

Docket Nos.: 50-369  
and 50-370

December 8, 1986

Mr. H. B. Tucker, Vice President  
Nuclear Production Department  
Duke Power Company  
422 South Church Street  
Charlotte, North Carolina 28242

Dear Mr. Tucker:

Subject: Issuance of Amendment No.66 to Facility Operating License NPF-9 and  
Amendment No.47 to Facility Operating License NPF-17 - McGuire  
Nuclear Station, Units 1 and 2

The Nuclear Regulatory Commission has issued the enclosed Amendment No.66 to Facility Operating License NPF-9 and Amendment No.47 to Facility Operating License NPF-17 for the McGuire Nuclear Station, Units 1 and 2. These amendments consist of changes to the Technical Specifications in response to your letter dated December 13, 1985.

The amendments change the Technical Specifications related to reporting requirements for primary coolant iodine spikes, delete existing shutdown requirements if coolant iodine activity limits are exceeded for 800 hours in a 12 month period, and clarify the sampling technique to allow analysis of a non-degassed sample.

A copy of the related safety evaluation supporting Amendment No.66 to Facility Operating License NPF-9 and Amendment No.47 to Facility Operating License NPF-17 is enclosed.

Notice of issuance of amendments will be included in the Commission's next bi-weekly Federal Register notice.

Sincerely,  
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Darl Hood, Project Manager  
PWR Project Directorate #4  
Division of PWR Licensing-A

Enclosures:

1. Amendment No. 66 to NPF-9
2. Amendment No. 47 to NPF-17
3. Safety Evaluation

cc w/enclosures: See next page

Distribution:

See attached page

DSH  
PWR#4/DPWR-A  
MDuncan/mac  
11/25/86

DSH  
PWR#4/DPWR-A  
DHood  
11/25/86

BJYoungblood  
11/25/86

8612170255 861208  
PDR ADOCK 05000369  
PDR

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Duke Power Company

McGuire Nuclear Station

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

DUKE POWER COMPANY

DOCKET NO. 50-369

McGUIRE NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 66  
License No. NPF-9

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment to the McGuire Nuclear Station, Unit 1 (the facility) Facility Operating License No. NPF-9 filed by the Duke Power Company (the licensee) dated December 13, 1985, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations as set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

8612170268 861208  
PDR ADOCK 05000369  
P PDR

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachments to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. NPF-9 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No.66, are hereby incorporated into the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

151

Darl Hood, Project Manager  
PWR Project Directorate #4  
Division of PWR Licensing-A

Attachment:  
Technical Specification  
Changes

Date of Issuance: December 8, 1986

*OGC changes made.*

DSH/m  
PWR#4/DPWR-A  
MDuncan:mac  
11/25/86

DSH  
PWR#4/DPWR-A  
DHood  
11/25/86

OGC/BETH  
(JOHNSON)  
11/2/86

PWR#4/DPWR-A  
BJYoungblood  
11/5/86

*see 507  
Env. im.  
Section / PWR*



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

DUKE POWER COMPANY

DOCKET NO. 50-370

McGUIRE NUCLEAR STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 47  
License No. NPF-17

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment to the McGuire Nuclear Station, Unit 2 (the facility) Facility Operating License No. NPF-17 filed by the Duke Power Company (the licensee) dated December 13, 1985, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations as set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

- 2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachments to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. NPF-17 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No.47, are hereby incorporated into the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

- 3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

151

Darl Hood, Project Manager  
 PWR Project Directorate #4  
 Division of PWR Licensing-A

Attachment:  
 Technical Specification  
 Changes

Date of Issuance: December 8, 1986

*OGC changes made.  
md*

DSH/mr  
 PWR#4/DPWR-A  
 MDuncan:mac  
 11/25/86

DSH  
 PWR#4/DPWR-A  
 DHood  
 11/25/86

OGC/BETH  
 JB Wilson  
 12/2/86

*PRP*  
 PWR#4/DPWR-A  
 B. Youngblood  
 12/5/86

*DSH  
 no legal  
 my tech  
 see 85X  
 env. m.  
 secret / ERW*

ATTACHMENT TO LICENSE AMENDMENT NO. 66

FACILITY OPERATING LICENSE NO. NPF-9

DOCKET NO. 50-369

AND

TO LICENSE AMENDMENT NO. 47

FACILITY OPERATING LICENSE NO. NPF-17

DOCKET NO. 50-370

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the areas of change.

