NRC FORM 195 (2-76)

U.S. NUCLEAR REGULATORY COMMISSION

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TO: B.C. Rusche

FROM: Duke Power Co.
Charlotte, N.C
W.O. Parker, Jr.

DATE OF DOCUMENT: 6-15-76

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DESCRIPTION

Ltr. re. our 2-25 and 5-7-76 ltrs.....
Changes in analytical method and results..W/
Revision 2 to BAW-1425 (Cycle # 2 Reload Report)

(1 Signed Cy. Received)
(8 Pages)

ENCLOSURE

DO NOT REMOVE
ACKNOWLEDGED

PLANT NAME: Oconee # 2

FOR ACTION/INFORMATION

SAFETY — SAB 6-28-76 — ENVIRO

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Regulatory File Cy.

DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

June 15, 1976

TELEPHONE: AREA 704
373-4083

Mr. Benard C. Rusche, Director
Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. A. Schwencer, Chief
Operating Reactors Branch No. 1

Re: Oconee Unit 2
Docket No. 50-270

Dear Mr. Rusche:

In letters dated February 25, 1976 and May 7, 1976, revisions to the Oconee Nuclear Station Technical Specifications were requested to support the operation of Oconee 2, Cycle 2. Subsequent to those submittals, an error has been identified in the Oconee 2, Cycle 2 DNBR densification penalty calculations. This error has resulted from the use of inconsistent heat flux (flux shape) and enthalpy rise calculations in evaluating the DNBR densification penalty. The revised calculations indicate that the change (reduction) in DNBR margin due to densification effects should be 5.93 percent and the change (reduction) in power peaking margin should be 3.47 percent instead of the previously reported values of 1.88 percent and 1.06 percent, respectively.

In the analysis incorporating the revised DNBR densification penalty, the penalty for an assumed open internals vent valve was deleted. Removal of the penalty for an open vent valve was addressed by the Commission's letter dated January 30, 1976 and proposed Technical Specifications submitted pursuant thereto on June 11, 1976.

The pressure-temperature limit curve based upon the internals vent valves remaining closed and incorporating the revised densification penalty is approximately 3°F less restrictive (maximum allowable temperature will be 3°F higher at a given pressure) than the previously submitted curve. Since the variable low pressure trip setpoint is based upon the four-pump pressure-temperature limit curve, the previously proposed variable low pressure trip setpoint also continues to be conservative.

The flux/flow trip setpoint is based upon a two-pump coastdown analysis. When the revised densification penalty is incorporated and the penalty for an assumed open vent valve is removed, a flux/flow trup setpoint of 1.08

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can be justified. This setpoint also includes a 1.2 percent error to account for the precision of various components in the RPS flow instrument string. The previously proposed flux/flow trip setpoint is 1.07 for Oconee 2, Cycle 2.

Therefore, the specifications previously proposed for Oconee 2, Cycle 2 are conservative with respect to setpoints which could be justified based upon the incorporation of the revised densification penalty and removal of the penalty for an assumed open internals vent valve.

Surveillance of the Oconee 2 internals vent valves will be performed during this refueling outage in accordance with the Technical Specifications requested in our June 11, 1976 submittal.

Revision 2 to Babcock and Wilcox BAW-1425, "Oconee 2, Cycle 2 Reload Report," is attached to reflect the above changes in analytical method and results.

Very truly yours,

William O Parker Jr /JK

William O. Parker, Jr.

REVISION 2 TO
BAW-1425

OCONEE 2, CYCLE 2 RELOAD REPORT

used in the analysis are 1.087 and 3.10 inches, respectively. The results of the two effects are -5.93% and -3.47% change* in the minimum hot channel DNBR and peaking margin, respectively. The changes in these margins are summarized in Table 6-1, which includes comparisons of other pertinet cycle 1 and 2 data. | 2

The DNBR analysis has been based on a core configuration consisting of 177 Mark B fuel assemblies. The incorporation of two Mark C demonstration fuel assemblies in batch 4 in place of two Mark B assemblies, results in an increase in the overall margin to DNB, as discussed in reference 2.

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*Change from undensified values. These are actually an improvement over cycle 1 densified conditions.

Table 6-1. Cycle 1 and 2 Maximum Design Conditions

	Cycle 1[1]	Cycle 2
Design power level, MWt	2568	2568
System pressure, psia	2200	2200
Reactor coolant flow, % design flow	100.0	107.6
Vessel inlet coolant temperature, 100% power, F	554.0	555.9
Vessel outlet coolant temperature, 100% power, F	603.8	602.2
Ref. design radial-local power peaking factor	1.78	1.78
Ref. design axial flux shape	1.5 cosine	1.5 cosine
Active fuel length, in.	144 (undens.)	141.1 (dens.)
Avg heat flux, 100% power, Btu/h-ft^2	171,470	174,995
Max heat flux, 100% power, Btu/h-ft^2 (for DNBR calc)	457,825	467,236
CHF correlation	W-3	B&W-2
Minimum DNBR (max design conditions, no densif penalties)	1.55 (114% power)	1.98 (112% power)
Hot channel factors		
Enthalpy rise	1.011	1.011
Heat flux	1.014	1.014
Flow area	0.98	0.98
Densification effects		
Change in DNBR margin, %	-6.08[4]	-5.93
Change in power peaking margin, %	-2.82[4]	-3.47

