

September 27, 1991

Docket No. 50-369

Mr. M. S. Tuckman
Vice President,
Nuclear Operations
Duke Power Company
P. O. Box 1007
Charlotte, North Carolina 28201-1007

Dear Mr. Tuckman:

SUBJECT: MCGUIRE NUCLEAR STATION, UNIT 1 - EXEMPTION FROM 10 CFR PART 50.46,
APPENDIX K TO 10 CFR 50, AND 10 CFR 50.44 FOR DEMONSTRATION
ASSEMBLIES (TAC NO. 80308)

The enclosed exemption responds to your request dated April 18, 1991, for an exemption from 10 CFR 50.46 to enable the use of demonstration fuel assemblies during Cycles 8, 9, and 10 for McGuire Unit 1. Subsequent to your request, the staff found it necessary to issue an exemption to Appendix K to 10 CFR 50 and 10 CFR 50.44 in addition to the exemption to 10 CFR 50.46.

A copy of this exemption has been forwarded to the Office of the Federal Register for publication.

Sincerely,

ORIGINAL SIGNED BY:

Timothy A. Reed, Project Manager
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

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Sincerely,

A handwritten signature in cursive script, appearing to read "Timothy A. Reed".

Timothy A. Reed, Project Manager
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
See next page

Mr. M.S. Tuckman
Duke Power Company

McGuire Nuclear Station

cc:

Mr. A.V. Carr, Esq.
Duke Power Company
422 South Church Street
Charlotte, North Carolina 28242-0001

Dr. John M. Barry
Department of Environmental Health
Mecklenburg County
1200 Blythe Boulevard
Charlotte, North Carolina 28203

County Manager of Mecklenburg County
720 East Fourth Street
Charlotte, North Carolina 28202

Mr. Dayne H. Brown, Director
Department of Environmental,
Health and Natural Resources
Division of Radiation Protection
P.O. Box 27687
Raleigh, North Carolina 27611-7687

Mr. Paul Guill
Duke Power Company
Nuclear Production Department
P.O. Box 1007
Charlotte, North Carolina 28201-1007

Mr. Alan R. Herdt, Chief
Project Branch #3
U.S. Nuclear Regulatory Commission
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

J. Michael McGarry, III, Esq.
Winston and Strawn
1400 L Street, N.W.
Washington, DC 20005

Ms. Karen E. Long
Assistant Attorney General
N. C. Department of Justice
P.O. Box 629
Raleigh, North Carolina 27602

Senior Resident Inspector
c/o U.S. Nuclear Regulatory Commission
12700 Hagers Ferry Road
Huntersville, North Carolina 28078

Mr. R.L. Gill, Jr.
Nuclear Production Department
Duke Power Company
P.O. Box 1007
Charlotte, North Carolina 28201-1007

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W., Suite 2900
Atlanta, Georgia 30323

Mr. Frank Modrak
Project Manager, Mid-South Area
ESSD Projects
Westinghouse Electric Corporation
MNC West Tower - Bay 241
P. O. Box 355
Pittsburgh, Pennsylvania 15230

September 27, 1991

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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|----------------------------------|---|-------------------|
| In the Matter of |) | |
| DUKE POWER COMPANY |) | Docket No. 50-369 |
| (McGuire Nuclear Station Unit 1) |) | |

EXEMPTION

I.

Duke Power Company (the licensee) is the holder of Facility Operating License No. NPF-9 which authorizes operation of McGuire Nuclear Station, Unit 1. The license provides, among other things, that the licensee be subject to all rules, regulations, and Orders of the Nuclear Regulatory Commission (the Commission) now or hereafter in effect.

The facility consists of a pressurized water reactor at the licensee's site located in Mecklenburg County, North Carolina.

II.

By letter dated April 18, 1991, the licensee requested an exemption to 10 CFR 50.46 that would enable the use of two demonstration assemblies during McGuire Unit 1 Cycles 8, 9, and 10. Subsequent to that request, the NRC staff determined that exemptions to Appendix K to 10 CFR 50 and 10 CFR 50.44 were needed in addition to the 10 CFR 50.46 exemption. These regulations refer to pressurized water reactors fueled with uranium oxide pellets within cylindrical Zircaloy cladding. The two demonstration assemblies contain fuel rods with zirconium based claddings that are not chemically identical to Zircaloy.

