: NSWS Alignment During 14 Day Out of Service Window in Attachment 4. Also see Figure 7: Contingency for Loss of 'B' NSWS pump After Response to Loss of Lake Norman in Attachment 4 shows the contingency alignment for a failure of 1B NSWS pump.

In support of the contingency the following conditions will be established before the start of activities in the LAR:

- The 'A' valve (0RN-14A) will be opened prior to the evolution and power will be removed from the valve operator.
- The 'B' valve (0RN-15B) will be maintained closed with the ESFAS signal from each unit blocked prior to the evolution. Maintaining 0RN-15B closed with power removed satisfies operability requirements for the 'B' Train NSWS. The 'B' valve (0RN-15B) can be opened from the control room after power is restored if conditions warrant the use of this contingency.

The Main Supply Crossover is not normally operated. Nevertheless, biological growth and corrosion or sediment is not anticipated in this short section of pipe for the following reasons:

- The section of pipe is oxygen depleted which halts the corrosion process. There is no motive force to cause flow through the pipe. Therefore there is no means of replenishing oxygen.
- The section of piping between the isolation valves is a vertically inverted U bend and therefore has no means of capturing sediment.

FLEX Strategy
The FLEX strategy is summarized in section 3.1. The FLEX strategy provides another level of defense-in-depth that will provide a seismically qualified source (SNSWP) of water to the Turbine Driven Auxiliary Feedwater (TDAFW) pumps and procedures to cool down and depressurize the Reactor Coolant System to preserve the RCP seals should NSWS be interrupted on both trains. The strategy also includes guidelines that initiate actions to maintain long term containment integrity based on long duration RCP seal releases.

Defense-in-Depth Principles:
McGuire intends to isolate and repair the 'A' Train NSWS supply from the SNSWP. This activity will require that NSW Train 'A' be aligned to Lake Norman with 'A' Train NSWS pumps operating until the system is ready for post maintenance testing. This action maintains the NSW 'A' Train's normal and automatic alignment to Lake Norman but will result in the inability to manually align the 'A' Train directly to the SNSWP subsequent to a seismic event resulting in damage to the supply piping from Lake Norman or the highly improbable loss of Lake Norman.

Although considered inoperable, 'A' Train NSWS will be technically capable of performing its intended function for all events except the seismic event that causes loss of the Lake Norman water supply. Station procedures require that the 'A' and 'B' Trains of NSWS be aligned to the SNSWP on the loss of Low Level Intake from Lake Norman or an earthquake equal to or greater than an OBE. Other than normal maintenance and periodic testing, these are the only occasions requiring the alignment of the 'A' Train NSWS to the SNSWP. In all other cases, the 'A' Train is aligned to Lake Norman.

In addition to the TS, Work Control Program and Work Process Manual and the associated procedures and programs that implement the Maintenance Rule Program under 10CFR 50.65(a)(4) provide for controls and assessments to preclude the possibility of simultaneous planned outages of redundant Trains and ensure system reliability.

This proposed LAR meets the defense-in-depth principle consisting of a number of elements. These elements and the impact of the proposed change on these elements are as follows:

- A reasonable balance among prevention of core damage, prevention of containment failure and consequence mitigation is preserved.

  Although inoperable, the 'A' Train NSWS and the SSCs supported by it remain fully functional. The proposed LAR will not affect mission time requirements for the 'A' Train NSWS for all events excluding the loss of the Lake Norman water supply because the proposed activities do not affect the functionality or performance 'A' Train NSWS. The 'B' Train NSWS will remain operable. Because the 'B' Train NSWS will be pre-aligned to the SNSWP during the proposed activities the manual operator actions associated with transferring the train to the SNSWP during a seismic event and any potential equipment failures associated with repositioning of valves during an ESFAS are eliminated.

  Procedures to align the 'B' SNSWP suction path to the 'A' Train NSWS pump will be available should a 'B' Train NSWS become unavailable following a seismic event that damages the Cowan's Ford Dam or LLI provides additional defense in depth for prevention of core damage, and containment failure.

The capability to implement FLEX strategies adds additional defense in depth and will be available for deployment on Unit 1 and Unit 2 prior to the proposed evolution. These defense-in-depth measures are aimed at ensuring availability of the UHS function during the proposed activity and preventing core damage, containment damage and preservation of consequence mitigation.

As stated earlier in this LAR, if the repair evolution is such that diver access is not possible using the existing NSWS manway for removing the obstruction, then the affected pipe will be drained and a contingency pipe opening for personnel access will be created between the auxiliary building wall and the first isolation valve (0RN-7A). The contingency access opening will be controlled by using procedures developed or revised for this purpose to maintain positive control of the opening and to prevent an unmonitored release

TS 3.7.11 includes a note in the Limiting Condition for Operation (LCO) section: "The Auxiliary Building pressure boundary may be opened intermittently under administrative controls." The auxiliary building pressure boundary will be controlled by using procedures developed or revised for this purpose to maintain positive control of the opening and to prevent an unmonitored release.

Dedicated personnel with procedure guidance will be provided to close the pathway from the auxiliary building on the affected 'A' Train NSWS piping from the SNSWP in the event of any of the following:

- An Engineered Safety Feature (ESF) actuation
- Entry into RP/0/A/5700/006 Natural Disasters
- Entry into RP/0/A/5700/007 Earthquake

- Avoidance of over-reliance on programmatic activities to compensate for weaknesses in plant design.

  The proposed change involves a one-time extension of TS 3.5.2, Emergency Core Cooling System (ECCS) - Operating; 3.6.6, Containment Spray System (CSS); 3.7.5, Auxiliary Feedwater (AFW) System; 3.7.6, Component Cooling Water (CCW) System; 3.7.7, Nuclear Service Water System (NSWS); 3.7.9, Control Room Area Ventilation System (CRAVS); 3.7.1 1, Auxiliary Building Filtered Ventilation Exhaust System (ABFVES), and 3.8.1, AC Sources - Operating for McGuire Nuclear Station Units 1 and 2 to allow the 'A' Train NSWS supply from the SNSWP to be taken out of service up to a total of 14 days for pipe repair.

  The only programmatic features are those associated with risk management actions described in Section 3.5, Compensatory Actions and Commitments. The defense-in-depth measures to be taken rely on existing and new proceduralized actions.

- System redundancy, independence and diversity are maintained commensurate with the expected frequency and consequences of challenges to the system.

  The 'B' Train NSWS will remain completely operable and capable of performing the necessary safety functions consistent with accident analysis assumptions during the period of time the 'A' Train NSWS Suction path from the SNSWP is isolated. Additionally, the 'A'

Train NSWS remains functional and capable during this period for all normal and ESFAS functions.

NRC Generic Letter 80-30, "Clarification of the Term 'Operable' as it Applies to Single Failure Criterion for Safety Systems Required by TS states," there is no requirement to assume a single failure while operating under a Technical Specification (TS) required action. Therefore, there will be no effect on the analysis of any accident or the progression of the accident since the operable NSW 'B' train is capable of serving 100 percent of all the required heat loads.

The contingency for a 'B' NSWS pump failure following the seismic event that takes away the Lake Norman water source provides defense in depth for a low probability seismic event followed by the additional failure of a 'B' Train NSWS pump. The configuration used for this alignment will ensure that there will be no adverse interaction between the trains. Each aspect of using the Main Supply Crossover piping to restore flow to the affected unit will be proceduralized and designated operators will be available to execute the manual actions associated with aligning the affected unit's 'A' Train NSWS pump to the 'B' NSWS SNSWP via the Main Supply Crossover piping. Any adverse impact due to the unavailability of the 'A' SNSWP water source is offset by the compensatory measures and commitments listed in Attachment 6.

Additionally, use of the 14 day Completion Time requested by the proposed amendment will not exceed the baseline unavailability time established under 10 CFR 50.65, Maintenance Rule guidance and monitored via the plant system performance indicators.

- Independence of barriers is not degraded.

The proposed 'A' Train NSWS activity does not directly impact any of the three principle safety barriers (Fuel Cladding, Reactor Coolant System, Containment Building) or otherwise cause their degradation. Independence of barriers is not degraded because the proposed TS Completion Time extension has no impact on the physical barriers.

Although not considered one of the fission product barriers, the Auxiliary Building Ventilation Boundary plays a role in minimizing the offsite dose consequences from ECCS system leakage into the Auxiliary Building during a design basis accident. As stated in this LAR, the Auxiliary Building Ventilation Boundary will be breached if the 'A' Train NSWS piping is opened for access in the Auxiliary Building. TS 3.7.11 includes a note in the Limiting Condition for Operation (LCO) section: "The Auxiliary Building pressure boundary may be opened intermittently under administrative controls." The contingency personnel access piping opening will be controlled by using procedures developed or revised for this purpose to maintain positive control of the opening and to prevent an unmonitored release.

Dedicated personnel with procedure guidance will be provided to close the pathway from the auxiliary building on the affected 'A' Train NSWS piping from the SNSWP in the event of any of the following:

- An Engineered Safety Feature (ESF) actuation
- Entry into RP/0/A/5700/006 Natural Disasters
- Entry into RP/0/A/5700/007 Earthquake

- Defenses against human errors are preserved.

  Defense-in-depth measures will be proceduralized and personnel training for the temporary TS change will be conducted in accordance with the Systematic Approach to Training process. Compensatory measures will be in place. Pre-job briefs will be conducted prior to and during the evolution to reinforce good human performance behaviors and barriers that will reduce risk. In addition, 'A' Train NSWS evolution will be controlled under the IPTE process defined in Fleet Directive AD-OP-ALL-106, "Conduct of Infrequently Performed Tests or Evolutions" (IPTE). The IPTE process establishes an IPTE Manager, and an IPTE Coordinator. The process also establishes controls and processes such as JITT, Formal briefings, evolution termination criteria, clear roles and responsibilities including the role of Operations and the Shift Manager. As such, defenses against human errors are preserved.

- The intent of the plant's Design Criteria is maintained.

  This activity does not modify the plant design or the design criteria applied to systems, structures, or components (SSCs) during the licensing process. The NSWS is designed to be operated in the proposed manner. Additional details regarding compliance with the GDCs are provided in Section 4.1.

3.5 Compensatory Measures and Commitments

1. The 'A' Train NSWS pumps will remain running and aligned to Lake Norman during the extended completion time (CT) until the system is ready for post maintenance testing.

2. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' NSWS piping from the SNSWP is not available will be limited to a 72 hour completion time.

3. The 'B' Train NSWS will be placed in its ESFAS alignment to the SNSWP water source with the 'B' Train pumps in standby prior to starting the LAR activity and remain in this alignment until the 'A' Train NSWS SNSWP water source is restored and ready for post maintenance testing.

4. Procedures will be established to provide an additional defense in depth contingency that could be used in the event of an extremely low probability of a loss of the Lake Norman water source due to a seismic event. The procedures will ensure that system operation is maintained within design limits (less than or equal to 2 NSWS pumps running on a header), control of maximum system flow, and that system configuration prevents interaction of the degraded equipment with the functional equipment.

5. Fukushima Response FLEX modifications will be installed and the FLEX strategies will be available for implementation as additional defense-in-depth on both units.

6. During the period in which the 'A' NSWS suction path from the SNSWP is non-functional, no discretionary maintenance or discretionary testing will be planned on the following:
    a. 1A EDG
    b. 2A EDG
    c. The 'A' Train of NSWS excluding the activities described in the LAR for the 'A' Train NSWS piping to the SNSWP.
    d. The 'B' Train of NSWS, ECCS, CSS, AFW, CCW, CRAVS, ABFVES or the EDGs
    e. The switchyard and other offsite power sources
    f. The SSF

7. A condition in which repairs could impact the ability of an SSC to perform its Safety Function would result in termination of activities. The inspection may identify a condition that cannot be resolved within the 14 day completion time. Should such a condition be identified then the system will be restored to its current OBDN condition. If the ROV survey presents any opportunities for a less intrusive or less time consuming solution for addressing the OBDN condition, then these opportunities will be pursued, as appropriate.

8. In an activity planned to be performed this summer separate from the 14 day completion time repair activity, 0RN-7A will be tested for leakage and adjusted if necessary to minimize leakage.

9. In an activity planned to be performed this summer separate from the 14 day completion time repair activity the SNSWP isolation flange will be test fitted to the 'A' SNSWP pipe.

10. Procedure guidance will establish controls to limit evacuation air pressure to less than a predetermined value in order to prevent air intrusion into the operating NSWS.

11. Dedicated personnel with procedure guidance will be provided to close the pathway from the auxiliary building on the affected 'A' Train NSWS piping from the SNSWP in the event of any of the following:
    - An Engineered Safety Feature (ESF) actuation
    - Entry into RP/0/A/5700/006 Natural Disasters
    - Entry into RP/0/A/5700/007 Earthquake

12. This activity will be controlled under the Infrequently Performed Test or Evolution (IPTE) process defined in Fleet Directive AD-OP-ALL-106, "Conduct of Infrequently Performed Tests or Evolutions", and Duke Energy's Work Management and Execution procedures.

13. Dedicated personnel will be available for monitoring and immediate response to unanticipated leakage. Procedural actions will provide guidance to stop the leakage. If the leakage cannot be stopped, then dedicated personnel will establish NSWS flow from the 'B' Train NSWS, shutdown the 'A' Train NSWS pumps and close 0RN-12AC to stop the leakage.

14. If the second personnel access opening is necessary, then prior to the opening of the system an evaluation of leakage will be performed to validate proper isolation and that leakage is within expected limits.

15. McGuire will communicate with the Transmission Control Center (TCC) to ensure that the McGuire Control Room is notified in the event of potential grid disturbances in order that an appropriate plant response can be formulated.

16. The Work Control Center or OCC will monitor weather forecasts and radar during the activities that require the NSWS piping personnel access points to be open to assess the potential for severe weather conditions (tornado, thunderstorms).