Amended  
Page

3/4 4-25  
3/4 4-26  
3/4 4-29  
B3/4 4-5  
B3/4 4-6  
6-17  
6-17a (new)

REACTOR COOLANT SYSTEM

3/4.4.8 SPECIFIC ACTIVITY

LIMITING CONDITION FOR OPERATION

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3.4.8 The specific activity of the reactor coolant shall be limited to:

- a. Less than or equal to 1.0 microCurie per gram DOSE EQUIVALENT I-131, and
- b. Less than or equal to  $100/\bar{E}$  microCuries per gram of gross specific activity.

APPLICABILITY: MODES 1, 2, 3, 4, and 5.

ACTION:

MODES 1, 2 and 3\*:

- a. With the specific activity of the reactor coolant greater than 1.0 microCurie per gram DOSE EQUIVALENT I-131 for more than 48 hours during one continuous time interval or exceeding the limit line shown on Figure 3.4-1, be in at least HOT STANDBY with  $T_{avg}$  less than 500°F within 6 hours;
- b. With the specific activity of the reactor coolant greater than  $100/\bar{E}$  microCuries per gram, be in at least HOT STANDBY with  $T_{avg}$  less than 500°F within 6 hours; and
- c. The provisions of Specification 3.0.4 are not applicable.

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\* With  $T_{avg}$  greater than or equal to 500°F.



## REACTOR COOLANT SYSTEM

ACTION: (Continued)

MODES 1, 2, 3, 4, and 5:

With the specific activity of the reactor coolant greater than 1.0 microCurie per gram DOSE EQUIVALENT I-131 or greater than  $100/\bar{E}$  microCuries per gram of gross specific activity, perform the sampling and analysis requirements of Item 4.a) of Table 4.4-4 until the specific activity of the reactor coolant is restored to within its limits.

## SURVEILLANCE REQUIREMENTS

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4.4.8 The specific activity of the reactor coolant shall be determined to be within the limits by performance of the sampling and analysis program of Table 4.4-4.

TABLE 4.4-4 (Continued)

TABLE NOTATION

# Until the specific activity of the Reactor Coolant System is restored within its limits.

\* Sample to be taken after a minimum of 2 EFPD and 20 days of POWER OPERATION have elapsed since reactor was last subcritical for 48 hours or longer.

\*\* A gross radioactivity analysis shall consist of the quantitative measurement of the total specific activity of the reactor coolant except for radionuclides with half-lives less than 10 minutes and all radioiodines. The total specific activity shall be the sum of the beta-gamma activity in the sample within 2 hours after the sample is taken and extrapolated back to when the sample was taken. Determination of the contributors to the gross specific activity shall be based upon those energy peaks identifiable with a 95% confidence level. The latest available data may be used for pure beta-emitting radionuclides.

\*\*\* A radiochemical analysis for  $\bar{E}$  shall consist of the quantitative measurement of the specific activity for each radionuclide, except for radionuclides with half-lives less than 10 minutes and all radioiodines, which is identified in the reactor coolant. The specific activities for these individual radionuclides shall be used in the determination of  $\bar{E}$  for the reactor coolant sample. Determination of the contributors to  $\bar{E}$  shall be based upon those energy peaks identifiable with a 95% confidence level.

## REACTOR COOLANT SYSTEM

### BASES

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#### OPERATIONAL LEAKAGE (Continued)

PRESSURE BOUNDARY LEAKAGE of any magnitude is unacceptable since it may be indicative of an impending gross failure of the pressure boundary. Therefore, the presence of any PRESSURE BOUNDARY LEAKAGE requires the unit to be promptly placed in COLD SHUTDOWN.

#### 3/4.4.7 CHEMISTRY

The limitations on Reactor Coolant System chemistry ensure that corrosion of the Reactor Coolant System is minimized and reduces the potential for Reactor Coolant System leakage or failure due to stress corrosion. Maintaining the chemistry within the Steady State Limits provides adequate corrosion protection to ensure the structural integrity of the Reactor Coolant System over the life of the plant. The associated effects of exceeding the oxygen, chloride, and fluoride limits are time and temperature dependent. Corrosion studies show that operation may be continued with contaminant concentration levels in excess of the Steady State Limits, up to the Transient Limits, for the specified limited time intervals without having a significant effect on the structural integrity of the Reactor Coolant System. The time interval permitting continued operation within the restrictions of the Transient Limits provides time for taking corrective actions to restore the contaminant concentrations to within the Steady State Limits.

The Surveillance Requirements provide adequate assurance that concentrations in excess of the limits will be detected in sufficient time to take corrective ACTION.

