



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

JAN 28 1976

Docket Nos. 50-275  
and 50-323

R. S. Boyd, Director, Division of Project Management, NRR

MEETING WITH NEWMARK, HALL, AND USGS CONCERNING DIABLO CANYON SEISMIC DESIGN

We met with our consultants, Dr. N. Newmark, Dr. W. Hall, and the U. S. Geological Survey, on January 22, 1976, in San Francisco, California, to discuss the seismic design of Diablo Canyon. A list of attendees is enclosed.

Dr. Newmark made a general introductory statement. He said the January 12, 1976 draft USGS report appeared to be an excellent document.

He then reviewed the report with reference to specific points. On page 1 he asked about the content of Amendment 37. J. Devine said it presented Dr. Blum's structural analysis and it was generally agreed that it would not impact the basic intent of this meeting.

The 1927 earthquake is addressed on page 4. Dr. Newmark inquired about the joint uncertainty of the magnitude and location of the historical 1927 event. The USGS (Coulter, Page, and Devine) discussed the USGS position which indicates a limited degree of uncertainty, but they stated their feeling that the applicant's assessment demands an assumption that the event be placed on the Hosgri. Dr. Coulter pointed out that if the applicant wanted to do another analysis of magnitude and location they would review it, but as the record now stood the USGS feels it cannot refute the documented record. R. Hofmann presented some arguments which indicate a significant level of uncertainty in the earthquake's location.

I. Sihwell asked Mr. Devine about his statement that the USGS specification was within the one-sigma value based on historical evidence. He wanted to know what USGS would have come up with if they had done their usual review and selected a one-sigma value. Mr. Devine said he reviewed the case ignoring the presence of the plant but would have come up with about the same type of report, in his opinion.

8209100108 820802  
PDR FOIA  
EISSLER82-286 PDR

JAN 28 1976

Carl Stepp expressed his opinion that the staff could not, on the basis of the current record, disagree with the USGS position concerning the location of the 1927 earthquake, but restated the staff's view that if the quake did occur on the Hosgri fault, its magnitude must have been much less than 7.3. Dr. Newmark said his intent was to accept the USGS position and make a judgment on site response by considering all factors influencing that response. He indicated one factor would be the intensity data. Carl Stepp said he doubted if he could support Dr. Newmark on his use of intensity in the way he understood was intended. Dr. Newmark expanded on his intentions and resolved Dr. Stepp's concern.

J. Tourtellotte questioned the approach of accepting only what the applicant has provided as the basis of a final judgment. A great deal of discussion on this ensued. USGS said they would not pre-judge any new submittal by the applicant but remarked that unless there was new information rather than a reanalysis of currently available data, it was very unlikely that their draft report conclusions would be significantly altered.

R. Page discussed his opinion that the observed pattern of intensities supported placement of the 1927 event on the Hosgri. He said he could not see how more weight can be given to intensity data. Carl Stepp said the size of the felt area was of more interest; while the pattern would be supportive of any size, the extent of the felt area could answer the difference of opinions on the size-location question.

Dr. Newmark asked R. Hofmann as to the source of information he referred to; R. Hofmann said S. Smith had provided him a copy of a draft of a report he is preparing. Dr. Newmark asked if he could get a copy. We said we would look into it; we believe it is to be submitted to us formally.

Dr. Newmark questioned the use of the phrase "shown by the applicant" on page 8. USGS agreed it should be "shown by the best available evidence."

Dr. Newmark questioned on page 10 the use of the word "shows." USGS said it would revise the phrasing.

Dr. Newmark went to page 12 which he termed "the meat of the matter." He agrees with the first paragraph. In paragraph 2 Dr. Newmark said the peaks in the referenced USGS Circular he would assume to be upper bound values. Dr. Page said he could not agree. Dr. Newmark said would they concur with respect to velocities versus acceleration. Dr. Page said it was not apparent to him. A general discussion

ensued mostly between R. Hofmann and R. Page, but without resolution. In response to Mr. Devine's question, Dr. Newmark said if the answer to his question had been yes, he would have used that answer to influence selection of a one-sigma value. Dr. Newmark again said the peak velocities could only occur in the strongest rock at the source and significant drops would occur with distance. Dr. Newmark cautioned R. Hofmann not to use a mass of uncertain data to reach an uncertain conclusion on an uncertain parameter.

Dr. Coulter said above 6.5 they would not characterize the values as peak values. Dr. Coulter agreed that they could modify the second and third paragraphs, in accordance with Dr. Newmark's suggestions, and add an additional paragraph that Dr. Newmark thought would add to the utility of the report. This latter suggestion was dropped after subsequent discussion. The end result would be to change page 12 so as to:

- (1) Delete "as a " after "and 7.5 be used" and insert "to form the basis for the" in line 13.
- (2) Change the second sentence in the third paragraph to read "values to allow implicitly for non-linear energy absorbing mechanisms in the structure-foundation interface and in the . . . appropriate design spectra as described in . . ."

USCS said they considered the revised page 12 a realistic way of specifying an SSE for the designers. Then Carl Stepp voiced some concern as to how he could legally do the same; however, he thought he might be able to do so. Isa Sihweil then voiced several concerns regarding:

- (1) The inadvisability of referring to Circular 672 in the USCS report.
- (2) The inconsistency of the recurrence interval with the normal practice of his Branch.