17. Training will be provided in accordance with the Systematic Approach to Training (SAT) process to Operations personnel on this TS change and the associated evolution to inspect and correct the degraded condition in the 'A' NSWS supply piping from the SNSWP.

18. Operations will review applicable abnormal operating procedures related to the response to an earthquake, the loss of the Lake Norman and the loss of NSWS prior to making 'A' NSWS suction path from the SNSWP inoperable and each shift until 'A' Train NSWS operability is restored.

19. The repair work on the 'A' Train NSWS suction from the SNSWP will be scheduled during a period in which hurricanes and tornadoes have a lower likelihood of occurrence.

20. The Outage Command Center (OCC) will be manned while performing the activities authorized by this amendment.

21. The following list of equipment will be protected:

    a. 'B' Train NSWS
    b. 1B EDG
    c. 2B EDG
    d. 1B ECCS
    e. 2B ECCS
    f. 1B CSS
    g. 2B CSS
    h. 1B AFW
    i. 2B AFW
    j. 1B CCW
    k. 2B CCW
    l. B CRAVS
    m. B ABFVES
    n. Auxiliary Building WZ Sump and equipment supporting function of sump

22. If required to be installed the new personnel access opening to be located on the 'A' Train NSWS piping in the auxiliary building will be designed and installed in accordance with the Engineering Change Process.

23. Foreign Material Exclusion (FME) will be controlled during the proposed activities in accordance with AD-MN-ALL-0002, Foreign Material Exclusion (FME). Any debris resulting from the obstruction removal activity will be mechanically cleaned out before the system is closed for return to service per FME plan developed in accordance with the above procedure. The system will be video inspected and reversed flushed from the LLI to the SNSWP with isolation to downstream components to force any sediment back to the SNSWP.

24. Following 'A' Train NSWS restoration, testing will be performed to verify that the as left NSWS performance meets or exceeds pre-activity performance including 'A' Train NSW pump NPSH conditions.

25. Prior to entering the 14 day CT, perform an evaluation to ensure that there will be no anticipated impact to 'A' NSWS water supply from the LLI from Alewife fish the during 14 day CT.

26. The new personnel access piping opening (in the auxiliary building) will be controlled by using procedures developed or revised for this purpose to maintain positive control of the opening and to prevent an unmonitored release.

27. The ERAT program includes the option to use a SSA (Safety Significant Activity) code which will cause the risk condition color to be "YELLOW". MNS will use this code during the activities described in this LAR.

28. Designated operators will be available to execute the manual actions associated with aligning the affected unit's 'A' Train NSWS pump to the 'B' NSWS SNSWP via the Main Supply Crossover piping.

29. If the contingency personnel access opening is installed, then Security personnel will establish the proper controls and compensatory measures prescribed by security procedures and the security plan.

30. In support of the contingency the following conditions will be established before the start of activities in the LAR:

    - The 'A' valve (0RN-14A) will be opened prior to the evolution and power will be removed from the valve operator.

    - The 'B' valve (0RN-15B) will be maintained closed with the ESFAS signal from each unit blocked prior to the evolution. Maintaining 0RN-15B closed with power removed satisfies operability requirements for the 'B' Train NSWS. The 'B' valve (0RN-15B) can be opened from the control room after power is restored if conditions warrant the use of this contingency.

3.6 Compliance with Current Regulations

This LAR itself does not propose to deviate from existing regulatory requirements, and compliance with existing regulations is maintained by the proposed one time change to the plant's Technical Specification requirements. Additional details may be found in the Regulatory Evaluation section of this LAR.

The design and installation of the new NSWS piping access opening in the auxiliary building will be in accordance with the Engineering Change process to ensure that the modification meets all applicable codes and regulations.

The design and construction of the blank flange to be used for isolation of the SNSWP from the 'A' Train NSWS piping meets all applicable ASME requirements.

3.7 Evaluation of Safety Margins

- Codes and standards or alternatives approved for use by the NRC are met (e.g., proposed LAR not in conflict with approved codes and standards).

The design and operation of the NSWS is not altered by the proposed TS completion time extension. The alignment of the system is currently allowed by the McGuire Technical Specifications for a limited period of time.

- Safety analysis acceptance criteria in the plant licensing basis are met or proposed revisions provide sufficient margin to account for analysis and data uncertainties.

The safety analysis acceptance criteria stated in the UFSAR are not impacted by this change. The proposed change will not allow plant operation in a configuration outside the design basis. The requirements regarding the NSWS credited in the accident analysis will remain the same.

As such, it can be concluded that safety margins are not impacted by the proposed change.

3.8 Configuration Risk Management

10 CFR 50.65 (a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," requires that prior to performing maintenance activities, risk assessments shall be performed to assess and manage the increase in risk that may result from proposed maintenance activities. These requirements are applicable for all plant modes.

The proposed LAR will not result in any changes to the current configuration risk management program. The existing program uses a blended approach of quantitative and qualitative evaluation of each configuration assessed. The McGuire on-line computerized risk software, Electronic Risk Assessment Tool (ERAT), considers both internal and external initiating events with the exception of seismic events.

Thus, the overall change in plant risk during maintenance activities is expected to be addressed adequately considering the proposed amendment.

McGuire has Duke Energy's Work Management and Execution procedures that are in place to ensure that risk significant plant configurations are avoided. These documents are used to

address the Maintenance Rule requirements, including the on-line (and off-line) Maintenance Policy requirement to control the safety impact of combinations of equipment removed from service. The key documents are as follows:

- AD-WC-ALL-410, "Work Activity Integrated Risk Management"
- NSD 403, "Shutdown Risk Assessment (Modes 4, 5, 6, and No-Mode) per 10 CFR 50.65 (a)(4)"
- NSD 415, "Operational Risk Management (Modes 1-3) per 10 CFR 50.65 (a)(4)"
- WPM-608, "Outage Risk Assessment Utilizing Electronic Risk Assessment Tool (ERAT)"
- WPM-609, "On-Line Risk Assessment Utilizing Electronic Risk Assessment Tool (ERAT)"

More specifically, the Directives referenced above address the process; define the program, and state individual group responsibilities to ensure compliance with the Maintenance Rule. The Work Process Manual procedures provide a consistent process for utilizing the computerized software assessment tool, ERAT, which manages the risk associated with equipment inoperability.

The Electronic Risk Assessment Tool (ERAT) is a computer program used to facilitate risk informed decision making associated with station work activities. Its guidelines are independent of the requirements of the Technical Specifications and Selected Licensee Commitments and are based on probabilistic risk assessment studies and deterministic approaches.

The "A" Train NSWS will remain in its normal alignment and will be capable of mitigating the accidents that are modeled in ERAT. The 'B' Train NSWS will be placed in its ESFAS alignment and will remain operable and capable of mitigating the accidents modelled in ERAT. This would normally result in a "GREEN" risk condition. The ERAT program includes the option to use a SSA (Safety Significant Activity) code which will cause the risk condition color to be "YELLOW". MNS will use this code during the activities described in this LAR.

Additionally, prior to the release of work for execution, operations personnel must consider the effects of severe weather and grid instabilities on plant operations. This qualitative evaluation is inherent of the duties of the Work Control Center Senior Reactor Operator (WCC SRO). Responses to actual plant risk due to severe weather or grid instabilities are programmatically incorporated into applicable plant emergency or response procedures (RP/0/A/5700/006, Natural Disasters; AP/1(2)/A/5500/05, Generator Voltage and Grid Disturbances).

Foreign Material Exclusion will be controlled during the proposed activities in accordance with AD-MN-ALL-0002, Foreign Material Exclusion (FME). Any debris resulting from the obstruction removal activity will be mechanically cleaned out before the system is closed for return to service per FME plan developed in accordance with the above procedure. The system will be reversed flushed from the LLI to the SNSWP with the downstream components isolated to force any sediment back to the SNSWP. Following system cleanup and restoration a final test will be performed to identify any downstream effects caused by debris blockage.

The key safety significant systems impacted by this proposed LAR are currently included in the Maintenance Rule program, and as such, availability and reliability performance criteria have been established to assure that they perform adequately.

3.9 Conclusions

The results of the deterministic engineering justification described above provide assurance that the systems and equipment required to safely shutdown the plant and mitigate the effects of a design basis accident will remain capable of performing their safety functions.

The proposed TS Completion Time extension is consistent with NRC guidance and meets the following principles of:

1. Current regulations
2. Defense-in-depth philosophy
3. Sufficient safety margins

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with NRC regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

During the applicable period of this proposed license amendment, McGuire will maintain the ability to meet the applicable General Design Criteria (GDC) as outlined in 10 CFR 50, Appendix A. The applicable GDCs are:

- GDC-2, Design Basis for Protection Against Natural Phenomena:-
  Structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions. The design bases for these structures, systems, and components shall reflect: (1) Appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated, (2) appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena and (3) the importance of the safety functions to be performed.

  The 'A' and 'B' suction piping from the SNSWP is buried approximately 25 feet below the surface of the ground in the vicinity of the manway access well. The piping is separated by approximately two feet between the two trains. The manway access well is normally covered by a concrete missile barrier that protects the 'A' train piping from potential tornado missiles. Because of the depth of the well, the adjacent 'B' piping is not susceptible to a missile strike. Nonetheless, as an additional compensatory measure, in the event of a tornado warning, the activities associated with addressing the OBDN condition will be suspended and the manway providing access to the buried 'A' Train NSWS suction piping from the SNSWP will be covered with the existing cover that will provide a barrier between the piping and potential tornado missiles. Additionally, this action will eliminate any adverse impact of the tornado vacuum on equipment inside the auxiliary building. A tornado warning is an alert issued by weather services to warn that severe thunderstorms with tornadoes may be imminent.

- GDC-4, Environmental and Dynamic Effects Design Basis
  Structures, systems, and components important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. These structures, systems, and components shall be appropriately protected against dynamic effects, including the effects of missiles, pipe whipping, and discharging fluids, that may result from equipment failures and from events and conditions outside the nuclear power unit. However, dynamic effects associated with postulated pipe ruptures in nuclear power units may be excluded from the design basis when analyses reviewed and approved by the Commission demonstrate that the probability of fluid system piping rupture is extremely low under conditions consistent with the design basis for the piping.

  The design and installation of the new NSWS piping access opening in the auxiliary building will be in accordance with the Engineering Change process to ensure that the modification meets all applicable codes and regulations.

  The 'B' suction piping from the SNSWP is not susceptible to turbine missiles for the same reasons discussed under GDC 2 above.

- GDC-5, Sharing of Structures, Systems and Components:
  Structures, systems, and components important to safety shall not be shared among nuclear power units unless it can be shown that such sharing will not significantly impair their ability to perform their safety functions, including, in the event of an accident in one unit, an orderly shutdown and cooldown of the remaining units.

  The 'A' and 'B' NSWS suction paths from the SNSWP are normally shared between Units 1 and 2. This shared SSC was previously reviewed and approved by the NRC during plant licensing. The additional defense-in-depth measure to use the Main Supply Crossover line will allow the SNSWP to provide suction to the affected unit 'A' Train NSWS pump via the 'B' NSWS SNSWP piping in the very unlikely event that a 'B' Train NSWS pump fails subsequent to an earthquake that takes away the ability to use 'A' Train NSWS.

  Prior to opening the main supply crossover, the procedure will ensure that NSWS conditions are maintained within design limits. The NSWS supply lines from the SNSWP are only designed to supply a maximum of two NSWS pumps; therefore, the procedure will provide actions to ensure only one NSWS pump is running on each unit when the main supply crossover flowpath is used. Maximum NSWS flow during execution of this contingency will be limited to ensure that positive pressure is maintained at the suction of the running NSWS pumps.

  System configuration will ensure that the failed pump and equipment are isolated from the NSWS main supply crossover to preserve the integrity and independence of the equipment providing NSW flow to each unit. For example, the breaker will be opened and the discharge valve closed on the affected pump to ensure that full flow will be delivered to the applicable unit and prevent losses due to bypass flow on the failed train or components.

  This alignment may result in the 'B' train SNSWP supply feeding the 'B' Train NSWS pump on one unit and the 'A' Train NSWS pump on the affected unit. This defense in depth contingency does not alter the degree to which Units 1 and 2 share this suction path.

- GDC-44. Cooling Water:
  A system to transfer heat from structures, systems, and components important to safety, to an ultimate heat sink shall be provided. The system safety function shall be to transfer the combined heat load of these structures, systems, and components under normal operating and accident conditions. Suitable redundancy in components and features, and suitable interconnections, leak detection, and isolation capabilities shall be provided to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished, assuming a single failure.

  As stated previously although the 'A' Train NSWS will be inoperable during the proposed 14 day Completion Time the train and the equipment it supports will remain in its normal ESFAS configuration and be functional. The 'B' Train NSWS will remain operable. The NSWS remains functionally capable of meeting single failure criteria for all non-seismic postulated events. As previously stated, NRC Generic Letter 80-30, "Clarification of the Term 'Operable' as it Applies to Single Failure Criterion for Safety Systems Required by TS states," there is no requirement to assume a single failure while operating under a Technical Specification (TS) required action. For defense in depth following the seismic event that causes a loss of the LLI and a subsequent 'B' Train NSWS pump failure procedures will be available to restore cooling water to the affected unit with an 'A' Train NSWS pump. The 'A' NSWS pump will be aligned to the SNSWP via the 'B' Train NSWS piping. These procedures will ensure that configuration of the failed 'B' Train NSWS will not adversely affect NSWS operation on either unit.

There will be no permanent changes to the design of the ECCS, CSS. NSWS, AFW, CCW, CRAVS, ABFVES and the EDG such that compliance with any of applicable design criteria would come into question. The evaluations provided within this proposed amendment confirm that the plant will continue to comply with the applicable design criteria.

