




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

February 3, 1976

OFFICE OF THE
SECRETARY

MEMORANDUM FOR THE RECORD

FROM: Samuel J. Chilk, Secretary 

SUBJECT: BRIEFING ON SEISMIC CRITERIA, JANUARY 26, 1976, 11:35 A.M.,
COMMISSIONERS' CONFERENCE ROOM, D. C. OFFICE

Mr. Minogue introduced Mr. Gammill and Mr. Stepp. The first three slides were shown.*

Chairman Anders asked if slide 3 indicated that recent earthquakes have resulted not from non-active faults, but rather from deeper crust movements. Mr. Stepp responded affirmatively. The Chairman then asked if a capable fault was defined in the regulations. Mr. Stepp said yes, there is a rigid definition in Appendix A (to 10 CFR Part 100). Chairman Anders asked if there had been any correlation found between east coast faults and tectonic action in the recent past. Mr. Stepp answered negatively, but said that the possibility remains.

Mr. Stepp noted that the recently adopted Appendix A has formalized reporting requirements and acceptance criteria for geologic and seismic siting of reactors. Over 100 previous reviews have been affected. Chairman Anders asked if any old sites had been found to be grossly out of compliance. Mr. Stepp said yes, where a new plant was proposed for an old site, but no shutdowns had been found necessary for older plants.

Mr. Stepp said that it is now assumed by NRC that random earthquakes are possible within tectonic provinces, contrary to the pre-1973 assumption that only patterned and stationary earthquakes would occur. He said that the probability of earthquake within the Kelvin trend area is greater than without and that little is known about large infrequent earthquakes because no source theory has been developed for them.

Responding to a question from Chairman Anders, Mr. Stepp said that there is disagreement between NRC and other seismologists about the repeatability of earthquakes and the location of tectonic provinces. He also said that the eastern earthquake driving mechanism is not nearly as well understood as west coast seismic forces.

*Numbered Vu-graphs used during the briefing are attached.

Contact:
Fred Emigh (SECY)
634-1410

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Responding to another question by the Chairman, Mr. Stepp said that NRC would pick up the seismic review workload and not call on the USGS at hearings to discuss sites they have not reviewed. He added that the USGS could be called as a witness, but NRC probably would not do so. Mr. Stepp said that he felt the USGC does not like case work very much because they prefer to work on general trends and theories, and tend to look at a case in terms of its research value. He also said the he felt USGS expertise lies more on the west coast and that the Service usually tries to stay out of hearings. It was stated that NRC now has capable people on board to assume most of the seismic workload.

Mr. Stepp said that USGS seems to be sensitive about their employees commenting as individuals because it is afraid the NRC might influence their independent judgment. Chairman Anders said that improved communication with USGS is necessary. Mr. Minogue replied that the NRC might propose a memorandum of understanding to USGS.

Mr. Stepp reviewed some site-specific problems, noting that the USGS seems to often give its interpretation of problems without underlying reasons and that USGS often will not operate within NRC schedules. He added that there have been no difficulties with the U.S. Army Corps of Engineers.

The Commission requested:

1. that staff return with another briefing focussing on difficulties of coordination with the USGS; and
2. that staff recommend areas in which the Commission can take immediate action to work out problems with USGS.

(12:45 p.m.)

Those in attendance were:

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Brf on Seismic Criteria
1/26/76

- 3 -

February 3, 1976

Commissioners

William A. Anders, Chairman
Marcus A. Rowden
Edward A. Mason
Victor Gilinsky
Richard T. Kennedy

Secretary of the Commission

Samuel J. Chilk

Staff

H. Denton
F. Enigh
W. Gammill
M. Grossman
J. Hard
J. Harves
C. Heltemes
B. Huberman
A. Kenneke
R. Minogue
T. Quay
W. Ramsay
B. Snyder
C. Stepp
C. Stoiber
L. Weiss

