

February 12, 1964

50-205

Dr. Herbert Kouts
Chairman, Advisory Committee
on Reactor Safeguards
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Dr. Kouts:

Transmitted herewith for the use of the Committee are
eighteen copies of questions concerning certain geological-
seismological and design aspects of the Bodega Bay reactor.

Sincerely yours,

Director
Division of Licensing
and Regulation

Enclosures:
As stated above

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SURNAME ▶	<i>[Signature]</i> ECCRETT	RLowenstein			
DATE ▶	2/12/64	2/12/64			

2/11/64

QUESTIONS RE BODEGA

The basic issue to be considered is whether and to what extent there is a likelihood of differential ground motion, "faulting", occurring during a future earthquake in the bedrock or sedimentary layers which would underlay the proposed reactor facility at the Bodega Head site. The following questions are among those relevant to the basic issue:

A. On the bedrock at Bodega:

1. What is the age of the bedrock?
2. At what time was the bedrock first covered by sedimentary layers?
3. What significance is attached to the extensive faults on Bodega:
 - a. What is the significance of the orientation of bedrock faults?
 - b. What is the age of the bedrock faults?
 - c. Are any bedrock faults younger than others? How is this determined?
4. Is the bedrock fault significantly different in any way from others in the excavation or elsewhere on Bodega?
 - a. What was the cause of "the" bedrock fault?
 - b. Was "the" bedrock fault occasioned by one or by many different movements? - Evidence?

- c. Can the extent of (a) lateral movement; (b) vertical movement in "the" bedrock fault be estimated?
 - d. Can the age of the most recent movement along "the" bedrock shaft be determined?
 - e. Did "the" bedrock fault move in the 1906 earthquake? How much movement may there have been, with the observational facts before us as they now are?
5. In another 1906 type earthquake, what is the likelihood of movement of (a) 1" or less; (b) 1-2 feet; (c) >5 feet on (1) "the" shaft fault in bedrock, (2) other bedrock faults under the proposed reactor site, (3) elsewhere on Bodega.

B. On the Sedimentary Layers at Bodega:

- 1. What is the age of the successive layers of sediment on Bodega? How is this determined?
- 2. What is the relationship (location) between "the" bedrock shaft fault and the shaft fault in the overlying sediments.
- 3. Assuming that the sediment offset was tectonic in origin, did it occur all at one time or in several separate movements and what were the horizontal and vertical displacements; what are the reasons for the opinion held?

4. What evidence exists for: (a) tectonic origin of the sediment offset; (b) non-earthquake origin of the sediment offset; (c) for "smearing" of the original offset (however caused) by non-earthquake phenomena?
 5. What is the age of the sediment fault in years: A few hundred years; a few thousand years; greater than 40 thousand years; greater than a half million years? What is evidence for this in (a) location of offset in sediment layers; (b) color banding of mineral layers; (c) other.
 6. What is significance of the age of the sediment fault, to likelihood and magnitude of possible future earthquakes?
 7. How much lateral movement in the bedrock within the last 100 years could be accommodated by overlying sediments without now being observable in the sediments?
 8. How much displacement could occur in the bedrock at Bodega Head without rupturing the surface of the sediments?
- C. Significance of Pt. Reyes Observations:
1. How far away from (1) the 1906 trace in the San Andreas fault zone and (2) the western boundary of the zone did

surface ruptures occur at Point Reyes as a result of the 1906 earthquake?

2. What was the amount of displacement (1) in the bedrock and (2) in the overlying sediments of ruptures which occurred in 1906 at Point Reyes outside the main San Andreas fault zone?
3. What was the cause of these ruptures?
4. Did all of the 1906 ruptures outside the main fault line at Point Reyes apparently occur along previous fault lines and, if not, how many did?
5. What was the estimated time of movement along these previous fault lines prior to 1906?
6. In regard to the likelihood of ruptures in the bedrock and ruptures in the sediments, what are the significant differences and similarities between Point Reyes and Bodega Head?
7. What is the probability of a rupture of the near surface granitic rock in the Bodega excavation should a 1906 earthquake recur in the vicinity of Bodega Head?

