

December 29, 1998

Mr. Gary R. Peterson  
Site Vice President  
Catawba Nuclear Station  
Duke Energy Corporation  
4800 Concord Road  
York, South Carolina 29745-9635

SUBJECT: CATAWBA NUCLEAR STATION - ISSUANCE OF EXEMPTION TO 10 CFR PART 50, APPENDIX A, GENERAL DESIGN CRITERION 57 (TAC NOS. M99561 AND M99562)

Dear Mr. Peterson:

The Commission has issued the enclosed exemption from certain requirements of Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix A, General Design Criterion 57, regarding isolation of main steam branch lines penetrating the containment. This exemption is related to your application dated September 2, 1997.

A copy of the Exemption and the supporting Safety Evaluation by the staff are enclosed. The Exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,  
ORIGINAL SIGNED BY:  
Peter S. Tam, Senior Project Manager  
Project Directorate II-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket Nos. 50-413 and 50-414

Enclosures: 1. Exemption  
2. Safety Evaluation

cc w/encls: See next page

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

December 29, 1998

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Site Vice President  
Catawba Nuclear Station  
Duke Energy Corporation  
4800 Concord Road  
York, South Carolina 29745-9635

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PART 50, APPENDIX A, GENERAL DESIGN CRITERION 57 (TAC NOS.  
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Dear Mr. Peterson:

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Sincerely,

A handwritten signature in black ink that reads "Peter S. Tam".

Peter S. Tam, Senior Project Manager  
Project Directorate II-2  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket Nos. 50-413 and 50-414

Enclosures: 1. Exemption  
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cc w/encls: See next page

Catawba Nuclear Station

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Catawba Nuclear Station

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of )  
DUKE ENERGY CORPORATION, ET AL. ) Docket Nos. 50-413 and 50-414  
(Catawba Nuclear Station, )  
Units 1 and 2) )

EXEMPTION

I.

Duke Energy Corporation, et al. (the licensee) is the holder of Facility Operating License Nos. NPF-35 and NPF-52, for the Catawba Nuclear Station (CNS), Units 1 and 2. The licenses provide, among other things, that the licensee is subject to all rules, regulations, and orders of the Commission now or hereafter in effect.

These facilities consist of two pressurized water reactors located at the licensee's site in York County, South Carolina.

II.

Title 10 of the Code of Federal Regulations (10 CFR), Part 50, Appendix A, specifies general design criteria for nuclear power plants. General Design Criterion (GDC) 57, regarding closed system isolation valves, states:

Each line that penetrates primary reactor containment and is neither part of the reactor coolant pressure boundary nor connected directly to the containment atmosphere shall have at least one containment isolation valve which shall be either automatic, or locked closed, or capable of remote manual operation. This valve shall be outside containment and located as close to the containment as practical. A simple check valve may not be used as the automatic isolation valve.

The Commission may grant an exemption from the requirements of the regulations pursuant to 10 CFR 50.12 if the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. The Commission will not consider granting an exemption unless special circumstances are present. Special circumstances are considered to be present under 10 CFR 50.12(a)(2) where application of the regulation in the particular circumstances conflicts with other rules or requirements of the Commission or where application of the regulation would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.

### III.

By letter dated September 2, 1997, the licensee requested an exemption from GDC-57 for Containment Penetrations M261 and M393, which are main steam penetrations. These lines penetrate the containment and are not part of the reactor coolant pressure boundary, nor are they connected directly to the containment atmosphere. Outside of the containment, these lines branch into various separate, individual lines before reaching the respective main steam isolation valves. From each of these main steam lines, one branch supplies main steam to the turbine-driven auxiliary feedwater pump (CAPT, using the licensee's abbreviation).

Valves SA-1 and SA-4 are manual gate valves located in the Interior Doghouse immediately downstream of the respective main steam piping. These valves are locked open (with breakaway locks) and are only capable of local manual operation. These valves are required to be open by the Technical Specifications (TS) in order to supply steam to the CAPT, which is part of the engineered safety features. From a probabilistic risk assessment perspective, the CAPT is one of the most risk-significant safety system components. Adding motor operators to SA-1 and SA-4, so that they become automatic or capable of remote operation (i.e., meeting GDC-57) would, thus, degrade the reliability of the CAPT to mitigate an

accident because the motor operators would introduce a new failure mode. Keeping SA-1 and SA-4 closed (i.e., meeting GDC-57) during plant operation would violate a TS requirement.

Valves SA-1 and SA-4 can be manually closed, as needed during certain accidents, to isolate the steam lines they serve. If SA-1 and SA-4 are inaccessible due to post-accident environmental conditions, the associated stop check valves can be used to isolate these steam lines. The licensee stated that the amount of time needed by operators to isolate steam using SA-1 and SA-4, or their associated stop check valves, has been factored into the accident analyses and resultant dose calculations in the Updated Final Safety Analysis Report.

Thus, as stated in the staff's safety evaluation, modifying valves SA-1 and SA-4 so that they can meet the operational requirement specified by GDC-57 would reduce the reliability of the CAPT, violate an existing TS, or both. The time needed by operators to manually close SA-1 and SA-4, or their associated stop check valves, during an accident, has been factored into accident analyses and is bounded by the design-basis accident scenarios and consequences. On such bases, the staff concludes that literal compliance with the operational aspect of GDC-57 is not desirable and the proposed exemption is acceptable.