During the requested 14 day period, 'A' Train NSWS will be aligned to Lake Norman until the system is ready for post maintenance testing. This action maintains the 'A' Train's NSWS normal and automatic alignment to Lake Norman but will result in the inability to manually align the 'A' Train directly to the SNSWP subsequent to a seismic event resulting in damage to the supply piping from Lake Norman or the highly improbable loss of Lake Norman. The operability of 'B' Train NSWS is not affected by the proposed change. During this period, no discretionary maintenance or discretionary testing will be planned on either NSWS Train except for the 'A' Train NSWS piping to the SNSWP described in this proposed amendment. Any adverse impact is offset by defense in depth actions and other compensatory measures listed in this submittal.

Additionally, no discretionary maintenance or discretionary testing will be planned on the 'B' Trains of ECCS, CSS, AFW, CCW, CRAVS, ABFVES, and EDGs. In this configuration, the operable Trains will respond as designed during design basis events. Cooling water for Train 'A' heat exchangers and pump motor coolers will be supplied from Lake Norman via 'A' Train NSWS. Although considered inoperable, the affected Train 'A' systems will be capable of performing their intended functions.

The one time requested period of 14 days to complete the Required Actions of the affected Technical Specifications is reasonable considering the redundant capabilities of the above systems, the defense in depth measures that will be available, and the compensatory measures that will be in place as discussed within this proposed amendment.

4.2 Precedents

This proposed license amendment was modeled after similar amendments submitted by Catawba Nuclear Station and approved by the NRC on January 7, 2003 (ADAMS Accession No ML030070375) and November 17, 2005 (ADAMS Accession No ML053250121). The Catawba amendment temporarily modified their Technical Specifications to allow the NSWS headers for each Unit to be taken out of service for up to 14 days each for system upgrades.

This proposed license amendment was also modeled after a similar amendment submitted by South Texas Project Unit 1 where extensive, unplanned repairs were necessary for the 'B' Train Essential Cooling Water pump. The STP request for a 7 day extension (up to 14 days) was approved by the NRC on January 10, 2005 (ADAMS Accession No ML050100291).

The proposed amendment was modeled after similar Callaway Nuclear Station amendment requests for an extension of the Technical Specification ESW and EDG Completions Times from 72 hours to 14 days to replace ESW piping, approved October 31, 2008 (ADAMS Accession No ML082810643) and February 24, 2009 (ADAMS Accession No ML090360533).

4.3 Significant Hazards Consideration

Pursuant to 10 CFR 50.90, Duke Energy Carolinas, LLC (Duke Energy) proposes a license amendment request (LAR) for the Renewed Facility Operating License (FOL) and Technical Specifications (TS) for McGuire Nuclear Station, Units 1 and 2.

The proposed LAR would revise the McGuire TS 3.7.7 and associated TS supported by the Nuclear Service Water System (NSWS) to allow the correction of a degraded condition affecting NSW pump performance on the 'A' Train. The proposed LAR would be applicable on a one time basis as described below.

The activity cannot be accomplished within the current TS completion time of 72 hours. The proposed amendment will permit the 'A' Train NSWS to be inoperable for a total of 14 days to allow for the correction of a degraded condition on the 'A' Train supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity or by December 31, 2016, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time. The latter will not count against the 14 day completion time.

Duke Energy has concluded that operation of the McGuire Nuclear Station Units 1 & 2, in accordance with the proposed changes to the Technical Specifications, does not involve a significant hazards consideration. Duke Energy's conclusion is based on its evaluation, in accordance with 10CFR50.91(a)(1), of the three standards set forth in 10CFR50.59(c) as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   The 'B' Train NSWS and supported equipment will remain fully operable during the 14 day CT. The alignment of the 'A' Train NSWS will remain consistent with the NSWS normal and ESFAS alignment. Although not fully operable the 'A' Train NSWS and its supported equipment will be capable of performing their functions during the 14 day CT.

   The 'A' NSWS and supported equipment function as accident mitigators. Removing 'A' Train SNSWP supply piping from service for a limited period of time does not affect any accident initiator and therefore cannot change the probability of an accident. The proposed changes and the 'A' Train NSWS repair evolution have been evaluated to assess their impact on the systems affected and ensure design basis safety functions are preserved.

   The risk analysis for the proposed NSW system alignment during the 14 day CT shows no delta risk for any ESF actuation event that does not involve an earthquake. The most significant risk contributor is a seismic event with a magnitude great enough to cause the failure of Cowan's Ford dam and subsequent loss of Lake Norman or LLI during the 14 day CT. The estimated Incremental Conditional Core Damage Probability (ICCDP) due to the seismic event is much less than the limits associated with Regulatory Guide 1.177.

   In addition, as previously stated, a Seismic Fragility Assessment of the McGuire Low Level Intake Water Pipeline in December of 2011 indicates that the dam and water supply would withstand a SSE. Therefore for the short duration of this proposed alignment the increase in risk is deemed to be negligible.

   Risk associated with tornado/high winds was assessed. The months of November through February have been the seasonal low for tornado frequency. This evolution is currently scheduled for the fall November 2015 time frame. The risk contribution from tornado and high wind events is negligible during the proposed NSWS configuration described in this LAR and therefore, the calculated Core Damage Frequency (CDF) or the Large Early Release Fraction (LERF) contribution due to high wind and tornado events is negligible with respect to overall risk. The activities covered by this LAR also include a defense-in-depth action to cease activities and close the personnel access openings in the event of a tornado warning. Weather patterns will be monitored and this activity will be modified if tornado/high wind conditions become imminent.

The overall increase in risk for the 14 day CT is solely due to the seismic event which results in a loss of Lake Norman or LLI. However, this risk is reduced by the defense in depth strategy described in the LAR that provides a contingency for the loss of a 'B' Train NSWS pump after the loss of the Lake Norman water supply. This defense in depth contingency effectively offsets the unavailability of the 'A' Train NSWS SNSWP supply.

In addition, pre-aligning the 'B' Train NSWS to the SNSWP water supply in advance of the proposed activities prevents the introduction of potential equipment failures during an ESFAS demanded transfer. This action also eliminates the time it would take operators to perform the transfer following a seismic event.

The quantified impact of defense in depth measures and compensatory actions on CDF/LERF cannot be precisely determined, yet it is agreed that the implementation of these actions would only serve to improve these risk parameters.

Not included in the overall risk evaluation is the additional margin identified by the Fragility Assessment discussed previously that concluded that the Lake Norman Dam and LLI would survive a SSE.

As stated in NRC Generic Letter 80-30, "Clarification of the Term 'Operable' as it Applies to Single Failure Criterion for Safety Systems Required by TS," there is no requirement to assume a single failure while operating under a Technical Specification (TS) required action. Therefore, there will be no effect on the analysis of any accident or the progression of the accident since the operable NSW 'B' train is capable of serving 100 percent of all the required heat loads. As such, there is no impact on consequence mitigation for any transient or accident.

In light of the above discussion, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed amendment is the one time extension of the required CTs from 72 hours for the ECCS, CSS, NSWS, AFW, CCW and the EDG systems and from 168 hours for the CRAVS and ABFVES systems to 336 hours. The requested change does not involve the addition or removal of any plant system, structure, or component.

   The proposed temporary TS changes do not affect the basic design, operation, or function of any of the systems associated with the TS impacted by the amendment. Implementation of the proposed amendment will not create the possibility of a new or different kind of accident from that previously evaluated.

   McGuire intends to isolate and repair the 'A' Train NSWS supply from the SNSWP. This activity will require that 'A' Train NSW be aligned to Lake Norman until the system is ready for post maintenance testing. This action maintains the NSW 'A' Train's normal and automatic alignment to Lake Norman but will result in the inability to manually align the 'A' Train NSWS to the SNSWP subsequent to a seismic event that results in damage to the supply piping from Lake Norman or the highly improbable loss of Lake Norman.

Although considered inoperable, the 'A' Train NSWS and supported systems will be technically capable of performing their intended functions. Throughout the repair project, compensatory measures will be in place to provide additional assurance that the affected systems will continue to be capable of performing their intended safety functions.

No new accident causal mechanisms are created as a result of the requested changes creating the possibility of a new or different kind of accident from any accident previously evaluated.

In conclusion, this proposed LAR does not impact any plant systems that are accident initiators and does not impact any safety analysis. Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in the margin of safety?

   Response: No.

   Margin of safety is related to the confidence in the ability of the fission product barriers to perform their design functions during and following an accident situation. These barriers include the fuel cladding, the reactor coolant system, and the containment system. The performance of the fuel cladding, reactor coolant and containment systems will not be impacted by the proposed LAR.

   Although not a fission product barrier, the Auxiliary Building Ventilation Boundary plays a role in minimizing the dose consequences from ECCS system leakage into the Auxiliary Building during a design basis accident. The Auxiliary Building Ventilation System in conjunction with ECCS equipment air handling units that automatically start on an ECCS demand draw potentially contaminated air from the ECCS equipment rooms and into the ABFVES. As stated in this LAR, the Auxiliary Building Ventilation Boundary will be breached when the 'A' Train NSWS piping is opened for access in the Auxiliary Building. The Validation: personnel access opening will be controlled by using procedures developed or revised for this purpose to maintain positive control of the auxiliary building pressure boundary and prevent any unmonitored release.

   Dedicated personnel with procedure guidance will be provided to close the pathway from the auxiliary building on the affected 'A' Train NSWS piping from the SNSWP in the event of any of the following:

   - An Engineered Safety Feature (ESF) actuation
   - Entry into RP/0/A/5700/006 Natural Disasters
   - Entry into RP/0/A/5700/007 Earthquake

   The pathway will be closed upon notification of an abnormal event as described above. TS 3.7.11 includes a note in the Limiting Condition for Operation (LCO) section: "The Auxiliary Building pressure boundary may be opened intermittently under administrative controls." Based on these measures the performance of this barrier will not be affected by the proposed LAR.

   Additionally, the proposed amendment does not involve a change in the design or operation of the plant. The activity only extends the amount of time the 'A' NSW system

is allowed to be inoperable to correct the degraded condition on the 'A' NSWS supply piping from the SNSWP. As stated previously, the 'A' Train NSWS and supported equipment will remain in its Normal and ESFAS alignment during the extended CT and be functionally capable for all postulated events except a seismic event that results in loss of the Lake Norman water supply.

Defense-in-depth measures involving use of the Main Supply Crossover piping to supply suction to affected unit's 'A' Train NSWS pump from the 'B' train SNSWP suction piping and the ability to implement the FLEX strategy on both units provide additional safety margin for this event. Use of the Main Supply Crossover line is only needed in the unlikely event that one unit's 'B' Train NSWS pump fails after loss of 'A' Train NSWS due to an earthquake.

The estimated ICCDP during the 14 day CT extension is much less than the limits associated with Regulatory Guide 1.177.
Therefore, it is concluded that the proposed changes do not involve a significant reduction in the margin of safety.

Based upon the above evaluation, Duke Energy concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c) and, accordingly, a finding of "no significant hazards consideration" is justified.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATIONS

A review by Duke Energy has determined that the proposed amendment would temporarily change a requirement with respect to use of a facility component located within the restricted area, as defined in 10 CFR 20. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released onsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9).

Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

ATTACHMENT 2

Marked-Up McGuire Technical Specification Pages

3.7 PLANT SYSTEMS

3.7.7 Nuclear Service Water System (NSWS)

LCO 3.7.7 Two NSWS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One NSWS train inoperable.	A.1 ----------NOTES---------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources— Operating," for emergency diesel generator made inoperable by NSWS. 2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops—MODE 4," for residual heat removal loops made inoperable by NSWS. ---------- Restore NSWS train to OPERABLE status.	72 hours*

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

----------NOTE----------

* 'A' Train NSWS is allowed to be inoperable for a total of 14 days for correction of a degraded condition on the 'A' Train NSWS supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity or by December 31, 2016, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' Train NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-15-026.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.7.1	----------NOTE---------- Isolation of NSWS flow to individual components does not render the NSWS inoperable. ---------- Verify each NSWS manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program 31 days
SR 3.7.7.2	Verify each NSWS automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program 18 months
SR 3.7.7.3	Verify each NSWS pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program 18 months

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 ECCS — Operating

LCO 3.5.2 Two ECCS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

---NOTE---
In MODE 3, both safety injection (SI) pump or RHR pump flow paths may be isolated by closing the isolation valves for up to 2 hours to perform pressure isolation valve testing per SR 3.4.14.1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more trains inoperable. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	A.1 Restore train(s) to OPERABLE status.	72 hours*
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

---NOTE---
*'A' Train ECCS is allowed to be inoperable for a total of 14 days for correction of a degraded condition on the 'A' Train NSWS supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity or by December 31, 2016, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' Train NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-15-026.

3.6 CONTAINMENT SYSTEMS

3.6.6 Containment Spray System

LCO 3.6.6 Two containment spray trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One containment spray train inoperable.	A.1 Restore containment spray train to OPERABLE status.	72 hours*
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours

----------NOTE----------

* 'A' Train Containment Spray is allowed to be inoperable for a total of 14 days for correction of a degraded condition on the 'A' Train NSWS supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity or by December 31, 2016, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' Train NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-15-026.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	Verify each containment spray manual and power operated valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.6.6.2	Verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.6.6.3	Not Used	Not Used
SR 3.6.6.4	Not Used	Not Used
SR 3.6.6.5	Verify that each spray pump is de-energized and prevented from starting upon receipt of a terminate signal and is allowed to manually start upon receipt of a start permissive from the Containment Pressure Control System (CPCS).	In accordance with the Surveillance Frequency Control Program
SR 3.6.6.6	Verify that each spray pump discharge valve closes or is prevented from opening upon receipt of a terminate signal and is allowed to manually open upon receipt of a start permissive from the Containment Pressure Control System (CPCS).	In accordance with the Surveillance Frequency Control Program
SR 3.6.6.7	Verify each spray nozzle is unobstructed.	Following activities which could result in nozzle blockage

3.7 PLANT SYSTEMS

3.7.5 Auxiliary Feedwater (AFW) System

LCO 3.7.5 Three AFW trains shall be OPERABLE.

