DUKE POWER COMPANY
POWER BUILDING
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WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

TELEPHONE: AREA 704
373-4083

November 11, 1981

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Re: McGuire Nuclear Station
Docket Nos. 50-369

Dear Mr. Denton:

Attached is a proposed change to the McGuire - Unit 1 Technical Specifications concerning the minimum measured Reactor Coolant System flowrate. This item has been reviewed and it has been determined that there are no adverse safety or environmental impacts associated with the proposed change.

The proposed amendment is considered to be a Class III amendment pursuant to 10CFR 170.22. Therefore, enclosed is a check in the amount of $12,300.

Very truly yours,

William O. Parker, Jr.

GAC/smh

Attachment

cc: M. J. Graham
Resident Inspector
McGuire Nuclear Station

Mr. James P. O'Reilly, Director
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

B001 S 1/1 Rec'd w/out Check

WILLIAM O. PARKER, JR., being duly sworn, states that he is Vice President of Duke Power Company; that he is authorized on the part of said Company to sign and file with the Nuclear Regulatory Commission this revision to the McGuire Nuclear Station Technical Specifications, Appendix A to License No. NPF-9; and that all statements and matters set forth therein are true and correct to the best of his knowledge.

William O. Parker, Jr.

William O. Parker, Jr., Vice President

Subscribed and sworn to before me this 11th day of November, 1981

[illegible signature]
Notary Public

My Commission Expires:

September 20, 1984

Attachment 1

Technical Specification 3/4.2.3 - RCS Flowrate and Nuclear Enthalpy Rise Hot Channel Factor

Proposed Change

Revise Figure 3.2-3 to lower the minimum Reactor Coolant System flowrate to 383,500 gpm for operation at or below 90% Rated Thermal Power. This value corresponds to 95% of thermal design flow plus measurement uncertainties of 3.5%.

Justification and Safety Analysis

Preliminary measurements of total RCS flow at McGuire Unit 1 indicate that the measured flow may be less than the Thermal Design Flow used in the plant accident analyses. The Technical Specifications allow a finite time period in which to restore RCS flow to above the minimum required value; however the time period is based on the assumption that the low flow is due to time limited local effects, e.g. grid voltage/frequency dips. The indications at McGuire are not believed to be due to grid or flow fluctuations, but rather the results of actions taken to increase core bypass flow to lower upper head temperature to T_c.

In the event the RCS flow is actually verified to be less than Thermal Design Flow, the plant Technical Specifications are quite specific in action to be taken. However the Technical Specifications do not recognize the possibility of a long term reduction in flow, nor the relationships between flow and DNB or flow and core power which allow various trade-offs. These trade offs allow continued operation at some reduced flow and a corresponding reduction in allowed maximum power.

It is widely recognized that there are relationships between core power, flow, and DNB as noted below:

$$\frac{\partial \text{ Flow}}{\partial \text{ DNB}} = \frac{1\%}{1\%} \qquad \text{(Eq. 1)}$$

$$\frac{\partial \text{ Power}}{\partial \text{ DNB}} = \frac{1\%}{1.8\%} \qquad \text{(Eq. 2)}$$

thus the relationship between Power and Flow is:

$$\frac{\partial \text{ Power}}{\partial \text{ Flow}} = \frac{1\%}{1.8\%} \qquad \text{(Eq. 3)}$$

As a result of the above noted relationships and a conservative assumption (based on current indications) that the verified RCS flow will be no lower than 0.95 of Thermal Design Flow it is proposed that McGuire Unit 1 be operated at a maximum power level of 90% of Rated Thermal Power (3070 MWth core power) in the event that measured flow is less than Thermal Design Flow (plus measurement uncertainty).

