



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

SEP 21 1983

MEMORANDUM FOR: William D. Paton, Attorney
Office of Executive Legal Director

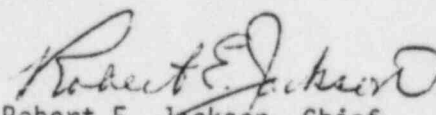
FROM: Robert E. Jackson, Chief
Geosciences Branch, DE

SUBJECT: COMMENTS ON APPLICANT'S PROPOSED FINDINGS OF
FACT AND CONCLUSIONS OF LAW ON REMEDIAL SOIL
ISSUES - MIDLAND PLANT UNITS 1 AND 2

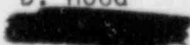
As you have requested we have read through the Midland applicant's proposed findings of fact and conclusions of law on remedial soils issues. Specific comments are attached to this memorandum.

These comments were prepared by Jeff Kimball, Seismologist, who reviewed both testimony and legal briefs prepared by the staff and applicant along with transcript pages 4537 to 4941.

We are available to discuss these comments and the preparation of the staff's findings with you, if necessary.


Robert E. Jackson, Chief
Geosciences Branch, DE

Attachment:
As stated

cc: w/attachment
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Comments on Midland Findings of Fact

In general the comments below point out areas in the transcripts and testimony that discuss the various issues from the staff's viewpoint. The addition of these references would make the findings more complete.

- 1) Page 11 footnote 7 - A discussion of the difference between magnitude and intensity can also be found in Kimball testimony page 8.
- 2) Page 11 line 6 and footnote 8 - Housner is spelled wrong
- 3) Page 12 concerning the 2 alternatives discussed in footnote 9 - Holt Ex 3 which is the 10/14/80 letter states that using magnitude that target of 5.3 is chosen to be similar to 1937 Anna, Ohio earthquake. The word similar is important for magnitude because other events are about the same size, see Kimball testimony page 5. Thus, the 5.3 did not depend solely on 1937 Anna, Ohio earthquake.
- 4) Page 16 bottom of footnote 17 - the Staff's SER, NUREG-0793 pg 2-41 specifically states that faults are not capable. The SER specifically discusses the extensive investigation mentioned at the bottom of footnote 17. If the SER can be used it should be referenced here.
- 5) Page 17 paragraph 10 second sentence - the definition of seismicity as the relative frequency of earthquakes in a particular region is too narrow a definition. It also includes the location and size of historic events which are not necessarily probabilistic considerations. This point is made again on the top of page 18 prior to footnote 21 where it is implied that seismicity is a probabilistic consideration. Seismicity involves both deterministic and probabilistic considerations.
- 6) Page 17 footnote 20 - this reference should be checked to make sure it is worded correctly.
- 7) Page 17 last sentence - deterministic and "cookbook" are not the same. A probabilistic approach can be a "cookbook" approach. This wording should be altered.
- 8) Page 18 footnote 22 - see also Kimball testimony pg 4 and page 20.
- 9) Page 18 footnote 23 and 24 should be checked to make sure proper section of 10 CFR Part 100 Appendix is being referenced.
- 10) Page 19 last sentence top paragraph and footnote 26 - what is the point here? We recommend stopping at "site independent". The staff would not necessarily agree that Regulatory Guide 1.60 response spectrum generally defines a level of ground motion in

excess of that which the site would experience due to the occurrence of such an earthquake at the site. That would depend on the peak acceleration used. It does not seem necessary to try and make the point that the licensee is making.