---NOTE---
Only one AFW train, which includes a motor driven pump, is required to be OPERABLE in MODE 4.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

---NOTE---
LCO 3.0.4.b is not applicable when entering MODE 1.

CONDITION		REQUIRED ACTION		COMPLETION TIME
A.	One steam supply to turbine driven AFW pump inoperable.	A.1	Restore steam supply to OPERABLE status.	7 days AND 10 days from discovery of failure to meet the LCO
B.	One AFW train inoperable in MODE 1, 2 or 3 for reasons other than Condition A.	B.1	Restore AFW train to OPERABLE status.	72 hours* AND 10 days from discovery of failure to meet the LCO

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time for Condition A or B not met. OR Two AFW trains inoperable in MODE 1, 2, or 3.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	6 hours 12 hours
D. Three AFW trains inoperable in MODE 1, 2, or 3.	D.1 ----------NOTE---------- LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status. ---------- Initiate action to restore one AFW train to OPERABLE status.	 Immediately
E. Required AFW train inoperable in MODE 4.	E.1 Initiate action to restore AFW train to OPERABLE status.	Immediately

----------NOTE----------

* 'A' Train AFW is allowed to be inoperable for a total of 14 days for correction of a degraded condition on the 'A' Train NSWS supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity or by December 31, 2016, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' Train NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-15-026.

3.7 PLANT SYSTEMS

3.7.6 Component Cooling Water (CCW) System

LCO 3.7.6 Two CCW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CCW train inoperable.	A.1 ----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops — MODE 4," for residual heat removal loops made inoperable by CCW. ---------- Restore CCW train to OPERABLE status.	72 hours*
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

----------NOTE----------
* 'A' Train CCW is allowed to be inoperable for a total of 14 days for correction of a degraded condition on the 'A' Train NSWS supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity or by December 31, 2016, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' Train NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-15-026.

3.7 PLANT SYSTEMS

3.7.9 Control Room Area Ventilation System (CRAVS)

LCO 3.7.9 Two CRAVS trains shall be OPERABLE.

---NOTE---
The control room envelope (CRE) boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies,
During CORE ALTERATIONS.

ACTIONS

CONDITION		REQUIRED ACTION		COMPLETION TIME
A.	One CRAVS train inoperable for reasons other than Condition B.	A.1	Restore CRAVS train to OPERABLE status.	7 days*
B.	One or more CRAVS trains inoperable due to inoperable CRE boundary in MODE 1,2,3, or 4.	B.1 Initiate action to implement mitigating actions.		Immediately
		AND		24 hours
		B.2	Verify mitigating actions ensure CRE occupant exposures to radiological, chemical, and smoke hazards will not exceed limits.	
		AND		90 days
		B.3	Restore CRE boundary to OPERABLE status.	
C.	Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4.	C.1	Be in MODE 3.	6 hours
		AND		
		C.2	Be in MODE 5.	36 hours

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of irradiated fuel assemblies, or during CORE ALTERATIONS.	D.1 Place OPERABLE CRAVS train in emergency mode. OR D.2.1 Suspend CORE ALTERATIONS. AND D.2.2 Suspend movement of irradiated fuel assemblies.	Immediately Immediately Immediately
E. Two CRAVS trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies, or during CORE ALTERATIONS. OR One or more CRAVS trains inoperable due to an inoperable CRE boundary in MODE 5 or 6, or during movement of irradiated fuel assemblies, or during CORE ALTERATIONS.	E.1 Suspend CORE ALTERATIONS. AND E.2 Suspend movement of irradiated fuel assemblies.	Immediately Immediately
F. Two CRAVS trains inoperable in MODE 1, 2, 3, or 4 (for reasons other than Condition B).	F.1 Enter LCO 3.0.3.	Immediately

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. One or more CRAVS train(s) heater inoperable.	G.1 Restore CRAVS train(s) heater to OPERABLE status. OR G.2 Initiate action in accordance with Specification 5.6.6.	7 days 7 days

----------NOTE----------

* 'A' Train CRAVS is allowed to be inoperable for a total of 14 days for correction of a degraded condition on the 'A' Train NSWS supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity or by December 31, 2016, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' Train NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-15-026.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Operate each CRAVS train for ≥ 10 continuous hours with the heaters operating.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.2	Perform required CRAVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.9.3	Verify each CRAVS train actuates on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.4	Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program

3.7 PLANT SYSTEMS

3.7.11 Auxiliary Building Filtered Ventilation Exhaust System (ABFVES)

LCO 3.7.11 Two ABFVES shall be OPERABLE.

----------NOTE----------
The Auxiliary Building pressure boundary may be opened intermittently under administrative controls.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ABFVES inoperable.	A.1 Restore ABFVES to OPERABLE status.	7 days*
B. Two ABFVES inoperable.	B.1 Restore one ABFVES to OPERABLE status.	24 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

----------NOTE----------
* 'A' Train ABFVES is allowed to be inoperable for a total of 14 days for correction of a degraded condition on the 'A' Train NSWS supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity or by December 31, 2016, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' Train NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-15-026.

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources — Operating

LCO 3.8.1 The following AC electrical sources shall be OPERABLE:

a. Two qualified circuits between the offsite transmission network and the Onsite Essential Auxiliary Power System; and

b. Two diesel generators (DGs) capable of supplying the Onsite Essential Auxiliary Power Systems;

AND

The automatic load sequencers for Train A and Train B shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

----------NOTE----------
LCO 3.0.4.b is not applicable to DGs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for OPERABLE offsite circuit. AND	1 hour AND Once per 8 hours thereafter
	A.2 Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable. AND	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.3 Restore offsite circuit to OPERABLE status.	72 hours AND 6 days from discovery of failure to meet LCO
B. One DG inoperable.	B.1 Perform SR 3.8.1.1 for the offsite circuit(s).	1 hour AND Once per 8 hours thereafter
	AND	
	B.2 Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)
	AND	
	B.3.1 Determine OPERABLE DG is not inoperable due to common cause failure.	24 hours
	OR	
	B.3.2 Perform SR 3.8.1.2 for OPERABLE DG.	24 hours
	AND	

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.4 Restore DG to OPERABLE status.	72 hours *, ** AND 6 days from discovery of failure to meet LCO *
C. Two offsite circuits inoperable.	C.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.	12 hours from discovery of Condition C concurrent with inoperability of redundant required feature(s)
	AND	
	C.2 Restore one offsite circuit to OPERABLE status.	24 hours

(continued)

* For Unit 1 only, the Completion Time that the 1A EDG can be inoperable as specified by Required Action B.4 may be extended beyond the "72 hours and 6 days from discovery of failure to meet the LCO" up to a total of 10 days as part of the 1A EDG Jacket/Intercooler Water Pump Motor repair. Upon completion of the repair and restoration, this footnote is no longer applicable and will expire at 1741 hours on June 15, 2007.

** 'A' Train EDGs are allowed to be inoperable for a total of 14 days for correction of a degraded condition on the 'A' Train NSWS supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity or by December 31, 2016, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' Train NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-15-026.

ATTACHMENT 3

McGuire TS Bases Pages

B 3.7 PLANT SYSTEMS

B 3.7.7 Nuclear Service Water System (NSWS)

BASES

BACKGROUND

The NSWS provides a transfer mechanism for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. During normal operation, and a normal shutdown, the NSWS also provides this function for various safety related and nonsafety related components. The safety related function is covered by this LCO.

The NSWS is normally supplied from Lake Norman as a non-seismic source, through a single supply line as shown in Figure B 3.7.7-1. An additional safety-related and seismic supply of water to the NSWS, in the event of a loss of Lake Norman, is the Standby Nuclear Service Water Pond (SNSWP). The supply line from Lake Norman separates into two supply headers; each header is capable of being isolated by two, independently powered, motor operated valves. The two supply headers feed into two separate supply trains. The "A" train supplies water to the "A" pump on each unit and the "B" train to the "B" pump on each unit. During normal operation, only one pump, per unit, is in operation to supply NSWS flow to the essential and non-essential headers for each unit. The "B" train supply is automatically realigned to the SNSWP and supplies the "B" header on an SI signal from either unit. The "A" train supply is automatically realigned to the low-level supply from Lake Norman and supplies the "A" header on an SI signal from either unit.

Essential headers provide flow to the following safety related components and systems:

1. Component Cooling (CCW) Heat Exchangers and Pump Motor Coolers,
2. Containment Spray Heat Exchangers and Pump Motor Coolers,
3. Control Room Area Chiller Condensers,
4. Diesel Generator Heat Exchangers,
5. Centrifugal Charging Pump Motor, Bearing Oil and Gear Oil Coolers,
6. Nuclear Service Water Pump Motor Coolers,
7. Auxiliary Feedwater Pump Motor Coolers,
8. Safety Injection Pump Motor and Bearing Oil Coolers,
9. Residual Heat Removal Pump Motor Coolers,
10. Fuel Pool Pump Motor Coolers,
11. Assured Auxiliary Feedwater Supply,
12. Assured Component Cooling System Makeup,
13. Assured Fuel Pool Cooling System makeup, and
14. Assured Diesel Generator Engine Cooling System makeup.

BASES

BACKGROUND (continued)

The non-essential channel supply comes from the "A" and "B" train crossover piping and isolates on an SI or Blackout signal.

The Reactor Coolant Pump Motor Air Coolers are not essential for safe shutdown, but are set up to receive cooling flow until the Containment, High-High signal is received. The pumps and valves are remote and manually aligned, except in the unlikely event of a loss of coolant accident (LOCA). The pumps aligned to the critical loops are automatically started upon receipt of a safety injection or Station Blackout signal, and all essential valves are aligned to their post-accident positions.

Additional information about the design and operation of the NSWS, along with a list of the components served, is presented in the UFSAR, Section 9.2 (Ref. 1). The principal safety related function of the NSWS is the removal of decay heat from the reactor via the CCW System.

APPLICABLE SAFETY ANALYSES

The design basis of the NSWS is for one NSWS train, in conjunction with the CCW System and the Containment Spray system, to remove core decay heat following a design basis LOCA as discussed in the UFSAR, Section 6.2 (Ref. 2). This prevents the containment sump fluid from increasing in temperature during the recirculation phase following a LOCA and provides for a gradual reduction in the temperature of this fluid as it is supplied to the Reactor Coolant System by the ECCS pumps. The NSWS is designed to perform its function with a single failure of any active component, assuming the loss of offsite power.

The NSWS, in conjunction with the CCW System, also removes heat from the residual heat removal (RHR) system, as discussed in the UFSAR, Section 5.4 (Ref. 3), from RHR entry conditions to MODE 5 during normal and post-accident operations. The time required for this evolution is a function of the number of CCW and RHR System trains that are operating. One NSWS train is sufficient to remove decay heat during subsequent operations in MODES 5 and 6. This assumes a maximum NSWS inlet temperature of 102°F is not exceeded.

The NSWS satisfies Criterion 3 of 10 CFR 50.36 (Ref. 4).

LCO

Two NSWS trains are required to be OPERABLE to provide the required redundancy to ensure that the system functions to remove post-accident

BASES

LCO (continued)

heat loads, assuming that the worst case single active failure occurs coincident with the loss of offsite power.

An NSWS train is considered OPERABLE during MODES 1, 2, 3, and 4 when:

a. The associated unit's pump is OPERABLE; and

b. The associated piping, valves, and instrumentation and controls required to perform the safety related function are OPERABLE.

Portions of the NSWS system are shared between the two units (Figure B 3.7.7-1). The shared portions of the system must be OPERABLE for each unit when that unit is in the MODE of Applicability. Additionally, both normal and emergency power for shared components must also be OPERABLE. If a shared NSWS component becomes inoperable, or normal or emergency power to shared components becomes inoperable, then the Required Actions of this LCO must be entered independently for each unit that is in the MODE of applicability of the LCO.

APPLICABILITY

In MODES 1, 2, 3, and 4, the NSWS is a normally operating system that is required to support the OPERABILITY of the equipment serviced by the NSWS and required to be OPERABLE in these MODES.

In MODES 5 and 6, the requirements of the NSWS are determined by the systems it supports.

ACTIONS

A.1 *

If one NSWS train is inoperable, action must be taken to restore OPERABLE status within 72 hours. In this Condition, the remaining OPERABLE NSWS train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE NSWS train could result in loss of NSWS function. Required Action A.1 is modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—Operating," should be entered if an inoperable NSWS train results in an inoperable emergency diesel generator. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops—MODE 4," should be entered if an inoperable NSWS train results in an inoperable decay heat removal train.

ACTIONS (continued)

This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period.

B.1 and B.2

If the NSWS train cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

*A one time change to TS 3.7.7 extends Action A.1 completion time (CT) from 72 hours to 14 days in order to address an 'A' Train Operable but Degraded Non-Conforming (OBDN) condition that affects the 'A' Train NSWS pump NPSH. The change also affects TS 3.5.2, Emergency Core Cooling System (ECCS) - Operating; TS 3.6.6, Containment Spray System (CSS); TS 3.7.5, Auxiliary Feedwater (AFW) System; TS 3.7.6, Component Cooling Water (CCW) System; TS 3.7.7, Nuclear Service Water System (NSWS); TS 3.7.9, Control Room Area Ventilation System (CRAVS); TS 3.7.11, Auxiliary Building Filtered Ventilation Exhaust System (ABFVES), and TS 3.8.1, AC Sources- Operating.

A Note similar to the following is placed in each of the above listed TS:

"* 'A' Train NSWS is allowed to be inoperable for a total of 14 days for correction of a degraded condition on the 'A' Train NSWS supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity or by December 31, 2016, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-15-026."