D. Questions for Reactor Designers:

1. What maximum displacement of the bedrock will the reactor facility be designed to accommodate safely?
2. What is the maximum displacement in the bedrock

that the reactor facility could be designed to accommodate safely.

3. What would be the extent of the damage to the facility if a rupture several feet of the near surface granitic rock at the reactor site should occur?
4. What are the estimated off-site consequences if a rupture of several feet of the near surface granitic rock at the reactor site should occur?

Lu Watters, Box 88, Cotati, California.

February 12, 1964.

RECEIVED NO. 10-205

Members of the Atomic Energy Commission:

When the Pacific Gas and Electric Company was feverishly digging the hole on Bodega Head you stood silently by and watched this expensive shovel work proceed step by step. No words of encouragement from you. No words of caution. Just silence as costs mounted and the hole deepened.

Considering that no construction permit had been issued for the nuclear, ^{PLANT} this was a strange game for two grownup organizations to be playing. All this scene lacked was a few of Hitchcock's dummy birds roosting in the background.

What was the reason for your silence and your inertia? Were you waiting for a message from outer space? Or were you waiting for P.G.&E. to stop believing ^{ITS} their own press releases? Or could it be that the "gray areas" in your elastic by-laws left you tongue-tied while this million dollar comedy was being enacted?

Now that the United States Geological Survey report has punctured P.G.&E's bag of hot air about Bodega Head, I have ^A strong feeling that P.G.&E. will ~~concentrate~~ ~~on~~ ~~selling~~ ~~the~~ ~~public~~ ~~the~~ ~~fallacy~~ ~~that~~ "modern engineering" will guarantee foolproof safety if a nuclear plant is located close to the San Andreas fault zone. You should remind P.G.&E. that a fundamental rule of modern engineering, when locating a dam, a bridge, or a nuclear plant is to pick a safe site rather than a highly questionable one.

Sincerely,

Lu Watters

Lu Watters

Rec'd Of. Dir. of Regn.

Date 2-20-64

Time 1:15

H ST Beth

DL-546

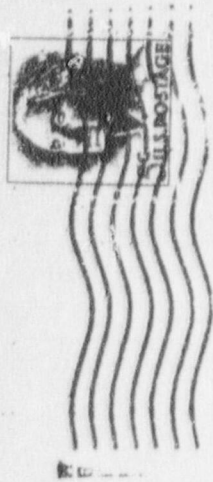


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UNITED STATES POSTAGE
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LEW WATERS
BOX 88
COFHAI, CALIF.



GLEN T. SEIBERG
% THE U.S. ATOMIC ENERGY COMMISSION
WASHINGTON, D.C.

*1) Max
Bode 2/26*

FROM LU WATTERS

Box 88
Cotati, Calif.

TO: Seaborg (forwarded DR for appropriate handling)

CLASSIF.: U

POST OFFICE

REG. NO:

DATE OF DOCUMENT:
2-12-64

DATE RECEIVED
2-20-64

NO.:
DR-546

LTR.

MEMO:

REPORT:

OTHER:

X

ORIG.:

CC:
X (1)

OTHER:

W

ACTION NECESSARY

CONCURRENCE

DATE ANSWERED:

NO ACTION NECESSARY

COMMENT

BY:

FILE CODE:

50-205

DESCRIPTION: (Must Be Unclassified)

Ltr. commenting on our silence with respect to PG&E's shovel work on Bodega Head; and stating that we should remind PG&E that a fundamental rule of modern engineering, when locating a dam, etc., is to pick a safety site rather than a highly questionable one.

REFERRED TO	DATE	RECEIVED BY	DATE
3) H. Price	2-20		2/26
w/cc (as rec'd)			

NOTE: Orig. Cy. of this ltr, addressed to Eber Price, was received 2-19-64. Info Copies sent DR under Control No. 836. HSmith

file 3/2

OFFICE OF THE DIRECTOR

REMARKS:

Copy of this Control Ticket furnished C. T. EDWARDS for info.

