Suppl.

Distribution
cc: Mr. C. C. Whelchel
Pacific Gas & Electric Co.

Doc. Rm.
Formal
Suppl.
R&PRSB Files
DL&R Files
P. A. Morris - 2
E. G. Case
R. H. Bryan
F. N. Watson

Docket No.
50-205

Pacific Gas & Electric Company
245 Market Street
San Francisco 6, California

Attention: Mr. Richard H. Peterson
General Counsel

Gentlemen:

As you know, the Regulatory staff of the Commission is reviewing your application for a construction permit for the proposed Bodega Bay Atomic Park Unit No. 1. Transmitted herewith is a request for additional technical information which the staff believes is necessary to complete its review of your application. Your reply should be submitted as an amendment to your application; three copies signed under oath or affirmation and 47 additional copies should be provided.

We understand that you have research and development programs in progress which are expected to expand your knowledge in certain areas of the facility design. Where we have asked questions concerning design features included in these areas, you should, as provided by Part 50.35 of the Commission's regulations, describe the research and development program to be conducted to resolve the question or questions. Also, there may be instances in which you are unable to answer questions at this time because details of the plant design have not been completed. In these instances, you should describe the criteria upon which the detailed design will be based.

Please do not hesitate to contact us if you have any difficulty in understanding the intent of the enclosed questions. The additional information which you submit in reply to this letter will be evaluated by the staff and further discussions will be held with you concerning any unresolved matters. We will also advise you further concerning scheduling this project for discussions with the ACRS.

Sincerely yours,

Edson G. Case, Assistant Director
Facilities Licensing
Division of Licensing and Regulation

Enclosure:
List of questions

OFFICE ▶	R&PRSB:DL&R	R&PRSB:DL&R	FL:DL&R			
SURNAME ▶	FNWatson:th	RHBryan	EGCase			
DATE ▶	2/25/63	2/26/63	2/27/63			

Form AEC-318 (Rev. 9-53)

U. S. GOVERNMENT PRINTING OFFICE 16—62761-3

8709210522 851217
PDR FOIA
FIRESTO85-665 PDR

PACIFIC GAS AND ELECTRIC COMPANY

BODEGA ATOMIC PARK - UNIT NO. 1

QUESTIONS RAISED BY THE

DIVISION OF LICENSING AND REGULATION

RELATIVE TO CONSTRUCTION PERMIT APPLICATION

1.	Page I-1,* Page III-1	As required by Paragraph 50.35, Title 10 of the Code of Federal Regulations, (see revision effective January 29, 1963) describe the research and development programs which will be conducted to resolve those design problems having a bearing on the safety of the plant.
2.	Page I-1	Delineate the division of responsibility between Pacific Gas and Electric Company and General Electric Company, in this project.
3.	Page II-1	Indicate whether a filter will be provided for the air ejector discharge to the stack and the approximate delay time provided ahead of this filter. (Figure II-1).
4.	Page II-2	Justify, through reference to previous operating experience and experiments, your fuel element design using stainless steel cladding having a thickness of 11 mills.
5.	Page III-2	Indicate the height of water shielding which will be provided above a fuel element when it is being transferred through the gate opening from the reactor to the storage pool. State the calculated radiation dose rates at the pool surface under these conditions.
6.	Page III-3	What precautions are being taken to ensure that a rupture of a line penetrating the containment wall will not cause containment rupture?

*Designates reference to section and pages of Exhibit C of the Bodega Bay application for construction permit.

7.	Page III-3	State the manner in which the biological shield will be cooled and the design criteria to be followed in designing this cooling system.
8.	Page III-4	What are to be the closing time specifications on the containment isolation valves and the turbine trip valves?
9.	Fig. III-2	State whether the drywell will be provided with an airlock entrance and indicate your intentions relative to entering the drywell during operation. State the type of instrumentation which will be provided to indicate recirculation pump performance. Indicate what assurance there is that the equipment will operate satisfactorily under 150°F ambient conditions.
10.	Page III-5	Indicate how the spent fuel will be handled preparatory to shipment off-site.
11.	Page III-6	How many scrams can be accomplished with the stored energy in the scram accumulators?
12.	Page III-7	State the core inlet sub-cooling at rated conditions.
13.	Page III-8	What is the reactivity worth of starting a recirculation pump under various normal and abnormal conditions? Are interlocks provided to (a) prevent starting a pump when the loop valve is open and (b) limit the rate of valve opening?
14.	Page III-9	What conditions, such as low condenser vacuum, can prevent use of the main feedwater pump?
15.	Page III-9	What is the reactivity worth of the liquid poison system and what is its rate of reactivity addition? What is the worth of the system when the refueling pool is connected to the reactor vessel?
16.	Page III-10	What is the heat removal capacity of one tube bundle of the emergency condenser?
17.	Fig. III-10	Describe the research and development program which has been or will be conducted to support the use of the internal steam separators, and indicate the separation efficiency expected. Indicate the data which are presently available upon which the design will be based.