#### 3/4.4.8 SPECIFIC ACTIVITY

The limitations on the specific activity of the reactor coolant ensure that the resulting 2 hour doses at the site boundary will not exceed an appropriately small fraction of Part 100 dose guideline values following a steam generator tube rupture accident in conjunction with an assumed steady state primary-to-secondary steam generator leakage rate of 1.0 gpm. The values for the limits on specific activity represent limits based upon a parametric evaluation by the NRC of typical site locations. These values are conservative in that specific site parameters of the McGuire site, such as site boundary location and meteorological conditions, were not considered in this evaluation.

The ACTION statement permitting POWER OPERATION to continue for limited time periods with the reactor coolant's specific activity greater than 1.0 microCurie/gram DOSE EQUIVALENT I-131, but within the allowable limit shown on Figure 3.4-1, accommodates possible iodine spiking phenomenon which may occur following changes in THERMAL POWER.

## REACTOR COOLANT SYSTEM

### BASES

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#### SPECIFIC ACTIVITY (Continued)

The sample analysis for determining the gross specific activity and  $\bar{E}$  can exclude the radioiodines because of the low reactor coolant limit of 1 micro-Curie/gram DOSE EQUIVALENT I-131, and because, if the limit is exceeded, the radioiodine level is to be determined every 4 hours. If the gross specific activity level and radioiodine level in the reactor coolant were at their limits, the radioiodine contribution would be approximately 1%. In a release of reactor coolant with a typical mixture of radioactivity, the actual radioiodine contribution would probably be about 20%. The exclusion of radionuclides with half-lives less than 10 minutes from these determinations has been made for several reasons. The first consideration is the difficulty to identify short-lived radionuclides in a sample that requires a significant time to collect, transport, and analyze. The second consideration is the predictable delay time between the postulated release of radioactivity from the reactor coolant to its release to the environment and transport to the SITE BOUNDARY, which is relatable to at least 30 minutes decay time. The choice of 10 minutes for the half-life cutoff was made because of the nuclear characteristics of the typical reactor coolant radioactivity. The radionuclides in the typical reactor coolant have half-lives of less than 4 minutes or half-lives of greater than 14 minutes, which allows a distinction between the radionuclides above and below a half-life of 10 minutes. For these reasons the radionuclides that are excluded from consideration are expected to decay to very low levels before they could be transported from the reactor coolant to the SITE BOUNDARY under any accident condition.

Based upon the above considerations for excluding certain radionuclides from the sample analysis, the allowable time of 2 hours between sample taking and completing the initial analysis is based upon a typical time necessary to perform the sampling, transport the sample, and perform the analysis of about 90 minutes. After 90 minutes, the gross count should be made in a reproducible geometry of sample and counter having reproducible beta or gamma self-shielding properties. The counter should be reset to a reproducible efficiency versus energy. It is not necessary to identify specific nuclides. The radiochemical determination of nuclides should be based on multiple counting of the sample with typical counting basis following sampling of less than 1 hour, about 2 hours, about 1 day, about 1 week, and about 1 month.

## ADMINISTRATIVE CONTROLS

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### STARTUP REPORT (Continued)

6.9.1.2 The Startup Report shall address each of the tests identified in the FSAR and shall include a description of the measured values of the operating conditions or characteristics obtained during the test program and a comparison of these values with design predictions and specifications. Any corrective actions that were required to obtain satisfactory operation shall also be described. Any additional specific details required in License conditions based on other commitments shall be included in this report.

6.9.1.3 Startup Reports shall be submitted within: (1) 90 days following completion of the STARTUP test program, or (2) 90 days following resumption or commencement of commercial POWER OPERATION, or (3) 9 months following initial criticality, whichever is earliest. If the Startup Report does not cover all three events (i.e., initial criticality, completion of STARTUP test program, and resumption or commencement of commercial operation), supplementary reports shall be submitted at least every 3 months until all three events have been completed.

### ANNUAL REPORTS<sup>1/</sup>

6.9.1.4 Annual Reports covering the activities of the unit as described below for the previous calendar year shall be submitted prior to March 1 of each year. The initial report shall be submitted prior to March 1 of the year following initial criticality.

6.9.1.5 Annual Reports shall include the activities of the unit as described below:

a. Personnel Exposures

Reports required on an annual basis shall include tabulation on an annual basis of the number of station, utility, and other personnel (including contractors) receiving exposures greater than 100 mrem/yr and their associated man-rem exposure according to work and job functions,<sup>2/</sup> e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance (describe maintenance), waste processing, and refueling. The dose assignments to various duty functions may be estimated based on pocket dosimeter, TLD, or film badge measurements. Small exposures totalling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole-body dose received from external sources should be assigned to specific major work functions.

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<sup>1/</sup>A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station.

<sup>2/</sup>This tabulation supplements the requirements of §20.407 of 10 CFR Part 20.