#### IV.

Accordingly, the Commission has determined that special circumstances are present as defined in 10 CFR 50.12(a)(2)(ii). Specifically, the Commission finds that application of GDC-57 with respect to Valves SA-1 and SA-4 conflicts with existing TS and is not necessary to achieve the underlying purpose of the rule. The underlying purpose of GDC-57 is to ensure that reliable means exist to isolate this type of line when isolation is needed. As previously discussed, Valves SA-1 and SA-4 can be manually closed to isolate their respective steam lines. Thus, the design of these valves and the existence of appropriate procedures for manually closing these valves provide a reliable method of isolating the steam lines when

needed. The Commission hereby grants the licensee an exemption from the requirement of 10 CFR Part 50, Appendix A, GDC-57. Specifically, this exempts the licensee from having to lock close Valves SA-1 and SA-4 against TS requirements, or having to so modify them that they become automatic, or are capable of remote manual operation.

Pursuant to 10 CFR 51.32, the Commission has determined that granting of this exemption will have no significant effect on the quality of the human environment (63 FR 71659, dated December 29, 1998).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

ORIGINAL SIGNED BY:

Brian W. Sheron, Acting Director  
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland, this 29th day of December 1998.

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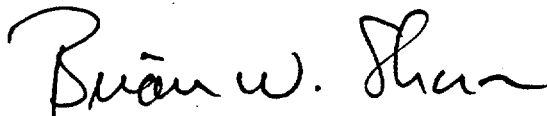


needed. The Commission hereby grants the licensee an exemption from the requirement of 10 CFR Part 50, Appendix A, GDC-57. Specifically, this exempts the licensee from having to lock close Valves SA-1 and SA-4 against TS requirements, or having to so modify them that they become automatic, or are capable of remote manual operation.

Pursuant to 10 CFR 51.32, the Commission has determined that granting of this exemption will have no significant effect on the quality of the human environment (63 FR 71659), dated December 29, 1998).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in cursive script that reads "Brian W. Sheron".

Brian W. Sheron, Acting Director  
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland, this 29th day of December 1998.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

EXEMPTION FROM 10 CFR PART 50, APPENDIX A,

GENERAL DESIGN CRITERION 57, CLOSED SYSTEM ISOLATION VALVES

CATAWBA NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-413 AND 50-414

1.0 INTRODUCTION

Title 10 of the Code of Federal Regulations (10 CFR), Part 50, Appendix A, General Design Criterion (GDC) 57, regarding closed system isolation valves, states that:

Each line that penetrates primary reactor containment and is neither part of the reactor coolant pressure boundary nor connected directly to the containment atmosphere shall have at least one containment isolation valve which shall be either automatic, or locked closed, or capable of remote manual operation. This valve shall be outside containment and located as close to the containment as practical. A simple check valve may not be used as the automatic isolation valve.

By letter dated September 2, 1997, Duke Energy Corporation (the licensee) submitted a request for an exemption from GDC 57 for Containment Penetrations M261 and M393 (erroneously stated as M363 in the submittal).

2.0 EVALUATION

Containment Penetrations M261 and M393 are main steam penetrations. These lines penetrate the containment and are not part of the reactor coolant pressure boundary or connected directly to the containment atmosphere. Outside of containment, these lines branch into various separate, individual lines before reaching the respective main steam isolation valves. From each of these main steam lines, one branch supplies main steam to the turbine-driven auxiliary feedwater pump (CAPT, using the licensee's abbreviation). Figure 10-6 of the Updated Final Safety Analysis Report (UFSAR) provides details of the line arrangement.

Valves SA-1 and SA-4 are manual gate valves located in the Interior Doghouse immediately downstream of the respective main steam piping. These valves are locked open (with break away locks) and capable of local manual operation only. These valves are required to be open (Technical Specification SR 3.7.5.1) to supply steam to the CAPT, which is part of the engineered safety features. The CAPT can operate with one of these valves closed, providing that steam is available from the opposite main steam piping. (Penetrations M261 and M393, and corresponding Valves SA-1 and SA-4, are listed in Table 6-77 of the UFSAR. Requirements for containment isolation valves are set forth in Section 3.6.3 of the Catawba Technical Specifications.) From a probabilistic risk assessment perspective, the CAPT is one of the most risk-significant safety system components. Adding motor operators to SA-1 and

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SA-4 such that they become automatic or capable of remote operation (i.e., meeting GDC 57) would, thus, adversely impact the reliability of the CAPT to mitigate an accident because the motor operators would introduce a new failure mode. Keeping SA-1 and SA-4 closed (i.e., meeting GDC 57) during plant operation would violate a Technical Specification requirement.

The licensee indicated that under certain postulated accident conditions, SA-1 and SA-4 would be in environmental conditions inaccessible to operators. In that circumstance, stop check valves SA-3 and SA-6, which are located downstream of SA-1 and SA-4 in the Auxiliary Building, respectively, would be used to isolate steam flow if needed. The licensee listed all the emergency procedures currently in existence that direct the operators to preferentially close SA-1 and SA-4, then SA-3 and SA-6. The licensee indicated that the times needed by operators to isolate steam using SA-1 and SA-4, or SA-3 and SA-6, have been factored into the accident analyses and resultant dose calculations in the UFSAR.

### 3.0 CONCLUSION

The staff finds that (1) modifying valves SA-1 and SA-4 such that they can meet the operational requirement specified by GDC 57 would reduce reliability of the CAPT, violate an existing TS, or both; and (2) the times needed by operators to manually close SA-1 and SA-4, or SA-3 and SA-6, during an accident have been factored into accident analyses and are bounded by the design-basis accident scenarios and consequences. On such bases, the staff concludes that literal compliance with the operational aspect of GDC 57 is not desirable and therefore an exemption is acceptable.

Principal Contributors: James Pulsipher  
Peter S. Tam

Date: December 29, 1998