18.	Fig. III-11, Page IV-2	State the design criteria to be followed in sizing the plenum space in each fuel rod and in preventing collapse from external pressure.
19.	Page III-10	Describe the techniques and equipment to be used for decay heat removal during the first hour after shut down from full power under the assumption of failure of the entire feedwater system.
20.	Page III-10	What is the heat removal capacity of the emergency core spray system? Assume a major rupture of a recirculation pipe line has caused the water level to fall below the core.
21.	Page III-10	What are the consequences of a leak in a recirculation loop that causes the water level in the core to fall in spite of maximum feedwater flow while the vessel pressure remains above 150 psi?
22.	Page III-15	Do any pipes or tubes, such as pneumatic or hydraulic lines, lead from the drywell area or the suppression pool tank to the control room? If so, discuss the potential for the transmission of radioactivity through these conduits to the control room if a severe accident occurs in the drywell.
23.	Page III-16	Show that the start-up source will be capable of producing a satisfactory response in the nuclear instrumentation in view of the proposal that the nuclear instrumentation is to cover only a range of nine decades.
24.	Page III-18	Justify the omission of the following as reactor scram signals: a. Seismic shock b. Low control rod drive system hydraulic pressure c. Low reactor pressure
25.	Page III-18	The reactor scram system includes a number of solenoid valves and other electrical devices. Is the reactor automatically shut down any time there is an interruption of electrical power to these devices or to the control chain which activates these scram devices?
26.	Page III-18	Explain how the two-channel reactor protection system is "fail safe" if both channels must be de-energized to produce a reactor scram. Is there any way, such as transistor shorting, in which a channel may fail and yet maintain an energized output?

27.	Page III-24	Describe the shielding that will be placed below the reactor vessel to permit maintenance operations in the "sub-pile" room.
28.	GENERAL	If an earthquake or some other occurrence should interrupt the supply of sea water, what auxiliary sources of cooling water will always be available and how long could these water supplies be used to dissipate reactor decay heat?
29.	GENERAL	What reactor operations resulting in reactivity changes will be permitted while the drywell vessel head is removed?
30.	GENERAL	What water clean-up equipment and off-gas removal equipment will be provided for the removal and control of fission products in the fuel storage pool?
31.	GENERAL Page III-4	Explain the criteria to be followed in determining whether both or only one of a pair of isolation valves is to receive automatic closure signals.
32.	GENERAL	What is the magnitude of the pressure rise in the Refueling Containment Building in the event of a failure of a reactor auxiliary system (for example, a leak in the emergency condenser system or the high pressure demineralizer)? What is the design pressure rating of the Refueling Containment Building?
33.	Page IV-1	Justify the use of the proposed minimum burnout ratio criterion for the design of the core. What burnout data correlation has been used in burnout analyses? At what reactor power level is the burnout ratio of 1.5 expected to occur? At what reactor power level (steady state) would the burnout ratio reach 1.0? Discuss the nature of any conservatism used in estimating the heat fluxes used in burnout ratio calculations. What minimum burnout ratio is reached as a consequence of a loss of feedwater flow accident?
34.	Page IV-3	State where poison curtains will be located in the core, how they will be supported, and how they will be held in place.

35. Page IV-4 — State the average steam volume fraction in the core at rated conditions and the average exit as well as the hot channel exit volume fractions. Describe the research and development and/or analytical programs which have been or will be conducted to determine the stability of the reactor at proposed conditions.

36. Page IV-6 — State the design shutdown margin for the most reactive condition and at the most reactive time in core life.

37. Page V-10 — Describe the catch basins and how they will function. Discuss whether they can overflow. Estimate maximum radioactivity concentrations to be allowed to accumulate in a catch basin, both in solution or suspension and as deposited material.

38. Page VI-2 — Provide an analysis to demonstrate that the proposed design, operating procedures, and release limits for the circulating water and waste disposal systems in conjunction with the proposed monitoring equipment and procedures assure that no person will be exposed to concentrations of radioactivity in excess of those permitted by Commission regulations if the marine environment is subjected to the effects of the operations contemplated. This analysis should take into account re-concentration effects and other pertinent factors.

39. Page VI-2, Page VI-3 — What is expected to be the total annual discharge of radioactive liquid and gaseous wastes from this plant?

40. Page VII-3 — Delineate the conditions under which (1) the emergency condenser will be in service while other containment isolation valves are closed, (2) the emergency condenser isolation valves will be closed while other containment isolation valves are open and (3) all isolation valves are closed.

41. Page VII-9 — What are the consequences of an accident in which the feedwater system fails and operator action or a reactor high pressure signal causes the isolation bleed valves to open?

42. Page VII-8 — Describe the gas holdup system and state the system capacity.

43.	Page VII-14	How far from the nearest earthquake fault or branch fault is the reactor to be located? How far from the San Andreas fault is the reactor to be located?
44.	Page VII-15	Describe the research and development program which will be conducted to support the belief that a 2700 Mw-sec nuclear excursion will not result in damage to the reactor pressure vessel. Indicate any design features which could reduce the likelihood or magnitude of a rod drop out accident.
45.	Page VII-14	Discuss the possible effects on this plant should an earthquake cause displacements along minor faults under the plant.
46.	Page VII-17	What are the consequences of a major steam line break in the pipe tunnel if the accident occurs during inversion conditions? Treat both a case in which the containment isolation valve functions properly and a case in which the isolation valve fails to close.
47.	Page VII-18.	What are the consequences of the MCOA, taking no credit for fallout in the drywell and taking credit for plate out only as provided in treatments of similar problems in TID 14844?
48.	Page VII-23, 24	Submit samples of the calculations used in determining the doses rates set forth in the Radiological Effects of Major Accidents.
49.	GENERAL	Describe the test program to be used to demonstrate the acceptability of the proposed control rod drive system and indicate the acceptability criteria.