#	REGULATORY COMMITMENTS ASSOCIATED WITH ONE TIME TS CHANGE
1	The 'A' Train NSWS pumps will remain running and aligned to Lake Norman during the extended CT until the system is ready for post maintenance testing.
2	Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time
3	The 'B' Train NSWS will be placed in its ESFAS alignment to the SNSWP water source with the 'B' Train pumps in standby prior to starting the LAR activity and remain in this alignment until the 'A' Train NSWS SNSWP water source is restored and ready for post maintenance testing.
4	Procedures will be established to provide an additional defense in depth contingency that could be used in the event of an extremely low probability of a loss of the Lake Norman water source due to a seismic event. The procedures will ensure that system operation is maintained within design limits (less than or equal to 2 NSWS pumps running on a header), control of maximum system flow, and that system configuration prevents interaction of the degraded equipment with the functional equipment.
5	Fukushima Response FLEX modifications will be installed and the FLEX strategies will be available for implementation as additional defense-in-depth on both units.
6	During the period in which the 'A' NSWS suction path from the SNSWP is non-functional, no discretionary maintenance or discretionary testing will be planned on the following: a. 1A EDG b. 2A EDG c. The 'A' Train of NSWS excluding the activities described in the LAR for the 'A' Train NSWS piping to the SNSWP. d. The 'B' Train of NSWS, ECCS, CSS, AFW, CCW, CRAVS, ABFVES or the EDGs e. The switchyard and other offsite power sources f. The SSF
7	A condition in which repairs could impact the ability of an SSC to perform its Safety Function would result in termination of activities. The inspection may identify a condition that cannot be resolved within the 14 day completion time. Should such a condition be identified then the system will be restored to its current OBDN condition. If the survey presents any opportunities for a less intrusive or less time consuming solution for addressing the OBDN condition, then these opportunities will be pursued, as appropriate.
8	In an activity planned to be performed this summer separate from the 14 day completion time repair activity, 0RN-7A will be tested for leakage and adjusted if necessary to minimize leakage.
9	In an activity planned to be performed this summer separate from the 14 day completion time repair activity the SNSWP isolation flange will be test fitted to the 'A' SNSWP pipe.
10	Procedure guidance will establish controls to limit evacuation air pressure to less than a predetermined value in order to prevent air intrusion into the operating NSWS.
11	Dedicated personnel with procedure guidance will be provided to close the pathway from the auxiliary building on the affected 'A' Train NSWS piping from the SNSWP in the event of any of the following: • An Engineered Safety Feature (ESF) actuation • Entry into RP/0/A/5700/006 Natural Disasters

	• Entry into RP/0/A/5700/007 Earthquake
12	This activity will be controlled under the Infrequently Performed Test or Evolution (IPTE) process defined in Fleet Directive AD-OP-ALL-106, "Conduct of Infrequently Performed Tests or Evolutions", and Duke Energy's Work Management and Execution procedures.
13	Dedicated personnel will be available for monitoring and immediate response to unanticipated leakage. Procedural actions will provide guidance to stop the leakage. If the leakage cannot be stopped, then dedicated personnel will establish NSWS flow from the 'B' Train NSWS, shutdown the 'A' Train NSWS pumps and close 0RN-12AC to stop the leakage.
14	If the second personnel access opening is necessary, then prior to the opening of the system an evaluation of leakage will be performed to validate proper isolation and that leakage is within expected limits.
15	McGuire will communicate with the Transmission Control Center (TCC) to ensure that the McGuire Control Room is notified in the event of potential grid disturbances in order that an appropriate plant response can be formulated.
16	The Work Control Center or OCC will monitor weather forecasts and radar during the activities that require the NSWS piping personnel access points to be open to assess the potential for severe weather conditions (tornado, thunderstorms).
17	Training will be provided in accordance with the Systematic Approach to Training (SAT) process to Operations personnel on this TS change and the associated evolution to inspect and correct the degraded condition in the 'A' NSWS supply piping from the SNSWP.
18	Operations will review applicable abnormal operating procedures related to the response to an earthquake, the loss of the Lake Norman and the loss of NSWS prior to making 'A' NSWS suction path from the SNSWP inoperable and each shift until 'A' Train NSWS operability is restored.
19	The repair work on the NSWS 'A' Train suction from the SNSWP will be scheduled during a period in which hurricanes and tornadoes have a lower likelihood of occurrence.
20	The Outage Command Center (OCC) will be manned while performing the activities authorized by this amendment.
21	The following list of equipment will be protected: a. 'B' Train NSWS b. 1B EDG c. 2B EDG d. 1B ECCS e. 2B ECCS f. 1B CSS g. 2B CSS h. 1B AFW i. 2B AFW j. 1B CCW k. 2B CCW l. B CRAVS m. B ABFVES n. Auxiliary Building WZ Sump and equipment supporting function of sump
22	If required to be installed the new personnel access opening to be located on the 'A' Train NSWS piping in the auxiliary building will be designed and installed in

	accordance with the Engineering Change Process.
23	Foreign Material Exclusion (FME) will be controlled during the proposed activities in accordance with AD-MN-ALL-0002, Foreign Material Exclusion (FME). Any debris resulting from the obstruction removal activity will be mechanically cleaned out before the system is closed for return to service per FME plan developed in accordance with the above procedure. The system will be video inspected and reversed flushed from the LLI to the SNSWP with isolation to downstream components to force any sediment back to the SNSWP.
24	Following 'A' Train NSWS restoration, testing will be performed to verify that the as left NSWS performance meets or exceeds pre-activity performance including 'A' Train NSW pump NPSH conditions.
25	Prior to entering the 14 day CT perform an evaluation to ensure that there will be no anticipated impact to 'A' NSWS water supply from the LLI from Alewife fish the during 14 day CT.
26	The new personnel access piping opening (in the auxiliary building) will be controlled by using procedures developed or revised for this purpose to maintain positive control of the opening and to prevent an unmonitored release.
27	The ERAT program includes the option to use a SSA (Safety Significant Activity) code which will cause the risk condition color to be "YELLOW". MNS will use this code during the activities described in this LAR.
28	Designated operators will be available to execute the manual actions associated with aligning the affected unit's 'A' Train NSWS pump to the 'B' NSWS SNSWP via the Main Supply Crossover piping.
29	If the contingency personnel access opening is installed, then Security personnel will establish the proper controls and compensatory measures prescribed by security procedures and the security plan.
30	In support of the contingency the following conditions will be established before the start of activities in the LAR: • The 'A' valve (0RN-14A) will be opened prior to the evolution and power will be removed from the valve operator. • The 'B' valve (0RN-15B) will be maintained closed with the ESFAS signal from each unit blocked prior to the evolution. Maintaining 0RN-15B closed with power removed satisfies operability requirements for the 'B' Train NSWS. The 'B' valve (0RN-15B) can be opened from the control room after power is restored if conditions warrant the use of this contingency.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

This SR is modified by a Note indicating that the isolation of the NSWS components or systems may render those components inoperable, but does not affect the OPERABILITY of the NSWS.

Verifying the correct alignment for manual, power operated, and automatic valves in the NSWS flow path provides assurance that the proper flow paths exist for NSWS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.7.2

This SR verifies proper automatic operation of the NSWS valves on an actual or simulated actuation safety injection signal. The NSWS is a normally operating system that cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.7.3

This SR verifies proper automatic operation of the NSWS pumps on an actual or simulated actuation signal. The NSWS is a normally operating system that cannot be fully actuated as part of normal testing during normal operation. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

REFERENCES

1. UFSAR, Section 9.2.

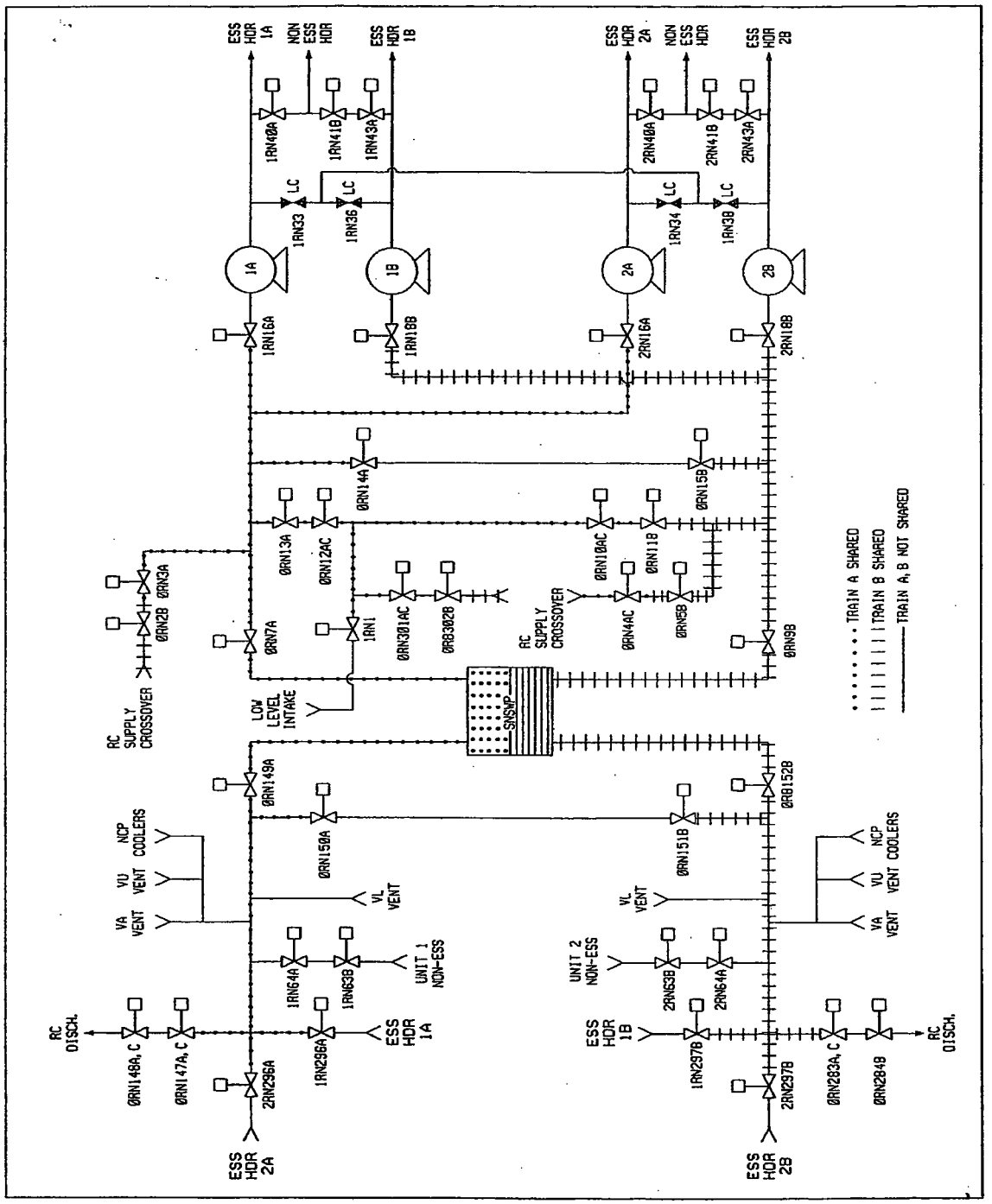
2. UFSAR, Section 6.2.

3. UFSAR, Section 5.4.

4. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).

5. 10 CFR 50, Appendix A, GDC 5, "Sharing of Structures, Systems, and Components".

