

THE BABCOCK & WILCOX COMPANY
POWER GENERATION GROUP

To R.B. Davis, Manager, Control Analysis

from C.W. Tally, Control Analysis

CWJ

805 663-5

Cust. TECO

File No.
or Ref. T3.59/NSS-14

Subj. Pressurizer Level Problems Following Reactor Trip

Date
December 22, 1978

This letter is cover one customer and one subject only.

On December 20, 1978, a brief study was performed on the Old Forest Road Simulator to determine the sensitivity of the reactor trip transient to the auxiliary feedwater flowrate. The results are basically qualitative because the output available for recording is in units used in the computer program and has not been user oriented. For example, pressurizer mass is available, but no level. Parameter scaling also makes quantitative results difficult to obtain. However, it was clear from the runs we made that the transient pressurizer inventory is strongly dependant on the AFW feedrate. Although we could not achieve the AFW feedrate of 1200 gpm per loop which DS-1 supposedly has, we did reach about 1100 gpm. Runs made with this flowrate were compared with others with half this rate. The effect was marked: RCS pressure and generator dropped more slowly and the minimum level reached was higher. The runs also showed that the pressurizer is not very far from empty after a normal reactor trip from 100% FP, reaching levels in the neighborhood of -45 to -50 inches. These results, although slightly more severe, basically confirm R.W. Wink's predictions i.e. maintaining some inventory in the pressurizer may be marginal for situations in which AFW is permitted to rapidly raise OTSG level to 120 inches.

I do not offer these results as evidence to stand alone. For one thing, the simulator is a training tool and not intended for analytical purposes. However, it can be quite instructive in situations like this and I believe points out the feasibility of using PT-IV (177 FA version) to do an AFW sizing analysis to support a design change to the DB-I system. It appears that this may be the salient point in the plant's capability to maintain an acceptable pressurizer level and as such, should be addressed in any discussions for a permanent fix if plans for a dual level setpoint fix fall through.

CWT/lp

cc: [REDACTED]

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