

NRR-PMDAPEm Resource

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Sent: Monday, May 11, 2015 12:25 PM
To: Wheeler, Larry; Tilton, Caroline; Elliott, Robert; Casto, Greg; Hamm, Matthew; Zeiler, John
Subject: McGuire Presentation for Pre-Submittal Call on 5-13-15
Attachments: 5-11-15 A RN SNSWP Supply LAR presentation Final .pptx

All,
Here is the presentation information that the licensee intends to use at the meeting on Wednesday.

Ed
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McGuire Nuclear Station 'A' NSWS Supply LAR



- The proposed LAR would revise the McGuire TS 3.7.7, “Nuclear Service Water System (NSWS),” and other supported TSs to allow time to correct a degraded condition in the common Unit 1 and 2 ‘A’ Train supply piping from the Standby Nuclear Service Water Pond (SNSWP).
- The proposed change would introduce the following note into each affected TS:

'A' Train to be inoperable for a total of 14 days from [The date of NRC Safety Evaluation issuance] until December 31, 2016 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 during this period of time. 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. Any maintenance that is performed on the remaining portions of A' NSWS train 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.

- Other affected TSs are:
 - 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
 - 3.7.9, Control Room Area Ventilation System (CRAVS)
 - 3.7.11, Auxiliary Building Filtered Ventilation Exhaust System (ABFVES)
 - 3.8.1, AC Sources – Operating
- Proposed LAR is deterministic with risk insights

- The NSWS is designed for operation during and after seismic conditions and supplies cooling water to the following coolers:
 - Component Cooling Pump Motors
 - Centrifugal Charging Pump Motors
 - Safety Injection Pump Motors
 - Residual Heat Removal Pump Motors
 - Containment Spray Pump Motors
 - Nuclear Service Water Pump Motors
 - Auxiliary Feedwater Pump Motors
 - Fuel Pool Cooling Pump Motors

- The NSWS also supplies cooling water to the following heat exchangers:
 - Containment Spray Heat Exchangers
 - Diesel Generator Heat Exchangers
 - Component Cooling Heat Exchangers
 - Centrifugal Charging Pump Bearing Oil Coolers
 - Centrifugal Charging Pump Gear Oil Coolers
 - Assured Auxiliary Feedwater Supplies
 - Assured Diesel Generator Cooling Supplies
 - Assured Fuel Pool Makeup Supplies
 - Assured Component Cooling Supplies
 - Safety Injection Pump Bearing Oil Coolers
 - Control Room Area Chilled Water System Chiller Condensers

Degraded condition

- The pressure drop for the 'A' train SNSWP supply piping pressure drop is significantly higher than for the 'B' train SNSWP supply piping pressure drop
 - The piping configurations are similar
 - Historical records indicate that this difference has existed as early as initial plant startup
- The 'A' SNSWP supply piping has been flushed numerous times
 - Maximum anticipated flows have been used
 - Flushes have demonstrated the degraded condition is stable

Degraded condition (cont'd)

- Most of the 'A' SNSWP supply piping has been inspected
 - Only the last few hundred feet of piping have not been inspected by submarines or divers
 - The remaining uninspected portion is largely below the Unit 1 diesel building
 - A 35 ft. deep manway and wet tap was recently completed for access to inspect the remaining pipe
 - Piping will be inspected using a submarine and divers will also be used if necessary
 - The inspections can be performed within the existing 72 hour completion time
 - Correction of the degraded condition will require more than the 72 hour completion time.

Correction of the Degraded Condition

Work Scope

- Drain and vent supply piping
 - Isolate supply piping inside Auxiliary Bldg.
 - Fill supply piping with air and push water back into SNSWP
 - Isolate SNSWP from supply piping by having divers install blind flange at 40 ft. deep intake
 - Vent piping to atmosphere
- Install new penetration to supply piping inside Auxiliary Building
- Install ventilation and climbing equipment, enter piping and correct degraded condition
- Fill and vent supply piping
- Remove blind flange at intake
- Un-isolate supply piping from system and perform flush test
- Estimated time to complete is approximately 14 days with contingencies included

Correction of the Degraded Condition

- Safe personnel ingress and egress and ventilation will be provided by:
 - Recently completed manway outside Auxiliary Bldg.
 - New supply pipe penetration inside the Auxiliary Bldg.
- Existing station processes will be used to control:
 - Auxiliary Building Ventilation Boundary
 - Unauthorized access



