Duke Power
A Duke Energy Company

D.M. JAMIL
Vice President

Duke Power
Catawba Nuclear Station
4800 Concord Rd. / CN01VP
York, SC 29745-9635

803 831 4251
803 831 3221 fax

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

Subject: Duke Energy Corporation
Catawba Nuclear Station, Units 1 and 2
Docket Numbers 50-413 and 50-414
Proposed Technical Specifications Amendments
3.3.2, Engineered Safety Feature Actuation System
Instrumentation

In accordance with the provisions of 10 CFR 50.90, Duke Energy Corporation proposes to revise the Catawba Nuclear Station Facility Operating Licenses and Technical Specifications (TS) to modify the requirements for the Containment Pressure Control System (CPCS) in TS 3.3.2, Table 3.3.2-1, Function 9. This change is being requested in order to eliminate a problem with CPCS circuit fluctuation as a result of electronic noise. The details and basis concerning the proposed change are contained in the attachments to this letter.

The contents of this amendment request package are as follows:

Attachment 1 provides marked copies of the affected TS and Bases pages for Catawba, showing the proposed changes. Attachment 2, the reprinted pages of the affected TS and Bases pages, will be provided to the NRC upon issuance of the proposed amendment. Attachment 3 provides a description of the proposed changes and technical justification. Pursuant to 10 CFR 50.92, Attachment 4 documents the determination that the amendment contains No Significant Hazards Considerations. Pursuant to 10 CFR 51.22(c)(9), Attachment 5 provides the basis for the categorical exclusion from performing an Environmental Assessment/Impact Statement.

Implementation of this amendment to the Catawba Facility Operating Licenses and TS will impact the Catawba Updated Final Safety Analysis Report (UFSAR). Affected UFSAR sections include Tables 3-105 and 3-106, "Electrical Equipment Seismic Qualification," 6.2.1, "Containment Functional Design," and

A001

7.6.4, "Containment Pressure Control System." Necessary UFSAR changes will be submitted in accordance with 10 CFR 50.71(e). In accordance with Duke Energy Corporation administrative procedures and the Quality Assurance Program Topical Report, this proposed amendment has been previously reviewed and approved by the Catawba Plant Operations Review Committee and the Corporate Nuclear Safety Review Board.

Duke Energy Corporation is requesting NRC approval of this proposed amendment by February 29, 2004 and has determined that the standard 30-day implementation period will be acceptable. Catawba plans to implement the modifications associated with this proposed amendment during innage periods for both units. There are no NRC commitments contained in this letter or its attachments.

Pursuant to 10 CFR 50.91, a copy of this proposed amendment is being sent to the appropriate state official.

Inquiries on this matter should be directed to L.J. Rudy at (803) 831-3084.

Very truly yours,

Dhiaa M. Jamil

LJR/s

Attachments

Dhiaa M. Jamil, affirms that he is the person who subscribed his name to the foregoing statement, and that all the matters and facts set forth herein are true and correct to the best of his knowledge.

Dhiaa M. Jamil, Vice President

Subscribed and sworn to me: 8-19-2003
Date

Notary Public

My commission expires: 7-10-2012
Date

SEAL

xc (with attachments):

L.A. Reyes
U.S. Nuclear Regulatory Commission
Regional Administrator, Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, GA 30303

E.F. Guthrie
Senior Resident Inspector (CNS)
U.S. Nuclear Regulatory Commission
Catawba Nuclear Station

R.E. Martin (addressee only)
NRC Senior Project Manager (CNS)
U.S. Nuclear Regulatory Commission
Mail Stop 08-H12
Washington, D.C. 20555-0001

H.J. Porter, Director
Division of Radioactive Waste Management
Bureau of Land and Waste Management
Department of Health and Environmental Control
2600 Bull St.
Columbia, SC 29201

