Docket Nos. 50-329
and 50-330

September 29, 1976

Consumers Power Company
ATTN: Mr. S. H. Howell
Vice President
212 West Michigan Avenue
Jackson, Michigan 49201

Gentlemen:

This letter is in partial response to your request for a review of the implementation of regulatory guides on the Midland Plant. The enclosed comments pertain to your letters of August 19, 1975 and November 7, 1975 regarding regulatory guides in the miscellaneous category.

The enclosure contains specific comments on Regulatory Guides 1.1, 1.4, 1.7, 1.13, 1.26, 1.27, 1.42, 1.49, 1.52 and 1.58. Our evaluation of your commitments regarding Regulatory Guide 1.54 will be addressed as part of our evaluation of the Quality Assurance group of guides. Our comments concerning Regulatory Guide 1.70 were addressed in our previous letter of June 2, 1976.

The enclosed comments result from our review of your letters of August 19, 1975; November 7, 1975; and your two letters of February 3, 1976, file numbers 2123 and 2124; review of pertinent parts of your Preliminary Safety Analysis Report and license application; consideration of the discussions we have had with you on this matter; and the application of appropriate regulations, codes and standards. Based on this review, we have concluded that the implementation of regulatory guides and acceptable alternatives indicated by our enclosed comments does not constitute a change to the principal architectural and engineering criteria which formed the basis for issuance of the construction permits for the Midland Plant, and that such implementation does conform to the General Design Criteria of Appendix A to 10 CFR 50.

It is requested that you document the degree to which you will implement the regulatory guides and acceptable alternatives, indicated in the enclosed comments by appropriate amendments to the Midland application and revisions to the Preliminary Analysis Report.

Sincerely,

(S)

S. A. Varga, Chief
Light Water Reactors Branch No. 4
Division of Project Management

Enclosure:
Regulatory Guide Review

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MIDLAND PLANT UNITS 1 AND 2
REGULATORY GUIDE REVIEW

1. Regulatory Guide 1.1 - "Net Positive Suction Head For Emergency Core Cooling And Containment Heat Removal System Pumps" - (Safety Guide 1, 11/2/70)

This guide describes a suitable relationship between increases in containment pressure caused by postulated loss-of-coolant accidents and the net positive suction head of emergency core cooling and containment heat removal system pumps which may be used to implement General Design Criterion 41.

The applicant has used a standard computational method for determining the net positive suction head (NPSH) available to the pumps. An assumption used in the analysis is that the sump water temperature equals the saturation temperature corresponding to the containment pressure. The available NPSH is then a function of the static head and the system friction losses. This calculational method assures a conservative calculation of the available NPSH. We therefore find this approach to be acceptable and we conclude that the design is in conformance with Regulatory Guide 1.1.

2. Regulatory Guide 1.4 - "Assumptions Used For Evaluating the Potential Radiological Consequences of a Loss-of-Coolant Accident for Pressurized Water Reactors" - (Revision 2, June 1974)

This guide gives acceptable assumptions that may be used in evaluating the radiological consequences of a loss-of-coolant accident for a pressurized water reactor.

The staff has reviewed the applicant's February 13, 1976 response to our letter of January 13, 1976 concerning the implementation of Regulatory Guide 1.4 by Midland in the preparation of their FSAR. We find the applicant's proposed method of analysis of evaluating the radiological consequences of a loss-of-coolant accident to be unacceptable. It is the staff position that the applicant present a conservative analysis of the radiological consequences of a LOCA based on the "semi-infinite cloud" assumptions contained in Regulatory Guide 1.4. The applicant may use the "finite cloud" model described in the February 13, 1976 letter for a realistic analysis of the consequences of a LOCA, if he so chooses.

The staff recently has revised the model for calculation of whole body doses for judging acceptability with respect to 10 CFR Part 100. The revised model considers the dose from low penetrating beta radiation as a skin dose, rather than as a contributor to the whole body dose, as the former model did. The staff considers only that radiation which penetrates the body to a depth of 5 cm to be a contributor to the whole body dose.

3. Regulatory Guide 1.7 - "Control of Combustion Gas Concentrations In Containment Following a Loss-of-Coolant Accident" - (Safety Guide 7, 3/10/71 with Supplement dated October 27, 1971)

This guide describes an acceptable method of implementing General Design Criterion 41 as regards provision of systems to control the concentrations of hydrogen, oxygen and other substances that may be released into the reactor containment following postulated accidents.

The applicant has committed to comply with the design guidance and assumptions for analysis contained in Regulatory Guide 1.7 as supplemented by Standard Review Plan Section 6.2.5 and Branch Technical Position CSB 6-2, "Control of Combustible Gas Concentrations for Containment Following a LOCA," for the design of the combustible gas control system. We find this approach to be acceptable. We will review the combustible gas control system design and supporting analyses in conjunction with the application for an operating license.

4. Regulatory Guide 1.13 - "Fuel Storage Facility Design Basis" - (Safety Guide 13, 3/10/71)

This guide describes an acceptable method of implementing General Design Criterion 61 as regards the design of spent fuel storage and handling systems.

The initial plant design did not include charcoal filters in the exhaust system for the spent fuel storage facility. During discussions with the applicant, the applicant agreed to install charcoal filters in conformance with the guide.

On the basis of this commitment by the applicant, the staff finds that the design is in conformance with Regulatory Guide 1.13 and is acceptable.

5. Regulatory Guide 1.25 - "Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors" - (Safety Guide 25, March 23, 1972)

This guide gives acceptable assumptions that may be used in evaluating the radiological consequences of a postulated fuel handling accident in the fuel handling and storage facility for a boiling or a pressurized water reactor plant.

