

APR 23 1974

Docket Nos. 50-269
and 50-270

V. A. Moore, Assistant Director for Light Water Reactors Group 2, L

LOCKED ROTOR ANALYSIS (TAR-878)

Plant Name:	Oconee, Units 1 & 2
Docket Nos.:	50-269 & 50-270
Licensing Stage:	Post-OL
Responsible Branch	LWR 2-3
and Project Manager:	I. Peltier
Technical Review Branch Involved:	Core Performance Branch
Requested Completion Date:	May 1, 1974
Description of Review:	Reanalysis of Locked Rotor Accident

The Core Performance Branch was requested to determine if the locked rotor accident analysis for Oconee 1/2 as described in the FSAR is still acceptable under the Tech Spec trip settings for the flux/flow ratio proposed by the licensee. The evaluation is intended to be equally applicable to Oconee 3, Arkansas 1, and Three Mile Island 1. Rancho Seco was evaluated individually due to slight differences in input parameters.

Our evaluation is provided in the enclosure. The responsible engineer for this task was M. McCoy.

Original Signed by
Victor Stello

Victor Stello, Jr., Assistant Director
for Reactor Safety
Directorate of Licensing

Enclosure:
Evaluation

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DATE ▶	4/22/74	4/22/74	4/22/74	4/23/74		

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SUMMARY OF EVALUATION

As the result of an increase in the delay time of the flux/flow trip in the Reactor Protection System for certain Babcock & Wilcox plants, it was considered necessary to evaluate the effect of the change on DNBR determinations. B&W has performed analyses to show that the increased Tech Spec trip settings are conservative for the loss-of-flow transient. The Core Performance Branch has reanalyzed the locked rotor accident using the computer code COBRA-IIIC. The Oconee 1/2 plant was used as the basic model for the analysis.

The original analysis of the locked rotor accident presented in the FSAR was based on a flux/flow trip delay time of 0.65 seconds and used the W-3 correlation for the determination of DNBR. The Core Performance Branch has analyzed the accident using both the W-3 and BAW-2 correlations and including the effects of densification. The relevant input parameters are listed below.

Power Level, %	102
Densified Length, in.	141.5
Coolant inlet temp., °F	555.5
Axial flux shape	1.5 cosine
Enthalpy rise factor, $F_{\Delta H}$	1.78
Spike penalty, %	8
Geometry and transient parameters	As given in FSAR
Thermal Diffusion Coefficient (TDC)	0.011

The reanalysis of the locked rotor analysis for the proposed flux/flow delay time of 1.4 seconds used the same parameters with the exception of revised power decay data supplied by the licensee and considered applicable for the revised Tech Spec change. The core flow and pressure transient are essentially unchanged.

The analysis for Rancho Seco was essentially the same except for increased design values for coolant flow rate, coolant inlet temperature and average heat flux. The power decay data supplied for Oconee was considered applicable for Rancho Seco.

The results of the reanalysis are summarized in the following table:

<u>MINIMUM DNB RATIO</u>							
Delay Time (sec)	<u>Oconee 1/2</u>			Delay Time (sec)	<u>Rancho Seco</u>		
	W-3	BAW-2	FSAR		W-3	BAW-2	FSAR
0.65	1.305	1.655	1.15	0.75	1.075	-	1.0
1.40	1.257	1.537	-	1.50	1.031	1.262	-

The effect of the delay time change on Oconee 1/2 is illustrated in the enclosed Figure 1, using the W-3 correlation for determination of DNB. The DNBR transient for Rancho Seco with an assumed delay time of 1.5 seconds is also presented.

