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U. S. Nuclear Regulatory Commission
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Subject: McGuire Nuclear Station Units 1 and 2
Docket Nos. 50-369/370
Catawba Nuclear Station Units 1 and 2
Docket Nos. 50-413/414
Response to Generic Letter 91-13
Essential Service Water System Failures at Multi-Unit Sites

Gentlemen:

On September 19, 1991 the NRC issued Generic Letter 91-13 requesting information from licensees at affected multi-unit sites regarding the Loss of Essential Service Water System (ESWS) postulated event.

The Generic Letter proposes that the Licensee implement certain administrative improvements such as Technical Specification amendments and emergency procedure upgrades in order to enhance the availability of the ESWS. While enhancements for both stations have been identified, Duke Power has determined that existing Technical Specifications for McGuire and Catawba adequately ensure the availability of their respective Essential Service Water systems.

Accordingly, please find our attached response to the Generic Letter for McGuire and Catawba Nuclear Stations. If there are questions concerning our response, please contact Allison D. Jones at (704) 373-2026.

I declare under penalty of perjury that these statements are true and correct to the best of my knowledge.

Very truly yours,

H. B. Tucker, Senior Vice President
Nuclear Generation

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Attachment

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Regional Administrator, Region II

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DUKE POWER COMPANY
RESPONSES TO GENERIC LETTER 91-13
McGUIRE AND CATAWBA NUCLEAR STATIONS

1. INTRODUCTION

Generic Issue 130, "Essential Service Water System Failures at Multi-Unit Sites," was initiated to investigate concerns regarding the Essential Service Water (ESW) system at multi-unit reactor sites that contained two ESW trains per unit and crosstie capability between units ESW Systems. It was found that this crosstie feature enhanced operational flexibility and would reduce the consequences associated with a loss of ESW event. Insights from the evaluation indicated that the core damage frequency associated with a loss of ESW event was highly sensitive to the reliability and availability of this crosstie feature. Based on the results of these evaluations, the NRC staff has decided that improvements to existing Technical Specifications, testing procedures, and emergency procedures may be warranted for certain plants based on the safety benefit derived and the cost of implementation. Generic Letter 91-13 forwarded the recommended Technical Specification and procedure improvements and requested information regarding the applicability, and implementation of the proposed improvements.

2. MCGUIRE RESPONSE

2.1 McGuire Nuclear Service Water (RN) System

At McGuire the Essential Service Water System is referred to as the Nuclear Service Water (RN) System. McGuire Units 1 and 2 each have a two-pump train RN System which provides cooling for many plant loads. The RN System is an open-loop system which normally takes suction from Lake Norman and discharges to the Condenser Circulating Water (RC) System discharge piping which leads back to the lake. The RN Systems are normally isolated between units but do contain cross-connect piping and normally shut manual valves which can be opened to cross-connect RN between units in the case of an emergency. Normal power operations require one pump train to be in operation providing cooling for all normal essential and non-essential loads for that unit. The other RN pump train is normally in standby and would be started automatically following a blackout, a safety injection (SS) signal, starting of a motor driven Auxiliary Feedwater (CA) pump, and by procedure following indication of insufficient RN flow.

At McGuire, the Containment Ventilation Cooling Water (RV) System can deliver adequate backup cooling water in the event of a loss of the normal RN flow. The McGuire Inservice Testing program (IWV) requires those valves necessary for the proper RV to RN alignment to be tested quarterly. McGuire also has an independent

Standby Shutdown Facility (SSF) which contains a dedicated makeup pump to supply injection flow to the Reactor Coolant (NC) pump seals in the event of a loss of all normal seal cooling.

2.2 Probabilistic Risk Assessment Results

Results from the McGuire Probabilistic Risk Assessment (PRA) study (MNS IPE Submittal Report, Nov., 1991) indicate that the core melt frequency resulting from the loss of RN event is approximately 1E-05/yr. Credit is taken in the PRA for recovering from this loss of RN event by either (i) aligning the Containment Ventilation Cooling Water (RV) System to provide cooling water backup through the RN non-essential header, (ii) cross-connecting to the other units RN System to provide cooling water, or (iii) activating the SSF standby makeup pump to provide NC pump seal cooling.