Dr. Newmark refuted all of the concerns but not to the apparent satisfaction of I. Sihweil and K. Kapur. This seems to be the "new" major problem.

I. Sihweil suggested a revised page 12 that would essentially include the first paragraph and the next sentence. This was discussed at some length. Mr. Devine said he strongly preferred the prior suggested version and would insist on the reference to the USCS Circular being

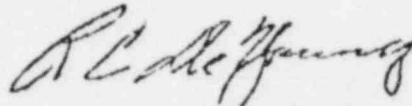
retained. I. Sihweil and K. Kapur evidenced rather strong concerns that they would be able to support Dr. Newmark if they adhered to established NRC procedures. R. DeYoung pointed out that established procedures were in significant measure selected on the basis of convenience and practicality. Acceptance of a conservative procedure lessened the review and design effort and time since smaller margins, while not necessarily any less safe, required a great deal more analysis to use and justify.

R. DeYoung reminded everyone that we were not meeting to arrive at a suggested final version of the USGS report. The intent of the meeting was to provide Dr. Newmark, in particular, and the others, in general, with an understanding of the factors involved and approaches that might be available to resolve the matter in a technically sound manner acceptable to all. The current draft report presents the views of the USGS; slightly different language might be suggested to clarify the intent of the USGS to users of the report. It is not intended that word changes would alter the intent of the Survey; the USGS representatives stated strongly that they would not alter the intent of their report even if asked to do so. Their final report will be "their" report. R. DeYoung said he understood everyone would consider the views expressed at this meeting and be prepared to meet again with "final" suggestions about the end of February or very early March. After that a revised, and perhaps final, USGS report would be submitted. This was agreed to by all parties.

USGS agreed to participate in a meeting with the applicant which was tentatively scheduled for February 3, 1976. The purpose of the meeting would be to inform the applicant of the status of our review, to hear presentations by the applicant on specific items, to respond to questions by the applicant as to why his views on specific items had been rejected, and finally, to allow the applicant to question the staff and the USGS as to the bases for their developing positions. The location for the meeting was left open; Denver, Bethesda, and Chicago were suggested as possibilities. A draft agenda was distributed by W. Gammill; a copy is enclosed. R. DeYoung said he would have D. Allison, the Licensing Project Manager, follow up on the arrangements for the meeting and would also inform the applicant of the proposed meeting and provide him with a copy of the draft agenda before departure from San Francisco.

JAN 28 1976

It was generally agreed that progress had been made at the meeting. The staff's engineering concerns, while more fully expressed, were not apparently alleviated to any significant degree. They now constitute the major barrier to timely and favorable resolution of the matter.



R. C. DeYoung, Assistant Director  
for Light Water Reactors  
Division of Project Management

Enclosures:

1. List of Attendees
2. Proposed Agenda

cc w/enclosures:

B. Rusche  
E. Case  
H. Denton  
W. Gammill  
C. Stepp  
R. Hofmann  
O. Parr  
D. Allison  
R. Heineman  
F. Schroeder  
R. Maccary  
I. Sihweil  
K. Kapur  
L. Shao  
J. Tourtellotte  
~~M. Malmros~~, IE Region V

LIST OF ATTENDEES

MEETING CONCERNING DIABLO CANYON

JANUARY 22, 1976

W. J. Hall	N. M. Newmark Consulting Engineering Services
N. M. Newmark	N. M. Newmark Consulting Engineering Services
S. Brockman	USGS
J. Devine	USGS
P. Hanshaw	USGS
R. H. Morris	USGS
H. W. Coulter	USGS
R. A. Page	USGS
R. C. DeYoung	NRC
W. P. Gamill	NRC
J. C. Stepp	NRC
J. Tourtellotte	NRC
R. B. Hofmann	NRC
K. K. Kapur	NRC
I. Sihweil	NRC
M. H. Malmros	NRC

PROPOSED AGENDA  
USGS - APPLICANT MEETING  
DIABLO CANYON

1. Detailed discussion of each profile intersecting or possibly intersecting the Hosgri fault near its Southern termination as mapped by Hoskins and Griffith 1970 or USGS other than in published or open file maps.
2. Discussion of all documentable phenomenon regarding the northern end of the fault and possible connection with the San Simeon e.g. borings and the stratigraphic relationship recently proposed by Hall.
3. The epicenter and error associated with an unweighted solution of all seismic data for the 1927 Pt. Arguello earthquake.
4. The accuracies of P times given in the ISS, ISC or DCIS for data used in the 1927 re-solution.
5. The effect of gaps in azimuthal coverage and the critical dependence on data at about  $340^\circ$ , pointed out by Engdahl, on the shape of the 95% confidence areas over the proposed epicenters.
6. Reconciliation of Intensity contours and proposed locations of the  $M=7.25$  1927 Pt. Arguello earthquake.
7. Reconciliation of the maximum Intensity observed with the proposed epicenters of the  $M=7.25$ , 1927 Pt. Arguello earthquake.
8. Discussion of attenuation and method of specification of design accelerations or other parameters.