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March 31, 2008

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Subject: Duke Power Company LLC d/b/a Duke Energy Carolinas, LLC (Duke)
Catawba Nuclear Station, Units 1 and 2
Docket Nos. 50-413, 414
2007 10CFR50.59 Summary Report

Attached please find a report containing a brief description of changes, test, and experiments, including a summary of the safety evaluation for each, for Catawba Nuclear Station, Units 1 and 2 for the year 2007. This report is submitted pursuant the provisions of 10CFR50.59(d)(2) and 10CFR50.4.

If there are any questions regarding this report, please contact A. Jones-Young at (803) 831-3051.

Sincerely,

James R. Morris

Attachments

IE47

NRR

xc (with attachment):

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Type: Procedure change **Unit:** 2

Title: OP/2/A/6200/050, Zinc Acetate Addition to the Reactor Coolant System, Revision 000

Description: OP/2/A/6200/050 is a new procedure for the addition of zinc acetate to the reactor coolant system via the Nuclear Sampling (NM) system. Catawba is initiating zinc addition to the reactor coolant system based on industry experience that indicates that controlled addition of zinc to reactor coolant can result in reduction of outage dose rates around various primary system components. Dose rate reduction occurs because zinc displaces some of the nickel and radiocobalt present on wetted surfaces of the reactor coolant system. The displaced nickel and cobalt in the reactor coolant system can be removed through normal use of letdown flow through mixed-bed demineralizers.

Evaluation: This evaluation is for procedure, OP/2/A/6200/050, Zinc Acetate Addition to the Reactor Coolant System, Revision 0. This procedure is used to inject zinc acetate into the Unit 2 reactor coolant system for the purpose of reducing outage dose rates around primary systems. Zinc acetate is added to the reactor coolant System using a skid connected to the nuclear sampling system. There are physical and procedural controls on injection flow rate and volume. Evaluation of zinc addition to reactor coolant system and operating experience with zinc addition, within the physical and procedural limits of the zinc addition skid and this procedure, show no adverse impact on plant equipment or accident probabilities. Zinc addition to reactor coolant system can increase levels of nickel and radiocobalt in the system during operation but accident consequences are unaffected. Chemical properties of the reactor coolant, notably pH, is not changed by the addition of zinc acetate. Zinc addition can cause a slight increase in crud deposition on fuel cladding; however, there is no effect on the cladding as a fission product barrier. NRC approval is not

required prior to starting zinc addition to the reactor coolant system. No Technical Specification changes are required and no other SAR document changes are required.

Type: Miscellaneous Item **Units: 1 and 2**

Title: Catawba LOCA Dose Analysis Revision to Preclude a LOCADOSE Code Error

Description: An error was discovered in the computer code LOCADOSE used in the analysis of the design basis Loss of Coolant Accident (LOCA) at Catawba Nuclear Station. The error was associated with the use of containment spray for washing out contamination from the containment environment. The dose analysis was revised to preclude the code error. To offset some of the effect of the error correction, an overly conservative analysis assumption was also revised. These two changes to the dose analysis (error work around and assumption change) have been reviewed separately. A 10 CFR 50.59 screen was performed for these two dose analysis changes. The screen determined that a 10 CFR 50.59 evaluation was not required for the change in the analysis assumption of particulate spray washout constants. However, the code error work around screened in as a change to a method of evaluation. Therefore, the scope of this 10 CFR 50.59 evaluation will focus only on the work around to preclude the code error.

Evaluation: The proposed activity under evaluation is a change to the CNS UFSAR to update the description of the calculation model and calculated dose results from the LOCA. This 10CFR50.59 evaluation demonstrates that the UFSAR Chapter 15 accident dose re-analysis does not satisfy any of the criteria in 10CFR50.59(c)(2) for a license amendment via 10CFR50.90. UFSAR sections which will require revision due to these dose analysis changes are Tables 15-14,

15-40 and 15-81 and Sections 15.6.5.3 and 15.9.

No Technical Specification changes are required, and the proposed activity may be implemented without prior NRC approval.

Type: Design Change **Unit: 1**

Title: CD-101416, 1NV-63B, NCP 1B Seal Return Isolation, AOV in the Fail-Safe OPEN Position, with Control Power Removed and Incapable of being Closed (PIP C07-0367)

Description: 1NV-63B, reactor coolant pump (NCP) 1B Seal Return Isolation is an air operated globe valve which operates on open-shut operation and fails in the open position (i.e., following a loss of air). During normal operation, 1NV-63B is in an open position. After trouble shooting identified a ground fault in the valve's control circuit, 1NV-63B control power was removed such that the valve cannot be closed. This evaluation supports a temporary engineering change CD-101416 that will allow 1NV-63B to remain in the fail-safe open position until repairs can be performed at the next refueling outage.