- 11) Page 19 second paragraph sentence prior to footnote 27 - Holt ex 3, 10/14/80 letter from staff does not state that site specific spectra can be constructed for most sites. This could mislead the ASLB.
- 12) Page 20 top paragraph footnote 28 - see also Kimball testimony pages 6 and 7.
- 13) Page 20 paragraph 14 in total - the staff would not agree that 84th percentile results in a probabilistic statement. As noted in Kimball testimony pg. 10, the 84th percentile is based upon staff practice and is a deterministic judgement. We recommend that this paragraph be altered to remove specific statements regarding probabilistic nature of site specific spectra. In fact, the staffs brief states that this is a deterministic procedure, although we would agree that the final spectrum results in some type of probabilistic statement we would hesitate to specifically define what that statement is. We would also recommend changing the word "at" to "near" in the second to last line page 20.
- 14) Page 21 footnote 32 - see also Staffs brief page 14.
- 15) Page 21 paragraph 15 - we would not necessarily agree that the use of site specific spectra is more consistent with Appendix A than the use of Regulatory Guide 1.60. We would say that both a site independent response spectrum, as defined in Regulatory Guide 1.60, and the site-specific response spectrum are consistent with the requirements of Appendix A. See staff's brief page 10.
- 16) Page 23 regarding the Michigan Basin tectonic province paragraph 20 - The staff still does not accept the Michigan Basin as a tectonic province. A few comments are in order - Note on transcript page 4669 that Mr. Holt states that crystalline basement rocks are not consistent under the Michigan Basin although he stated that this is not significant as an earthquake source mechanism. Kimball transcript page 4789 and 4791 specifically discuss Michigan Basin. The discussion on pages 23 & 24 specifically highlights Michigan Basin too much. What should be highlighted is inconsistency of seismicity and the Central Stable region no matter what the subdivision is. If in the end the actual tectonic province is a moot point then why does the applicant make such an issue out of the Michigan Basin?

- 17) Page 24 foot note 42 - again the 1937 Anna, Ohio event is only an example of the controlling earthquake.
- 18) Page 24 paragraphs 21 and 22, page 25 paragraph 23 - There is too much emphasis on the crystalline basement rock - The emphasis should be placed on the extreme low level of seismicity. See Kimball testimony pages 3 and 4. Paragraph 23 is a good summary, it may not be necessary to go through all the preamble particularly about basement rocks, because this issue is a moot point.
- 19) Page 26 last sentence paragraph 26 - regarding smaller tectonic province. Kimball testimony page 20 states that the Midland site is in a different seismotectonic province. Kimball testimony page 4 states that seismotectonic regions are the "tectonic province" defined in Appendix A. We would recommend using the word seismotectonic province to be consistent with the testimony. Other places where we recommend this change are page 25 paragraph 23 first sentence, page 29 paragraph 28 + 29 in total, page 31 paragraph 30, page 44 ninth line.
- 20) Page 27 paragraph 26 first sentence - This sentence is misleading - it is not compared to other sites surrounding the Michigan Basin footnote 52 misrepresents Kimball testimony p. 18 by bringing in the Michigan basin.
- 21) Page 29 footnote 61 - see also Kimball transcript page 21.
- 22) Page 30 footnote 64 - although it may be related to a tectonic structure, it is the staffs position that it is not and the way it is written may mislead the ASLB.
- 23) Page 32 just after footnote 70 - to the best of our recollection there was not an initial disagreement as to the appropriate spectral level, this discussion was initiated after Parkfield became an issue.
- 24) Pg 33 footnote 76 - see also Kimball transcripts page 4729, 4730, 4733, 4734.
- 25) Page 34 paragraph 34 second line delete the word "all".
- 26) Pg 34 bottom and top of 35 paragraph 34. It is recommended that problems with the stations not be discussed here - such as the recording station may have been too close to the Fault or been influenced by near field effects. The applicant's consultant did not use this criterion in the original reports, only after Parkfield became an issue and discussing at this point in the findings is unnecessary because this is a moot point. See Kimball transcripts pages 9 to 12.

- 27) Pg. 40 second sentence paragraph 46. The word "still" is misleading. The applicants consultant did not originally offer that the Parkfield records, which fit the magnitude and distance were anomalous because of earthquake rupture characteristics. Their Feb. 1981 report states that these records were too soft yet when they checked the site conditions they did match. The April 1981 report is when rupture characteristics became involved.
- 28) Pg. 41 paragraph 48. The sentence referring to Dr. Nuttli and footnote 101 should be removed. Dr. Nuttli is likely to no longer support what he wrote.
- 29) Pg 41 in general - note transcript pages 4610 and 4741 which would contradict paragraph 48.
- 30) We recommend that Section II not be included unless absolutely necessary. Again this is a moot issue and there is no real advantage to discussing it in the findings.