## ADMINISTRATIVE CONTROLS

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### ANNUAL REPORTS<sup>1/</sup>

#### b. Primary Coolant Specific Activity

Reports required on an annual basis shall include the results of specific activity analysis in which the primary coolant exceeded the limits of Specification 3.4.8. The following information shall be include: 1) Reactor power history starting 48 hours prior to the first sample in which the limit was exceeded; 2) Results of the last isotopic analysis for radioiodine performed prior to exceeding the limit, results of analysis while limit was exceeded and results of one analysis after the radioiodine activity was reduced to less than limit. Each result should include date and time of sampling and the radioiodine concentrations; 3) Clean-up system flow history starting 48 hours prior to the first sample in which the limit was exceeded; 4) Graph of the I-131 concentration and one other radioiodine isotope concentration in microcuries per gram as a function of time for the duration of the specific activity above the steady-state level; and 5) The time duration when the specific activity of the primary coolant exceeded the radioiodine limit.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO.66 TO FACILITY OPERATING LICENSE NPF-9  
AND AMENDMENT NO. 47 TO FACILITY OPERATING LICENSE NPF-17

DUKE POWER COMPANY

DOCKET NOS. 50-369 AND 50-370

McGUIRE NUCLEAR STATION, UNITS 1 AND 2

INTRODUCTION

By letter dated December 13, 1985, the Duke Power Company proposed changes to the Technical Specifications for the McGuire Nuclear Station, Units Nos. 1 and 2 that would involve: (1) a revision to the reporting requirements related to primary coolant iodine spikes, (2) the deletion of existing Technical Specifications (TS) requirements to shut down the facility if coolant iodine activity limits are exceeded for 800 hours in a 12-month period, and (3) a clarification of the sampling technique to allow analysis of a non-degassed reactor coolant system (RCS) sample for determination of total specific activity. The proposed changes in items (1) and (2) are in accordance with NRC Generic Letter No. 85-19 dated September 27, 1985.

EVALUATION

Generic Letter 85-19, Reporting Requirements on Primary Coolant Iodine Spikes, is part of an ongoing effort to delete unnecessary reporting requirements. It has been determined that reporting requirements related to primary coolant specific activity levels, specifically iodine spikes, can be reduced from a short term report to an item to be included in the Annual Report.

It has also been determined that existing shutdown requirements based on exceeding the primary coolant iodine activity limits for an accumulated period of over 800 hours are no longer necessary. This is based on an improvement in the quality of nuclear fuel over the past 10 years and the fact that appropriate actions would be initiated long before approaching the limit as currently specified.

Generic Letter 85-19 reports these findings and presents model Technical Specifications in Standard Technical Specification format which reflect these findings. Duke Power Company has proposed amending the McGuire Units 1 and 2 Technical Specifications to match the model Technical Specifications presented. We find the revisions to the reporting requirements and the deletion of requirements to shut down the facility if coolant iodine activity limits are exceeded for 800 hours in a 12 month period to be consistent with the Generic Letter and model Technical Specifications and, therefore, to be acceptable.

The licensee has proposed to change the Technical Specifications to allow the use of a new analysis technique to quantify reactor coolant system activity. The present Technical Specifications require the taking of a pressurized sample of reactor coolant, degassing the sample, and analyzing the gas and the liquid separately. The results of the two analyses are then added to determine the gross radioactivity. The proposed change would permit analyzing a pressurized sample that had not been degassed. This approach is viewed as being more desirable because it reduces occupational radiation exposures. Data submitted by the licensee indicate that the single analysis method meets regulatory requirements, and therefore, the proposed change to the Technical Specifications allowing its use is acceptable.

#### ENVIRONMENTAL CONSIDERATION

These amendments involve changes to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and changes in reporting or administrative procedures or requirements. The staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational exposure. The NRC staff has made a determination that the amendments involve no significant hazards consideration, and there has been no public comment on such finding. Accordingly, the amendments meet either the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) or (c)(10). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of these amendments.

#### CONCLUSION

The Commission made a proposed determination that the amendments involve no significant hazards consideration which was published in the Federal Register (51 FR 30571) on August 27, 1986, and consulted with the state of North Carolina. No public comments were received, and the state of North Carolina did not have any comments.

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: C. Willis  
H. Gilpin  
D. Wigginton

Dated: December 8, 1986



DATED: December 8, 1986

AMENDMENT NO.66 TO FACILITY OPERATING LICENSE NPF-9 - McGuire Nuclear Station, Unit 1  
AMENDMENT NO.47 TO FACILITY OPERATING LICENSE NPF-17 - McGuire Nuclear Station, Unit 2

DISTRIBUTION:

Docket File 50-369/370

NRC PDR

Local PDR

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