UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

7/6/76

In the Matter of	)	
	)	
PACIFIC GAS AND ELECTRIC COMPANY	)	Dockets 50-275-OL
	)	50-323-OL
Units 1 and 2	)	
	)	
Diablo Canyon Site	)	
	)	

RESPONSE OF PACIFIC GAS AND ELECTRIC COMPANY TO INTERROGATORIES PROPOUNDED BY WILLIAM P. CORNWELL POSTMARKED JUNE 21, 1976

1. What substantial evidence does PGandE have to assure that thermal discharging will not damage the kelp population in Diablo Cove and surrounding areas?

RESPONSE

Monitoring flights using infrared sensitive film have continued to show the natural variation from year to year in the kelp canopy in Diablo Cove and surrounding areas. In recent years the kelp canopy has increased (Environmental Report Supplement No. 5, ER-5 p. 25 and ER-6 Section 1.2.3). This increase was noted and discussed in California Department of Fish and Game's Annual Report (July 1, 1974 - June 30, 1975) provided as part of ER-8. These changes in kelp distribution are discussed in NRC's Addendum to the Final Environmental Statement. The tolerance of kelp species to temperature variation is discussed in ER-2, the FES, and in Anticipated Biological Effects from Heated Effluents at Diablo Cove, Wheeler J. North and Einar K. Anderson. The latter document was submitted as Exhibit 2 during the NEPA Environmental Hearing in 1973.

On the bases of these documents and the results of a physical model study of the thermal discharge at Diablo Canyon (ER-8 and FES Addendum) the potential for the thermal discharge to affect kelp in the vicinity of Diablo Canyon may be estimated.

The area within Diablo Cove directly in line with the discharge to a distance of 500 feet is not expected to be suitable for juvenile kelp to holdfast because of hydraulic pressures. Historically, the area to the southeast of the discharge centerline has not been kelp habitat, and it is not expected to become favorable habitat for kelp after the plant starts operations.

1. RESPONSE (Continued)

The northwest half of Diablo Cove contains kelp, and it is expected to continue to do so after operations commence because of the seasonal relationships between the biological stages of kelp development and the physical model predictions of thermal plume behavior. When the coastal current is upcoast (the Davidson Period), the physical model predicts that a layer of warm surface water will be present in the north half of Diablo Cove. However, an upcoast current is observed from about November through February, which is the same time period in which each year's kelp canopy is destroyed by natural storm action and normal life cycle processes. Shortly after the coastal current reversal to the south in March of each year, a new season's kelp canopy takes hold and begins to form well beneath the surface. During the canopy's forming period, May through August, the physical model predicts that plant-warmed water will leave through the west exit at Diablo Cove, under the influence of the downcoast ocean currents. Some warmed surface area in the Cove to the northwest of the discharge plume may occur, but it is expected to be stabilized by cold water inflow from the north entrance to the Cove in such a way as to limit the amount of temperature increase and to limit the extent of the area to the northwest with any temperature increase at all. The northwest Cove area should continue to be a satisfactory kelp habitat.

Kelp habitat outside Diablo Cove is not expected to be influenced by the thermal plume. Again, during the upcoast oceanographic current season, November through February, kelp is not present. In other ocean current regimes, Upwelling and Oceanic, the physical model predicts that the thermal plume will extend seaward in a direction which will range from south to west. The waters in this area are too deep to be suitable for kelp habitat. In particular, Pecho Rock, an historical kelp habitat about three miles southeast of Diablo Cove, is predicted to be outside the influence of the thermal plume.

2. Please identify and supply any research, studies and reports done by or contracted by PGandE on the effect of temperature on abalone and bull kelp (Nereocystis).

RESPONSE

Larval and adult abalone thermal tolerance studies were included as Chapters VI and VII of Environmental Investigations at Diablo Canyon, 1972-73 (ER-4). Abalone thermal tolerance studies by California Department of Fish and Game are part of the Annual Report (July 1, 1973 - June 30, 1974) which was included as an appendix to ER-5. The thermal tolerance of kelp is discussed in Anticipated Biological Effects from Heated Effluents at Diablo Cove, North and Anderson, which was Exhibit 2 at the environmental hearing,

2. RESPONSE (Continued)

and in an abstract furnished NRC and all parties with a forwarding letter dated December 23, 1975.

3. Please identify by date and publication all prototype dye studies and supply any results that have not yet been distributed to all parties to these proceedings, including the report "Diablo Canyon Unit No. 1 Power Plant Survey using Tracer Dye Imaging Techniques - 1975."

RESPONSE

As stated in Appendix 6 of ER-6 copies of Diablo Canyon Unit No. 1 Power Plant Survey Using Tracer Dye Imagery Techniques-1975 are available for review at PGandE's Department of Engineering Research, 3400 Crow Canyon Road, San Ramon, California, or, on prior arrangement, at the Company's office in San Luis Obispo.

Reports of earlier dye studies conducted near the site are found in ER-2, Appendix R.