ATTACHMENT 1

MARKED-UP TECHNICAL SPECIFICATIONS AND BASES PAGES FOR CATAWBA

Table 3.3.2-1 (page 5 of 5)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
8. ESFAS Interlocks						
a. Reactor Trip, P-4	1,2,3	1 per train, 2 trains	F	SR 3.3.2.8	NA	NA
b. Pressurizer Pressure, P-11	1,2,3	3	O	SR 3.3.2.5 SR 3.3.2.9	≥ 1944 and ≤ 1966 psig	1955 psig
c. T_{avg} - Low Low, P-12	1,2,3	1 per loop	O	SR 3.3.2.5 SR 3.3.2.9	≥ 550°F	553°F
9. Containment Pressure Control System					1.0	0.9
a. Start Permissive	1,2,3,4	4 per train	P	SR 3.3.2.1 SR 3.3.2.7 SR 3.3.2.9	≤ 0.45 psid	0.4 psid
b. Termination	1,2,3,4	4 per train	P	SR 3.3.2.1 SR 3.3.2.7 SR 3.3.2.9	≥ 0.25 psid	0.35 0.3 psid
10. Nuclear Service Water Suction Transfer - Low Pit Level	1,2,3,4	3 per pit	Q,R	SR 3.3.2.1 SR 3.3.2.9 SR 3.3.2.11	≥ El. 555.4 ft	El. 557.5 ft

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Since T_{avg} is used as an indication of bulk RCS temperature, this Function meets redundancy requirements with one OPERABLE channel in each loop. These channels are used in two-out-of-four logic. This Function must be OPERABLE in MODES 1, 2, and 3 when a secondary side break or stuck open valve could result in the rapid depressurization of the steam lines. This Function does not have to be OPERABLE in MODE 4, 5, or 6 because there is insufficient energy in the secondary side of the unit to have an accident.

9. Containment Pressure Control System Permissives

The Containment Pressure Control System (CPCS) protects the Containment Building from excessive depressurization by preventing inadvertent actuation or continuous operation of the Containment Spray and Containment Air Return Systems when containment pressure is at or less than the CPCS permissive setpoint. The control scheme of CPCS is comprised of eight independent control circuits (4 per train), each having a separate and independent pressure transmitter and current alarm module. Each pressure transmitter monitors the containment pressure and provides input to its respective current alarm. The current alarms are set to inhibit or terminate containment spray and containment air return systems when containment pressure falls to or below 0.25 psig (psid). The alarm modules switch back to the permissive state (allowing the systems to operate) when containment pressure is greater than or equal to 0.45 psig (1.0 psid).

This function must be OPERABLE in MODES 1, 2, 3, and 4 when there is sufficient energy in the primary and secondary sides to pressurize containment following a pipe break. In MODES 5 and 6, there is insufficient energy in the primary and secondary sides to significantly pressurize the containment.

10. Nuclear Service Water System Suction Transfer – Low Pit Level

Upon an emergency low pit level signal from either NSWS pit, interlocks isolate the NSWS from Lake Wylie, align NSWS to the standby nuclear service water pond, close particular crossover

ATTACHMENT 2

REPRINTED TECHNICAL SPECIFICATIONS AND BASES PAGES FOR CATAWBA

(TO BE PROVIDED UPON NRC ISSUANCE OF AMENDMENT)

ATTACHMENT 3

DESCRIPTION OF PROPOSED CHANGES AND TECHNICAL JUSTIFICATION

Description of Proposed Changes

TS Table 3.3.2-1, Function 9a, CPCS Start Permissive, is proposed to be changed as follows:

- Change allowable value from $\leq$ 0.45 psid to $\leq$ 1 psid
- Change nominal trip setpoint from 0.4 psid to 0.9 psid

TS Table 3.3.2-1, Function 9b, CPCS Termination, is proposed to be changed as follows:

- Change nominal trip setpoint from 0.3 psid to 0.35 psid

Changes are also made to the TS Bases, consistent with these changes.