FIGURE B 3.7.7-1 NUCLEAR SERVICE WATER SYSTEM

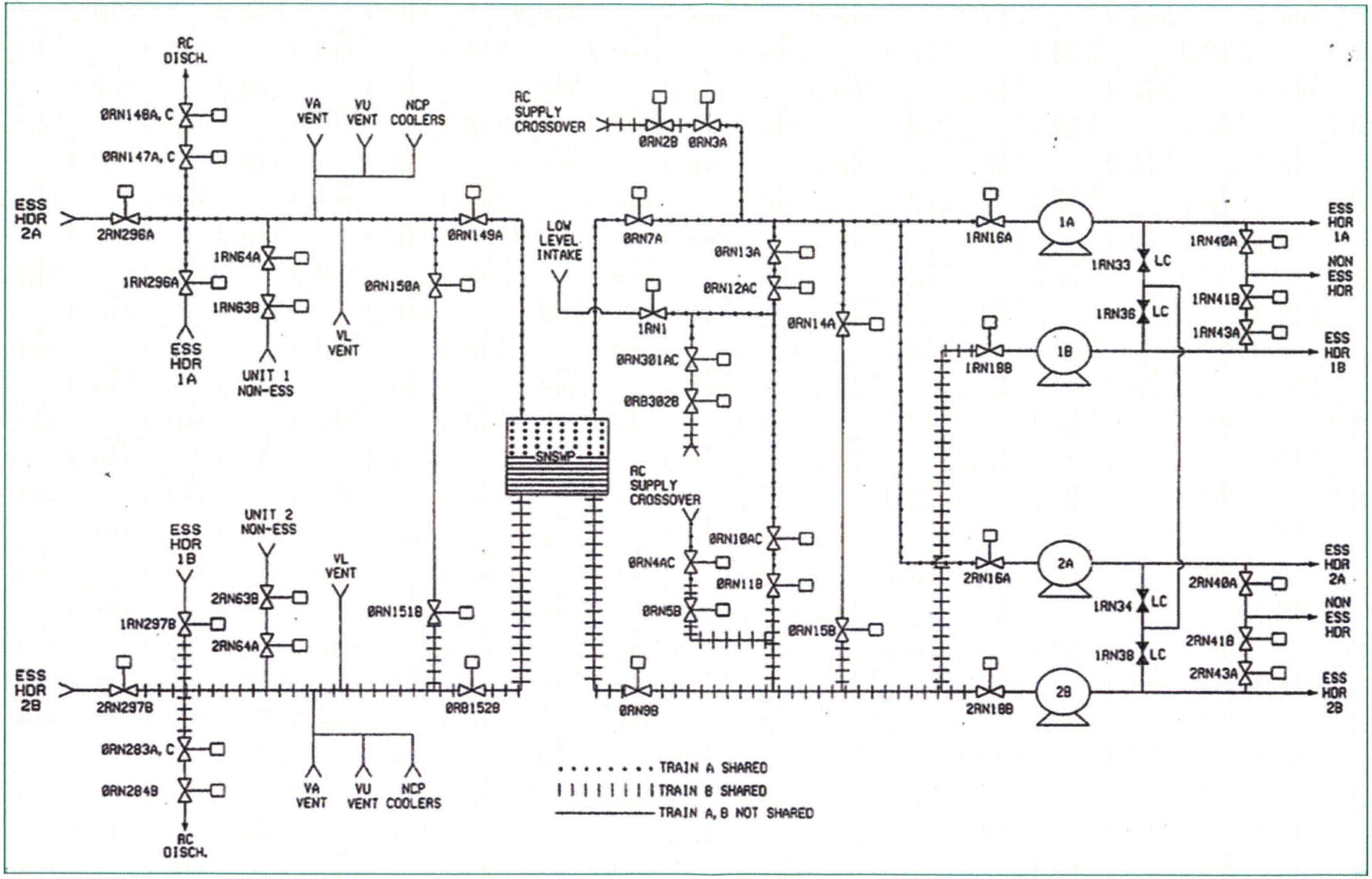


ATTACHMENT 4

Marked Up Simplified NSWS Flow Diagrams

INFORMATION ONLY

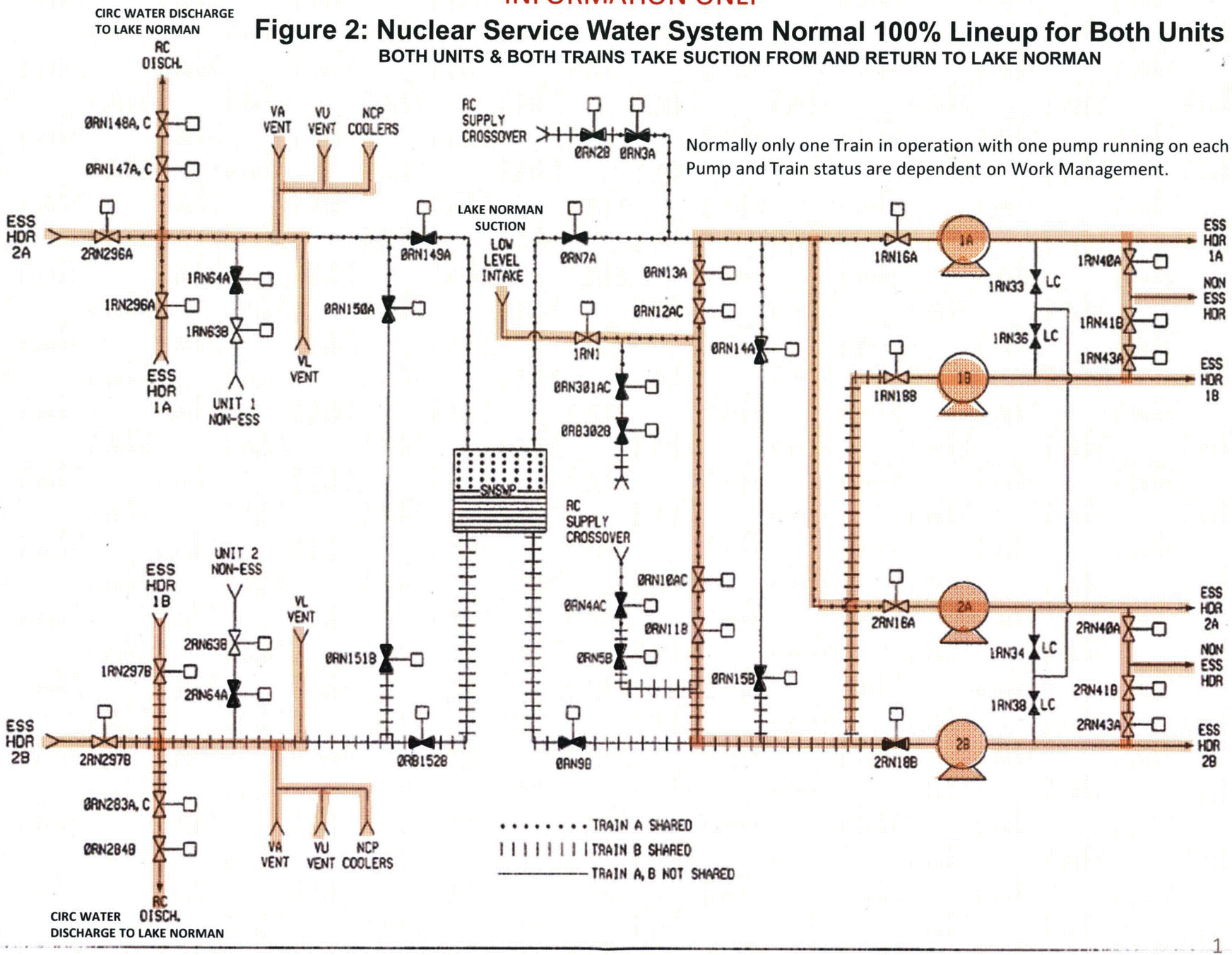
Figure 1: Nuclear Service Water System



INFORMATION ONLY

Figure 2: Nuclear Service Water System Normal 100% Lineup for Both Units

BOTH UNITS & BOTH TRAINS TAKE SUCTION FROM AND RETURN TO LAKE NORMAN

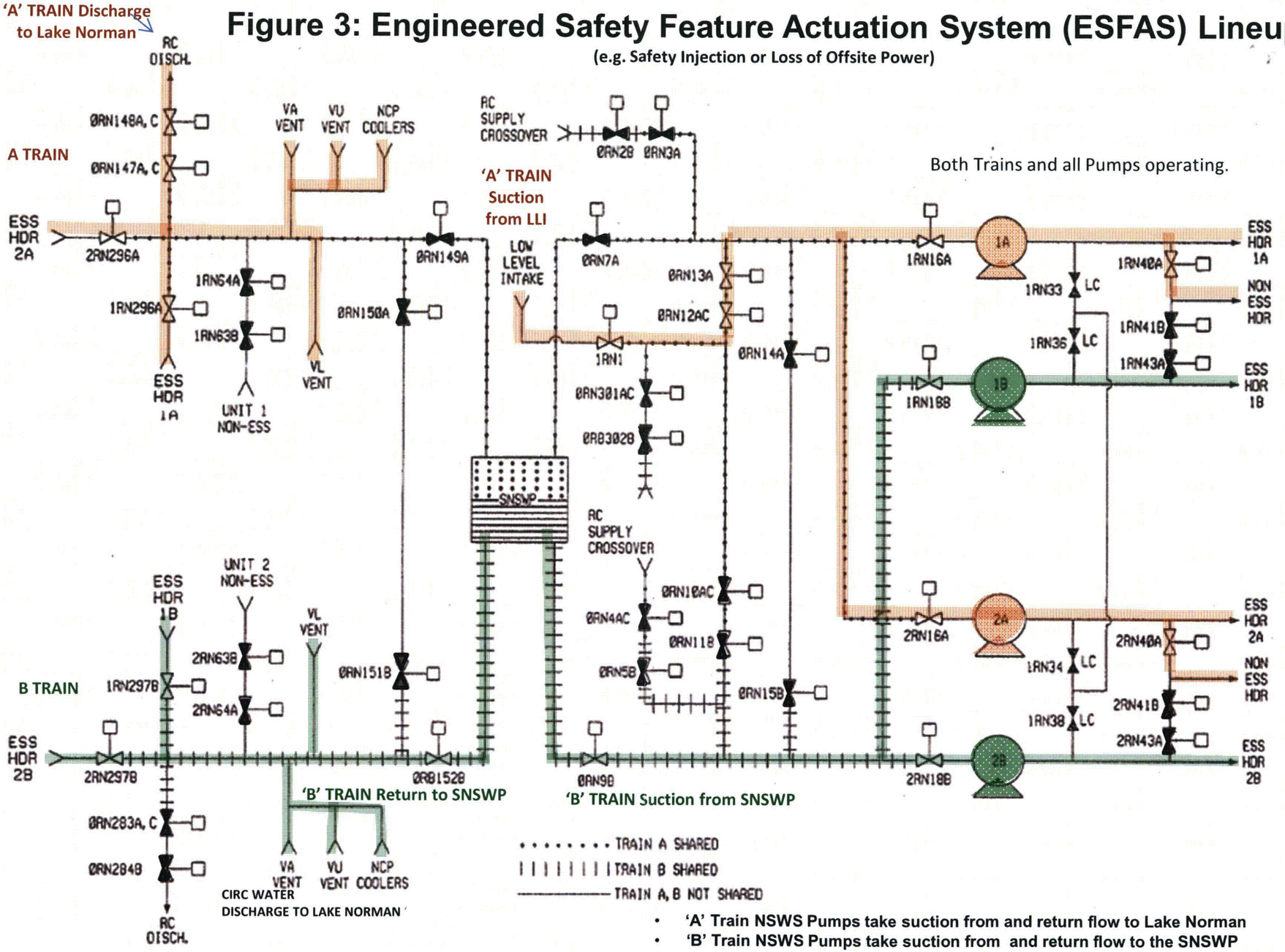


Normally only one Train in operation with one pump running on each unit.
Pump and Train status are dependent on Work Management.

INFORMATION ONLY

Figure 3: Engineered Safety Feature Actuation System (ESFAS) Lineup

(e.g. Safety Injection or Loss of Offsite Power)

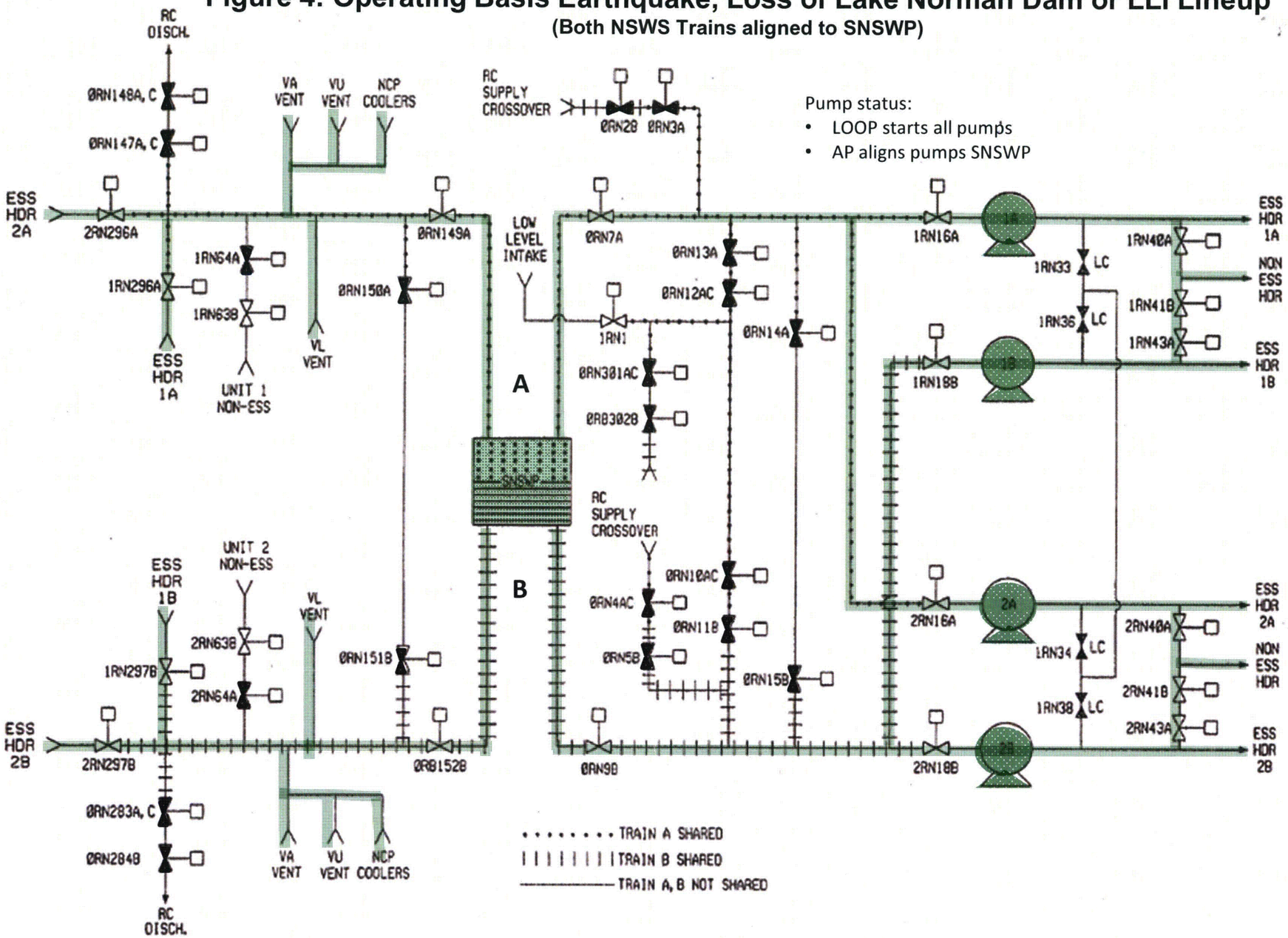


- 'A' Train NSWS Pumps take suction from and return flow to Lake Norman
- 'B' Train NSWS Pumps take suction from and return flow to the SNSWP

INFORMATION ONLY

Figure 4: Operating Basis Earthquake, Loss of Lake Norman Dam or LLI Lineup

(Both NSWS Trains aligned to SNSWP)