Correction of the Degraded Condition

In the event of an adverse weather event (tornado, probable maximum precipitation, the manway will be rapidly covered to prevent:

- Entry of rainwater into the auxiliary building
- Any adverse impact of tornado vacuum or missiles



Technical Evaluation

- NSWS is designed such that after an ESFAS actuation:
 - 'A' NSWS aligns to Lake Norman
 - 'B' NSWS aligns to SNSWP
- NSWS is manually aligned to SNSWP in the event Lake Norman is in jeopardy due to an:
 - Earthquake
 - Tornado and turbine missiles
- The Lake Norman dam is designed to sustain an Operating Basis Earthquake (OBE)

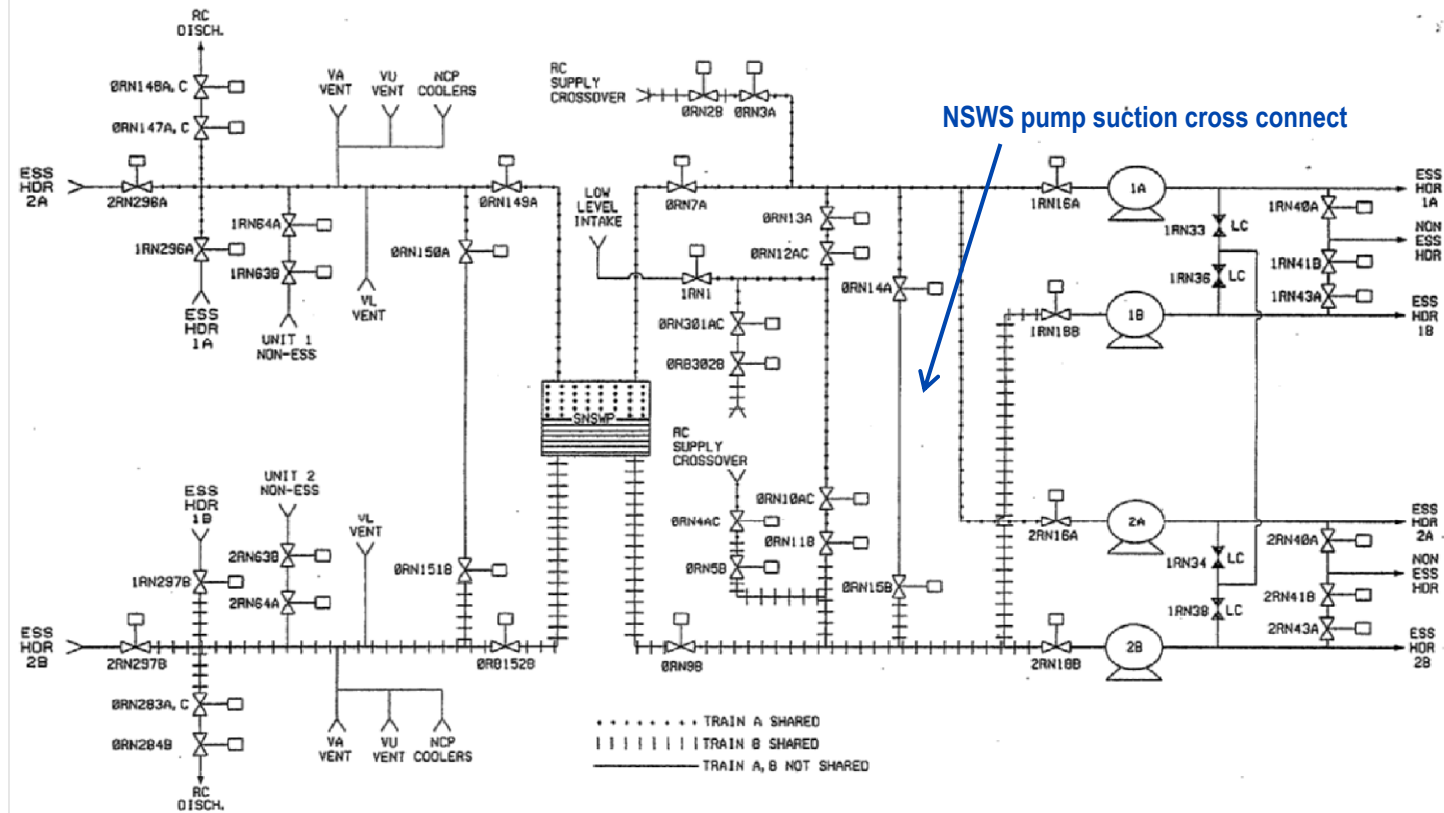
