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Docket No. 50-346

Richard C. DeYoung, Assistant Director for Light Water Reactors, Group 1, L

REQUEST FOR ADDITIONAL INFORMATION FOR DAVIS-BESSE

POOR ORIGINAL

Plant Name: Davis-Besse
Licensing Stage: OL
NSSS Supplier: Babcock and Wilcox
Architect Engineer: Bechtel
Containment Type: Dual
Docket No.: 50-346
Responsible Branch & Project Manager: LWR 2-3; I. Peltier
Requested Completion Date: September 6, 1974
Applicant's Response Date: December 6, 1974
Review Status: Awaiting Information

The enclosed request for additional information (Q-2) for the Davis-Besse Nuclear Power Station operating license review has been prepared by the Containment Systems Branch after having reviewed the applicable sections of the FSAR.

Our questions pertain to the containment analysis, subcompartment analysis, bypass leakage analysis, containment isolation system, and hydrogen control system.

Original signed by:
Robert L. Tedesco

Robert L. Tedesco, Assistant Director
for Containment Safety
Directorate of Licensing

Enclosure:
As stated

cc: w/o encl.
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03.0 CONTAINMENT SYSTEMS BRANCH

03.1 (6.2.1) For the design basis loss-of-coolant accident, specify the integrated energy release to the containment up to the end of the initial blowdown phase.

03.2 (6.2.1) As requested previously (see Question 6.2.12), provide a curve of air cooler performance showing energy removal rate as a function of containment atmosphere temperature.

03.3 (6.2.1) With respect to the main steam line break analysis, discuss possible single failures in the main and auxiliary feedwater systems by which additional fluid could be added to the affected steam generator. For example, the failure of isolation valves to close in the main or auxiliary feedwater lines should be considered.

03.4 (6.2.1) For typical vent flow paths in the reactor cavity and steam generator compartments, present the method including the assumptions made, of calculating the flow coefficients for the vent flow paths. Also provide the entrance and exit loss coefficients and $\frac{fL}{D}$'s for all vent flow paths.

03.5 (6.2.1) For the postulated pipe breaks considered in the subcompartment analysis, provide tables of mass and energy release data (lbm/sec and Btu/sec) as functions of time (sec) over the time span of interest for subcompartment analysis.

03.6 (6.2.1) The statement is made in the discussion of the reactor cavity analysis, on page 6-16 of the Davis-Besse FSAR, that the insulation was assumed to blow off immediately. Describe in more detail the insulation that is being referred to and discuss the validity of the assumption. Also discuss how other removable vent flow path obstructions, such as sand plugs, were treated in the analysis.

03.7 (6.2.1) In the discussions of the subcompartment analyses, on page 6-16 of the Davis-Besse FSAR, the statement is made that the calculated pressures are below the maximum allowable. Specify the maximum allowable pressures.

03.8 (6.2.1) Figure 5-4 shows restraint rings around the hot and cold leg pipes of the reactor coolant system, within the primary shield pipe penetrations. Discuss whether or not the restraint rings were considered in evaluating the vent flow path areas for the reactor cavity analysis. If they were not considered, redo the analysis.

03.9 (6.2.1) Describe and discuss the function of the restraint rings shown around the reactor coolant system pipes, within the primary shield pipe penetrations (see Figure 5-4). Provide drawings of a restraint ring.

03.10 (6.2.1) From Figure 5-4, it appears that a limited displacement break or split break could occur within a primary shield pipe penetration. Provide an analysis of a pipe break within a pipe penetration, and compare the results to the design capability of the primary shield.

03.11 (6.2.3) Identify all high energy lines that pass through the shield building annulus, and indicate whether or not guardpipes have been provided. For the high energy lines that are not provided with guardpipes, provide analyses of postulated pipe breaks within the annulus. Graphically show the pressure response of the annulus. Provide tabulations of the mass and energy release data for the postulated pipe breaks. Describe the method of analysis, including the assumptions made regarding heat sinks and outleakage. Specify the external design pressure of the containment and the design pressure of the shield building.

03.12 (6.2.3) Discuss when, during normal plant operation, purging of the containment would be required, and the frequency and duration of purge operations. Estimate the fraction of time during a plant operating cycle that the purge system would be operated.

03.13 (6.2.3) Provide an analysis of the radiological consequences of a loss-of-coolant accident assuming the containment purge system is operating at the time of the accident. The analysis should be done for a spectrum of pipe break sizes. The instrumentation and setpoints that actuate the purge system valves closed should be identified and justified. Specify the purge valve closure times, including instrument delays. Provide assurance that the safety features actuation system setpoints will be reached and that containment isolation will occur. The radiological source term should consider the activity in the primary coolant until fuel rod perforation is calculated to occur, then a fission product release model based on Regulatory Guide 1.4 should be assumed.

03.14 (6.2.3) Discuss the capability of the structures and safety-related equipment located beyond the purge system isolation valves to withstand, without loss of function, the environment created by the escaping air, steam and debris.

03.15 (6.2.3) Provide an analysis of the pressure reduction caused by the escaping air and steam during a loss-of-coolant accident for ECCS backpressure determination.

03.16 (6.2.3) Describe the analyses or tests that have been or will be conducted to demonstrate the capability of the containment isolation valves, in particular, valves whose lines are open to the containment atmosphere such as the containment purge system valves, to function under the dynamic loading conditions resulting from high air and steam flow rates, and high differential pressures following a pipe break accident. Justify that test conditions are representative of conditions that would be expected to prevail following a pipe break accident. Provide the analytical and test results.

03.17 (6.2.3) Provide a tabulation of the vent areas between the rooms served by the emergency ventilation system, including the shield building annulus.

03.18 (Q6.2-23) In the response to Question 6.2-23 it is assumed that many isolation valve arrangements and seals and gaskets on airlocks, hatches, and flanges are leaktight. Also from the test it is difficult to determine which containment penetrations and system lines are actually potential leakage paths which could bypass the volumes treated by the emergency ventilation system (EVS) following a LOCA. Therefore, identify all system lines which penetrate the containment and enter areas not served by the EVS, and penetrations which interface directly with areas not served by the EVS. Discuss the basis for estimating the through-line leakage or leakage past seals and gaskets for each penetration. [illegible] bypass leakage path, and express the total bypass leakage as a fraction of the containment design leak rate. Estimate the leakage from the shield building annulus and other areas served by the EVS during the time period following a LOCA when a positive pressure exists in these areas.

03.19 (6.2.3) Describe the proposed leak test program to measure the fraction of containment leakage that bypasses the shield building annulus and other areas served by the emergency ventilation system.

03.20 (6.2.5) Specify the capacities of the containment recirculation system fans.

03.21 (6.2.5) Provide a curve of the hydrogen concentration in the containment as a function of time with one train of the containment hydrogen dilution (CHD) system operating. Provide a curve of the containment pressure as a function of time, and specify the time after CHD system operation that the limiting containment pressure would be reached.