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NUCLEAR POWER

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April 13, 1981

U. S. Nuclear Regulatory Commission
Division of Operating Reactors
Office of Nuclear Reactor Regulation
Washington D.C. 20555

Attention: Paul S. Check, Chief
Reactor Safety Branch

Gentlemen:

SUBJECT: SINGLE LOOP OPERATION - GE/NRC TELECON OF FEBRUARY 11, 1981

The purpose of this letter is to document the information transmitted verbally to members of your staff during the telephone conference of February 11, 1981.

The purpose of the telephone conference was to provide information on the single loop operating experience at Browns Ferry Nuclear Plant Unit 1. We understand that Tennessee Valley Authority (TVA) has previously provided information concerning their experience in their March 17, 1980 letter to T. A. Ippolito (NRC). During power ascension in single loop operation, jet pump flow variations above those normally observed were noted in the active loop above a pump speed of 65 percent of rated. Pump speed was reduced and tests were run to determine suitable power levels for extended power operation. Data taken during the tests indicated that the variations occurred only in jet pump flow, neutron flux, related parameters, and increased with increasing pump speed. No unusual variations were observed in drive flow, vessel level, vessel pressure, or feedwater flow. This data established that observed neutron flux variations were consistent with observed variations in core flow and core plate pressure drop.

Prior to completion of the evaluation of the data, TVA administratively limited Browns Ferry Unit 1 plant operation to 60-percent power to preclude the observed variations and subsequently shut the plant down for the scheduled refueling and maintenance outage. After two continuous months of single loop operation, other than these observations, TVA reported operation in single loop as routine with no problems.

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The primary consideration in evaluating the test data was the impact on vessel internals vibration, critical power ratio (CPR), fuel cladding, and fuel channels. Since the variations increased monotonically with pump speed, thermal hydraulic core stability which increases with decreasing core flow is not a concern. Internals vibration had been previously tested at Browns Ferry during the startup test program and no criteria were exceeded. The CPR calculations were shown to be conservative due to the method of calculation used during single loop operation. Fuel cladding and channel wall evaluations verified that the variations did not have any significant impact on mechanical integrity.

Prior to any further single loop operation calculations, a design review was held. The design review reevaluated the variations observed at Browns Ferry Unit 1 on a more generic basis in the event that they should occur at another plant. This evaluation considered potential variations at considerably higher magnitudes than observed at Browns Ferry Unit 1 (i.e., neutron flux variations up to incipient scram). The design review concluded that single loop operation, with the appropriate limit changes (i.e., safety limit minimum critical power ratio, maximum average planar linear heat generation rate) contained in the plant specific report, does not adversely impact the safety of the plant even in the event of variations more severe than observed at Browns Ferry Unit 1.

If you require additional information on this subject, please contact R. T. Hill (408) 925-3255 of my staff.

Very truly yours,

Ronald E Engel

Ronald E. Engel, Manager
Reload Fuel Licensing
Nuclear Safety & Licensing Operation

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cc: L. Gifford