Technical Evaluation

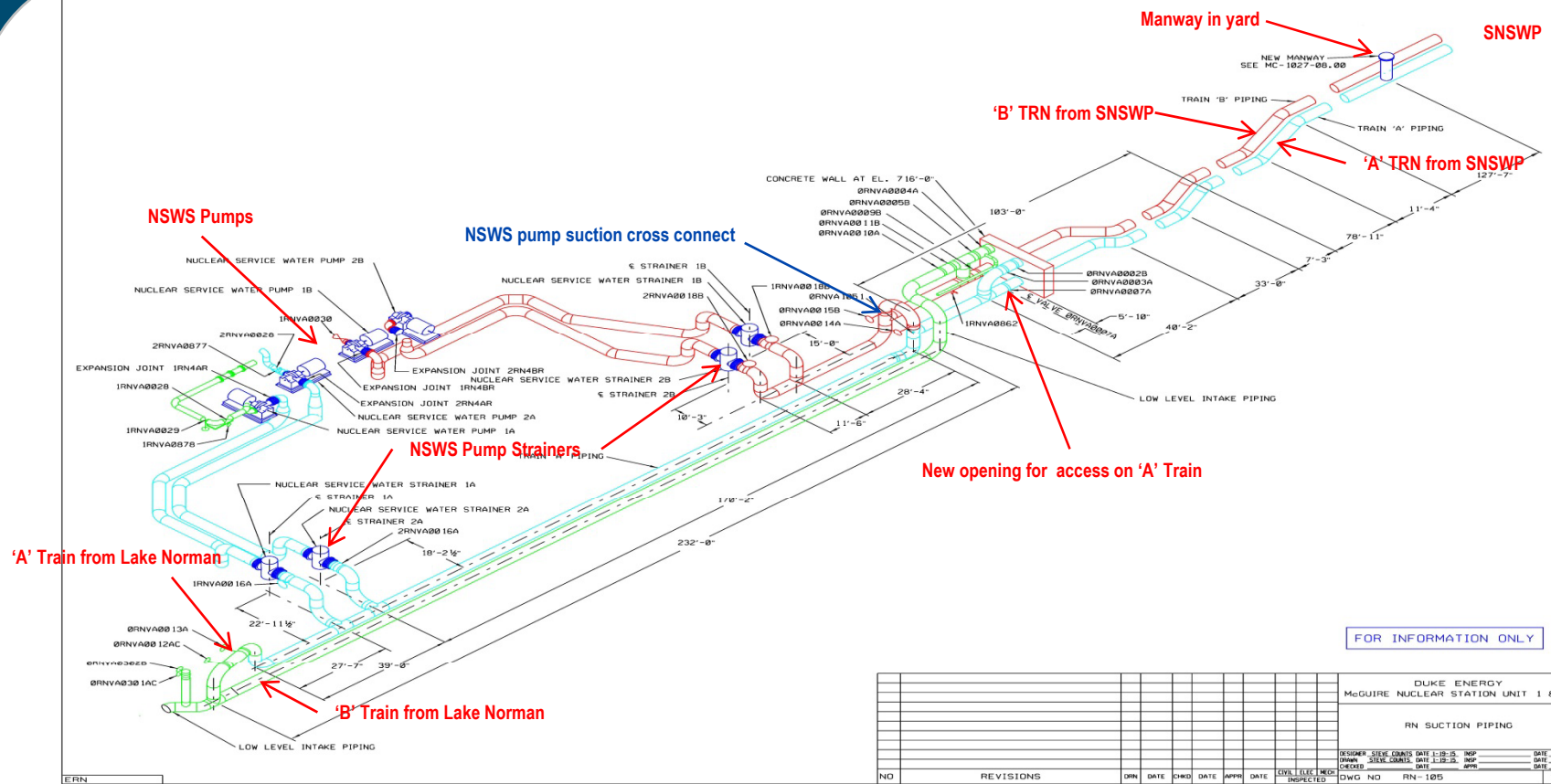
- Dam fragility studies indicate that the seismic capability is much greater than OBE.
- The probability of an OBE is no greater than $5E-4$ even based on the new GMRS curves
- In the unlikely event of an OBE and unavailability of the 'A' SNSWP supply for the 14 day period proposed:
 - The 'A' train would be shutdown and preserved by abnormal operating procedures
 - The 'B' train would be aligned to the SNSWP
- The Lake Norman dam is designed to sustain an Operating Basis Earthquake (OBE)
- Probability of turbine or tornado missile damage to exposed piping is negligible