Technical Justification

Background and System Description

The CPCS functions to prevent a vacuum condition inside containment which would cause containment design negative pressure to be exceeded by preventing an inadvertent actuation of containment spray and/or upper containment air return to lower containment. The CPCS prevents actuation of the Containment Spray System and the Air Return System when containment pressure is below the start permissive and enables operation when containment pressure increases above the permissive. The upper and lower TS allowable values for the CPCS are currently 0.45 psid and 0.25 psid, respectively. When containment pressure is greater than or equal to 0.45 psid, the CPCS is enabled, whereas when containment pressure is less than or equal to 0.25 psid, the CPCS is disabled. The normally closed Air Return System fan isolation damper receives a permissive to open following a 10-second time delay after receipt of a high-high containment pressure signal (3.0 psid). In addition to a CPCS start permissive, a differential pressure signal of less than 0.5 psid across the isolation damper must also be present for the isolation damper to open. The isolation damper is designed to open during the Loss of Coolant Accident blowdown period to allow the upper and lower containment pressures to equalize, thus preventing a peak pressure reverse differential pressure transient. After receipt of a high-high containment pressure signal, the Air Return System fan is designed to start after a 9-minute ($\pm$1 minute) time delay, provided several permissives have been satisfied. These permissives include signals from the CPCS and the diesel generator load sequencer. Upon receipt of a

high-high containment pressure signal, concurrent with the CPCS permissive, containment depressurization is provided by the Containment Spray System.

The CPCS is designed to automatically trip all Containment Spray System pumps and Air Return System fans, and to close the Containment Spray System discharge valves when containment pressure decreases to 0.25 psid following system actuation. The purpose of this design feature is to prevent containment pressure from being reduced below the design negative pressure of 13.2 psia (-1.5 psid). The Air Return System fan isolation dampers do not automatically close when containment pressure decreases to 0.25 psid.

The Containment Spray System is actuated by a high-high containment pressure signal, concurrent with the CPCS permissive. As containment pressure is reduced following an accident, the CPCS is designed to automatically cycle the Containment Spray System and Air Return System equipment as needed to maintain containment pressure at or below 0.45 psid. The TS nominal trip setpoints for the CPCS are 0.3 psid and 0.4 psid for termination and initiation, respectively. Since pressure can rise through this instrumentation deadband relatively quickly with the Containment Spray System and/or the Air Return System disabled, excessive cycling of the equipment could occur as the CPCS attempts to control containment pressure within the deadband range. Excessive cycling or deadheading the equipment is prevented by steps in the emergency procedures to reset the high-high containment pressure signal. The high-high containment pressure signal is reset at 2.4 psid if the Containment Spray System pumps are receiving suction from the refueling water storage tank, and at 1 psid if the pumps are aligned for containment sump recirculation. This prevents the CPCS from performing automatic control in the latter stages of an accident.

Description of Problem

The Containment Spray System pumps have tripped on three occasions during testing when the anti-pump protective circuit was spuriously activated. This has occurred twice during Auxiliary Safeguards testing and once during inservice IWP testing. In all cases the root cause determination was that the CPCS logic circuits fluctuated and caused the respective pump motor circuitry to trip and lock out the pump run signal. The setpoint deadband of the current alarm module is used as the CPCS permissive/terminate setpoints for the pumps. This deadband is only 20 mV (i.e., 0.5% of the current alarm module span

of 4 V). It has been demonstrated by testing that the existing CPCS circuit can fluctuate sufficiently in the region of the permissive/terminate setpoint and trip the pumps. The electronic circuit noise induced fluctuation manifests itself as a problem on the CPCS pump permissive because the associated pump breaker start and stop contacts change states from this one setpoint. When the CPCS start signal is activated and reaches the pump motor circuit, the contacts chatter from the closed to the open state several times, causing the breaker to open. This is not a problem during an actual emergency start because the 3.0 psid Solid State Protection System signal must be received before the Containment Spray System pumps actually start and the CPCS permissive noise has had time to settle out.

The CPCS relay logic circuit was designed with an undesirably narrow operating range, which only utilizes 0.5% of span, for the start/stop of the CPCS permissive. The impact of this narrow operating range is that it takes a very small amount of electrical noise to be coupled into the circuit and potentially cycle the current alarm device through its setpoint, resulting in a relay "chattering" condition. The Acopian power supplies utilized in this application are more sensitive and responsive to known conditions of relay "chattering". Consequently, the inherent noise within the CPCS circuitry has become more prevalent and now presents itself in the form of alarms during normal operation.