2

8. PROPOSED MODIFICATIONS TO TECHNICAL SPECIFICATIONS

The Technical Specifications have been revised for cycle 2 operation. Changes were the results of the following:

1. Using the B&W-2 CHF correlation rather than W-3, as discussed in section 6.1.

2. Using a 95/95 confidence level rather than 99/95, as discussed in section 6.1.

3. Using 107.6% of design flow rather than 100%, as discussed in section 6.1.

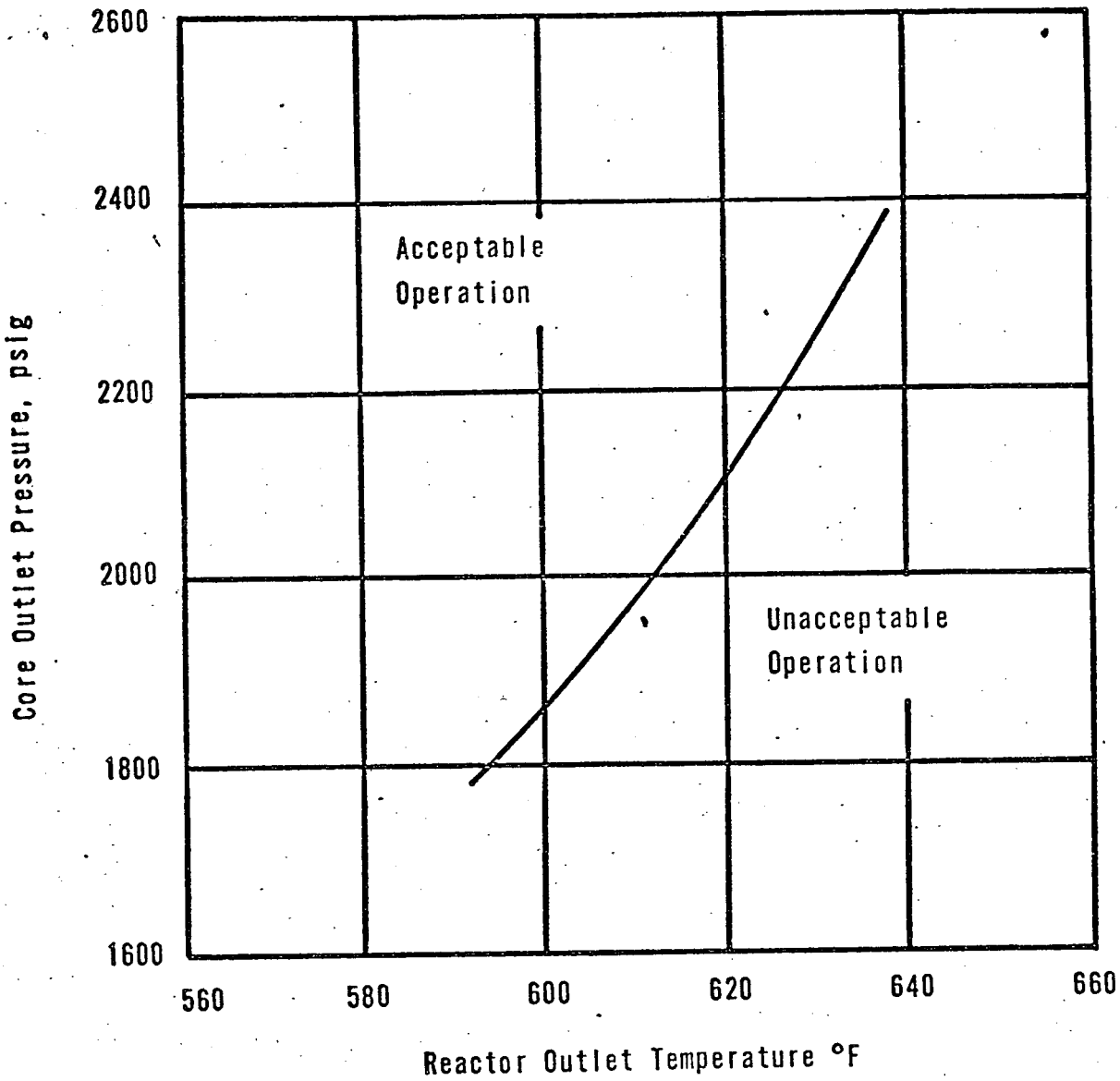
4. Using the Final Acceptance Criteria LOCA Analysis for restricting peaks during operation, as discussed in section 7.14.

5. Revising the assumptions on which the flux flow RPS setpoint is based. This setpoint now accounts for signal noise on the basis of data accumulated from operating B&W reactors.