NUCLEAR POWER PLANT
SEISMOLOGY AND GEOLOGY
REVIEW HISTORY

1ST APPLICATION FOR COMMERCIAL POWER PLANT (INDIAN POINT #1)	1956
1ST SEISMIC DESIGN (HUMBOLDT)	1959
1ST SEISMOLOGY REVIEW (SAN ONOFRE)	1963
1ST GEOLOGY & SEISMOLOGY REVIEW (HADDAM NECK)	1963
APPENDIX A (DRAFT)	1971
REG. GUIDE 1.70	1972
APPENDIX A (ADOPTED)	1973
REG. GUIDES 1.60 & 1.61	1973
NRC GEOLOGY/SEISMOLOGY STAFF FORMED	1973
STANDARD REVIEW PLAN	1975
STATE PARTICIPATION	1975

#1

EARLY
REVIEW PROCEDURE

- I. CONSULTANTS
 - A. USGS PARTICIPATION
 - B. USC&GS PARTICIPATION
 - C. NEWMARK

- II. PROCEDURE
 - A. MONTHLY MEETING OF CONSULTANTS
 - B. MEETING WITH APPLICANT
 - C. REQUIRED DOCUMENTATION

- III. GUIDELINES

10 CFR Part 50.34 -
"Contents of Application: Technical Infor
mation"

27

BASIC ASSUMPTIONS OF GEOLOGY AND SEISMOLOGY REVIEWS
PRIOR TO APPENDIX A

1. NO CAPABLE FAULTS IN EASTERN UNITED STATES
 2. NO SEISMICALLY ACTIVE FAULTS IN EASTERN UNITED STATES
 3. STATIONARITY OF EARTHQUAKE OCCURRENCE
 4. CONCEPT OF CONTROLLING EARTHQUAKE
 5. DEFINITION OF TECTONIC PROVINCES NOT NECESSARY
 6. MAXIMUM POSSIBLE ACCELERATION IS 50 PERCENT OF GRAVITY
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#3