Failure for cross-connecting to the other unit's RN System is dominated by the human error associated with performing the alignment in a timely manner. Human error also dominates the reliability of the RV backup and SSF alignment.

2.3 Applicability of Recommended Technical Specification and Procedural Changes

McGuire currently has Technical Specifications (TS) covering allowed outage times for RN trains while in Modes 1 through 4 (TS 3/4.7.4). Additionally, Technical Specifications for Residual Heat Removal (RHR) System requirements in Modes 5 and 6 (TS 3/4.1.4 and 3/4.9.8) and Diesel Generator (DG) requirements in Modes 5 and 6 (TS 3/4.8.1.2) adequately ensure availability of RN while in these modes since the operability of the required RHR and DG trains depend on the availability of the associated RN train. McGuire has developed an Operability Test for the manual RN crossover isolation valves to be performed during Unit 1 refueling outages. The McGuire Loss of RN procedure already provides guidance (including valve locations) for manipulating the RN crosstie between units during a loss of RN accident.

Generic Letter 91-13 evaluations assume that the Essential Service Water system crosstie feature is the only means of combating a loss of service water event. However, McGuire has two other systems which mitigate the consequences of a loss of RN event. The RV System can provide adequate backup cooling to RN System loads. Also, the SSF standby makeup pump provides an independent means of supplying NC pump seal cooling which will prevent NC pump seal degradation. The current Loss of RN procedure contains guidance for aligning both of these systems.

As a result of these design features, McGuire is not solely dependent on the RN crosstie feature for preventing core melt following a loss of RN event.

Thus, imposing the additional specifications does not appear justified since (i) the current specifications adequately ensure RN availability in all modes, (ii) the reliability of the cross-connect feature is dominated by human error and not the availability of the other unit's RN System, and (iii) there are two backup systems (RV and SSF) which can mitigate the consequences of a loss of RN event. Based on these facts, additional RN System Technical Specification requirements would not reduce the calculated core melt frequency at McGuire.

2.4 Proposed Actions

McGuire has developed an Operability Test for the RN crossover isolation valves (Valve #'s 1RN-33, 34, 36, & 38) (PT/1/A/4700/64). This test will be performed during each Unit 1 refueling outage.

McGuire will perform a one time flush of the stagnant RN piping between the crosstie valves to evaluate the existence of sedimentation and loose tubercles. Two wet taps to allow videoscope inspection for this section of piping will be installed. These actions will be completed during the Unit 1 EOC-8 refueling outage.

McGuire has reviewed the adequacy of the Loss of RN procedure (AP/1/A/5500/20) concerning the alignment of the RV System, steps for opening the RN crosstie valves, and SSF activation guidance, and has concluded that the procedure contains sufficient detail for performing these tasks.

Examination of the existing Technical Specifications indicates that the current Technical Specifications are adequate to provide reasonable assurance that the other unit's RN System would be available during conditions involving the limited period of Modes 5 and 6 operations. No change to the current Technical Specifications is necessary in response to this Generic Letter.

2.5 Bases for Resolution

McGuire has several design and operational features which reduce the consequences resulting from a loss of RN event. First, the RN System at McGuire can receive backup cooling flow from the RV System. This system is aligned to the RN non-essential header but can deliver adequate flow to the RN essential loads. The RV System contains three 3200 gpm pumps which will start automatically on low RN System pressure. Second, McGuire has an

independent backup system, the SSF, which contains a dedicated makeup pump to supply injection flow to the NC pump seals. The Loss of RN procedure directs the operators to (i) ensure that the RV System is providing sufficient flow, (ii) align to the other unit's RN System through the system crosstie if insufficient RN flow exists, and (iii) activate the SSF if all seal cooling is lost. As a result of these design features, McGuire is not solely dependent on the RN crosstie feature for preventing core melt following a loss of RN event. Imposing additional Technical Specifications will not result is a decrease in the calculated core melt frequency since credit for this crosstie feature is dominated by human error and not system availability, and credit for the other backup systems (RV and SSF) reduce the consequences of a loss of RN event.