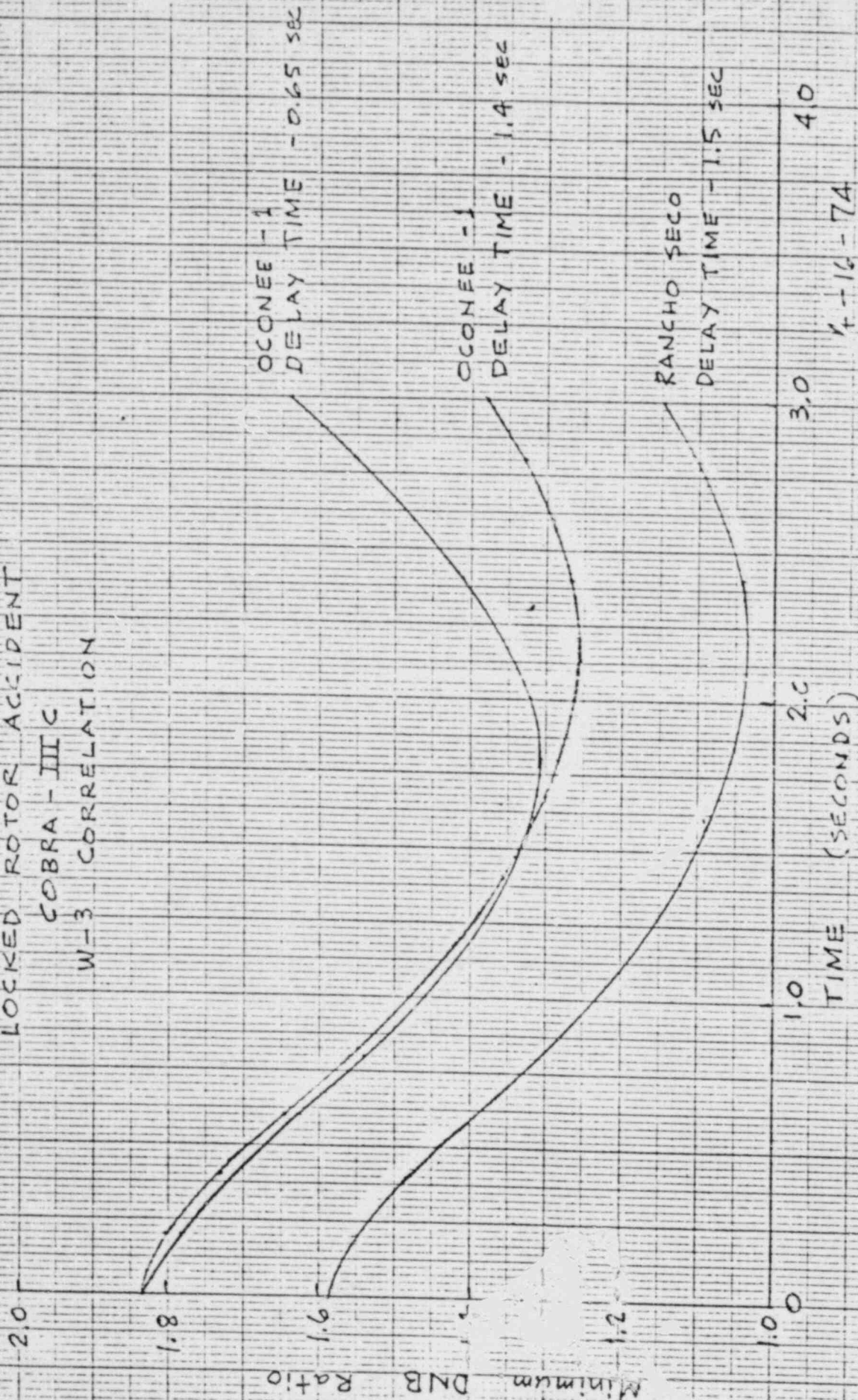
CONCLUSIONS

We find that the locked rotor accident analysis as presented in the Oconee 1/2 FSAR still acceptable under the proposed Tech Spec change in flux/flow trip delay time. This conclusion is also reached for the other B&W plants considered in this evaluation.

It should be noted that there is a considerable difference, sometimes as much as 25%, in the results obtained with the two DNB correlations, with BAW-2 giving higher values. We are in the process of reviewing this aspect generically. However, the B&W correlation is valid over a much smaller range of variables, and as such may be a "tighter" correlation. At any rate we concur in the continued use of the BAW-2 correlation for the time being.

Figure 1

LOCKED ROTOR ACCIDENT
COBRA - III C
W-3 CORRELATION



POOR ORIGINAL