Duke Energy®

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May 18, 2009

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

Subject: Duke Energy Carolinas, LLC
Catawba Nuclear Station, Units 1 and 2;
Docket Numbers 50-413 and 50-414
McGuire Nuclear Station, Units 1 and 2;
Docket Numbers 50-369 and 50-370
Oconee Nuclear Station, Units 1, 2 and 3;
Docket Numbers 50-269, 50-270 and 50-287
License Amendment Request to Revise the
Definition of Shutdown Margin (SDM)

Pursuant to 10 CFR 50.90, Duke is requesting amendments to the Technical Specifications (TS) for Catawba Nuclear Station (CNS), McGuire Nuclear Station (MNS), Units 1 and 2, and Oconee Nuclear Station (ONS), Units 1, 2 and 3. This proposed license amendment request (LAR) adopts TSTF 248, Revision 0 which modifies the definition of Shutdown Margin to include the following as a new sentence: "However, with all control rods verified fully inserted by two independent means, it is not necessary to account for a stuck control rod in the SDM calculation."

The changes are consistent with NRC approved Industry Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler TSTF-248, Rev. 0, "Revise Shutdown Margin definition for stuck rod exception." In the correspondence written October 31, 2000, the NRC concluded the proposed revisions to adopt TSTF-248 were acceptable. This TSTF has since been incorporated into the Westinghouse and B&W Standard Technical Specifications.

The contents of this LAR package are as follows:

A001
NRR

Attachment 1 provides the technical and regulatory evaluations of the proposed changes. Attachment 2 contains a marked-up version of the affected TS pages. Reprinted (clean) TS pages will be provided to the NRC prior to issuance of the approved amendments. This amendment request contains no NRC commitments as discussed in Attachment 3.

Duke requests NRC approval of these proposed changes as soon as reasonably possible.

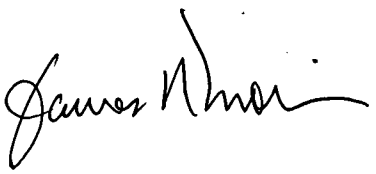
Duke is requesting a 60-day implementation period in conjunction with these amendments. Revisions to each station's UFSAR, necessary to reflect approval of this submittal, will be made in accordance with 10CFR50.71 (e).

In accordance with Duke administrative procedures and the Quality Assurance Program Topical Report, these proposed amendments have been reviewed and approved by all stations' Plant Operations Review Committee and by the Corporate Nuclear Safety Review Board.

Pursuant to 10 CFR 50.91, a copy of these proposed amendments is being sent to the designated official of the States of North and South Carolina.

Inquiries on this matter should be directed to M.J. Sawicki at (803) 701-5191.

Very truly yours,



James R. Morris

Attachments

James R. Morris 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.

James R. Morris, Vice President

Subscribed and sworn to me: 5-18-2009
Date

Micky Standridge - Mickey Standridge
Notary Public

My commission expires: 7-10-2012
Date

SEAL

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NCMPA-1
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PMPA
Catawba RGC Date File
ELL-EC05O
CNS Master File - CN04DM (File CN 801.01)
MNS Master File - MG01DM (File MC 801.01)
ONS Master File - ON03DM (File ON 801.01)

ATTACHMENT 1

TECHNICAL AND REGULATORY EVALUATIONS

Subject: Application for License Amendment to Revise Shutdown Margin Definition for Stuck Rod Exception

1. SUMMARY DESCRIPTION

2. DETAILED DESCRIPTION

3. TECHNICAL EVALUATION

4. REGULATORY EVALUATION

5. ENVIRONMENTAL CONSIDERATION

6. REFERENCES

1. SUMMARY DESCRIPTION

This evaluation supports a request to amend Operating Licenses NFP-35 (Catawba Nuclear Station Unit 1), NFP-52 (Catawba Nuclear Station Unit 2), NFP-9 (McGuire Nuclear Station Unit 1), NFP-17 (McGuire Nuclear Station Unit 2), DPR-38 (Oconee Nuclear Station Unit 1), DPR-47 (Oconee Nuclear Station Unit 2) and DPR-55 (Oconee Nuclear Station Unit 3).