DR

OFFICE OF THE CHAIRMAN

2-19
(Date)

TO: DR

_____ For Information

DR _____ For appropriate handling

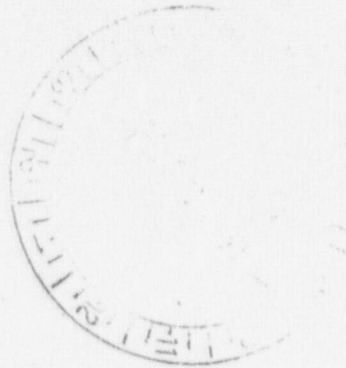
_____ For preparation of reply for Chairman's
signature (Refer to Manual Chapter 0240)

_____ For discussion at Commissioners' Information Meeting

_____ For distribution to other Commissioners

_____ Daily Log

REMARKS:



Howard C. Brown, Jr.
For the Chairman

Lu Watters, Box 88, Cotati, California.

February 12, 1964.

DOCKETED
L&R File Copy (suppl)
50-205

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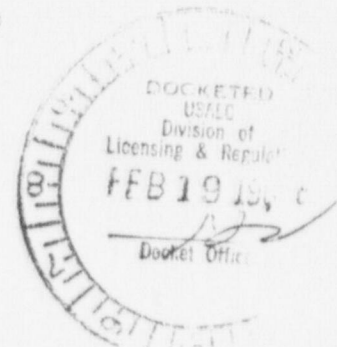
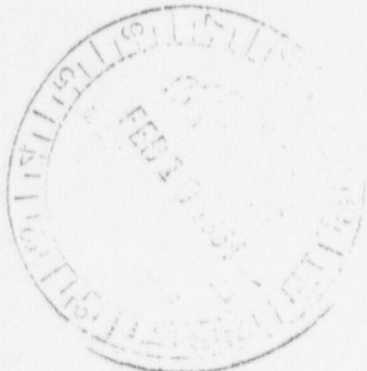
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Sincerely,

Lu Watters

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RECORDERS

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SAN LEANDRO, CALIF.

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Box 88

Contra, Calif.



Mr. EBER R. RICE

% Atomic Energy Commission

Washington, D.C. 20545

FROM: LU WATTERS Box 88 Cotati, Calif.		DATE OF DOCUMENT: 2-12-64	DATE RECEIVED 2-20-64	NO.: DR-546	
TO: Seaborg (forwarded DR for appropriate handling)		LTR. <input checked="" type="checkbox"/>	MEMO:	REPORT:	OTHER:
CLASSIF.: U		POST OFFICE REG. NO.:	ORIG.:	CC: X (1)	OTHER:
DESCRIPTION: (Must Be Unclassified) Ltr. commenting on our silence with respect to PG&E's shovel work on Bodega Head; and stating that we should remind PG&E that a fundamental rule of modern engineering, when locating a dam, etc., is to pick a safety site rather than a highly questionable one.		ACTION NECESSARY <input type="checkbox"/> NO ACTION NECESSARY <input type="checkbox"/>	CONCURRENCE <input type="checkbox"/> COMMENT <input type="checkbox"/>	DATE ANSWERED: BY:	FILE CODE: 50-205
ENCLOSURES NOTE: Orig. Cy. of this ltr, addressed to Eber Price, was received 2-19-64. Info Copies sent DR under Control No. 836. HSmith		REFERRED TO H. Price: 2-20 w/es (as rec'd)	DATE	RECEIVED BY	DATE
REMARKS: Copy of this Control Ticket furnished C. I. EDWARDS for info. <i>relative to H.S.</i>		OFFICE OF THE DIRECTOR			
		DR-546			

FROM: **MR WATERS**
Box 68
Ortati, Calif.

DATE OF DOCUMENT:

2-19-64

DATE RECEIVED

2-19-64

NO:

836

TO: **Eber Price**

LTR.

MEMO:

REPORT:

OTHER:

ORIG.:

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OTHER:

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ACTION NECESSARY

CONCURRENCE

DATE ANSWERED:

NO ACTION NECESSARY

COMMENT

BY:

CLASSIF.:

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POST OFFICE

REG. NO.:

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DATE

RECEIVED BY

DATE

Edwards: 2-19

w/suppl file cy--FOR ACTION AND/OR INFO

H. Price: 2-19

w/5 extras--For Info

Lewenstein: 2-19

w/info cy.

REMARKS:

**M R Distributions: 1 - formal file
1 - AEC PMR (Edwards)
1 - SAW PMR**