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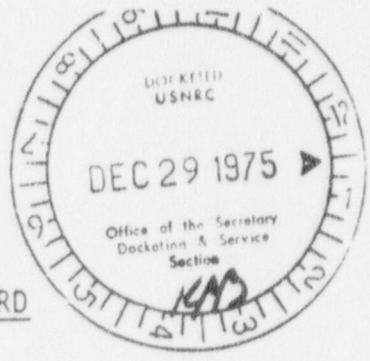

12-29-75

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
PACIFIC GAS AND ELECTRIC COMPANY	)	Docket Nos. ~~50-275 OL~~ 50-323 OL
(Diablo Canyon Nuclear Power Plant, Units 1 and 2)	)	

ORDER RELATIVE TO MOTIONS FROM SAN LUIS OBISPO MOTHERS FOR PEACE AND JOHN J. FORSTER PERTAINING TO SPECIAL NUCLEAR FUEL

By Order of June 24, 1975, the Board recited the various filings which flowed from the San Luis Obispo Mothers for Peace (MFP) motion of April 10, 1975 protesting the receipt by PGandE of nuclear fuel assemblies within the County of San Luis Obispo until a valid operating license has been issued and become effective for the Diablo Canyon Units 1 and 2. The Board Order determined that jurisdiction would be accepted and set forth the issues to be considered. A Board Order also dated June 24, 1975 granted Mr. John J. Forster's (Forster) motion "to associate with and support" the MFP motion concerning the receipt of nuclear fuel assemblies.

On September 2, 1975, the NRC Regulatory Staff (Staff) filed a "Joint Motion for Schedule for Fuel Storage Motion Hearing" which

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informed the Board that the parties agreed on a schedule for discovery and the evidentiary hearing. It was assumed that the Staff Part 70 Supplement to the Safety Evaluation Report would be issued on September 26, 1975 and the hearing would begin on October 21, 1975, but if the Staff did not issue its Part 70 Supplement on September 26, 1975, the hearing would be delayed on a day-for-a-day basis. On September 8, 1975, the Board issued an order adopting the proposed schedule with the proviso that a minor adjustment might be made to avoid commencing the hearing on a weekend or official holiday. The Staff document was issued on November 10, 1975. By Order of November 14, 1975, the Board determined that the evidentiary hearing would commence on December 9, 1975 at a designated place in San Luis Obispo, California.

The MFP filed a motion, dated November 18, 1975, for postponement of the scheduled hearing so that they could attend the "Warren Hearing" in Sacramento, California. PGandE responded on November 21, 1975 and the Staff on December 1, 1975. The Board denied the motion in its telegram of December 3, 1975 for reasons stated.

On December 4, 1975, the MFP and Forster filed a joint motion for a "continuance" of the scheduled evidentiary hearing on Special Nuclear Fuel on the basis that they had not been permitted inspection and discovery of security devices and plans. This motion was considered at

the beginning of the evidentiary hearing on December 9, 1975. After hearing from the parties, the Board denied the motion on the record on the basis that the movants would not be prejudiced since for the purposes of the hearing, it was assumed that saboteurs would gain entrance to the facility (Tr. pp. 644-658).

A total of fifty-three persons gave limited appearance statements. PGandE and the Staff responded to specific questions pertinent to special nuclear fuel and promised to respond to other matters at the operating license evidentiary hearing.

BACKGROUND INFORMATION

1. Inasmuch as this was the first public hearing to be held concerning matters related to the granting of a 10 CFR 70 license for the on-site storage of unirradiated fuel, no well-established guidelines as to the scope of the hearing existed. However, in the Board's view, the relevant consideration is set forth in 10 CFR 70.31(d), where it is provided that the Commission will not issue such a license if it finds:

> "... that the issuance of such a license would be inimical to the common defense and security or would constitute an unreasonable risk to the health and safety of the public."

2. It was established during the construction permit proceedings that the plant, with all its fuel, would not be inimical to the common defense and security. The issue to be considered by the Board was therefore whether the presence of the fuel at the site would constitute an unreasonable risk to the health and safety of the public.