Duke proposes a revision to each station's Shutdown Margin (SDM) definition to reflect the definition in the latest revision to Standard Technical Specifications (STS). The change in definition provides the flexibility to not assume a single rod of highest worth stuck out if two independent sources confirm all rods are at bottom.

Duke requests NRC approval of the proposed amendments to enhance consistency with Standard TS and increase analytical flexibility for determining SDM.

2. DETAILED DESCRIPTION

Duke proposes a revision to the Shutdown Margin (SDM) definition to reflect the definition in the latest revision to Westinghouse Standard Technical Specifications (TS) (NUREG-1431) and Babcock and Wilcox Standard TS (NUREG-1430). This change will revise the definition as a part of each station's Technical Specifications (TS) Section 1.1, "Definitions" to include a provision allowing an exception to the highest reactivity worth stuck Control Rod (for ONS) or Rod Cluster Control Assemblies (for CNS and MNS) penalty if there are two independent means of confirming that all Rod Cluster Control Assemblies (RCCA) or Control Rods are fully inserted in the core. Due to the Digital Rod Position Indication (DRPI) system (for CNS and MNS) having two redundant trains of indication; if both trains are fully operable on all control rods and with both trains confirming rods being fully inserted after a trip, there is adequate verification of the configuration of the rods such that past response to a calculation of SDM was overly conservative. Concurrently, ONS has two independent reed switches on the Position Indication (PI) tubes; one is an in-limit reed switch, while the other is a zero % limit switch. The Absolute Position Indication (API) also has two independent strings of indication.

The proposed change for all stations is to add the following statement:
For MNS and CNS; "However, with all RCCAs verified fully inserted by two independent means, it is not necessary to account for a stuck RCCA in the SDM calculation," to each station's TS, Section 1.1, "Definitions", SHUTDOWN MARGIN (SDM), Part a.
For ONS; "However, with all CONTROL RODS verified fully inserted by two independent means, it is not necessary to account for a stuck CONTROL ROD in the SDM calculation," to Oconee TS, Section 1.1, "Definitions", SHUTDOWN MARGIN (SDM), Part a.

Incorporating this definition into the ONS, CNS and MNS TS has potential benefit by avoiding boration following a reactor trip to maintain SDM, as well as saving water and acid processing leading up to and following the subsequent startup. Another advantage would be allowing the commencement of cooldown to occur more quickly.

3. TECHNICAL EVALUATION

This proposed license amendment request adopts TSTF 248, Revision 0 which modifies the subject TS by changing the definition of Shutdown Margin to include the following as a new sentence: "However, with all control rods (RCCAs for MNS and CNS) verified as fully inserted by two independent means, it is not necessary to account for a stuck control rod (RCCA for MNS and CNS) in the SDM calculation."

The change is consistent with NRC approved Industry Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler TSTF-248, Rev. 0, "Revise Shutdown Margin definition for stuck rod exception." The consideration of a stuck rod is provided only to allow for a single failure of one rod to not insert when a scram is initiated. However, with positive indication that all rods are already fully inserted, such a provision is overly conservative. This change is consistent with the definition of SDM provided in Westinghouse Standard Technical Specifications (TS) (NUREG-1431) and Babcock and Wilcox Standard TS (NUREG-1430).

Revising the TS definition of SDM would not require core designers to revise any SDM boron calculations; the change would afford the sites flexibility to either use the tabulated SDM boron concentrations (which include the one stuck rod penalty), or if all rods are confirmed fully inserted by two independent means (i.e. both trains of DRPI or reed switches), remove the one stuck rod penalty from the SDM boron to allow for a lower boron requirement. This change would only require station procedure changes to take advantage of the additional flexibility.

There is no technical reason that each station could not institute this TS change. The Digital Rod Position Indication (DRPI), designated as the EDA system at CNS and MNS, has two redundant trains of indication. If both trains of DRPI are fully operable on all control rods, and both trains confirm that all rods are fully inserted after a trip, there is adequate verification of the configuration of the rods such that the one stuck rod penalty is overly conservative.