Evaluation: Leakage from the reactor coolant pump shaft is controlled by three shaft seals arranged in series. Between the number 1 seal and number 2 seal, most of the leakage, approximately 3 gpm, leaves the pump via the number 1 seal return line. 1NV-63B is an air operated control valve located in the seal return line of the 1B reactor coolant pump, which operates on open-shut operation and fails in the open position (i.e., following a loss of instrument air). During normal operation, 1NV-63B is in an open position. After troubleshooting identified a ground fault in the control circuit, 1NV-63B control power was removed such that the valve cannot be closed. 1NV-63B is not required to perform a safety function in shutting down the unit to cold shutdown or in mitigating the consequences

of an accident. UFSAR Section 5.4.1.3.1 states that following warning of excessive reactor coolant pump number 1 seal return flow, operator action should be taken to close the seal return isolation valve (i.e., 1NV-63B on 1B pump). This evaluation shows that maintaining 1NV-63B in the fail-safe open position has no impact on pump seal performance and does not impact UFSAR accident analysis.

This evaluation addressed two separate modes-of-failure for a postulated NCP seal failure event. For a reactor coolant pump seal failure event where the number 1 seal is not functional, but the number 2 seal remains operational, leakage from the failed RCP seal will not exceed 76 gpm and loss of inventory for the reactor coolant system remains within the capability of the reactor makeup system. For this postulated event, the evaluation shows that there are no failure modes that would result in a number 2 seal failure; thereby, this event does not propagate to cause a more serious fault.

For a reactor coolant pump seal failure event where both the number 1 seal and number 2 seal are not functional, the reactor coolant pump seal leakage will not exceed 480 gpm. This leak rate is bounded by the UFSAR Small Break Loss of Cooling Accident (SBLOCA), and again does not propagate to cause a more serious fault.

With 1NV-63B in the fail-safe open position, the consequence of a reactor coolant pump seal failure remains bounded by current analysis for all UFSAR evaluated malfunctions and analyzed accidents. This condition does not result in a design basis limit for a fission product barrier being exceeded or altered, and does not involve a departure from a method of evaluation used in establishing the design basis or in the safety analysis. There is no Technical Specification change required as a result of this change.

Type: Design Changes **Units: 1 and 2**

Title: CD100702 and CD200705 Restore Control Air to Inlet, Outlet and Bypass Dampers to VA to allow for Normal ABFU Bypass Operation and Redundant Single Failure Proof Emergency Operation - Also, revise Control Air from 25 psi to 100 psi Operation

Description: The Auxiliary Building Filtered Exhaust Ventilation System (VA) was initially designed to operate filter units ABFU-1(2)A and ABFU-1(2)B in a bypass alignment during normal operation. Filter unit dampers automatically realign the filter units to the filter mode upon receipt of a Safety Injection signal (SI) or radiation monitor high alarm from 0EMF-41 (Auxiliary Building) or 1(2)EMF-35, 36, 37 (Unit Vent Stacks). PIP C95-0007 identified single failure concerns that could allow one of the filter units to continue to operate in the filter bypass alignment following a Design Basis Accident(DBA). Operation of the filter unit in a bypass alignment during a DBA could allow potentially contaminated air to be exhausted from the Auxiliary Building and exceed applicable dose limits. To resolve the immediate single failure concerns, minor modifications were completed in 1995 per PIP C95-0007, CA#2. Those modifications removed control air from Unit 1(2) VA train A and B filter unit dampers causing the filter units to operate continuously in the filtered alignment. Operation of VA in a continuous filtered alignment has significantly increased material, maintenance and operations support requirements caused by frequent filter and carbon change outs. Design Changes CD100702 (along with Design Changes CD100700 and CD100701 - processed separately) will allow Unit 1(2) VA filter units to operate in a filter bypass alignment during normal operation. Single failure concerns identified by PIP C95-0007 will be removed by this modification.

Control air will be restored to VA filter inlet isolation damper, outlet isolation damper and existing bypass damper. This modification will also revise the supply of control air through the Train A and B solenoid valves by eliminating the need for the downstream pilot valves currently used to supply 100 psi air to the damper actuators. The existing design utilizes 25 psi air to the Train A and B solenoid valves and that will be changed to 100 psi air supply. A direct interface of 100 psi air to the actuators will be supplied from Train A and B solenoid valves. The air tubing is designed for these conditions. Since Instrument Air is not Safety Related, the design provides for the absence of air to allow the spring actuators to fail to the safe position (open or closed depending on the damper location).

