

Diablo quake study

Engineering judgment basis of vote

By Carl Neiburger
Staff Writer

A federal report released Thursday says Nuclear Regulatory Commission licensing and appeal boards were right when they approved earthquake criteria for the Diablo Canyon nuclear power plant.

But the report kicks hard at some of the scientific claims used to prop up those rulings.

The report, produced by the Nuclear Regulatory Commission's Office of Policy Evaluation, said engineering judgment — not scientific proof — support the decisions by NRC licensing and appeal boards.

The commission cited the report last week when it voted 3-2 to uphold the earthquake safety determination.

The report was made public Thursday after plant opponents and Rep. Leon E. Panetta, D-Carmel Valley, asked for it.

The seismic safety criteria for the Diablo plant were approved by the licensing board in 1979 and upheld last June 16 by an NRC appeal board.

The boards' findings were endorsed by the report: "Overall, ... there is no basis for concluding that the appeal board erred in its decision regarding the adequacy of the seismic design criteria."

The report noted, however, "There are uncertainties in several areas" of the appeal board decision.

"On some issues the appeal board appears to have relied on the engineering judgment of key witnesses"

Among these issues was the intensity of ground vibrations that could be produced by the Hosgri fault, 3 miles offshore of the Diablo plant, and the use of a concept called the "tau effect" to justify reductions in these vibrations in some instances.

The witnesses the board relied on were the late Nathan M. Newmark, a University of Illinois engineer retained by the NRC staff, and John A. Blume, a Palo Alto engineering consultant hired by Pacific Gas and Electric Co.

The appeal board accepted Newmark's

testimony that the largest ground vibration the nuclear plant would feel if a 7.5 magnitude earthquake occurred on the Hosgri fault would be 0.75 times the acceleration of gravity.

Plant opponents claimed a major earthquake could produce shaking in excess of 1.2 times gravity.

The NRC report said "... questions arise about the assumptions Newmark may have used to make his calculations.... Other assumptions appropriate to Diablo Canyon can result in numbers higher than 0.75 g."

It added, "We believe there is insufficient evidence in the record except for

The report also suggested that Blume manipulated data.

Dr. Newmark's engineering judgment to allow us to conclude that 0.75 g is the appropriate anchor point...."

"This does not necessary indicate that .75 g is an inappropriate value, just that it is difficult to demonstrate its validity from Newmark's (testimony and data cited by him)."

The report also questioned evidence supporting the tau effect, which it described as term used by engineers to explain why earthquakes cause less damage to large buildings than they theoretically should.

While such a phenominon probably exists, the report said, there is too little data to explain why it exists or to show how to calculate it.

The report also suggested that PG&E consultant Blume manipulated data to minimize earthquake accelerations:

"Blume appears to have assumed earthquake wave velocities which are low when calculating the tau effect. This increases the tau effect. Blume assumed high wave velocities when calculating

peak accelerations. This decreases the peak."

The report said the tau effect may have also been included in the 0.75 g effective acceleration so, "there may be some double counting in these two reductions, ... but we are unable to confirm this."

Opponents of the Diablo plant said the report vindicated their contentions that the licensing and appeal boards erred in their rulings.

"So often the evidence looks good for us and yet, in the face of evidence like that, the NRC draws the opposite conclusion," said Nancy Culver of Mothers for Peace.

She said the commission and its subsidiary boards invoked "engineering judgment" to excuse their failure to confront the issues:

"They just say that if Newmark said it then they believe it." Culver said. "It's hard to argue with that kind of thing."

Pacific Gas and Electric Co. engineer John R. Sumner said he was pleased that the NRC report — and the commission itself — sustained the earlier rulings.

"The (commission's) conclusion was good," he said, "but I think the licensing board's point of view was even better."

He said the engineering judgment cited by in the report is "supported by facts."

Sumner said the nuclear plant's design still contained engineering safety margins and the issue was merely how large those margins should be.

Culver questioned whether the margins exist: "PG&E's gone through those margins several times at least," she scoffed.

Lawrence Coe Lanpher, a lawyer for Gov. Edmund G. Brown Jr., said the report showed, "There really isn't a basis for the judgment of the appeals board."

He quoted a statement by NRC member Victor Gilinsky, who dissented from the decision to uphold the appeal board ruling:

"We cannot escape the impression that the commission is declining review not because the (appeal board's) opinion is essentially sound but because it is unsound and the prospect of reviewing it is so unsettling."