4. Please identify by date and publication and supply aerial photography results of kelp distribution and concentration.

RESPONSE

Kelp monitoring flights are described in ER-5, p. 25, and ER-6, Section 1.2.3. The films made from these infrared flights are not reproducible without loss of definition in the basic visual appearance and extent of the kelp. These films are available for viewing at PGandE's Department of Engineering Research. In addition to photographic surveys studies of kelp canopy distribution and concentration in Diablo Cove conducted by California Department of Fish and Game are found in Annual Reports dated July 1, 1973-June 30, 1974 and July 1, 1974-June 30, 1975 and submitted as ER-5 and ER-8, respectively.

5. What further plans, if any, has PGandE to return the Intake Cove to Its unaltered state?

RESPONSE

PGandE objects to this interrogatory on the ground it involves information beyond the scope of the contention of Mr. Cornwell accepted for purposes of discovery.

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.

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Supervising Engineer
Pacific Gas and Electric Company

Respectfully submitted,

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Dated: July 6, 1976

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RESPONSE OF PACIFIC GAS AND ELECTRIC COMPANY TO INTERROGATORIES PROPOUNDED BY SAN LUIS OBISPO MOTHERS FOR PEACE DATED JUNE 21, 1976

13. Will Unit 1 operating staff have access to, and be able to monitor, outside air monitors and chlorine detector panels which are located in the Unit 2 side of control room, during Unit 2 construction activities?

RESPONSE

Yes.

18. Provide expected yearly plant availability and capacity factor for Units 1 and 2 for their expected lifetime.

RESPONSE

We expect capacity factors for the first year of operation to be approximately 65 percent and to increase over the first 5 to 7 years of operation to a level value of approximately 85 percent. We expect plant availability to be somewhat greater and consistent with these capacity factors.

19. How many years of operation, at rated capacity, are guaranteed by existent fuel contracts executed by PG&E and fuel suppliers?

RESPONSE

PGandE has contracts for uranium concentrate, conversion of uranium to uranium hexafluoride, uranium enrichment, and fuel fabrication. Such contracts provide for all the requirements of Diablo Canyon Units 1 and 2 for uranium supply through 1979 and for approximately 25% of such requirements for the period 1980 through 1982. PGandE's contracts also provide for the requirements of Diablo Canyon Units 1 and 2 for conversion through approximately 1979 and for enrichment

19. RESPONSE (Continued)

through 2001. Fuel fabrication contracts for Diablo Canyon Units 1 and 2 will supply their requirements through approximately 1985 and 1986, respectively.

24. Provide the anticipated completion dates of the discharge plume physical model study and the mathematical model study.

RESPONSE

The physical model study of the Diablo Canyon Unit 1 and Units 1 and 2 thermal discharge plume is technically completed. The results are contained in Environmental Report Supplement 8 (ER-8). We have no mathematical model study underway.

25. Reference Enclosure 1 [Guidance to Holders of Permits to Construct or Licenses to Operate Light-Water-Cooled Reactors for Which Application was Filed Prior to January 2, 1971 to Meet the Requirements of Appendix I to 10 CFR Part 50] of letter from R. C. De Young to Pacific Gas and Electric Co. dated February 25, 1976. Please provide intervenors with information requested in Enclosure 1.

RESPONSE

This information is being developed and will be provided to Intervenors when submitted to the U. S. Nuclear Regulatory Commission.

26. What will be the typical shape and area defined by the 4°F above ambient isotherm of the thermal plume. Please provide basis for response.

RESPONSE

On the basis of the physical model results, the thermal plume defined by a temperature 2° Celsius (3.8°F) above ambient is expected to separate from the bottom within Diablo Cove and, near the surface, extend in an elongated shape a few thousand feet into the Pacific Ocean. During the upcoast ocean current season (November through February) the 2°C surface isotherm is expected to cover Diablo Cove. During the downcoast and transition current seasons (March through October), the northwest half of Diablo Cove is expected to experience temperature rises less than 2°C. The surface area enclosed by the 2°C isotherm may be as high as 300-400 acres, but natural ocean turbulence which cannot be sufficiently well modeled is expected to produce smaller isotherm areas than the physical model predict.

27. Please indicate your basis, if any, for predicting the environmental impact of a cooling discharge delta T of 22°F and 25°F.

RESPONSE

A normal 19°F discharge temperature could rise occasionally, for a limited time period, above 19°F, if cooling water flow is reduced while the amount of waste heat being rejected remains the same. Short term discharge temperature excursions above 19°F would produce corresponding alterations in the thermal plume for a short time. These would be comparable to the short term diurnal and weather-caused fluctuations in the ambient temperature which marine life experiences now.

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

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Project Engineer
Units 1 and 2
Diablo Canyon Site

John T. Wells
Supervising Engineer
Pacific Gas and Electric Company

Respectfully submitted,

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Dated: July 6, 1976

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CERTIFICATE OF SERVICE

The foregoing document(s) of Pacific Gas and Electric Company ~~xxx~~ (have) been served today on the following by deposit in the United States mail, properly stamped and addressed:

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