FEB 1 8 1976

Richard C. DeYoung, Jr., Assistant Director for LWR's, DPM

REQUEST FOR ADDITIONAL ECCS INFORMATION ON DAVIS-BESSE 1

We are currently evaluating the submitted ECCS analyses for Davis-Besse 1. In addition to topical report BAW-10105, "ECCS Evaluation of B&W's 177-FA Raised Loop NSS," we are reviewing the contents of the letters from Toledo Edison Company dated July 9th, July 21st September 5th and October 8, 1975.

In addition to questions submitted to B&W pertaining to BAW-10105, enclosed is a list of additional information that is required for our review.

Original signed by
D. F. Ross

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Enclosure:
Request for Additional Information

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Form AEC-318 (Rev. 9-53) AECM 0240 U. S. GOVERNMENT PRINTING OFFICE: 1974-526-166

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DAVIS-BESSE 1

REQUEST FOR ADDITIONAL INFORMATION

1. Justify the selection of initial pin pressure and oxide layer for the CFT line break (referenced in BAW-10103 to FSAR). Explain not considering the Case 1 power shape previously shown to produce a higher PCT. What value of LHGR was assumed and why?

2. With regard to the single failure analysis in your letter dated September 5, 1975;

   a). The core flooding line isolation valves CFIA and CF1B will be required to have power disconnected and breakers locked open.

   b). Attachment 1 states that if valve HP1556 spuriously closed during the injection phase of a LOCA, there will be no effect on HPI capability. To confirm that your evaluation was complete, provide the details of your study which considered this spurious closure during a small break which allows RCS pressure to remain above the cut-off head of the HPI pumps for such a time as to compromise pump integrity (due to the loss of the 1 ½-inch bypass lines). Provide the time that you assumed it would take before pump damage would occur and relate this situation to its affect on the capability to meet the criteria of 10 CFR 50.46.

3. Your July 9, 1975 letter indicated that, with the exception of decay heat suction valves DH-11 and DH-12, no critical equipment is affected by post-LOCA flooding. Provide the level of water (above the containment floor) assumed for the LOCA and include the calculations upon which this value is based. Also, the statement is made that a water-tight "trench" will enclose valves DH-11 and DH-12. Provide a description, with diagrams, of the trench and discuss the surveillance planned to ensure that this installation remains water-tight throughout the reactor lifetime.

4. With regard to the partial loop analyses in your October 8, 1975 letter;

   a). Provide an analysis of a break in the idle pump discharge.

   b). Explain the double peak in cladding temperature under 20 seconds and explain why the 1st peak is more pronounced in this analysis relative to the 4-pump break spectrum and relative to the 3-pur analyses for other category plants.

c). Provide assurance that the PCT versus break size curve in BAW-10105 would not be significantly altered by partial loop operation.

d). Submit the LOCA parameters of interest identified in the "Minimum Requirements for ECCS Break Spectrum Submittals," dated April 25, 1975.

e). Explain the basis for the initial power level assumption of 77% for 3-pump operation.

f). It is stated that the containment building pressure calculated by CONTEMPT is similar to the worst case in BAW-10105. Why didn't the lower initial core flow and power level for 3-pump operation result in a lower containment pressure?

g). Provide the core-wide metal-water reaction for 3-pump operation.

h). Submit the values of initial pin pressure and oxide layers assumed and justify the selection of these values.

5. Provide your schedule for submitting the proposed Technical Specifications affected by the LOCA analysis.

6. Provide the passive failure analysis committed for January (see your September 5, 1975 letter).

7. With regard to the ability of Davis-Besse 1 to cope with potentially high boron concentrations in the long term after a LOCA, the staff notes that Toledo Edison Company has referenced B&W topical report BAW-10105 (see letter dated July 21, 1975). The following additional information is required:

   a. More recent boron dilution design proposals on such dockets as WPPSS and Oconee have the advantage of greater simplicity relative to the multi-mode piping networks described in the topical report. Also, it is the staff's position that Mode 1 (forced circulation through the decay heat drop line) should not be attempted as a method to control boron concentration in the core during long-term cooling. The success of this mode is not ensured because of the possibility of gas or steam entrainment in the decay heat suction nozzle. Such gas or steam entrainment can result in severe damage to the decay heat removal pump. Long-term heat removal requirements can exist for long durations (days or months) after the accident and continuous operation of one train of the decay heat removal system is required. In the event of equipment malfunction in this train, no method is available to remove the decay heat if the other train has been previously damaged. For the same reason, step 7 on page 10-7 should also not be attempted.

It is preferred that a simple design exist for boron dilution whereby operator involvement with major ECCS components that fulfill the primary role of long-term heat removal is kept simple and to a minimum. Accordingly, discuss alternate means to provide dilution of boron during the long-term after a LOCA.

b. Temperature indicators are not satisfactory instrumentation to verify that a minimum flow rate of 40 gpm is maintained. The staff requires flow rate indicators which will clearly show the operator that this minimum flow rate is achieved and maintained over the long term.

c. Discuss common power supply problems and the procedure to restore a loss of power to essential valves. Also, address possible access problems due to high doses should such a power loss occur after the shift to the recirculation mode.

d. Discuss the capability to test the dilution systems.

e. Discuss the feasibility of gravity draining from the hot leg to the sump.

f. Indicate the feasibility of monitoring boron concentration levels during the long term.

8. With regard to the REFLOOD code resistance values in Table 4-2 of BAW-10105 used for loop venting calculations, insufficient information exists to support the values selected.

   a. Identify each parameter which has been derived from actual measurements made on plant systems, components, models and/or prototypes. Provide calculations to show how these measured parameters were converted to the K-factors presented in Table 4-2.

   b. For each flow path shown in Table 4-2, justify the appropriateness of the flow resistance for Davis-Besse 1. For example, it is not clear that the most conservative areas were selected to serve as a generic calculation applicable to Davis-Besse 1.

   c. To allow a greater understanding of the effect of these resistances on reflood rate, re-submit Table 4-2 with the flow paths listed in decreasing order of importance to peak cladding temperature calculations. Provide the specific sensitivity study (peak cladding temperature versus K-factor) for the first, middle, and last value.

9. It is noted that no additional flow resistance was added to the cold legs due to the HPI pumps injecting ECC water during reflood. Evaluate the effect of an additional 0.25 psi cold leg ΔP upon the reflood rate and cladding temperature. For the LOCA limit analysis, compare the existing time at which the reflood rate goes below 1 in/sec to the new time calculated using the additional cold leg resistance.

10. Justify that the assumed CFT line resistance is appropriate for Davis-Besse 1. Provide the L/D's for the CFT line for Davis-Besse 1 and include the entrance and exit losses.