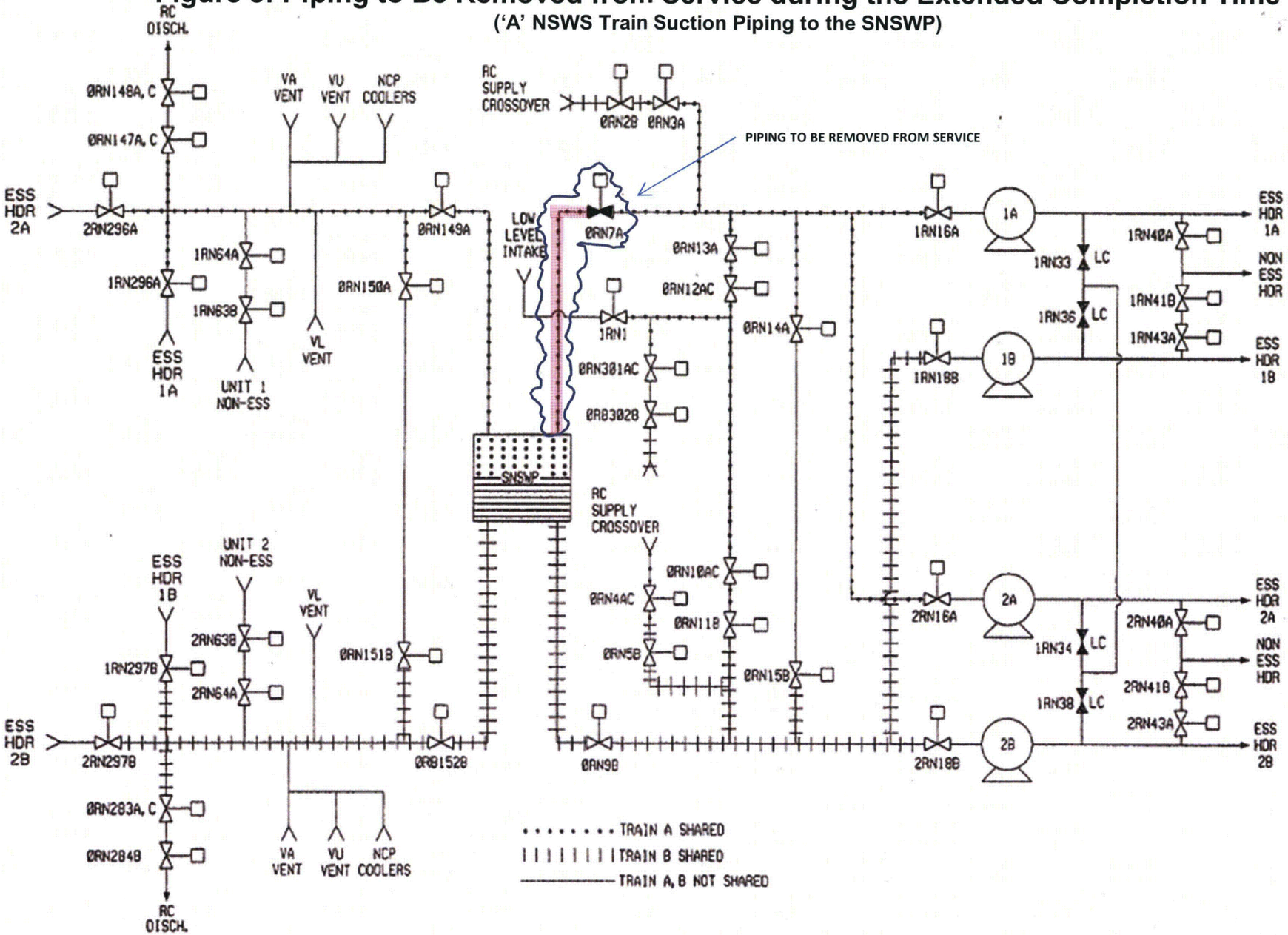
Pump status:

- LOOP starts all pumps
- AP aligns pumps SNSWP

INFORMATION ONLY

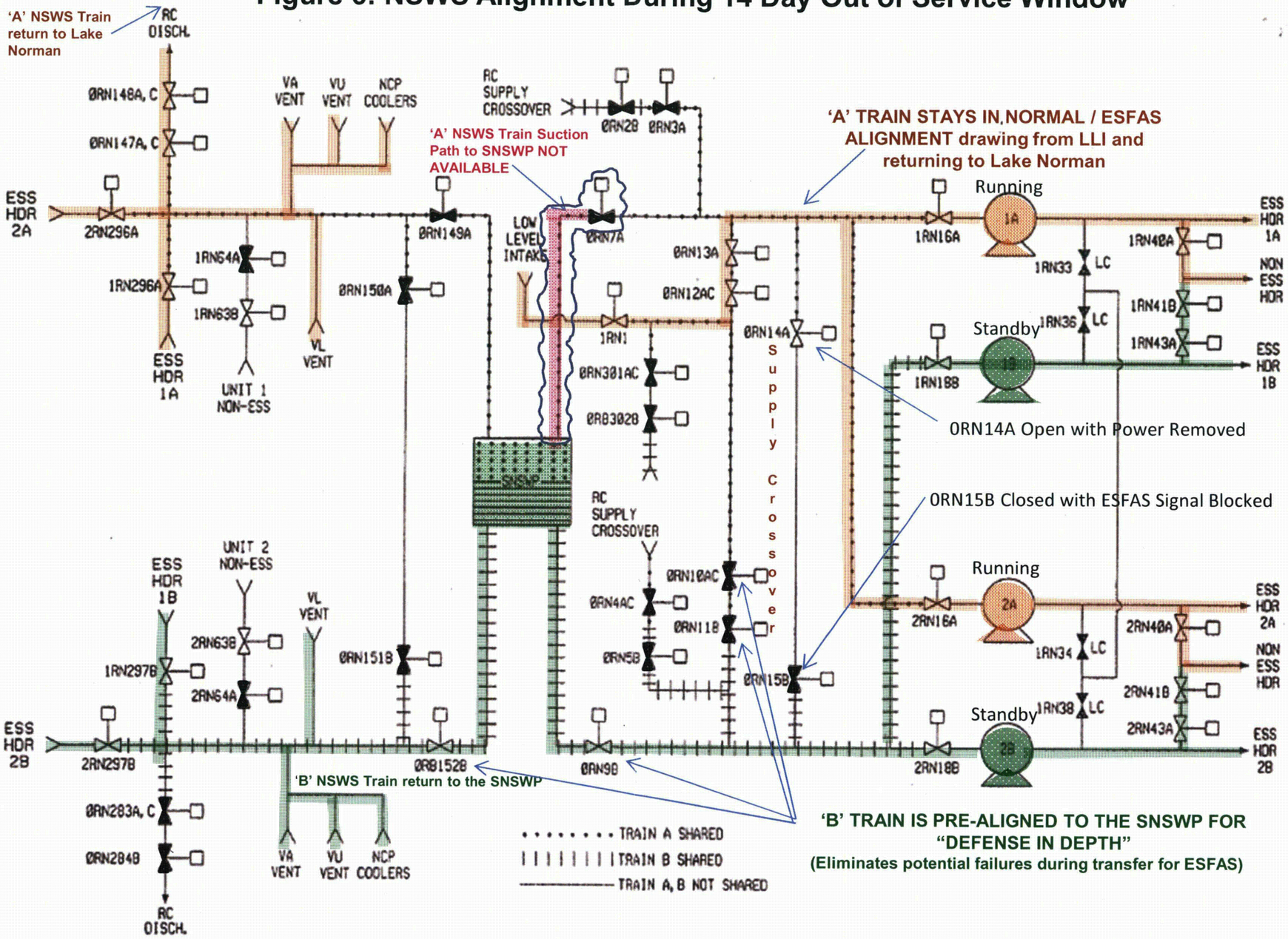
Figure 5: Piping to Be Removed from Service during the Extended Completion Time

('A' NSWS Train Suction Piping to the SNSWP)



INFORMATION ONLY

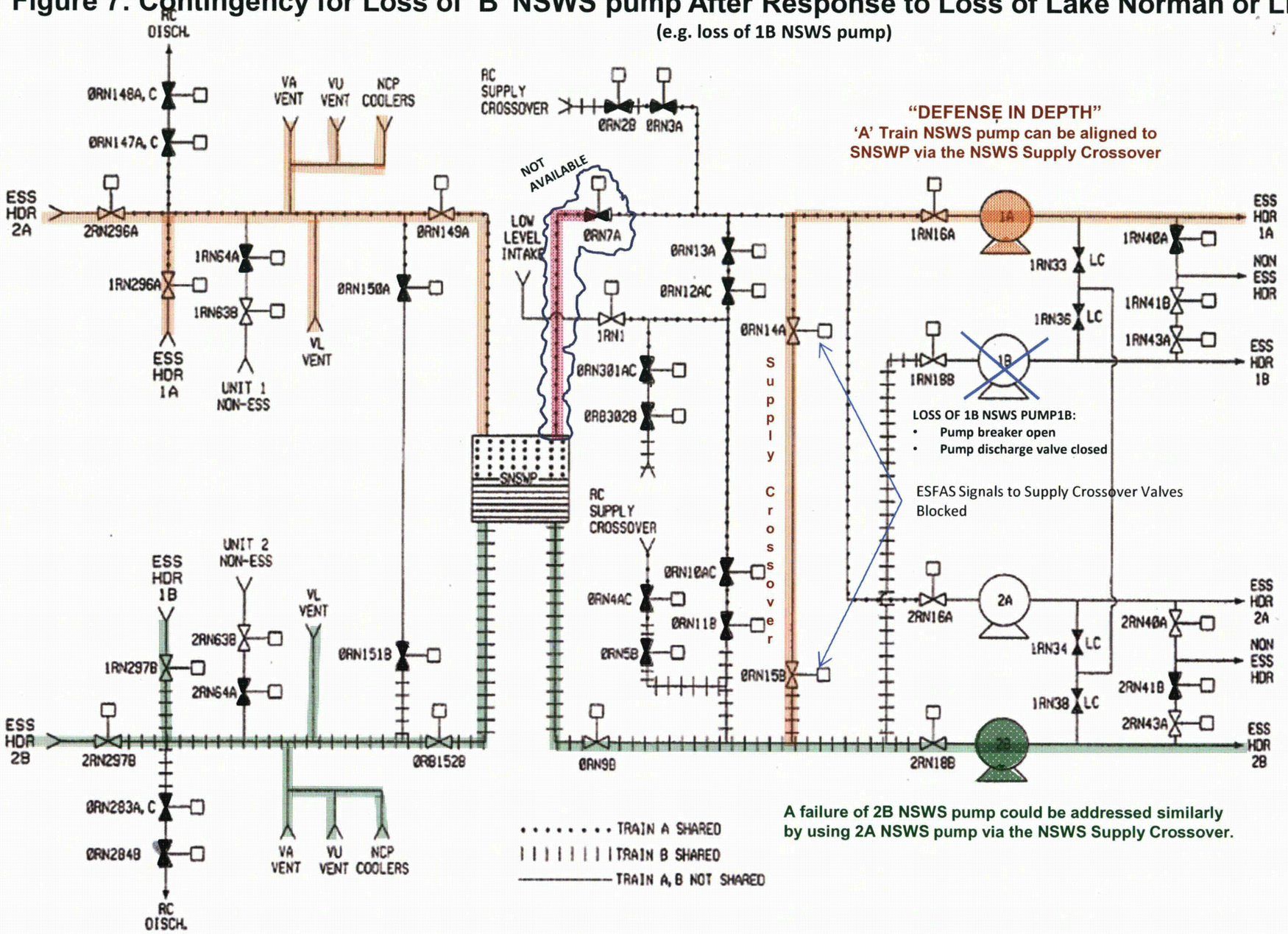
Figure 6: NSWS Alignment During 14 Day Out of Service Window



INFORMATION ONLY

Figure 7: Contingency for Loss of 'B' NSWS pump After Response to Loss of Lake Norman or LLI

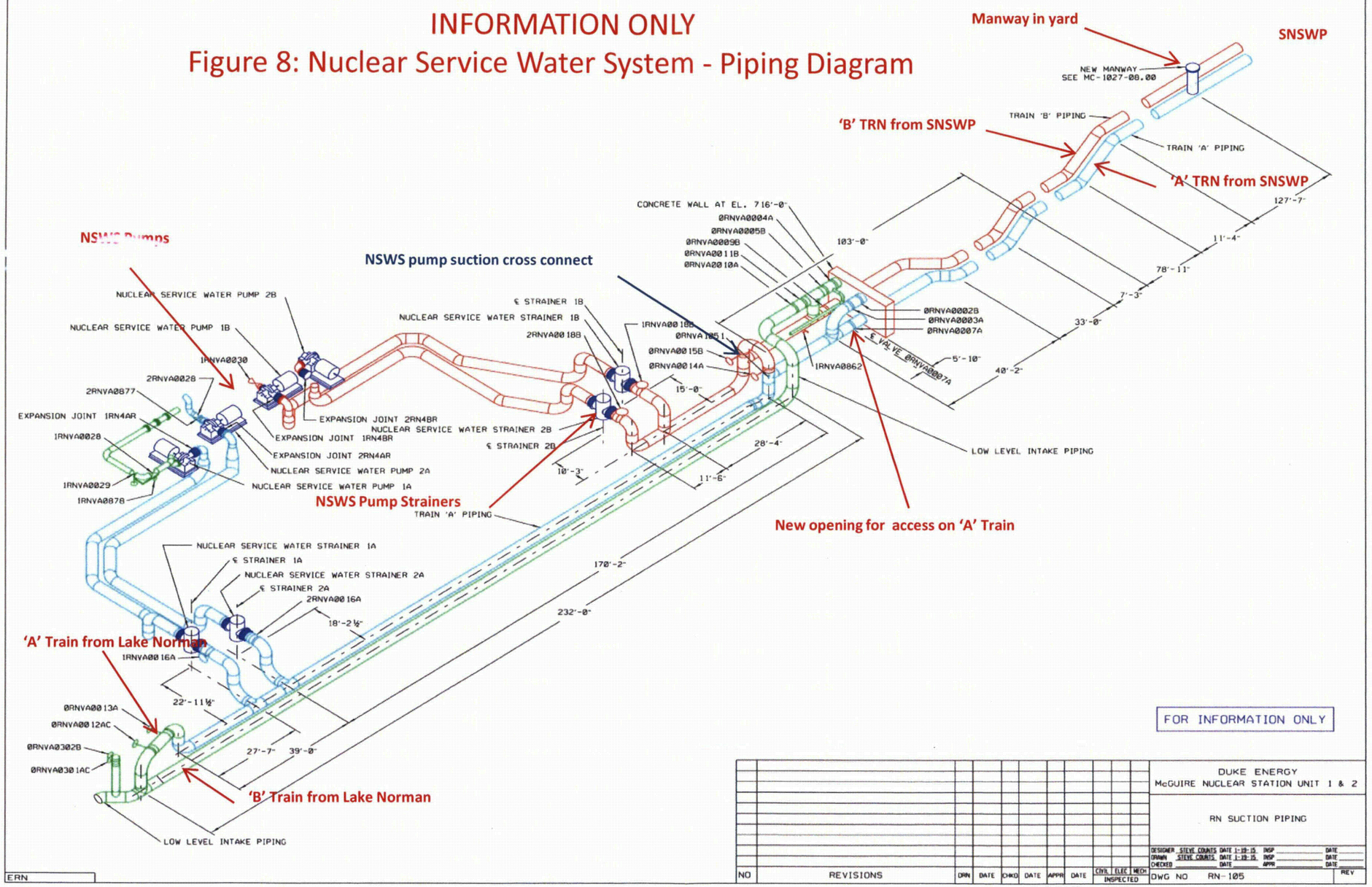
(e.g. loss of 1B NSWS pump)



A failure of 2B NSWS pump could be addressed similarly by using 2A NSWS pump via the NSWS Supply Crossover.