Defense-in-depth

- 'B' NSWS will be pre-aligned to SNSWP
 - Eliminates valve swap failure modes
 - Supports other defense-in-depth measure
- Procedures will be put in place to align the 'B' train SNSWP supply to the 'A' train in the unlikely event that the 'B' train fails subsequent to damage to the Lake Norman dam after an earthquake
- Dedicated personnel will be provided to close the manway outside the 'A' NSWS supply Auxiliary Bldg. manway in the unlikely event of an accident or adverse weather (tornado or maximum precipitation event)
- The FLEX strategy will be implemented on both units prior to the evolution

LAR Defense-in-Depth





Defense-in-depth Principles

- Over-reliance on programmatic activities for weaknesses in plant design
 - Proceduralized actions are used cross connect the NSWS pump suction
 - Existing security and radiation control directives are used to control the path from the Auxiliary Bldg. to the environment
- System redundancy, independence and diversity are maintained
 - The method to cross connect the NSWS pump suction ensures the failed train is configured so as not to adversely impact the operating train

Defense-in-depth Principles

- Independence of barriers is not degraded
 - Three principle fission product barriers are not impacted
 - Existing radiation control directives are used to control the path from the Auxiliary Bldg. to the environment
- Intent of plant design criteria is maintained
 - GDC-2, Design Basis Protection Against Natural Phenomena- Manway to be covered in the event of adverse weather
 - GDC-5, Sharing of Structures, Systems and Components- Defense-in-depth method to cross connect NSWS suction piping will continue to ensure only two units/trains are supplied from the same suction source.

Defense-in-depth Principles (Cont'd)

- Intent of plant design criteria is maintained
 - GDC-20, Protection System Independence- The Defense-in-depth method to cross connect NSWS suction piping will ensure the failed 'B' train is placed in a configuration that does not adversely impact the 'A' train placed in service.
 - GDC-29, Protection Against Anticipated Operational Occurrences- The proposed change does not adversely impact the existing ESFAS actuation of the 'A' or 'B' NSWS trains.

Compensatory Measures and Commitments

- Defense-in-depth measures in place
- Perform work during periods when tornadoes are not expected
- Monitor National Weather Service and Grid Stability
- Perform onsite surveillances in the event of a tornado warning
- Eliminate any discretionary maintenance on NSWS
- Train personnel using Systematic Assessment Approach
- Review applicable emergency procedures prior to evolution
- Use Infrequently Performed Test or Evolution Process (IPTE)
- Man the Outage Control Center

Significant Hazards Consideration

- Does proposal involve significant increase in probability or consequences of accident?
 - Normal and ESFAS alignment is unaffected
 - Existing directives will be used to control potential radioactive release path from Auxiliary Bldg. to environment
 - Incremental risk related to seismic or tornado events that require re-alignment of 'A' NSWS to the SNSWP is negligible for the 14 day extension proposed
- Does proposal create the possibility of a new or different accident ?
 - The proposal only involves an extension of the time the 'A' NSWS supply from the SNSWP is out of service
 - No new or different accidents from those already analyzed can be postulated as a result of the defense-in-depth or compensatory actions employed

LAR- Significant Hazards Consideration

Significant Hazards Consideration (cont'd)

- Does proposal involve a significant reduction in margin to safety?
 - The proposal only involves an extension of the time the 'A' NSWS supply from the SNSWP is out of service
 - The defense-in-depth or compensatory actions employed do not cause a design basis or safety limit (i.e., the controlling numerical value for a parameter established in the UFSAR or the license) to be exceeded or altered

Compliance with Regulations

- Reg. Guide 1.27 Rev. 1 – No impact

The information discussed in this presentation is preliminary in nature and has not yet been fully validated or vetted through the Duke Energy License Amendment Request review process which includes review and approval by the McGuire site Plant Operating and Review Committee (PORC).

Questions?

