



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
PACIFIC GAS AND ELECTRIC CO.)
Diablo Canyon, Units 1 and 2)

Docket Nos. 50-275/323-OL

RESPONSES OF JOHN J. FORSTER
TO INTERROGATORIES
PROPOUNDED BY NRC STAFF
DATED JUNE 21, 1976

Reliance is not being made upon issues specifically related to interrogatories 1, 2, 3, 4, 6, 10, 11.

5A. We find no documents to provide a reasonable basis for the Staff's assertion (Addendum, (a)3. at 3-10) that water testing (proposed in Addendum, p. 3-10, par. 2) will not expose potential damage before it is done.

5B. Given the Diablo Cove-South Cove geometry, recirculation could be caused by wind or coastal current.

5C,D. Information not available.

7A. Since the FES and Addendum fail to make a prediction of reasonably sufficient scope and depth, of the nature of the thermal plume we find it awkward to specify species.

7B. Information not available.

7C. Size and location of areas cannot be specified until the Staff treats the plume in a quantitative fashion.

7D. No.

7 E,F,G. Information not available.

8A. Addendum at p. 3-10 indicates for downcoast currents little can be said about the 4°F surface isotherm [(b) 8.] and for upcoast currents [(c) 12.] only that the 4°F surface isotherm is expected to "cover an extensive area. The maximum extent could not be determined in the model, however, due to the limited extent of the thermistor array and the size of the model." Modeling without results would appear to be inadequate.

8 B,C. Information not available.

9A. No.

9B. Convert the plant into an historical museum.

9C. A thermal plume of vanishingly small size is the only one allowed by a reactor operating at a vanishingly low level.

9 D,E. Information not available.

12A. Plant malfunctions or breakdowns caused by earthquakes may cause a low reliability factor. In the absence of complete geologic, seismologic, and related structural reviews, it is difficult to make a decision as to reliability factor. Neither OBE nor SSE have been agreed upon. The ASLB must consider the cost-benefit aspects of the plant, and reliability will enter into such a consideration.

12B. Quantitative data is not available, but clearly as reliability falls, so do capacity factor and plant availability, and with them the cost-benefit balance swings toward the cost end.

12C. See 12A,B above. We do not know the downtime schedule.

12D. We are not sure of the meaning of operational efficiency. But capacity factor and plant availability could be lowered by fuel shortages, accidents including those due to seismic forces, and unrealistic design.

12E,F. Information not available.

13A. This phrase refers to an ECCS which, upon being found to be deficient in design or construction, requires additional work or retrofitting and, therefore, added expenditures.

13B. We are not convinced that compliance can be rigorously shown but our instant argument is in connection with 10 CFR Part 50, AppendixA. Our position is that neither Applicant nor Staff has made substantial headway toward ensuring the ECCS (and other plant structures) complies with Criterion 2. There has been no showing that the ECCS can properly withstand the effects of a maximum credible earthquake on the Hosgri-San Simeon Fault Zone.

13C,F,E. Information not available.

14.A. Both Applicant and Staff assessments of radionuclide buildup in the food chain are inadequate because they fail to consider the effects of accidents, greater than class 8.3, caused by earthquakes on the nearby Hosgri-San Simeon Fault Zone, that could result in releases of large quantities of radionuclides that could enter the food chain in substantial amounts.

The accident analyses are improperly based on a postulated earthquake whose maximum expected ground acceleration at the site is 0.2g. Due to the existence of the Hosgri-San Simeon Fault, whose historical record includes a quake of 7.5 magnitude, we cannot accept the 0.2g value. Under the circumstances, we cannot rule out the possibility of a broad spectrum of accidents, including those of Class 9, thus leading to serious radiological consequences and massive radionuclide buildup in the food chain.

Further, it is to be noted that PG&E has not yet made submittals relative to meeting the criteria set forth in 10 CFR 20 Appendix I. Intervenor must be able to review these submittals rather than rely upon Applicant's or Staff's assurances of compliance. (See Sec. 3.4 of FES Addendum.)

14B. There has been no clear statement as to the total number of reactors that are anticipated for the State of California. As each new reactor comes on line, it adds its increment to the total amount of effluents, releases, and discharges. There is nothing in the documents of this docket that indicates the existence of upper limits on effluents established to ensure the health and safety of the public. Certainly a threshold theory of radiation damage, which we understand the NRC to sponsor, recognizes "upper limits." (See Hiroshima and Nagasaki data.)

We agree with the Acting Deputy Assistant of the Department of the Interior who wrote in a March 28, 1973 letter to Daniel R. Muller,

"The environmental impacts of this plant when combined with other thermal-electric plants on the California coast does not appear to have been properly considered. We think that the final environmental statement should discuss the contribution of environmental effects from the proposed plant in coastal waters from all existing and proposed power plants." (FES, p. A14-1-23)

14 C. We object to this question on the ground that it is too general.

14 D. We object to this question on the ground that it is too general, however, set forth below are several considerations which Staff documents treat inadequately.