The McGuire Selected Licensee Commitments (SLC) Manual provides a single location within the FSAR where certain selected licensee commitments are presented. The content is based on the results of application of a set of criteria to determine the content of technical specifications. Those previous technical specification requirements which did not meet the criteria are located in this manual. The SLC Manual includes requirements for ensuring the SSF is available for each unit in operation. These requirements include quarterly testing of the Standby Makeup pump. McGuire also has Technical Specifications covering allowed outage times for RN trains while in Modes 1 through 4. Additionally, Technical Specifications for Residual Heat Removal system and emergency DG requirements in Modes 5 and 6 adequately ensure availability of RN while in these modes.

3. CATAWBA RESPONSE

3.1 Catawba Nuclear Service Water (RN) System

At Catawba, the Essential Service Water System is referred to as the Nuclear Service Water (RN) System. The RN System at Catawba is shared between the two units. The RN System is an open-loop system with 4 pumps which normally take suction from Lake Wylie and discharge to the Conventional Low Pressure Service Water (RL) System piping which leads back to the lake. Normal power operations typically require 1 RN pump to be in operation providing cooling for all normal essential and non-essential loads for both units. The other three RN pumps are normally in standby and will start automatically following a blackout, a safety injection (SS) signal, low-low RN pump pit level, and by procedure following indication of insufficient RN flow.

Catawba also has an independent Standby Shutdown Facility (SSF) which contains a dedicated makeup pump to supply injection flow to the Reactor Coolant (NC) pump seals in the event of a loss of all normal seal cooling.

3.2 Applicability of Recommended Technical Specification and Procedural Changes

Generic Letter 91-13 evaluations assume that (i) the essential service water system crosstie feature is the only means of combating a loss of service water event, and (ii) the essential service water systems for each unit are independent and normally isolated. The Generic Issue 130 (GI-130) assessment is applicable to multi-unit sites where each unit has an independent service water system. The calculated core melt frequency of these plants was found to be affected by the ability to cross-connect to the other unit in the event of a loss of service water on one unit. This system arrangement does not apply to Catawba and therefore the evaluation results of GI-130 are not directly applicable. The RN System at Catawba is normally operated in a shared configuration. One RN pump normally supplies adequate cooling to both units RN loads. The isolation valves to unit specific RN headers in use are normally open with power removed. Should a loss of RN event occur, the SSF can be activated to provide NC pump seal cooling and thus prevent a potential seal LOCA. Based on the above discussions, the new additional Technical Specification requirements identified in Generic Letter 91-13 are not applicable to Catawba.

Operability and testing of these unit specific RN isolation valves is currently required. Technical Specifications concerning the system requirements in various operational modes currently exist (TS 3/4.7.4).

The Loss of RN procedure is being updated to include guidance for reopening valves that may have transferred closed (including unit specific RN isolation valves) and activating the SSF following a complete loss of RN in order to prevent an NC pump seal LOCA.

3.3 Proposed Actions

Catawba is improving the Loss of RN procedure to include guidance for ensuring unit isolation valves and discharge valves are open, and for activating the SSF in a timely manner. This action will be completed by October 1, 1992.

Examination of the existing Technical Specifications indicates that the current Technical Specifications are adequate for ensuring operability of the crosstie valves and provide assurance that an adequate number of RN pumps would be available during

conditions involving the limited period of Modes 5 and 6 operations. No change to the current Technical Specifications is necessary in response to this Generic Letter.

3.4 Bases for Resolution

Catawba's RN System is shared between units and normally operates with the unit specific isolation valves open. Thus, any of the 4 RN pumps can provide flow to either units RN loads. During normal power operation, 1 RN pump is sufficient for meeting all RN flow requirements on both units. Catawba has an independent facility, the SSF, which can provide backup cooling to the NC pump seals and prevent a seal LOCA, thereby mitigating the consequences of a loss of RN event. Technical Specifications are in place for ensuring the SSF is available (TS 3/4.7.13), and include quarterly testing requirements for the Standby Makeup pump.

Catawba has Technical Specifications in place that cover the RN System requirements in various operational modes that adequately ensure the availability of RN while in Modes 5 and 6. Operability and testing of these unit specific RN isolation valves is currently required. The Loss of RN procedure is being updated to include guidance for opening or reopening unit specific isolation valves and activating the SSF in a timely manner.