



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

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... during the loop operation of AUG 24 1983 ... temperature differences

MEMORANDUM FOR: S. Varga, Chief ?
Operating Reactors Branch #1, DL

FROM: C. Berlinger, Chief
Core Performance Branch, DSI

SUBJECT: BEAVER VALLEY UNIT 1, N-1 LOOP OPERATION QUESTION

Plant Name: Beaver Valley Unit 1
Docket Number: 50-334
Licensing Stage: Operating Reactors
Responsible Branch: ORB-1
Project Manager: Peter Tam
DSI Review Branch: Core Performance Branch
TAC Number: 10386
Review Status: Incomplete

The Thermal-Hydraulics Section of the Core Performance Branch has prepared the enclosed questions for the proposed N-1 operation of the Beaver Valley Unit 1 plant as part of their secondary review. The primary review is by the Reactor Systems Branch. A draft copy of these questions has been teletyped to the applicant.

Daniel Fieno
for Carl H. Berlinger, Chief
Core Performance Branch, DSI

Enclosure:
As stated

- cc: R. Mattson
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492.1 During two-loop operation of Beaver Valley Unit 1, temperature differences in the active cold legs of a few degrees could exist. Therefore a radial power tilt and an increase in enthalpy rise factor could result. Provide the following information for justifying the design for two-loop operation:

1. The method of accounting for differences (if any) in the two and three-loop thermal-hydraulic design;
2. Any special monitoring procedures required during two loop operation;
3. The reactor protective system setpoints related to DNBR protection and how they are generated;
4. The effects of anticipated operational occurrences on the cold leg temperature distributions and how this effect is included in the design;
5. A thermal hydraulic design comparison table similar to Table 4.4 in the SER for two and three-loop operation. In addition this comparison should include the core pressure drop, the critical heat flux correlation used, the minimum DNBR limit, the nominal minimum DNBR for the typical and thimble (cold wall) flow channel and design DNBR for the design transient for both the typical and thimble (cold wall) flow channel. What is the design transient?

492.2 Inlet flow maldistribution is a possibility with two-loop operation. Have flow model tests or analytical studies been made for this effect? If so, provide the reference and results and also provide the following information.

1. What asymmetries exist (if any) in the core flow due to isolation of one loop? Provide inlet flow distribution maps for two and three-loop operation.

2. What is the effect of any inlet flow maldistribution on the hot channel DNBR.
3. What impact do any asymmetries have on power distribution, DNB limits and fuel integrity?
4. Provide information on flow instability with two-loop operation.

492.3 Provide the following information relative to the Technical Specifications for two-loop operation.

1. What changes (if any) are required for safety limits, DNB parameters, and overtemperature delta T setpoint parameters?
2. What is the required minimum flow rate for two-loop operation?