Duke Power
A Duke Energy Company

Gary R. Peterson
*Vice President*

**Duke Power**
*Catawba Nuclear Station*
4800 Concord Road
York, SC 29745
*(803) 831-4251 OFFICE*
*(803) 831-3221 FAX*

September 10, 2001

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

Subject: Duke Energy Corporation
Catawba Nuclear Station, Unit 2
Docket Number 50-414
Response to Request for Additional Information for Revision of Unit 2 Reactor Coolant System Cold Leg Elbow Tap Flow Coefficients

By letter dated March 9, 2001, Duke Energy Corporation submitted a license amendment request to the Unit 2 Reactor Coolant System cold leg elbow tap flow coefficients. On July 25, 2001, Duke Energy Corporation provided additional information associated with the submittal. By telecon on September 6, 2001, the Staff requested additional information. Please find the requested information in the attachment.

The proposed amendment change was requested to support plant operation following the fall 2001 refueling outage. While Duke Energy considers the amendment to be technically justified and safe, we recognize that the Staff may require additional time to review all supporting information. Therefore, Duke Energy would be agreeable to an interim, one-cycle approval of the amendment if additional time is necessary prior to final approval.

Note that while the March 9, 2001, submittal constitutes a formal license amendment request, there are no associated technical specification changes required.

A001

This correspondence does not contain any commitments.

Pursuant to 10 CFR 50.91, a copy of this proposed amendment request is being sent to the appropriate State of South Carolina official.

Inquiries on this matter should be directed to G.K. Strickland at (803) 831-3585.

Very truly yours,

Gary R. Peterson

GKS/s
Attachment

Gary R. Peterson, being duly sworn, states that he is Site Vice President of Duke Energy Corporation; that he is authorized on the part of said corporation to sign and file with the Nuclear Regulatory Commission this amendment to the Catawba Nuclear Station Facility Operating License Number NPF-52; and that all statements and matters set forth herein are true and correct to the best of his knowledge.

Gary R. Peterson, Site Vice President

Subscribed and sworn to me: September 10, 2001
Date

Douglas M Black
Notary Public

My commission expires: October 24, 2004
Date

SEAL

xc (with attachments):

L.A. Reyes
U.S. Nuclear Regulatory Commission
Regional Administrator, Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, GA 30303

D.E. Billings
Senior Resident Inspector acting (CNS)
U.S. Nuclear Regulatory Commission
Catawba Nuclear Station

C.P. Patel (addressee only)
NRC Senior Project Manager (CNS)
U.S. Nuclear Regulatory Commission
Mail Stop O8-H12
Washington, D.C. 20555-0001

V.R. Autry, Director
Division of Radioactive Waste Management
Bureau of Land and Waste Management
Department of Health and Environmental Control
2600 Bull St.
Columbia, SC 29201

Reactor Coolant System Cold Leg Elbow Tap Coefficients
Attachment

## 1. Flow Margin

For the upcoming Catawba Unit 2 Cycle 12 reload, all of the core thermal-hydraulic and UFSAR Chapter 15 analyses have at least a 1% margin in core flow. This 1% margin is due to the assumed core bypass flow being greater than actual bypass flow, or margin in the assumed loop flow combined with bypass flow. In addition, there is a 4.9% DNBR margin for all DNBR-related analyses.

## 2. Reactor Coolant Pump Impeller Wear

The earliest calorimetric data, which has the highest derived values of flow, was not used to develop the values of the elbow tap flow coefficients currently in use or the proposed revised flow coefficients. Therefore, the issue of the earliest flow data being non-conservative due to being recorded prior to the initial breaking-in period for the pump impellers is not applicable. Also, the elbow tap based flow values for Catawba Unit 2 do not show any significant decrease in flow that can be attributed to longer-term pump wear for the past 15 years. Longer-term pump performance degradation is not evident.

Westinghouse does not have a design value for pump impeller wear rate because it is considered to be insignificant.

## 3. Early Calorimetrics Being at Less Than Full Power

All calorimetrics were performed at essentially full power conditions (98% to 100% power) except for the first data point shown on Figures 1 and 2 of the March 9, 2001 letter. This calorimetric was performed on 7/29/86 at 75% power; however, this data point was excluded from the determination of both the current and the proposed elbow tap coefficients. Therefore, in summary, all calorimetrics used to determine the elbow

tap coefficients were performed at essentially full power conditions.

## 4. Reactor Coolant Pump Energy Dissipation

We have evaluated the potential effect of not including NC pump energy dissipation into the coolant for the flow calculation. Of the 19.9 MWt pump heat that enters the NC System, only 8.87 MWt is dissipated between the T-cold RTD and the T-hot RTD. This contributes approximately +0.15F (0.255%) to the measurement of vessel delta-T. Since flow is calculated in the calorimetric by core power divided by vessel delta-T (converted to delta-enthalpy), and since measured delta-T is greater than that corresponding to the core power, the effect is a conservative error in flow of 0.255% (actual flow is higher than calculated flow).

## 5. Hot Leg Streaming

We believe that the data prior to RTD bypass manifold removal should represent a better sample of the hot leg temperature distribution compared to the current RTD installation. So, the early calorimetric data should have much less potential for non-conservative (measured T-hot less than bulk T-hot) streaming, and resulting overprediction of flow. Also, the early calorimetric data used for elbow tap flow coefficient averaging were for core fuel cycles (cycles 1 and 2) that had a much flatter radial power distribution than the later low-leakage loading patterns. The relatively flat radial power distribution resulted in smaller coolant temperature differences at core exit, so hot leg streaming was not as significant. The early calorimetric data (excluding the initial data that we did not use in the elbow tap flow coefficient averaging) ought to be quite accurate in this regard. In addition, the flow from all four loops is summed for the Tech Spec flow surveillance, so one or two loops with non-conservative streaming would likely be offset by the other loops.