THE BABCOCK & WILCOX COMPANY
POWER GENERATION GROUP

To

L.R. CARTIN, PLANT INTEGRATION

From

N.H. SHAH, ECCS ANALYSIS (2136)

BDS 663-5

Cust.

NSS-14 Davis-Besse 1

File No. or Ref.

86-2966-00

Subj.

RESPONSE TO TECO LETTER TBW-505

Date

February 14, 1979

This letter to cover one customer and one subject only.

Reference: C.R. Domeck to A.H. Lazar, "DB-1 Dual Level Setpoints on Steam Generators for Auxiliary Feedwater," TBW-505, dated January 2, 1979.

Please find attached ECCS's response to questions 1, 2, and 4 asked by TECO in their letter TBW-505, above reference.

Q/A: Reviewed and approved the responses, it's conclusions and applicability to DB-1.

Sign R. C. Jones Date 2/14/79

NHS/lc

cc: B.M. Dunn
R.C. Jones
E.A. Womack
B.A. Karrasch
E.W. Swanson
H.A. Bailey

8001160824 P

RESPONSE TO TECO LETTER TBW-505

Question 1.

Compare the small break analysis (BAW-10075A, Revision 1) with natural circulation test results considering interim operation and ultimate operation after the dual level setpoint change has been installed. Please note that TECo had also requested B&W to provide this information through TBW-503 (Item 5) dated December 4, 1978.

RESPONSE

The natural circulation test conducted at DB-1 on November 3 & 4, 1978, was reviewed for its applicability to a small break LOCA in an RC system. The test conditions of interest are as follows:

a. Steady-state natural circulation.

b. Reactor power =4% of 2772 MWt.

c. RC pressure =2200 psia (within normal range).

d. RC system full with subcooled liquid (except pressurizer).

e. SG secondary pressure =900 psia (using turbine bypass).

f. Secondary set level =variable (35" to 13 foot of cold liquid on startup and operate range).

g. Vent valves - closed.

The results showed that the natural circulation flow rates varied with the level from ~ 4.5% to ~ 5% of normal flow obtained by 4 pumps at full power. Also, for set levels above 8 foot, the steam generator heat transfer performance was adequate to cool the RC primary liquid approximately to the secondary saturation temperature. For the 35" level control, the RC cold leg temperature remained about 14F higher than the secondary saturation temperature.

During the small break transient (topical report BAW-10075A, Rev. 1), an RC pump coastdown occurs, when pump trips, due to the assumed loss of offsite power. Thus, the loop circulation during the initial stages of the transient is controlled by the pump coastdown and the system inertia and flows are in excess of natural circulation conditions. During the pump coastdown, or soon thereafter, sufficient steam will be created in the upper U-bend of the hot legs due to flashing in the hot legs and steam generation due to the decay heat, which will retard or break the continuity of the loop flow, i.e., natural circulation. The system flows thereafter are mainly governed by the loop drainage through the break and the opening of the vent valves. Thus, during a small break, the natural circulation, if it existed, would dominate for a limited period only. The ESFAS signal which occurs during the pump coastdown period will result in the auxiliary feedwater system controlled to a high level (10 foot level). As shown by the test, both the high and low levels will provide an efficient heat transfer media for decay