3. The MFP motion expressed two concerns: the possible effects of seismic activity and of sabotage. The Board, in its order of June 24, 1975, requested all parties to be prepared to present evidence on the following matters:

    1. The forces to which the fuel storage building could be subjected as the result of the occurrence of a hypothetical earthquake appropriate for this site;
    2. The probability and significance of the formation of a critical mass as a result of the application of this force (including the presence of water due to possible pipe breakage);
    3. The probability and significance of a critical mass being formed by an act of sabotage; and
    4. Alternatives to the storage of the fuel at the site.

4. The Board was aware that consideration of the probability of sabotage required an exploration of the security system at the plant, a subject not ordinarily addressed until the operating license hearing. The Board, in early October during a conference call initiated by Mr. Gordon Silver on behalf of Forster to discuss discovery relative to the security system, stated that the Board in Issue No. 3 assumed that saboteurs had gained entry to the plant, and would consider only the significance of their presence. The Intervenors would not therefore have the burden of going forward with evidence at the hearing on special nuclear fuel on the adequacy of the security system to prevent saboteurs from gaining entry.

5. The Intervenors presented no direct testimony, but relied upon cross-examination of PGandE and Staff witnesses. Both Staff and Applicant submitted testimony which assumed that appropriate earthquake had occurred. The first issue, therefore, was considered moot. The fourth issue developed into a question of uncertain possibilities but primarily one of economics. It is not a question of health and safety. The actual hearing issues then became, restated:

    1. The effect of an earthquake;

    2. The effect of entry by saboteurs.

DESCRIPTION OF THE STORAGE POOL

6. Between the time that the fuel is received on site and the time that it is loaded into the reactor, it will be stored in the fuel storage racks in the spent fuel pool. The pool is located in the fuel handling area of the Auxiliary building and is constructed of reinforced concrete as a part of the building. The pool has a volume of approximately 53,.00 cubic feet and is lined with stainless steel plate. The storage racks are designed to hold 270 fuel assemblies in a subcritical array such that a k_{eff} of not more than 0.9 is maintained when the pool is flooded with cold, unborated water. The entire Auxiliary building structure, including the pool and storage areas, is designed to Class I seismic requirements (Testimony of William J. Lindblad, p. 3, following Tr. 850).

7. In June, 1975, the Staff requested that the Applicant propose additional steps to insure that criticality could not be achieved even with loss of spacing between elements and flooding of the pool. The Applicant responded with the following:

    1. All new fuel will be stored in the spent fuel pool, rather than in the dry new fuel storage facility;

2. All control rod clusters and burnable poisons will be stored in their respective fuel assemblies;
3. An isolation valve will be added which will isolate the fire main supplying water to fire stations at elevation 140 ft. (top of pool) in its fuel handling area;
4. The pool will be flooded with borated water at a boron concentration of 4550 ppm or greater and the pool level will be no less than elevation 137 ft. 8 in.

(Applicant's Exh. 1, letter Crane to Rouse; Lindblad, pp. 4-6)

SEISMIC EFFECT

8. Applicant prepared a safety evaluation, using the proposed pool configuration and conservative assumptions, with the fuel assemblies at a spacing of 0.5 in., the minimum practical spacing. Their analysis showed that only if the boron concentration dropped below 2125 ppm was criticality possible (Appl. Exh. 1, p. 1). The Staff prepared an independent evaluation, using conservative assumptions, whose results essentially agreed with Applicant's (Safety Evaluation, NR-FM-003, following Tr. p. 1130, pp. 12-16).

The conclusion by both Staff and Applicant was that the only mechanism which could result in a critical mass being formed would be the introduction of sufficient fresh water to the pool to reduce the boron concentration to the requisite value.

