Docket No. 50-346

License No. NPF-3

Serial No. 1021

January 17, 1984

TOLEDO EDISON

RICHARD P. CROUSE
Vice President
Nuclear
(419) 259-5221

Director of Nuclear Reactor Regulation
Attention: Mr. John F. Stolz
Operating Reactor Branch No. 4
Division of Operating Reactors
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Stolz:

This letter is being submitted in response to a request from your Mr. Guy Vissing for additional information to support Toledo Edison's request for an Emergency License Amendment (Technical Specification change) for the Davis-Besse Nuclear Power Station Unit No. 1. This request was telecopied to you on January 14, 1984 (Serial No. 1020). Toledo Edison's response to Mr. Vissing's questions follows:

Question: Amplify the need for power that exists at Toledo Edison.

Response: The current demand on the Toledo Edison system is approximately 1270 MW. System demand is projected to be relatively stable for the near future. The unavailability of Davis-Besse is coupled with an outage at our Bay Shore Unit No. 4. This is a coal fired unit with a capacity of 215 MW. The Bay Shore outage, added to the loss of 428 MWs which is Toledo Edison's share of Davis-Besse's output, has resulted in a need for Toledo Edison to purchase 300 MW from Duquesne Power.

The repair of the Davis-Besse turbine to condenser boot seal is currently scheduled to be completed by January 18, 1984 with plant heatup to commence by January 19, 1984. Start-up of the Bay Shore unit is scheduled for January 21, 1984. With the Bay Shore unit on line, the need for purchased power will be reduced to approximately 150 MW (this includes the Davis-Besse in-house power needs for start-up). This figure is also contingent upon weather conditions in the Toledo Edison service area.

Question: What is the lead time on obtaining a replacement Containment Recirculation Fan?

Response: Toledo Edison has been in contact with the fan vendor (Reliance) and they have told us the lead time for a new fan assembly is approximately 5-6 weeks.

A001
1/1

Toledo Edison is continuing efforts to obtain a replacement fan through other vendors and also through other utilities. Despite these efforts, it is doubtful that a replacement can be obtained and installed prior to the currently scheduled start-up. However, if a fan is obtained, Toledo Edison will promptly notify you through Mr. Guy Vissing.

Question: How does Davis-Besse compare to the Midland plant with respect to hydrogen generation?

Response: Attachment 1 to this letter provides a direct comparison between the Midland and Davis-Besse designs.

Attachment II to this letter is a re-formatted Significant Hazard Consideration, as requested by your Mr. Vissing. This information coupled with the information provided in our January 14, 1984 submittal supports the issuance of the requested Emergency Technical Specification change.

Very truly yours,

RPC:RFP:lah

cc: DB-1 NRC Resident Inspector

Docket No. 50-346
License No. NPF-3
Serial No. 1021
Attachment I

Design Feature	Midland*	Davis-Besse
- Containment Volume	1.6×10^6 ft^3	2.8×10^6 ft^3
- Time Required to Reach 4% by Volume Hydrogen Concentration	12 days	50 days
- Containment Design Pressure	56 psig	47 psig
- Availability of Hydrogen Purge	Yes	Yes
- Ability for Hydrogen Dilution	No	Yes
- Containment Air Cooler Capacity	4 Units @ 80,000 CFM Each	3 Units @ 117,000 CFM Each
- Proposed Reactor Vessel Head Vent Design	½" Line to Top of Hot Leg	2.5" Line to Top of Steam Generator
- Ability to Sample Containment Dome Hydrogen Concentration	Uncertain	Yes
- Capability of Hydrogen Recombiner Hook-up	Yes (Recombiner On-Site)	Yes
- Containment Spray Configuration	1 Spray Ring	2 Spray Rings One/Pump

* Information verbally supplied to Toledo Edison through a third party, may be subject to further verification.