The same is true at ONS. There are two independent reed switches on the PI (position indication) tubes, one is an in-limit reed switch and the other is a zero% limit switch.

The API (Absolute Position Indication) also has two independent strings of indication. This again allows for the adequate verification of the configuration of the rods such that the one stuck rod penalty is too conservative.

Potentially avoiding having to borate following a reactor trip to maintain SDM would save on water and acid processing leading up to and following the subsequent startup. An additional benefit would be to allow for verification of SDM sooner following an End of Cycle shutdown, which would allow commencement of cooldown more swiftly. The technical advantage to using this improved definition of SDM arises late in cycle, when margin to the SDM limit is smaller than at Beginning of Cycle (BOC).

4. REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

Below are the design criteria that are applicable to this change. The Principal Design Criteria (PDC) for Oconee Nuclear Station [ONS] were developed by the Atomic Energy Commission. The seventy PDC are the predecessors of the General Design Criteria (GDC) which are applicable for both McGuire and Catawba Nuclear Stations [MNS and CNS].

[MNS and CNS] General Design Criteria 10 - Reactor design.

"The reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences."

[ONS] Principal Design Criteria 6- Reactor Core Design.

"The reactor core shall be designed to function throughout its design lifetime without exceeding acceptable fuel damage limits which have been stipulated and justified. The core design, together with reliable process and decay heat removal systems, shall provide for this capability under all expected conditions of normal operation with appropriate margins for uncertainties and for transient situations which can be anticipated, including the effects of the loss of power to recirculation pumps, tripping out of a turbine generator set, isolation of the reactor from its primary heat sink, and loss of all off-site power."

Discussion: This proposed amendment does not change the way we design the core, it only revises the way in which Shutdown Margin is defined. Revising the TS definition would not require any changes to the core design methodology used for calculating shutdown boron. Rather, it would afford the analytical flexibility for determining SDM for a particular circumstance. Therefore, the

ability to meet this criterion is not compromised.

[MNS and CNS] General Design Criterion 26 - Reactivity control system redundancy and capability.

"Two independent reactivity control systems of different design principles shall be provided. One of the systems shall use control rods, preferably including a positive means for inserting the rods, and shall be capable of reliably controlling reactivity changes to assure that under conditions of normal operation, including anticipated operational occurrences, and with appropriate margin for malfunctions such as stuck rods, specified acceptable fuel design limits are not exceeded. The second reactivity control system shall be capable of reliably controlling the rate of reactivity changes resulting from planned, normal power changes (including xenon burnout) to assure acceptable fuel design limits are not exceeded. One of the systems shall be capable of holding the reactor core subcritical under cold conditions."

[ONS] Principal Design Criteria 27- Redundancy of Reactivity Control.

"At least two independent Reactivity Control Systems, preferably of different principles, shall be provided."

Discussion: The change to Shutdown Margin Definition has no impact on the reactivity control system and thus does not compromise reactivity control system redundancy or capability. Therefore the proposed changes will not result in the inability to reliably control reactivity changes. This criterion will continue to be met.

[MNS and CNS] General Design Criterion 27 - Combined reactivity control systems capability.

"The reactivity control systems shall be designed to have a combined capability, in conjunction with poison addition by the emergency core cooling system, of reliably controlling reactivity changes to assure that under postulated accident

conditions and with appropriate margin for stuck rods the capability to cool the core is maintained."

Discussion: This proposed amendment revises the way in which Shutdown Margin is defined. There is no impact on the reactivity control systems capability to assure appropriate margin for stuck rods is being met. Concurrently, this change does obviate the need to assume one stuck control rod, as with adequate indication from two independent trains allow for flexibility in being able to avoid this over conservative assumption. Therefore, the ability to meet this criterion is not compromised.

[ONS] Principal Design Criterion 31 - Reactivity Shutdown Capability.

Note: *There is no ONS PDC that is similar to GDC 27; however PDC 29 is closely related and applicable to the change being proposed.*

"At least one of the Reactivity Control Systems provided shall be capable of making the core subcritical under any conditions (including anticipated operation transients), sufficiently fast to prevent exceeding acceptable fuel damage limits. Shutdown Margins greater than the maximum worth of the most effective control rod when fully withdrawn shall be provided."