The proposed solution to this problem will: 1) widen the deadband for the CPCS start permissive, and 2) narrow the span viewed by the CPCS pressure instrument. The range of the pressure transmitter will be decreased from 10 psid to 2 psid. This will increase the percentage of instrument signal span required to start the pumps automatically because the 4 V pressure transmitter signal will now cover 2 psid. Catawba has performed confirmatory testing and has determined that the proposed solution will be effective in eliminating the described CPCS noise problem. No relay chatter was observed as the tested circuit was cycled through the proposed new setpoints.

Safety Significance

CPCS functions to prevent a vacuum condition inside containment by preventing an inadvertent actuation of Containment Spray System and/or Air Return System equipment. The CPCS start permissive is designed such that it does not affect the accuracy, margin, or response of the engineered safety features, as the permissive setpoint is below the

high-high containment pressure setpoint. Therefore, changing the CPCS start permissive allowable value from 0.45 psid to 1 psid and the CPCS start permissive nominal trip setpoint from 0.4 psid to 0.9 psid does not affect the safety margins or safety analysis currently in place. During and after a Loss of Coolant Accident or a High Energy Line Break inside containment, the CPCS functions to control Containment Spray System and Air Return System operation. The proposed change will not affect any of the safety significant functions of the CPCS and does not alter the safety margins of any calculations.

The CPCS termination setpoint prevents the operation of the Containment Spray System and the Air Return System when containment pressure is below 0.25 psid. The proposed termination setpoint change is for conservatism only, and is being made to reflect the fact that current plant practice is to set the actual nominal trip setpoint at 0.35 psid, versus the TS nominal trip setpoint of 0.3 psid. This is acceptable according to the definition of nominal trip setpoint. This definition states, in part, "If plant conditions warrant, the trip setpoint implemented in plant hardware may be set outside the NOMINAL TRIP SETPOINT calibration tolerance band as long as the trip setpoint is conservative with respect to the NOMINAL TRIP SETPOINT." No safety margins are affected by the proposed conservative change in the termination setpoint, since the function of the termination setpoint is to prevent an excessive reduction in containment pressure caused by extended operation of the Containment Spray System and the Air Return System.

ATTACHMENT 4

NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

No Significant Hazards Consideration Determination

As required by 10 CFR 50.91(a)(1), this analysis is provided to demonstrate that the proposed license amendment involves no significant hazards consideration.

Conformance of the proposed amendment to the standards for a determination of no significant hazards as defined in 10 CFR 50.92 is shown in the following:

1) The proposed license amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed amendment has no impact on any accident probabilities or consequences. The CPCS functions to control the operation of the Containment Spray System and the Air Return System following certain design basis accidents. It cannot initiate any accidents by itself. Therefore, accident probabilities will be unaffected. Since the proposed change has been shown to have no effect upon any safety analysis results, the consequences of accidents will also be unaffected.

2) The proposed license amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

   As stated previously, the CPCS in and of itself cannot initiate any accident condition. No change to any method of plant operation is being proposed in conjunction with this amendment request. Therefore, no new accident types can be created.

3) The proposed license amendment does not involve a significant reduction in a margin of safety.

   The proposed amendment will have no impact on any safety margin. None of the results of any existing safety analyses is affected as a result of the proposed change. Margin of safety is related to the confidence in the ability of the fission product barriers to perform their design functions. The fission product barriers include the fuel cladding, the reactor coolant pressure boundary, and the containment. None of these fission product barriers will be affected as a result of the proposed change. Therefore, no safety margin will be impacted.

Based on the preceding discussion, it is concluded that the proposed license amendment does not involve a significant hazards consideration finding as defined in 10 CFR 50.92.

ATTACHMENT 5

ENVIRONMENTAL ANALYSIS

Environmental Analysis

The proposed amendment has been reviewed against the criteria of 10 CFR 51.22 for environmental considerations. The proposed amendment does not involve a significant hazards consideration, nor increase the types and amounts of effluents that may be released offsite, nor increase individual or cumulative occupational radiation exposures. Therefore, the proposed amendment meets the criteria given in 10 CFR 51.22(c)(9) for a categorical exclusion from the requirement for an Environmental Impact Statement.