The FES does not treat the radiological impact on plant workers. Sec. 14.13.7 of the Addendum admits that relative to the radiation exposure to workers, "The total dose for the plant will be influenced by several factors for which definitive numerical values are not available."

At p. 5.58 of the FES, Staff observes that "The dose estimated to the thyroid of a two-year-old child from radioactive iodine in milk is 10 times that for an average adult." Yet (FES p. A14-1-17) in FRP Report #4 (p. 23) it states that "It has been estimated that a small number of infants (6-18 months) in localized areas conceivably could receive doses from 10 to 30 times the average."

Section 14.13.6 of the FES estimates that the "Thyroid dose resulting from the ingestion of fresh milk from a cow pastured at 5 mile north-north-west has been changed from 3 to 16 millirems. However, with the present (modified) gaseous source term, this will be reduced to 4.7 mrem." This value is so close to the maximum permissible dose of 5 mrem that an adequate FES treatment would provide a basis for the 4.7 figure. This is particularly important for iodine.

The FES and Addendum has not taken into consideration the possibility of an earthquake on the Hosgri-San Simeon Fault Zone that could cause accidents, including Class 9, resulting in a release of large quantities of radionuclides that could enter the food chain in substantial amounts.

All FES doses are given on yearly bases. Intervenors consider this to be an improper and inadequate assessment because there is a linear relation between effect and dose magnitude. Therefore all calculations must include total cumulative doses.

A major accident, including Class 9, caused by an earthquake on the nearby Hosgri-San Simeon Fault Zone could contaminate air and water with significant quantities of radionuclides. These radionuclides would be carried by wind and water currents to various plants, animals, and humans, thereby getting into the food chain and causing somatic and genetic defects including cancer and leukemia.

14E. We presently have no formal commitments from potential witnesses.

14F. BEIR Report

14G. See answers to interrogatories 14 A,B,D above.

15A. Data of Stewart and McMahan show that right down into the background region, namely a few hundred mrem, an excess of cancers and leukemias in infants exposed in utero, showed a linear relation between dose and effects. The range was from 1500 mrem down to 300 mrem.

That cancers are caused by radiation has been common knowledge since the forties, and from the BEIR report at p. 2.

"...additional exposure of the U.S. population of 5 rem per 30 years (i.e., 170 mrem/yr.) could cause from roughly 3,000 to 15,000 cancer deaths annually, depending on the assumptions used in the calculations."

The BEIR committee as well as the ICRP and NCRP state that in the interest of the public health, the presumption must be made that effect is a linear function of dose and that there is no lower "threshold". In the field of genetic injury it is also agreed that there is no threshold.

A major accident, including Class 9, at the Diablo plant, caused by an earthquake on the Hosgri-San Simeon Fault Zone could contaminate air and water with significant quantities of radionuclides. These radionuclides could be carried by wind and water currents to plants, animals, and humans, thus getting into the food chain from where they eventually pass to humans, causing somatic and genetic damage.

15B. BEIR Report

Gofman & Tamplin, "Epidemiologic studies of carcinogenesis by ionizing radiation" presented July 20, 1971 at the Sixth Berkeley Symposium on Mathematical Statistics and Probability.

Stewart and Kneale, "Radiation Dose Effects in Relation to Obstetric X-Rays and Childhood Cancers" The Lancet 7658: 1185-1188, 1970.

Stewart and Kneale, "Changes in the Cancer Risk Associated with Obstetric Radiography, The Lancet, 7532: 104-107, 1968

15C. We presently have no formal commitments from potential witnesses.

16A. (1) Whether Pacific Gas and Electric Co. and the U.S. Nuclear Regulatory Commission are to collect epidemiologic data on human cancers, leukemias, infant mortalities and other somatic effects, and genetic effects of radioactive releases on the population within a 50-mile radius of the plant, during the operating lifetime of the plant and for a reasonable period of time thereafter.

(2) Whether the plant seismic design and construction precludes the possibility of accidents (including Class 9) causing adverse onsite and/or offsite radiological consequences. [See Petition to Intervene(MFP) dated, January 12, 1974, Contentions 1 and 2.]

16B. (1) Please see response to immediately preceding interrogatory.

(2) We are preparing a Motion to be submitted to the ASLB which will include the requested basis.

16C,D (1) and (2) Information not available.

I declare under penalty of perjury that the foregoing Responses To Interrogatories are true and correct to the best of my knowledge, information, and belief.

JOHN J. FORSTER

By Gordon Silver
Gordon Silver

CC: ASLB Members
All Parties
Secretary, NRC

Dated: July 20, 1976