SEISMIC AND GEOLOGIC SITING CRITERIA
FOR NUCLEAR POWER PLANTS

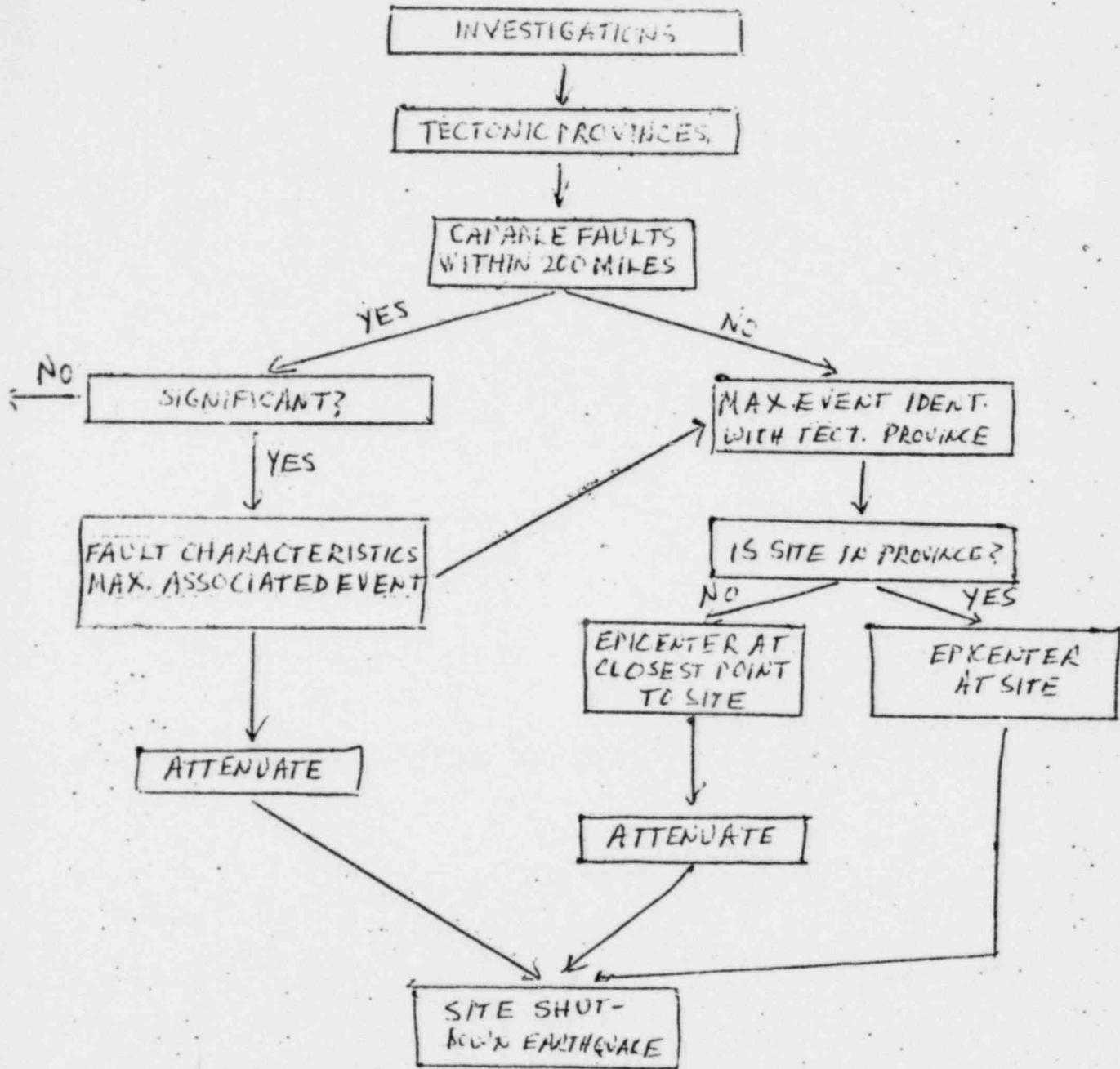
A. REQUIREMENTS

- Earthquake Design Bases
- Surface Faulting
- Seismically Induced Floods
- Associated Phenomena

B. IMPACT

- Pre-Appendix A Reviews
- No Grandfather Clause
- Formalization of Reporting Requirements
- Formalization of Acceptance Criteria

#.5



DETERMINATION OF SAFE SHUTDOWN EARTHQUAKE

SUMMARY OF USGS
REVIEWS OF NUCLEAR POWER PLANT SITES

<u>ACTION STATUS</u>	<u>NO. SITES</u>	<u>NO. SITES RE- VIEWED BY USGS</u>
I. LICENSED SITES		
A. OPERATING LICENSE	40	38
B. CONSTRUCTION PERMIT	33	33
II. CURRENT REVIEW		
A. CONSTRUCTION PERMIT	36	18
B. EARLY SITE	3	3
III. PROJECTED APPLICATIONS		
A. FY 76	9	1
B. FY 77	10	2
IV. NUMBER OF PLANTS LI- CENSED PRIOR TO ISSU- ANCE OF APPENDIX A		
	126	

#6

N R C
G E O L O G Y - S E I S M O L O G Y S T A F F

Seismology	3
Geology	8
Foundation Engineering	5

#7

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CURRENT AGREEMENT WITH USGS

A. SCOPE

1. REVIEW OF DOCKETS
2. RESEARCH
3. ADVISORY GROUP

B. MECHANICS OF COORDINATION, ETC.

1. MUTUAL AGREEMENT ON SITES TO BE REVIEWED BY USGS
2. MUTUAL AGREEMENT ON TESTIMONY, ETC.
3. OFFICIAL AGENCY CONTACTS
4. REVIEW LEVEL CONTACTS
 - a. ACCESS TO GS REVIEWERS
 - b. ACCESS TO SCIENTIST WITHIN USGS

8#

4

CURRENT REVIEW PROBLEMS

SKAGIT - SAFE SHUTDOWN EARTHQUAKE

PALO VERDE - LOCAL FAULTING

PEBBLE SPRING - VOLCANISM

MARBLE HILL - LATE RESPONSE

DIABLO CANYON - SAFE SHUTDOWN EARTHQUAKE

PILGRIM - REEVALUATION

SUNDESERT - LATE RESPONSE

#9

16

PROBLEMS

- A. LACK OF CONTACT WITH USGS SCIENTISTS
- B. SCHEDULES
- C. NATURE OF SCIENCE

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RECOMMENDATIONS

1. REVISE MEMORANDUM OF UNDERSTANDING
 - IMPROVE COMMUNICATION
 - SPECIAL GENERIC REVIEWS
 - REALISTIC SCHEDULES
2. POWER PLANT SITING ADVISORY GROUP
3. CONTINUE MINIMUM USGS PARTICIPATION
IN CASE REVIEWS

#11