

1 **From:** Lawrence Burkhart  
2 **To:** Brian Sepelak  
3 **Date:** 6/12/01 8:18AM  
4 **Subject:** RAI - 061201-1  
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6 Brian,

7  
8 Attached are questions in preparation for Thursday's meeting.  
9

10 Larry  
11

12 RAI RELATED TO BVPS RTDP TS CHANGES  
13

- 14 1. The BVPS current TS BASES states that the design DNBR limit using the mini-RTDP is  
15 1.21, and the safety analysis DNBR limit is 1.33. By using the RTDP, the design DNBR  
16 limits are 1.24 and 1.23 for typical cells and thimble cells, respectively.  
17
- 18 A. Provide the derivation of the design DNBR limits for the typical cells and thimble cells for  
19 the RTDP. The derivation should include the uncertainty values of these parameters, e.g.,  
20 nuclear enthalpy hot channel factor and enthalpy rise engineering hot channel factor,  
21 included in mini-RTDP, the uncertainty values for the reactor power, pressurizer pressure,  
22 RCS flow rate and temperature, as well as the WRB-1 correlation.  
23
- 24 B. The secondary power calorimetric measurement uncertainty have different uncertainty  
25 values depending on the use of feedwater venturi or Caldon leading edge flow meter for  
26 feedwater flow measurement. Is the RTDP design DNBR limits of 1.23 and 1.24 based on  
27 feedwater venturi or Caldon LEFM?  
28
- 29 2. As a result of changing from mini-RTDP to RTDP methodology, the design DNBR and  
30 safety analysis DNBR limits are changed accordingly. The reactor core safety limits figure,  
31 which show the loci of points of T-avg as a function of pressurizer pressure and rated  
32 thermal power for which the minimum DNBR is no less than the safety analysis DNBR limit,  
33 or the average enthalpy at the vessel exit is equal to the saturated liquid enthalpy, is also  
34 revised. Attachments A-1 and A-2, respectively, to the December 27, 2000, letter provide  
35 revised Figure 2.1-1, "Reactor Core Safety Limits," for Units 1 and 2.  
36
- 37 A. Describe how this new figure is determined. Is this figure based on the RTDP safety  
38 analysis DNBR limit of 1.36?  
39
- 40 B. Provide a reference to topical report which describe the methodology for the determination  
41 of the core safety limit.  
42
- 43 C. What is the rated power level the revised figure based on? Is the rated power in the revised  
44 Figure 2.1-1 the current power level of 2,652 Mwt, or the 1.4% power uprate condition of  
45 2,689 MWt?  
46
- 47 3. The DNB-related parameters in TS 3.2.5 for pressurizer pressure, RCS average  
48 temperature and total flow are changed from "analysis" values to "indicated" values as  
49 follows:  
50

	For Unit 1	Unit 2
51		
52	RCS T-avg: from 580.7°F to 580.0°F	from 580.2°F to 579.9°F
53	pressurizer pressure: from 2220 psia to 2215 psia	from 2220 psia to 2214 psia
54	RCS total flow : from 261,600 to 267,400 gpm	from 261,600 to 267,200 gpm
55		

56 Since the thermal design flow (current analysis value) for both BVPS units is 261,600 gpm, the  
57 minimum measured flows (indicated values) of 267,400 and 267,200 gpm, respectively, for Units  
58 1 and 2 reflect the corresponding flow measurement uncertainties of 2.2% and 2.1%, respectively.

- 59
- 60 A. Explain how the indicated values of pressurizer pressure and RCS average temperature  
61 are related to the safety analysis values and the uncertainty values.  
62
- 63 B. Why are the indicated values for the pressurizer pressure lower than the current TS values  
64 for Units 1 and 2?  
65
- 66 C. Explain how the current analysis values and the indicated values of these DNB parameters  
67 are related to the RTDP methodology.  
68
- 69 D. Have new analyses been performed with the revised DNB parameters values as the initial  
70 conditions to demonstrate that the RTDP safety analysis DNBR limit is not exceeded for all  
71 AOOs? If not, are the existing analyses for all AOOs satisfy the RTDP safety analysis  
72 DNBR limit?  
73
- 74 E. How are the indicated values of the DNB parameters related to the design parameter  
75 values?  
76
- 77 4. For the OT@T and OP@T trip function equations, the T-avg is 576.2°F which is the vessel  
78 average RC temperature, whereas the revised T-avg values in TS 3.2.5 are 580.0 and  
79 579.9°F, respectively, for Units 1 and 2. Explain the difference in the T-avg for the OT@T  
80 and OP@T trip function and the DNB parameter value.  
81
- 82 5. Describe how the constants  $K_1$ ,  $K_2$ ,  $K_3$ ,  $K_4$ ,  $K_5$  and  $K_6$  in the OT@ P and OP@T trip  
83 functions are determined from the revised reactor core safety limits associated with the  
84 RTDP.  
85
- 86 6. Since the OT@T and OP@T trip functions have been revised, have the safety analysis of  
87 various transients been performed to ensure that the SAFDL limits are not violated? If not,  
88 what is the basis for acceptability of the revised OT@T and OP@T trip functions setpoints?  
89
- 90 7. In the OT@T and OP@T trip functions:  
91
- 92 A. Explain the basis for assigning the "@" for the coefficients  $K_1$  and  $K_4$ , and the "@" for  $K_2$ ,  
93  $K_3$ ,  $K_5$  and  $K_6$ . Or provide the following reference:  
94 NTD-RROI-SSO-430/NTD-NSA-TA-95-370, "Identification of Conservative Directions for  
95 Constants in OT@T and OP@T Reactor Trip Functions," September 1, 1995.  
96
- 97 B. Explain the basis for assigning the "@" for the values of lead time constants, and "@" for  
98 lag time constants in the dynamic compensation of the OT@T and OP@T trip functions.  
99

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