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OFFICE OF SECRETARY
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October 13, 1981

The Honorable Victor Gilinsky
Commissioner
Nuclear Regulatory Commission
1717 "H" Street, N.W.
Washington, D.C. 20555

Dear Mr. Gilinsky:

I wish to commend your recent public statements questioning how the recently discovered design error at Diablo Canyon occurred and went unnoticed for several years. You are absolutely on target when you question the system that produced the man-made error.

The design error was predictable and even anticipated by experienced engineers and construction personnel. It is a direct result of the lack of detailed independent review for errors in design and construction drawings by the Nuclear Regulatory Commission.

The overall problem is far more serious than Diablo Canyon, because over seventy nuclear plants have now been built and are operating wherein only design criteria and methods were reviewed by the NRC. No detailed review to detect possible errors in the calculations and construction plans was made by the NRC.

The present system relies almost entirely on Quality Assurance Programs developed and administered by the utility company constructing the facility. It is common knowledge that, as with Diablo Canyon, such programs are far from perfect!

Isn't it likely that other undetected design errors exist?

Please do all in your power to change the present system of reviews. In addition, please see that an in-depth detailed independent review for design errors is made at all of the existing facilities and those that are in process of receiving operating licenses.

Very sincerely yours,

Stanley H. Mendes
Structural Engineer

SHM:pm

Enclosures 8

Inquiry on Diablo Reactor Design Expanded to Five Safety Systems

By JUDITH CUMMINGS
Special to The New York Times

LOS ANGELES, Sept. 30 — A Federal inquiry into design errors at the Diablo Canyon nuclear power plant, which focused at first on improper placement of supports protecting a cooling system against earthquakes, was broadened today to include five key safety systems.

The Pacific Gas and Electric Company confirmed today that some blueprints for the completed reactor were inadvertently switched with those for a second still under construction. As a result, stresses on the "seismic support hanger" would be different.

At issue in the expanded Federal inquiry is whether the reactor components could withstand an earthquake. The plant has been the target of repeated demonstrations because its site is near an offshore earthquake fault at San Luis Obispo, Calif.

Company Conducting Investigation

"It is a first-rate screw-up," said Peter Bradford, a member of the Nuclear Regulatory Commission. "Here you have the most controversial area of discussion in what is probably the most controversial nuclear plant in the country. To commit an error of that sort is almost analogous to a student copying down the wrong homework assignment: No matter how brilliant the work from then on, he's just not going to get the right answers."

The structural problems affect both reactors, according to a member of commission. A spokesman for Pacific Gas, George Sarkisian, said today, "We're aware of that possibility, and we're examining that right now."

Officials of the power company appeared before the commission in Washington to brief the five members on problems at the plant. Statements from the company, which reported the problem to the Federal authorities on Monday, had at first indicated only that the plans for the second reactor were mistakenly used in building part of the first.

Today, utility officials told the commission that five systems were involved in the blueprint switch and consequent

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REACTOR INQUIRY POSES NEW DELAYS

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errors in analyzing stresses affecting the fuel containment chamber.

Yesterday, the company reported the design "discrepancy" in the residual heat removal system, which disperses remaining heat when the reactor is shut down for refueling and also acts as a back-up cooling device in the event of a nuclear accident.

The other systems involved are the safety injection system, including accumulators and piping; the component cooling water system, including the fan cooler, reactor coolant pumps and piping; the steam generator blowdown system, including piping; and the hydrogen recombiners.

All except the hydrogen recombiners are systems involved in cooling the reactor in case of shutdown or nuclear accident. The recombiners remove explosive hydrogen from the reactor if hydrogen is created in an accident.

The error was made while the company was attempting to strengthen the systems to meet higher seismic safety standards set by the regulatory commission.

The transposition of the diagrams, Mr. Bradford said, resulted in "the plant designers' assuming that the fan cooler motors were in different places than they actually are in the container. They are the heaviest item, and they are the key to predicting the stresses in an earthquake."

Stresses Probably Miscalculated

"Therefore, there is a very high likelihood that the stresses themselves were mispredicted for the systems," he said. "The result is that they may have built those systems more strongly than needed in some places and not strongly enough in others."

