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THE EABCOCK & WILCOX COMPANY
POWER GENERATION GROUP

To |

L.R. CARTIN, INTEGRATION

From

R.C. JONES, ECCS ANALYSIS (2066)

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Cust.

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File No.
or Ref.

Subj.

SMALL BREAK ANALYSES WITH RC PUMPS POWERED

Date

DECEMBER 11, 1971

This letter is sent to customer and one retained only.

Presently approved small break analyses have all been performed assuming that offsite power is lost coincident with reactor trip. This results in tripping of the RC pumps, actuation of auxiliary feedwater, and control of the liquid level on the secondary side of the SG at high levels. Should offsite power remain available during the transient, the RC pumps will remain powered and the ICS will control the secondary side water level to approximately 30 inches by throttling the main (or auxiliary) feedwater control valve. Because of the importance of the SG water level to mitigation of small breaks, ECCS recommends an analysis of the RC pumps powered case.

In making this recommendation, ECCS has performed a review to determine what previous analyses are available with the RC pumps powered and also has made an engineering assessment of what would happen under this situation. No previous analyses could be found. However, it is expected that if any were performed, they were not done at break sizes of interest. With the RC pumps powered, it is expected that natural circulation would be maintained for a longer period of time and would aid system depressurization. Also, maintenance of the system flow would decrease T_{hot} after reactor trip and would result in a lower pressure for system flashing to occur. However, these positive influences would be offset by the decreased ability of the SG to condense steam, following the loss of natural circulation, due to the lower SG level control. It is also expected that, with the RC pumps running, a "steam pocket" will not form in the cold legs and lower quality fluid will exit through the break and thus shorten the time for the system to reach the "boiling pot" mode of the transient. An unknown factor at this time is whether or not the steam generated in the core will separate in the hot leg U-bend or be carried down into the SG and condensed. This may be an important factor for showing that the RC pumps running case is better than the present assumption of tripping the RC pumps. ECCS proposes that the impact of this phenomena be examined in a sensitivity study.

As illustrated above, it is not obviously clear that leaving the RC pumps running results in an enhanced ECCS situation. Thus, ECCS recommends an analysis be performed to examine this case. ECCS proposes that this analysis be run on the 205 FA plants for the following reasons:

Att's
Ex. CPU 330 For ID
Date 7-2-81 J.R. Danyo

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RC Jones to LR Cartin
Subject: Small Break Analyses With RC Pumps Powered

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Dec. 11, 1978

1. The present 205 FA small break topical (BAW-10074) assumes heat removal typical of that for the 177 FA plants. Therefore, a comparison of the pumps on case to BAW-10074 will provide an assessment of the impact on the 177 FA plants.
2. There presently exists an FAC model on the 205 FA plants.
3. The new SC model in CRAFT has been exercised on the 205 FA plants. This model more properly accounts for SC performance during the transient for the 205 FA and VEPco plants. Comparison of the pumps on case to recent 205 FA plant studies will provide information on the impact for 205 FA and VEPco plants.

It is expected that this work could be scheduled into the ECCS Unit workload now because of slippage in the NRC small break standard problem and the 205 FA small break work. It is estimated that this work will require 300 mh and 10 CDC hours and a span time of 3 months. Niru Shah will be the contact in ECCS for this issue. If any questions arise, please contact him, or call me on extension 2066.

RMJ/lc

cc: B.M. Dunn
H.A. Easley
E.W. Swenson
E.A. Wenzel
S.H. Duerson
B.A. Karrassch

- ① This satisfies the curiosity of the small break group in ECCS, but does not help Toledo establish a footprint based on pumps.
- ② It does no good for 205's, because no NRC footprint exists for 205's.
- ③ It does not reflect the Jeco HPI pumps.
- ④ I have no assurance that 205's will pass the test - Jones listed too many variables.
- ⑤ It only satisfies the timeliness needs of Jeco - not their design needs.

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