Evaluation: Design Changes CD100702 and CD200705 has been documented with a 50.59 Evaluation rather than a 50.59 Screening. All of the responses to the eight 50.59 Evaluation questions are "No". Thus, a License amendment is not necessary. UFSAR sections 9.4.3.2, 7.6.12, Table 9-28, and Figure 9-123 will be revised as indicated in the modification package. A change is needed to the Tech Spec BASES and is included in the modification package.

No changes to any Technical Specification are needed. Thus, prior NRC review will not be required.

Type: Miscellaneous Item **Unit: 2**

Title: C2C16 Reload Design

Description: The reload change document identifies changes in key physics parameters, operating limits, and design parameters between cycles 15 and 16 for the purpose of identifying possible impacts to reactivity management, technical specifications and operations.

The core design changes identified between cycle 15 and cycle 16 are briefly summarized below:

1. Nominal EOC burnup window reduced from 510 to 471 EFPD.
2. The fuel feed batch size for cycle 15 was 77 and the fuel feed batch for cycle 16 is 68.
3. Fuel feed batch central region enrichment(w/o U-235) changed from 52 assemblies @4.4, 24 assemblies @ 4.73, and 1 assembly at 3.80 in cycle 15 to 40 assemblies @4.38 and 28 assemblies @ 4.90 in cycle 16.
4. Number of integral fuel burnable absorber (IFBA) pins changed from 5184 to 6400.
5. A total of 656 wet annular burnable absorber (WABA) pins are utilized in cycle 16 while cycle 15 utilized 848. WABAs have been used in other Catawba fuel cycles and are therefore not a new core design parameter.
6. Minor power distribution and physics parameter changes are noted from Cycle 15.
7. The cycle 15 axial flux difference 100% full power negative limit was -20% and the cycle 16 axial flux difference 100% full power negative limit is -18%.

There are no fuel assembly component design changes, no Technical Specification changes, and no UFSAR changes associated with the operation of C2C16.

Evaluation: The C2C16 Reload Design Safety Analysis Review (REDSAR), performed in accordance with Nuclear Engineering Division workplace procedure NE-102, "Workplace Procedure for Nuclear Fuel Management," and the C2C16 Reload Safety Evaluation, confirm the updated final safety analysis report (UFSAR) Chapter 15 accident analysis remain bounding with respect to the C2C16 safety analysis reactor physics parameters. The safety analysis reactor physics parameters method is described in topical report DPC-NE-3001-PA, Multidimensional Reactor Transients and Safety Analysis Physics Parameters Methodology."

The C2C16 core reload is similar to past cycle core designs, with a design generated using NRC approved methods. The C2C16 Core Operating Limits Report is prepared in

accordance with Technical Specification 5.6.5 and submitted to the NRC in accordance with 10 CFR 50.4. Additionally, applicable sections of Technical Specifications and the UFSAR have been reviewed. No changes to Technical Specifications or the UFSAR are necessary to support operation of C2C16.

Type: Procedure change **Unit: 1**

Title: OP/1/A/6200/050, Zinc Acetate Addition to the Reactor Coolant System, Revision 000

Description: OP/1/A/6200/050 is a new procedure for the addition of zinc acetate to the reactor coolant system via the Nuclear Sampling (NM) system. Catawba is initiating zinc addition to the reactor coolant system based on industry experience that indicates that controlled addition of zinc to reactor coolant can result in reduction of outage dose rates around various primary system components. Dose rate reduction occurs because zinc displaces some of the nickel and radiocobalt present on wetted surfaces of the reactor coolant system. The displaced nickel and cobalt in the reactor coolant system can be removed through normal use of letdown flow through mixed-bed demineralizers.

Evaluation: This evaluation is for procedure, OP/2/A/6200/050, Zinc Acetate Addition to the Reactor Coolant System, Revision 0. This procedure is used to inject zinc acetate into the Unit 2 reactor coolant system for the purpose of reducing outage dose rates around primary systems. Zinc acetate is added to the reactor coolant system using a skid connected to the nuclear sampling system. There are physical and procedural controls on injection flow rate

and volume. Evaluation of zinc addition to reactor coolant system and operating experience with zinc addition, within the physical and procedural limits of the zinc addition skid and this procedure, show no

adverse impact on plant equipment or accident probabilities. Zinc addition to reactor coolant system can increase levels of nickel and radiocobalt in the system during operation but accident consequences are unaffected. Chemical properties of the reactor coolant, notably pH, is not changed by the addition of zinc acetate. Zinc addition can cause a slight increase in crud deposition on fuel cladding; however, there is no effect on the cladding as a fission product barrier. NRC approval is not required prior to starting zinc addition to the reactor coolant system. No Technical Specification changes are required and no other SAR document changes are required.