9. The possible sources of fresh water considered were rainfall, the raw water reservoir, storage tanks, piping above elevation 140 ft., and piping below elevation 140 ft. Of these, only the failure of piping above the 140 ft. elevation would result in criticality being achieved (Appl. Exh. 1, pp. 2-4). The Staff essentially concurs with Applicant, but required that both 2-inch fire lines and the 1-inch service water line above the 140-foot elevation be fitted with isolation valves and that the valves be set to isolate the lines under normal circumstances. The Staff also investigated the possibility of the cut slope above the fuel storage building failing in such a manner that it could slide into the storage building and displace all or part of the borated water. The Staff conclusion is that this is not viable (SER, pp. 16-23).

10. The Staff's condition on isolation of the piping above the 140-ft. elevation has been complied with by the Applicant (Lindblad, pp. 8-9). Staff and Applicant therefore agree that even the occurrence of an earthquake resulting in the highly unlikely conditions which were assumed cannot lead to the formation of a critical mass. The Board concurs.

THE EFFECT OF ENTRY BY SABOTEURS

11. The Board heard a great deal of testimony on the possible effects of sabotage to the fuel, principally in cross-examination. There was limited direct testimony presented, and that only in general terms, as all parties were understandably reluctant to place information which might be of aid to a sabotage effort in the public record. Several hypothetical situations were presented by Intervenors;[1/] however, the Board found only one which it deemed credible - that of the possibility of forming a critical mass in the fuel storage pool.

12. For a variety of reasons, both Applicant and Staff found that the formation of a critical mass, from a practical point of view, was from "highly improbable" to "incredible" (Tr. 899-904 ; Tr. 1142-1146). Applicant did testify, however, that under optimum, highly unlikely conditions, it was theoretically possible (Tr. 860-861).

13. The Board concurs with Staff and Applicant that as a justice matter it would be extremely difficult to form a critical mass. However, in order for the Board to reach a decision as to whether allowing even this remote possibility to exist would constitute an "unreasonable" risk to the health and safety of the public, some idea of the potential consequences of forming a critical mass had to be obtained.

1/ For example, see Tr. 913 et seq.

14. PGandE presented testimony which was, in effect, an empirical analysis of what consequences might be expected (testimony of William K. Brunot, following Tr. p. 912). Briefly, it considered a large number of power excursions which have occurred, and determined from these that the maximum number of fissions which could reasonably be expected following the assembly of a critical mass would be about 6×10^{19}. Comparing this with the fissions which have taken place in an average spent fuel bundle, about 5×10^{25}, it can be reasonably assumed that a critical mass power excursion would present a lesser hazard than a spent fuel handling accident, which the building is designed to control.

15. The analysis goes on to show that, using conservative assumptions, occurrence of criticality would be expected to cause potential radiological exposures approximately 600 times less than those expected following a spent fuel handling accident. Although Staff had not performed a like analysis, they had studied the testimony and concurred that the results were reasonable (Tr. pp. 1146-1151).

16. Although the Board does not regard the analysis as being a definitive one, it concurs with the Staff that it represents a reasonable one. The Board is thus convinced that the radiological

consequences of the formation of a critical mass in the fuel storage pool would be no greater than those resulting from a spent fuel handling accident and are therefore acceptable.

ORDER

The Board concludes that the evidence does not support a finding of fact that the entry of the special nuclear material into San Luis Obispo County and storage of same at the Diablo Canyon facility would constitute an unreasonable risk to the health and safety of the public. The motions of MFP and Forster are therefore DENIED. The Board concludes that the record supports the issuance of a Part 70 license to the Applicant for special nuclear material.

Since the motions concerning the special nuclear fuel were filed by the MFP and Forster (before they had even heard of the Part 70 license procedure) prior to the Staff taking a position on the application for the Part 70 license, it can never be known what position the Staff would have taken on the original application in the absence of the motions. It does appear to the Board that the motions focused the attention of the Board and all parties on this important matter and that it served

a very useful purpose. Changes were made in the application following the prehearing on May 28, 1975 which are additional factors to insure the health and safety of the people in San Luis Obispo County.

IT IS SO ORDERED.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Elizabeth S. Bowers

Elizabeth S. Bowers, Chairman

Issued this 23rd day of December,
1975 at Bethesda, Maryland.