The initial design did not include charcoal filters to limit possible iodine release following a postulated fuel handling accident. Following staff questions, the applicant agreed that suitable charcoal filters would be provided in the design in conformance with the recommendations of the guide.

On the basis of the applicant's commitment to provide adequate charcoal filters, the staff finds that the design is in conformance with Regulatory Guide 1.25 and is acceptable.

6. Regulatory Guide 1.27 - "Ultimate Heat Sink for Nuclear Power Plants" (Revision 1, March 1974)

This guide describes an acceptable basis for implementing General Design Criteria 44 and 2 with regard to the ultimate heat sink for a nuclear power plant.

In response to our request, the applicant provided the results of a transient heat analysis for the ultimate heat sink. The applicant stated that the analysis performed was more conservative than our Branch Technical Position APCSB 9-2. This more conservative method was used to allow for lack of station auxiliary heat loads data. We compared the calculated heat rejection data with other plants of similar size and design whose data included auxiliary heat loads. While it appears that the Midland core decay heat curves are conservative with respect to BTP-APCSB 9-2, data from other plants indicates that the final analysis may not be conservative when the auxiliary heat loads for the Midland Plant are added to the decay heat removal requirements. The applicant will include the station auxiliary heat loads in the FSAR.

The applicant's analysis of the Midland emergency pond (ultimate heat sink) for thermal performance and water loss was performed in accordance with the criteria outlined in Regulatory Guide 1.27. The resulting peak pond temperature of 108.5°F is 3.5°F above the present service water system design temperature, which conflicts with Position C.1 of Regulatory Guide 1.27. The design temperature will be exceeded for approximately 24 hours. An independent staff analysis, using meteorological and heat rejection rate data supplied by the applicant, confirms the calculated peak temperature of 108.5°F for the emergency pond.

As a result of our review, we have concluded that during the OL review, the applicant must demonstrate that all safety-related equipment whose design temperature is exceeded will be able to function for as long as the emergency lasts. If this cannot be accomplished, we will require the plant Technical Specifications to

include a power level limit to conform with Position C.4 of Regulatory Guide 1.27, when the ultimate heat sink reaches a predetermined temperature.

7. Regulatory Guide 1.42 - "Interim Licensing Policy on as Low as Practicable for Gaseous Radioiodine Releases from Light-Water-Cooled Nuclear Power Reactors" - (Revision 1, March 1974)

This guide provided guidance on implementing the interim criteria for keeping radioactive iodine release in gaseous effluents from light water reactor plants as low as practicable.

The applicant has indicated that Appendix I to 10 CFR Part 50 supersedes Regulatory Guide 1.42, and therefore, Regulatory Guide 1.42 is no longer appropriate. We find this position to be acceptable.

8. Regulatory Guide 1.49 - "Power Levels of Nuclear Power Plants" - (Revision 1, December 1973)

This guide describes acceptable maximum power levels for all nuclear power plants, implementing the Commission's policy statement of March 5, 1973, which stated that the size of all new nuclear power plants accepted for licensing review would be subject to a maximum power limit.

The proposed licensed power level for each of the Midland units is 2452 MWt, which is well within the maximum set by this guide.

On the basis of the information furnished by the applicant in the letter of November 7, 1975, and discussions during the meeting on December 19, 1975, the staff agrees that the applicant intends to conform fully to this guide.

9. Regulatory Guide 1.52 - "Design, Testing, and Maintenance Criteria for Atmosphere Cleanup System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants" - (June 1973)

This guide presents acceptable methods of implementing the requirements of General Design Criteria 41, 42 and 43 with regard to air filtration and atmosphere cleanup systems in light-water-cooled nuclear power plants for the purpose of mitigating the consequences of postulated accidents.

The applicant's design is in conformance with the positions of Regulatory Guide 1.52 with two exceptions. We do not consider the justification given for deviating from Regulatory Guide 1.52 acceptable. We recommend that the applicant revise his design to conform with the following positions of Regulatory Guide 1.52.

C.2.a Demisters should be provided in the design of the Emergency Fuel Handling Area Exhaust Units since there exists the potential for water droplets to be entrained in the air stream after a fuel handling accident.

C.3.j A low flow air bleed system to inhibit adsorber fires is acceptable. However, the design should satisfy the single failure criterion for providing low humidity (less than 70% relative humidity) cooling air flow.

10. Regulatory Guide 1.59 - "Design Basis Floods for Nuclear Power Plants" - (August 1973)

This guide describes an acceptable method of determining, for sites along streams or rivers, the design basis floods that nuclear power plants must be designed to withstand without loss of safety-related functions.

The applicant has proposed an alternative to position C.2.d of Regulatory Guide 1.59 which states that structures, systems, and components necessary for cold shutdown and maintenance thereof be designed with "hardened" flood protection. The applicant proposed sand-bagging certain entrances where permanent protection is not considered feasible due to access requirement for trucks and train cars, or due to the current stage of construction and building design. Entrances would be sand-bagged to an elevation of 635.5 feet mean sea level (ft MSL) (1.5 ft above plant grade). The 635.5 foot elevation was estimated from the Probable Maximum Flood on the Tittabawassee River plus coincident wind-generated wave action. We have independently estimated the run up and concur with the selected level.

Based on the duration of runup on the plant island (less than one day) and the shallow depth of estimated runup (1.5 feet), we will accept the proposed alternative to position C.2.d., provided that a technical specification referencing acceptable emergency procedures that assure acceptable sand-bagging procedures for flood protection be provided in the Final Safety Analysis Report (FSAR). Also, we will require that the applicant demonstrate (in the FSAR) that erosion of the Tittabawassee River bank adjacent to safety-related facilities will not endanger systems necessary to shutdown and cool down the plant.