

SEISMOLOGICAL AND GEOLOGICAL REVIEW

DAVIS-BESSE NUCLEAR POWER STATION

THE TOLEDO EDISON COMPANY

(Docket No. 50-346)

The following are additional comments and questions resulting from a preliminary review of the PSAR reference documents (see attached list) for the Davis-Besse Plant and are primarily directed toward seismological and geological considerations.

1. Reference is made to "significant solution fissures or solution cavities". What is the definition of a significant cavity or fissure? How is this distinction made when cavities or voids are encountered in drilling?
2. How was it determined that the boring grid used was adequate to detect all "significant" solution fissures or cavities?
3. We note that it is recommended that additional rock probes be made during construction to further investigate the possibility that the bedrock may contain significant voids. Will this recommendation be followed? If so, what are the specifications for this additional exploration work?
4. Has the seismic reflection method for detection of voids been evaluated?
5. The bar logs and the design log do not contain sufficient information to evaluate subsurface conditions. Please submit complete logs of all borings, probes, and drill holes which penetrate bedrock beneath or adjacent to critical structures. Also submit the

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procedures and standards (such as ASTM D1452-63T, D1586-64T, D1587-63T, D2113-62T) followed. In particular, the information listed in Section 4 of D2113-62T would be helpful in the evaluation including loss of drilling fluid.

6. What were the qualifications of the field supervisory personnel under which field investigations were performed?
7. Please discuss the possible causes and significance of the depression in the ground surface at the site of drill hole B3-10. Data obtained by drilling and conclusions reached should be included in the discussion.
8. Please submit the results of the broadside seismic survey and the shear wave refraction profiles. Include an evaluation of these results.
9. It is stated that the foundation level of the east wing of the auxiliary building will be of elevation 585 which is approximately 7 ft. above the existing grade. However, the contour map shows existing grades of 562 which is 23 ft. below foundation grade. Please clarify this.
10. The applicant states that the auxiliary building is to be founded at three elevations: 545 ft, 565 ft, and 585 ft. The response spectra presented are presumably for bedrock conditions. What are the response spectra for the top of the glacial deposits and fill on which portions of the auxiliary building will be founded? How will the different spectral responses at these various foundation elevations be treated in the seismic analyses and design? How will differential settlements under normal and/or earthquake conditions be evaluated and accounted for in the design?
11. The maximum ground acceleration due to the Operating Basis Earthquake should be equal to at least one-half of that due to the Design Basis Earthquake.

12. Elastic parameters for bedrock are given (plate 2C-61) and it is stated that they are valid only for very low stress levels existing in seismic surveys. It is further stated that parameters pertaining to earthquake induced forces would be determined by laboratory tests. Please present these laboratory determined values and the final values to be used as representative of the foundation materials. Please provide the bases for selection of these final values.
13. Please provide detailed design considerations for canal embankments and supporting data (Page 2C-86). Will the design provide for resistance to earthquake forces under saturated conditions?
14. Please discuss possible liquefaction of the sandy soils underlying site.

SEISMIC REVIEW

REFERENCE DOCUMENTS

Davis-Besse Nuclear Power Station  
The Toledo Edison Company  
Docket No. 50-346

Construction Permit

Preliminary Safety Analysis Report, Volume I  
Preliminary Safety Analysis Report, Volume II  
Preliminary Safety Analysis Report, Volume III