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Roger S. Boyd, Assistant Director for Boiling Water Reactors, IRL
THRU: Robert L. Tedesco, Chief, EWR-2, IRL

SITE RELATED MATTERS CONCERNING THE DAVIS-BESSE FACILITY
DOCKET NO. 50-346

The ACRS Subcommittee for the Davis-Besse facility requested that we make available for its use at the forthcoming meeting (May 26, 1970), a listing of site related problems. In response to this request, we plan to provide to the Subcommittee the following items along with our preliminary comments.

(1) Geology-Foundation

There is the potential that significant solution cavities and solution fissures exist just below the foundation level of Class I structures. To assure that any significant cavities and fissures will be discovered and properly treated, we believe that either of two actions would be acceptable. First, the applicants could make closer borings (about 15 feet apart) along with providing additional information regarding possible remedial treatment if found to be necessary. Second, the applicant could report the findings of its excavation and drilling along with appropriate treatments, and then accommodate a site visit by representatives of the AEC for review. Since the present plan is to start excavating in July, this approach may not be practical since it could delay completion of our review. This matter was discussed with the applicants at a meeting held on May 20, 1970. They indicated that they would give further study to the development of an acceptable program including criteria to provide assurance that any significant solution cavities would be discovered and repaired during the excavation.

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(2) Hydrology

Flooding aspects of the Davis-Besse site are still under review by us. We need acceptable analyses of the probable maximum design water level and the probable minimum low water level, to assure an adequate level of protection of essential plant safety features.

(3) Design Basis Accident

We and the applicants do not agree on accident models mainly because of assumptions used in modeling meteorological effects at the site. Based on available data we assume that the release of radioactivity from the containment occurs at the 20-foot elevation and is transported at a wind speed of 1 m/sec for the first 24 hours. Under these conditions we calculate a two-hour dose of 280 rem at the exclusion radius and a 330 rem at the low population zone. At a meeting held on May 20, 1970, the applicants agreed to install an additional charcoal filter in series in the exhaust duct. We consider this action to be acceptable.

(4) Seismic

The horizontal acceleration for the operating basis earthquake (OBE) and the design basis earthquake (DBE) are 0.08g and 0.15g, respectively. We and our consultant, U.S. Coast & Geodetic Survey, have concluded the above acceleration values are acceptable for the Davis-Besse site.

The applicants have proposed to design Class I structures based on an earthquake response spectrum which has an amplification factor of 3.0. Class I equipment will be designed using a time-history response spectrum which will not vary significantly from the smooth response spectrum. Amendment 4 of the PSAR describes the method the applicants intend to use to develop the time-history response spectrum.

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We and our seismic design consultant, John A. Blume & Associates, believe that (a) the seismic response spectrum proposed to be used in the seismic design of the Davis-Besse Class I structures and equipment should have an amplification of no less than 3.5 and (b) the time-history response spectrum used in seismic design should envelop the smooth response spectrum.

(5) Restricted Areas

There are three areas located near the station site which have been established as restricted areas for use by branches of the Armed Forces and industry as impact areas for air to ground gunnery and bombing training missions, small arms firing, and anti-aircraft weapons. These areas are clearly identified in Appendix 2A of the PSAR and the type of weapons fired in the restricted area is specified. The control of activities within the restricted areas is enforced by the Adjutant General, State of Ohio, and such agencies as he may delegate this authority. The applicants response to question 1.10, Amendment 3, indicates that the structures and vital components, which are required for safe shutdown of the facility and prevention of any radioactivity release, will be protected against external missiles by a reinforced concrete wall with a minimum thickness of 18 inches. We and our consultant, Mr. J. Proctor, U. S. Naval Ordnance Laboratory, have reviewed the penetration capability for the weapons described in the PSAR.

The following table indicates the reinforced concrete wall perforation, and scabbing from projectiles fired from the restricted areas.

Table 1

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| <u>Projectile</u> | <u>Impact Penetration</u> | <u>Limit of Perforation Thickness</u> | <u>Limit of Scabbing Thickness</u> |
|-------------------|---------------------------|---------------------------------------|------------------------------------|
| 40 mm | 5.49 inches | 8.9 inches | 10.85 inches |
| 25 mm APDS-T | 16.9 inches | 21.5 inches | 24.1 inches |
| 25 mm APHEI-T | 4.9 inches | 7.4 inches | 8.8 inches |
| 35 mm | 27.1 inches | 34.5 inches | 38.4 inches |

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The above perforation thicknesses indicate that the 25 mm APDS-T (Armor Piercing Discarding Sabot) and the 35 mm projectile could result in perforation of the minimum concrete wall thickness of 13 inches. In Appendix 2A of the PSAR the applicants have indicated that TRW has agreed to construct a bunker and shield system to provide a physical barrier to protect against accidental firing of the 25 mm and 35 mm in the direction of the facility. We will follow the implementation of this action.

RP
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Division of Reactor Licensing

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