Since 10 CFR 50.46 and Appendix K identify requirements for calculating ECCS performance for reactors containing fuel with Zircaloy cladding, and 10 CFR 50.44 relates to the generation of hydrogen gas from a metal-water reactor with reactor fuel having Zircaloy cladding, an exemption is required to place the two demonstration assemblies containing fuel rods with advanced zirconium based claddings in the core.

III.

10 CFR 50.12(a)(2)(ii) enables the Commission to grant an exemption from the requirements of Part 50 when special circumstances are present such that application of the regulation in the particular circumstances would not serve the underlying purpose of the rule, or is not necessary to achieve the underlying purpose of the rule. The underlying purpose of 10 CFR 50.46 and 10 CFR 50 Appendix K is to establish requirements for the calculation of ECCS performance. The licensee has performed a calculation demonstrating adequate ECCS performance for McGuire Unit 1 and has shown that the two demonstration assemblies do not have a significant impact on that previous calculation. As such, the licensee has achieved the underlying purpose of 10 CFR 50.46 and Appendix K. The underlying purpose of 10 CFR 50.44 is to ensure that means are provided for the control of hydrogen gas that may be generated following a postulated loss-of-coolant accident. The licensee has provided means for controlling hydrogen gas and has previously considered the potential for hydrogen gas generation stemming from a metal-water reaction. The small number of fuel rods in the two demonstration assemblies containing advanced zirconium based claddings in conjunction with the chemical similarity of the advanced claddings to Zircaloy ensures that previous calculations of hydrogen production resulting from a metal-water reactor would not be significantly changed. As such, the licensee has achieved the underlying purpose of 10 CFR 50.44.

The two demonstration assemblies that will be placed in the McGuire Unit 1 reactor during Cycles 8, 9, and 10 meet the same design bases as the fuel currently in the reactor. No safety limits or setpoints have been altered as result of the use of the two demonstration assemblies. The demonstration assemblies will be placed in core locations that will not experience limiting power peaking during Cycles 8, 9, or 10. The advanced claddings have been tested for corrosion resistance, tensile and burst strength, and creep characteristics. The results indicate that the advanced claddings are safe for reactor service.

IV.

For the foregoing reasons, the NRC staff has concluded that the use of the the two demonstration assemblies in the McGuire Unit 1 reactor during Cycles 8, 9, and 10 will not present an undue risk to public health and safety and is consistent with the common defense and security. The NRC staff has determined that there are special circumstances present as specified in 10 CFR 50.12(a)(2) such that application of 10 CFR 50.46, 10 CFR 50 Appendix K, and 10 CFR 50.44 to explicitly consider the advanced clad fuel rods present within the two demonstration assemblies is not necessary in order to achieve the underlying purpose of these regulations.

Accordingly, the Commission has determined that pursuant to 10 CFR 50.12, an exemption is authorized by law and will not endanger life or property or common defense and security and is otherwise in the public interest, and hereby grants Duke Power Company an exemption from an the requirements of 10 CFR 50.46, 10 CFR 50 Appendix K, and 10 CFR 50.44 in that explicit consideration of the advanced zirconium based clad fuel present within the two demonstration assemblies is

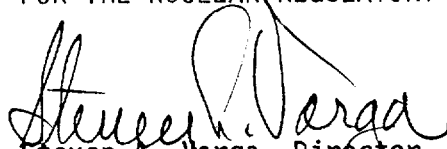
not required in order to be in compliance with these regulations. This exemption applies only to the two demonstration assemblies for the time period (Cycles 8, 9, and 10) for which these assemblies will be in the McGuire Unit 1 reactor core.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not result in any significant environmental impact (56 FR 48217).

For further information regarding this action, see the licensee's submittal dated April 18, 1991, which is available for inspection at the Commission's Public Document Room, 2120 L Street, N.W., Washington, D.C., and at Atkins Library, University of North Carolina, Charlotte (UNCC Station), North Carolina 28223.

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Steven A. Varga, Director
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 27th day of September 1991

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Steven A. Varga, Director
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 27th day of September 1991

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 - Above table: "set hold for environ. monitor" and "delivered to be put in list" with initials "DM" and "for".
 - In table: "9/13/91" is written over "9/13/91" in the third column.
 - Below table: A large signature is written over the date "9/25/91" in the sixth column.

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