Docket No. 50-133

Dennis L. Ziemann, Chief Operating Reactors Branch #2, L

LIQUEFACTION PROBLEM AT THE HUMBOLDT BAY SITE

As reported in the November 19, 1974 memorandum, the Site Analysis Branch (SAB) has completed its review of the Dames and Moore report, "Evaluation of Liquefaction Potential - Humboldt Bay Power Plant." I met with T. Cardone, J. Greeves and L. Heller of SAB on November 26, 1974, to discuss the results of their review and possible solutions. I had briefly discussed the liquefaction problem at Humboldt with Joe Scinto, OGC, on November 22, 1974.

The SAB staff's position is that liquefaction would occur at the Humboldt Bay site for earthquakes with a maximum acceleration of 0.4g or greater. Although a definitive value has not been assigned to the Humboldt Bay site for the SSE, values have been proposed at other meetings ranging from 0.5 to 0.7g with the most probable value being 0.66g. The SAB staff's position regarding liquefaction at the assumed OBE value of 0.25g is that additional data is required to establish whether liquefaction could occur for motion durations of up to 50 cycles.

Based upon the above SAB staff's position (which I assume is the Regulatory position), the liquefaction problem at the Humboldt Bay site represents an unreviewed safety question. The SAB staff also states that an engineering solution to the liquefaction potential may be possible to prevent failure of Category I structures. Whether or not an engineering solution is both feasible and worth the cost must be determined by PG&E. If an engineering solution such as grouting is feasible, the SAB staff has estimated that 9 months to a year would be required to complete the project. A possible cost range cannot be estimated since such an engineering project will depend on extent and feasibility but certainly could cost several million dollars.

The SAB staff is going to inform E. Case of the liquefaction problem and possible solutions as discussed at our meeting for the Humboldt Bay site. If this problem is considered in the same context as the high energy pipe break outside containment, i.e. an unreviewed safety question, the necessary fixes would have to be made as soon as possible with continued operation of the facility permitted only if additional surveillance was performed to reduce the probability of such an accident.

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Since additional surveillance is not credible for the earthquake liquefaction, should the facility be allowed to operate until an acceptable fix has been completed? I recommend that we request PG&E to have Dames and Moore perform the additional tests at the OBE value of 0.25g suggested by the SAB staff, i.e. up to 50 cycles. These tests could be completed in two weeks if the samples are available (as they should be) or six weeks if the samples have to be obtained from the site. If these results indicate that liquefaction can occur at the OBE, the facility should be shutdown until the engineering solution to the liquefaction problem has been submitted, and we have approved the methods and the work has been completed. If these results indicate that liquefaction cannot occur at the OBE for motion durations of up to 50 cycles, the facility should be allowed to operate for one year to allow time for the engineering solution to be reviewed, approved and installed at the Humboldt Bay site. I recommend that we prepare a letter to PG&E indicating the results of our review of the liquefaction problem at the Humboldt Bay site along with our position regarding the timing for a solution depending upon the additional data and period in which to obtain such results. Also to be considered is that: (1) Humboldt Bay is currently shutdown for refueling with scheduled startup for December 6, 1974, which may be delayed due to the required ECCS analysis, (2) the current refueling was minimal to allow six months operation with scheduled refueling again in June 1975 and (3) our letter of January 4, 1974, required all modifications for OBE be completed by July 31, 1975 for continued operation of reactor. Our letter should also state that a meeting to discuss our conclusions and the program necessary to obtain the additional data would be appropriate.

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