Discussion: This proposed amendment revises the way in which Shutdown Margin is defined. This revised definition has no adverse impact on the units' ability to meet the criteria of making the core subcritical under any conditions. Concurrently, this change does obviate the need to assume one stuck control rod, as with adequate indication from two independent trains allow for flexibility in being able to avoid this over conservative assumption. Therefore, the ability to meet this criterion is not compromised.

4.2 Precedent

Technical Specification Task Force (TSTF) 248-A, Revision 0 was approved by the NRC on October 31, 2000 and is incorporated into the STS (NUREG-1431, Revision 3, "Standard Technical Specifications, Westinghouse Plants" and NUREG-1430, Revision 3, Standard Technical Specifications, Babcock and Wilcox Plants").

4.3 Significant Hazards Consideration

The proposed amendments modify each station's TS to revise the definition of SDM, item a, to include the following as a new sentence: "However, with all RCCAs (for CNS and MNS) or CONTROL RODS (for ONS) verified as fully inserted by two independent means, it is not necessary to account for a stuck RCCA (for CNS and MNS) or CONTROL ROD (for ONS) in the SDM calculation." Each station is to validate all control rod position by two independent means.

Duke has evaluated whether or not a significant hazard consideration is involved with the proposed changes by analyzing the three standards set forth in 10 CFR 50.92(c) as discussed below:

Criterion 1:

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

Response: No.

The revision to SDM definition will result in analytical flexibility for determining SDM. Changes in the definition will not have an impact on the probability of an accident previously evaluated.

The introduction of this definition change does not change continued compliance with all applicable regulatory requirements and design criteria (e.g., train separation, redundancy, and single failure). Therefore, since all plant systems will continue to function as designed, all plant parameters will remain within their design limits. As a result, the proposed changes will not increase the consequences of an accident.

Based on this discussion, the proposed amendments do not significantly increase the probability or consequences of an accident previously evaluated.

Criterion 2:

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

Response: No.

Revising the TS definition of SDM would not require core designers to revise any SDM boron calculations. Rather, it would afford the analytical flexibility for determining SDM for a particular circumstance.

The proposed changes do not involve any change in the design, configuration, or operation of the nuclear plant. The current plant safety analyses, therefore, remain complete and accurate in addressing the design basis events and in analyzing plant response and consequences.

The Limiting Conditions for Operations, Limiting Safety System Settings and Safety Limits specified in the Technical Specifications are not affected by the proposed changes. As such, the plant conditions for which the design basis accident analyses were performed remain valid.

The amendment does not introduce a new mode of plant operation or new accident precursors, does not involve any physical alterations to plant configurations or make changes to system set points that could initiate a new or different kind of accident.

Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Criterion 3:

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

Response: No.

Margin of safety is related to the confidence in the ability of the fission product barriers to perform their accident mitigation functions. These barriers include the fuel and fuel cladding, the reactor coolant system, and the containment and containment related systems. The proposed changes will not impact the reliability of these barriers to function. Radiological doses to plant operators or to the public will not be impacted as a result of the proposed change. The change in the TS definition will have no impact to these barriers. Adequate SDM will continue to be ensured for all operational conditions.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Duke concludes that the proposed amendments do not involve a 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

Therefore 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 amendments will not be detrimental to the common defense and security or to the health and safety of the public.

5. ENVIRONMENTAL CONSIDERATION

The proposed amendment does not involve (1) a significant hazards consideration, (2) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (3) 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.