Mr. Sarkisian, the power company spokesman, said that computer analysis of seismic shock strengths was performed for the company by Dr. John Blume & Associates of San Francisco, which he called the country's leading authority on seismology. Dr. Blume did both the original analysis, when Unit One was built, and a second when the shock standards were raised.

Mr. Sarkisian said it had not been determined where the blueprints were mixed up.

"We had to submit the blueprints to him for analysis, and that's where the confusion started," Mr. Sarkisian said, adding that he did not know whether it was a case of the diagrams being mislabeled, and if so whether by the power company or by the consultant.

Pacific Gas and Electric officials are to appear before the commission again Monday to report on their investigation of the incident. Commission staff said that the error in the completed reactor might never have been found if company employees had not discovered structural errors during a review of the unfinished second unit.

The blunder will cause a further delay in plans to start the first reactor, which could have gone into full operation early in 1982, pending successful testing, company officials said.

New York Times
October 1, 1981
Front Page

LOS ANGELES TIMES, June 29, 1979

THE NATION

Los Angeles Times
6/29/79

Quake Vulnerability Found in 11 A-Plants

Pipes in at least 11 nuclear power plants do not match their original earthquake-resistance design requirements, the Nuclear Regulatory Commission's staff asserted. Staff members told the commission that a bulletin would soon be issued to all nuclear plants, requiring studies to determine whether pipe designs are safe and whether they were actually built as designed. Departures from design are considered serious, since they could lead to disruption of reactor safety systems during an earthquake and cause a nuclear accident as severe, or worse than the one three months ago at Three Mile Island in Pennsylvania, an official said.

ENGINEERING NEWS RECORD

September 17, 1981

Post-TMI safety fixes confound utilities

Soul-searching discussions between the Nuclear Regulatory Commission staff and utilities have confirmed suspicions that unless proposed safety fixes resulting from the Three Mile Island accident are phased in slowly, their monumental scope could make operating reactors less safe than before the 1979 mishap.

NRC's office of inspection and enforcement surveyed senior officials and operators at nine private utilities, the Tennessee Valley Authority and the Power Authority of the State of New York. The comments received confirmed the belief within NRC that the impact on utilities of implementing 50 post-TMI safety fixes, in addition to the normal flow of NRC orders, is straining manpower and financial resources to the breaking point.

As a result, NRC is currently assessing ways to implement the new requirements without hindering the operational safety of plants. That may prove difficult if the situation described by utilities in the survey applies to all nuclear plant owners.

For instance, the utilities stated that mandated NRC safety backfits, in some cases, are requiring construction crews larger than those that built the plant. For older plants, the costs of safety fixes can exceed the original plant cost.

One utility stated that workers putting in new base plates for piping supports had to drill 10 holes for every good one because the rebar was so close together. Space is so tight that patch jobs are nearly impossible, and as one owner told NRC, "Many plants are already too complex even to walk around in."

Moving target. Changing regulations are confounding construction, the utilities claim. One has initiated 300 engineering change orders for implementation between 1981 and 1983 due to NRC requirements. Operators reported it is impossible to keep up with new procedural changes. At one plant 450 changes were made last year and 205 during the early months of 1981.

"Real operational and design reviews are being delayed because no other actions are possible due to getting NRC requirements completed," one utility manager stated. "We are too busy to really help ourselves. As we see it, NRC better be right about the requirements."

The numbers and degree of required fixes has meant huge volumes of work for architect-engineers. One utility reported it spent $18 million for outside engineering in 1980. Utilities are competing in-house for the strained resources of A-Es. "Their engineers have become coordinators," one owner says. "They are losing touch and buying work, in some cases of poorer quality."

"Architect-engineers are making a large amount of money on interpreting the rules," another utility manager complained. "Is this really a role of the A-E or should the rules be properly articulated by the NRC?"

Reactor vendors came in for the criticism from a few plant owners. "Vendors are getting away with murder," one told NRC. "It sometimes seems they work with the NRC to get requirements from the staff to benefit themselves." Another claimed that the emphasis being placed on proper training as a solution to all operational problems is a "cop-out," especially by vendors.