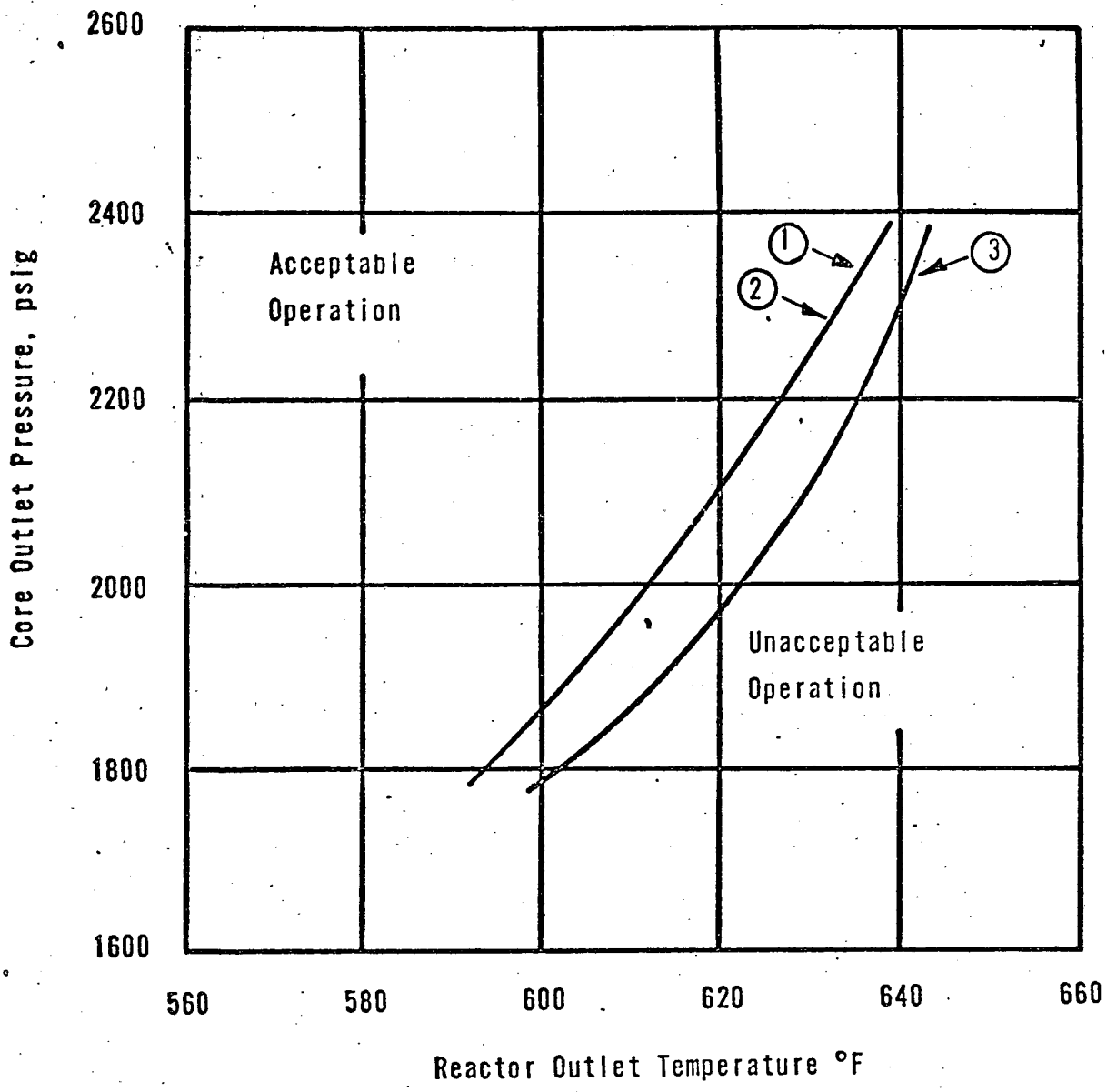
6. An analysis incorporating the effects of fuel rod bow on core parameters.

7. The penalty on core coolant flow due to an assumed open vent valve has been eliminated based on a vent valve surveillance program performed during each refueling shutdown. 2

Based on the Technical Specifications derived from the analyses presented in this report, the Final Acceptance Criteria ECCS limits will not be exceeded, nor will the thermal design criteria be violated. Figures 8-1 through 8-14 illustrate revisions to previous Technical Specification safety limits.



UNIT 2 CYCLE 2
CORE PROTECTION SAFETY LIMIT
Figure 8-1



CURVE	REACTOR COOLANT FLOW LBS/HR	POWER	PUMPS OPERATING (TYPE OF LIMIT)
1	141.3×10^6 (100%)	112%	Four Pumps (DNBR Limit)
2	105.6×10^6 (74.7%)	86%	Three Pumps (DNBR Limit)
3	69.3×10^6 (49.0%)	58%	One Pump in Each Loop (Quality Limit)

UNIT 2 - CYCLE 2
CORE PROTECTION SAFETY LIMITS
Figure 8-3