6. REFERENCES

1. Catawba Nuclear Station Technical Specifications, Units 1 and 2, through Amendments 249/244.

2. McGuire Nuclear Station Technical Specifications, Units 1 and 2, through Amendments 251/231.

3. Oconee Nuclear Station Technical Specifications, Units 1, 2 and 3, through Amendments 364/366/365.

4. NUREG 1431, Revision 3, "Westinghouse Standard Technical Specifications. March 31, 2004.

5. NUREG 1430, Revision 3, "Babcock and Wilcox Standard Technical Specifications. June, 2004.

ATTACHMENT 2.A

MARKED-UP TS PAGES

CATAWBA NUCLEAR STATION

1.1 Definitions (continued)

RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 3411 MWt.
REACTOR TRIP SYSTEM (RTS) RESPONSE TIME	The RTS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RTS trip setpoint at the channel sensor until loss of stationary gripper coil voltage. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.
SHUTDOWN MARGIN (SDM)	SDM shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming: a. All rod cluster control assemblies (RCCAs) are fully inserted except for the single RCCA of highest reactivity worth, which is assumed to be fully withdrawn. With any RCCA not capable of being fully inserted, the reactivity worth of the RCCA must be accounted for in the determination of SDM; and b. In MODES 1 and 2, the fuel and moderator temperatures are changed to the nominal zero power design level.
SLAVE RELAY TEST	A SLAVE RELAY TEST shall consist of energizing each slave relay and verifying the OPERABILITY of each slave relay. The SLAVE RELAY TEST shall include, as a minimum, a continuity check of associated testable actuation devices.
STAGGERED TEST BASIS	A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

INSERT

However, with all RCCAs verified fully inserted by two independent means, it is not necessary to account for a stuck RCCA in the SDM calculation.

(continued)

ATTACHMENT 2.B

MARKED-UP TS PAGES

MCGUIRE NUCLEAR STATION

1.1 Definitions (continued)

QUADRANT POWER TILT RATIO (QPTR)	QPTR shall be the ratio of the maximum upper excore detector calibrated output to the average of the upper excore detector calibrated outputs, or the ratio of the maximum lower excore detector calibrated output to the average of the lower excore detector calibrated outputs, whichever is greater.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 3411 MWt.
REACTOR TRIP SYSTEM (RTS) RESPONSE TIME	The RTS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RTS trip setpoint at the channel sensor until loss of stationary gripper coil voltage. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.
SHUTDOWN MARGIN (SDM)	SDM shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming: a. All rod cluster control assemblies (RCCAs) are fully inserted except for the single RCCA of highest reactivity worth, which is assumed to be fully withdrawn. With any RCCA not capable of being fully inserted, the reactivity worth of the RCCA must be accounted for in the determination of SDM; and b. In MODES 1 and 2, the fuel and moderator temperatures are changed to the nominal zero power design level.
SLAVE RELAY TEST	A SLAVE RELAY TEST shall consist of energizing each slave relay and verifying the OPERABILITY of each slave relay. The SLAVE RELAY TEST shall include, as a minimum, a continuity check of associated testable actuation devices.

INSERT

However, with all RCCAs verified fully inserted by two independent means, it is not necessary to account for a stuck RCCA in the SDM calculation.

ATTACHMENT 2.C

MARKED-UP TS PAGES

OCONEE NUCLEAR STATION

1.1 Definitions (continued)

OPERABLE – OPERABILITY

A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).

PHYSICS TESTS

PHYSICS TESTS shall be those tests performed to measure the fundamental nuclear characteristics of the reactor core and related instrumentation.

These tests are:

a. Described in the UFSAR;

b. Authorized under the provisions of 10 CFR 50.59; or

c. Otherwise approved by the Nuclear Regulatory Commission.

QUADRANT POWER TILT (QPT)

QPT shall be defined by the following equation and is expressed as a percentage.

$$QPT = 100\left(\frac{\text{Power in any Core Quadrant}}{\text{Average Power of all Quadrants}} - 1\right)$$

RATED THERMAL POWER (RTP)

RTP shall be a total reactor core heat transfer rate to the reactor coolant of 2568 MWt.

SHUTDOWN MARGIN (SDM)

SDM shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming:

a. All full length CONTROL RODS (safety and regulating) are fully inserted except for the single CONTROL ROD of highest reactivity worth, which is assumed to be fully withdrawn. With any CONTROL ROD not capable of being fully inserted, the reactivity worth of these CONTROL RODS must be accounted for in the determination of SDM;

INSERT

However, with all CONTROL RODS verified fully inserted by two independent means, it is not necessary to account for a stuck CONTROL ROD in the SDM calculation.

ATTACHMENT 3

NRC COMMITMENTS

There are no regulatory commitments being made with this license amendment request.