INFORMATION ONLY

Figure 8: Nuclear Service Water System - Piping Diagram



FOR INFORMATION ONLY

NO	REVISIONS	DRN	DATE	CHKD	DATE	APPR	DATE	CIVIL	ELEC	MECH INSPECTED

DUKE ENERGY
McGUIRE NUCLEAR STATION UNIT 1 & 2

RN SUCTION PIPING

DESIGNER STEVE COUNTS DATE 1-19-15 INSP ____ DATE ____
DRAWN STEVE COUNTS DATE 1-19-15 INSP ____ DATE ____
CHECKED ____ DATE ____ APPR ____ DATE ____

DWG NO RN-105 REV

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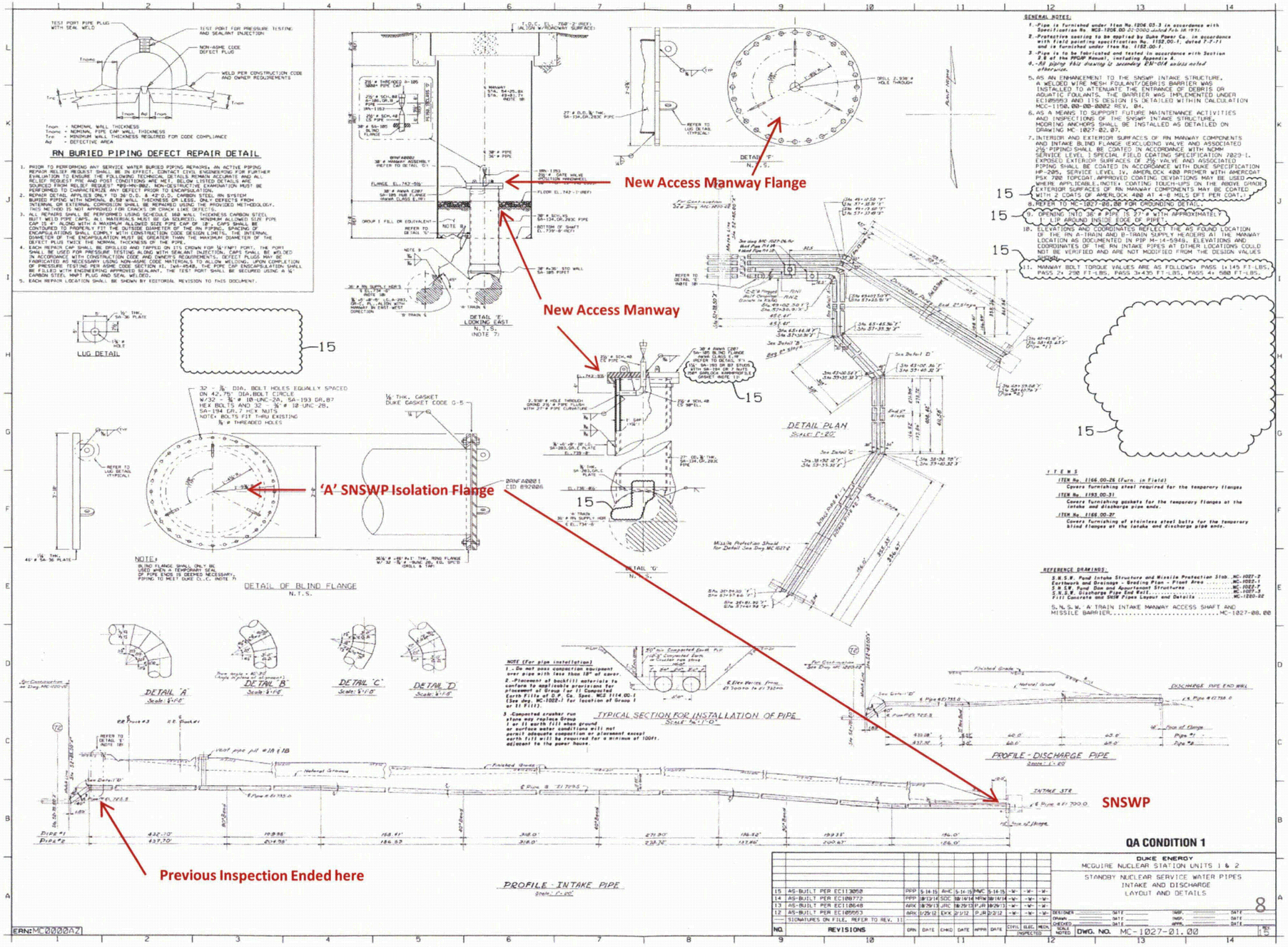
INFORMATION ONLY

Figure 9: Personnel Access Manway and SNSWP Isolation Flange Detail



ATTACHMENT 5

Plant Operating Diagrams

The following 8 Drawings specifically reference

ATTACHMENT 5

Plant Operation

Diagrams

D01 to D08

ATTACHMENT 6

Regulatory Commitments

REGULATORY COMMITMENTS

The following table identifies those actions committed to by Duke Energy in this document. Any other statements made in this licensing submittal are provided for informational purposes only and are not considered to be regulatory commitments. Please direct any questions you may have in this matter to George Murphy at 980-875-5715.

#	REGULATORY COMMITMENTS
1	The 'A' Train NSWS pumps will remain running and aligned to Lake Norman during the extended CT until the system is ready for post maintenance testing.
2	Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time
3	The 'B' Train NSWS will be placed in its ESFAS alignment to the SNSWP water source with the 'B' Train pumps in standby prior to starting the LAR activity and remain in this alignment until the 'A' Train NSWS SNSWP water source is restored and ready for post maintenance testing.
4	Procedures will be established to provide an additional defense in depth contingency that could be used in the event of an extremely low probability of a loss of the Lake Norman water source due to a seismic event. The procedures will ensure that system operation is maintained within design limits (less than or equal to 2 NSWS pumps running on a header), control of maximum system flow, and that system configuration prevents interaction of the degraded equipment with the functional equipment.
5	Fukushima Response FLEX modifications will be installed and the FLEX strategies will be available for implementation as additional defense-in-depth on both units.
6	During the period in which the 'A' NSWS suction path from the SNSWP is non-functional, no discretionary maintenance or discretionary testing will be planned on the following: a. 1A EDG b. 2A EDG c. The 'A' Train of NSWS excluding the activities described in the LAR for the 'A' Train NSWS piping to the SNSWP. d. The 'B' Train of NSWS, ECCS, CSS, AFW, CCW, CRAVS, ABFVES or the EDGs e. The switchyard and other offsite power sources f. The SSF
7	A condition in which repairs could impact the ability of an SSC to perform its Safety Function would result in termination of activities. The inspection may identify a condition that cannot be resolved within the 14 day completion time. Should such a condition be identified then the system will be restored to its current OBDN condition. If the ROV survey presents any opportunities for a less intrusive or less time consuming solution for addressing the OBDN condition, then these opportunities will be pursued, as appropriate.
8	In an activity planned to be performed this summer separate from the 14 day completion time repair activity, 0RN-7A will be tested for leakage and adjusted if necessary to minimize leakage.
9	In an activity planned to be performed this summer separate from the 14 day completion time repair activity the SNSWP isolation flange will be test fitted to the 'A' SNSWP pipe.

10	Procedure guidance will establish controls to limit evacuation air pressure to less than a predetermined value in order to prevent air intrusion into the operating NSWS.
11	Dedicated personnel with procedure guidance will be provided to close the pathway from the auxiliary building on the affected 'A' Train NSWS piping from the SNSWP in the event of any of the following: • An Engineered Safety Feature (ESF) actuation • Entry into RP/0/A/5700/006 Natural Disasters • Entry into RP/0/A/5700/007 Earthquake
12	This activity will be controlled under the Infrequently Performed Test or Evolution (IPTE) process defined in Fleet Directive AD-OP-ALL-106, "Conduct of Infrequently Performed Tests or Evolutions", and Duke Energy's Work Management and Execution procedures.
13	Dedicated personnel will be available for monitoring and immediate response to unanticipated leakage. Procedural actions will provide guidance to stop the leakage. If the leakage cannot be stopped, then dedicated personnel will establish NSWS flow from the 'B' Train NSWS, shutdown the 'A' Train NSWS pumps and close 0RN-12AC to stop the leakage.
14	If the second personnel access opening is necessary, then prior to the opening of the system an evaluation of leakage will be performed to validate proper isolation and that leakage is within expected limits.
15	McGuire will communicate with the Transmission Control Center (TCC) to ensure that the McGuire Control Room is notified in the event of potential grid disturbances in order that an appropriate plant response can be formulated.
16	The Work Control Center or OCC will monitor weather forecasts and radar during the activities that require the NSWS piping personnel access points to be open to assess the potential for severe weather conditions (tornado, thunderstorms).
17	Training will be provided in accordance with the Systematic Approach to Training (SAT) process to Operations personnel on this TS change and the associated evolution to inspect and correct the degraded condition in the 'A' NSWS supply piping from the SNSWP.
18	Operations will review applicable abnormal operating procedures related to the response to an earthquake, the loss of the Lake Norman and the loss of NSWS prior to making 'A' NSWS suction path from the SNSWP inoperable and each shift until 'A' Train NSWS operability is restored.
19	The repair work on the NSWS 'A' Train suction from the SNSWP will be scheduled during a period in which hurricanes and tornadoes have a lower likelihood of occurrence.
20	The Outage Command Center (OCC) will be manned while performing the activities authorized by this amendment.

21	The following list of equipment will be protected: a. 'B' Train NSWS b. 1B EDG c. 2B EDG d. 1B ECCS e. 2B ECCS f. 1B CSS g. 2B CSS h. 1B AFW i. 2B AFW j. 1B CCW k. 2B CCW l. B CRAVS m. B ABFVES n. Auxiliary Building WZ Sump and equipment supporting function of sump
22	If required to be installed the new personnel access opening to be located on the 'A' Train NSWS piping in the auxiliary building will be designed and installed in accordance with the Engineering Change Process.
23	Foreign Material Exclusion (FME) will be controlled during the proposed activities in accordance with AD-MN-ALL-0002, Foreign Material Exclusion (FME). Any debris resulting from the obstruction removal activity will be mechanically cleaned out before the system is closed for return to service per FME plan developed in accordance with the above procedure. The system will be video inspected and reversed flushed from the LLI to the SNSWP with isolation to downstream components to force any sediment back to the SNSWP.
24	Following 'A' Train NSWS restoration, testing will be performed to verify that the as left NSWS performance meets or exceeds pre-activity performance including 'A' Train NSW pump NPSH conditions.
25	Prior to entering the 14 day CT perform an evaluation to ensure that there will be no anticipated impact to 'A' NSWS water supply from the LLI from Alewife fish the during 14 day CT.
26	The new personnel access piping opening (in the auxiliary building) will be controlled by using procedures developed or revised for this purpose to maintain positive control of the opening and to prevent an unmonitored release.
27	The ERAT program includes the option to use a SSA (Safety Significant Activity) code which will cause the risk condition color to be "YELLOW". MNS will use this code during the activities described in this LAR.
28	Designated operators will be available to execute the manual actions associated with aligning the affected unit's 'A' Train NSWS pump to the 'B' NSWS SNSWP via the Main Supply Crossover piping.
29	If the contingency personnel access opening is installed, then Security personnel will establish the proper controls and compensatory measures prescribed by security procedures and the security plan.

30	In support of the contingency the following conditions will be established before the start of activities in the LAR: • The 'A' valve (0RN-14A) will be opened prior to the evolution and power will be removed from the valve operator. • The 'B' valve (0RN-15B) will be maintained closed with the ESFAS signal from each unit blocked prior to the evolution. Maintaining 0RN-15B closed with power removed satisfies operability requirements for the 'B' Train NSWS. The 'B' valve (0RN-15B) can be opened from the control room after power is restored if conditions warrant the use of this contingency.