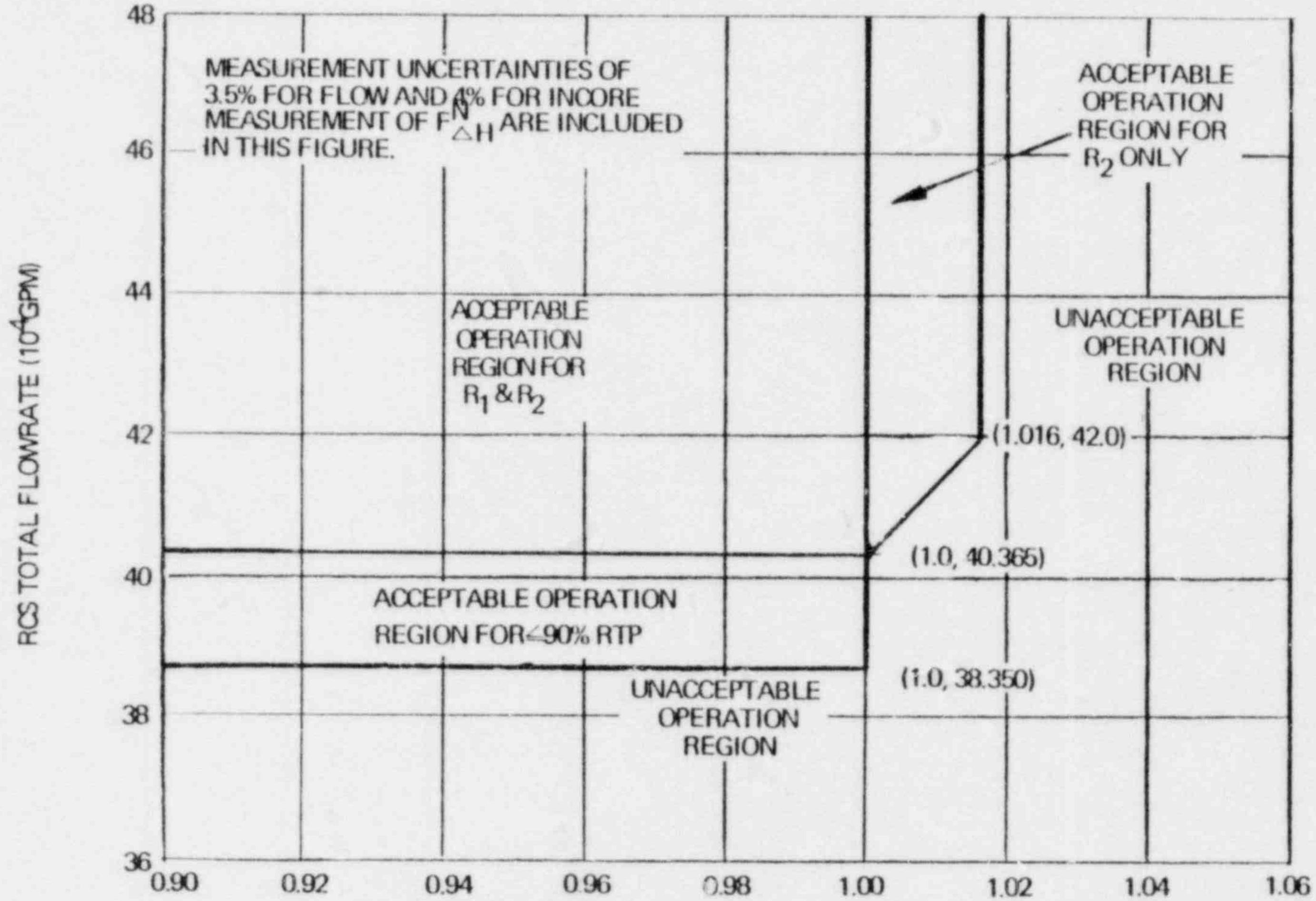
This reduction in core power is the equivalent of an RCS flow increase of ap-

proximately 18% in terms of margin to DNB. Since the expected flow deficit is 5% or less, the actual result in the power reduction is an increase of approximately 13% in terms of margin to DNB.

Operation of the plant within this power restriction results in no increase in T_{avg} thus there is no temperature impact in terms of margin to DNB.

McGuire Unit 1's Technical Specification limits and accident analyses results have been evaluated to determine the impact of the RCS flow and power reductions. In all cases sufficient margin exists to allow plant operation at the reduced power level. No Technical Specification limits require modification, including core limits, OTΔT, OPΔT, and Power Range Neutron Flux - High, High setpoint.

The core limits remain the same due to the increased margin to DNB afforded by the power reduction and interpretation that they are now valid for 3070 MWth instead of 3411 MWth. This implies that 3070 MWth should be considered to be 1.0 in fraction of Rated Thermal Power for Figure 2.1-1. With no change in the core limits the OTΔT and OPΔT trip setpoints remain unchanged. Utilizing the latest Westinghouse data, the uncertainty in the instrumentation for the Power Range Neutron Flux - High trip function is 4.7% span (or 5.6% RTP). With a normal assumption of reactor trip at 109% RTP the uncertainty analysis verifies that a trip will take place at 109% RTP plus 5.6% RTP, or 114.6% RTP. A 5% reduction in RCS flow requires a trip at 115.2% RTP, thus adequate margin exists in the instrumentation such that no change in the nominal setpoint is necessary.



$R_1 = F^N_{\Delta H}/1.49\ [1.0 + 0.2(1.0 - p)]$

$R_2 = R_1/[1 - RBP(Bu)]$

FIGURE 3.2-3 RCS TOTAL FLOWRATE VERSUS R_1 AND R_2 — FOUR LOOPS IN OPERATION