QUESTION 010.4

"We require that the compartment between the containment and the safety valve house which houses the main steam lines and feedwater lines and the isolation valves for those lines, be designed to consider the environmental effects (pressure, temperature, humidity) and potential flooding consequences from an assumed crack, equivalent to the flow area of a single ended pipe rupture in these lines. We require that essential equipment located within the compartment, including the main steam isolation and feedwater valves and their operators be capable of operating in the environment resulting from the above crack. We also will require that if this assumed crack could cause the structural failure of this compartment, then the failure should not jeopardize the safe shutdown of the plant. In addition, we require that the remaining portion of the pipe in the tunnel between the safety valve house and the turbine building meet the guidelines of Branch Technical Position APCSB 3-1.

"We require that you submit a subcompartment pressure analysis to confirm that the design of the pipe tunnel conforms to our position as outlined above.

"We request that you evaluate the design against this staff position, and advise us as to the outcome of your review, including any design changes which may be required. The evaluation should include a verification that the methods used to calculate the pressure buildup in the subcompartments outside of the containment for postulated breaks are the same as those used for subcompartments inside the containment. Also, the allowance for structural design margins (pressure) should be the same. If different methods are used, justify that your method provides adequate design margins and identify the margins that are available. When you submit the results of your evaluation, identify the computer codes used, the assumptions used for mass and energy release rates, and sufficient design data so that we may perform independent calculations.

The peak pressure and temperatures resulting from the postulated break of a high energy pipe located in compartments or buildings is dependent on the mass and energy flows during the time of the break. You have not provided the information necessary to determine what terminates the blowdown or to determine the length of time blowdown exists. For each pipe break or leakage crack analyzed, provide the total blowdown time and the mechanism used to terminate or limit the blowdown time of

flow so that the environmental effects will not affect safe shutdown of the facility."

RESPONSE

Qualification tests have been conducted for the components in the safety valve house. The components include the main steam and main feedwater isolation valves, the main steam power-operated relief valve, and the main steam safety valves. These tests conservatively applied aging, radiation, seismic, and worst case environmental (temperature, pressure, and humidity) loading to the components, and showed that loss of function did not occur.

The portion of the main steam and main feedwater pipe in the tunnel between the Safety Valve House and the Turbine Building meets the guidelines of Branch Technical Position APCSB 3-1. A special pipe whip restraint is located around each pipe as it passes through the wall separating the isolation valve room from the main steam tunnel. This restraint limits the amount of strain that can be transmitted to the isolation valves from any pipe break in the tunnel to a level which will not interfere with the proper functioning of the isolation valves.

The safety valve room, the steam tunnel, and the compartment between the containment and the safety valve room all have the same basis for design. These compartments have been designed for pressurization, impingement and temperature as specified in Table 3.8-10, load combinations 8, 13, and 14.

An assumed pipe crack or break in the tunnel, isolation valve room, or safety valve house cannot cause structural failure. The subcompartment pressurization analysis is included as Attachment C3.6 to the FSAR. The methods used to calculate the pressure buildup and allowance for structural design margins in subcompartments outside the containment (Attachments A3.6 and C3.6) are the same as those used for subcompartments inside the containment.