Docket No. 50-346
License No. NPF-3
Serial No. 1021
Attachment II

SIGNIFICANT HAZARD CONSIDERATION

The amendment request to delete the requirement for the Containment Recirculating System does not represent a Significant Hazard Consideration. The Containment Recirculation System was part of the original plant design for prevention of hydrogen concentrating in the containment dome. Since the issuance of the Davis-Besse Unit No. 1 (DB-1) license, other plant reviews have been performed and additional analysis have been researched to show that the system is not needed to prevent stratification of hydrogen concentration in containment.

The attached amendment request would delete the requirement for the Limiting Conditions for Operation, Sections 3.6.4.2, Surveillance Requirements 4.6.4.2 and the associated bases for the containment recirculating system from the Technical Specification (Davis-Besse is a B&W Standard Technical Specification Plant). The specifications for the recirculation system were required as part of the original plant design to assure proper mixing of hydrogen in the containment dome area to prevent localized hydrogen burn in that area following a LOCA. The concern that prompted the design for the containment recirculation system was originated from the thought that hydrogen, being a light density gas, may rise up and concentrate in the containment dome area creating a stratified hydrogen distribution. The containment recirculation system, consisting of two independent trains of duct works and fans, is designed to recirculate the air from the top of the containment dome to the lower elevations in the containment. This is the original design function of the system.

The mixing of hydrogen is and would be accomplished without the containment recirculation system through other existing systems namely containment spray, containment air coolers, and naturally occurring mechanisms such as convective mixing and the molecular diffusion.

The containment spray system (safety grade) is automatically initiated by the high containment pressure resulting from a LOCA. This creates a turbulent condition in the containment which ensures proper mixing of hydrogen generated from the initial metal-water reaction in the core.

Two of the three containment air coolers (safety grade) will be in operation after a LOCA to provide the heat sink for the containment atmosphere and recirculate the air in the areas below the operating deck. The radiolytic hydrogen generated from the water on the floor and in the containment sump will be mixed by the air coolers.

DB-1 has a large dry containment with 2.8 million cubic feet of free volume. Total height from the floor to the ceiling is more than 250 feet. The heat loss through the containment wall will promote the natural convective air circulation downward along the wall. This process is further enhanced by the concrete structure for the steam generator compartment (the D-rings) which have a natural chimney effect providing

an upward draft in the inner portion of the containment. The combined effects provide the natural internal recirculation of atmosphere in the containment with flow rates much greater than the containment recirculation system flow.

A research project was conducted by the Los Alamos National Laboratory in 1978. Their report NUREG/CR-0304 titled "Mixing of Radiolytic Hydrogen Generated Within a Containment Compartment Following a LOCA" was prepared for the Division of System Safety, Office of NRR. It showed that the molecular diffusion process will definitely promote the mixing of hydrogen with air. The same process also ensures that the mixture will not separate by gravitational force or other processes.

The Commission has provided guidance concerning the application of the standards in 10 CFR 50.92 by providing certain examples (48 FR 14870). One of the examples of actions involving no significant hazards considerations related to a change which either may result in some increase to the probability or consequences of a previously-analyzed accident or may reduce in some way a safety margin, but where the results of the change are clearly within all acceptable criteria with respect to the system or component specified in the Standard Review Plan: for example, a change resulting from the application of a small refinement of a previously used calculational model or design method.

This request to delete the Technical Specification requirement for the containment recirculation system is within the guidelines established. The associated Standard Review Plan SRP 6.2.5 "Combustible Gas Control in Containment", Section II "Acceptance Criteria" Number 3 states:

> "In meeting the requirements of 10 CFR Part 50, 10 CFR Part 50.44 and 50.46 to provide the capability for insuring a mixed atmosphere in the containment, and of GDC 41 to provide systems as necessary to assure that containment integrity is maintained, a system should be provided to mix the combustible gases within the containment. The functional design of this system will depend on the type of containment. This system may consist of a fan, a fan cooler, or containment spray. An analysis should be presented which shows that excessive stratification of combustible gases will not occur within the containment or within a containment subcompartment. For containments which rely on convective mixing in conjunction with system operation to mix the combustible gases, the containment internal structures must have design features which promote the free circulation of the atmospheres."

As discussed above, the DB-1 containment system design consists of containment spray and air coolers in conjunction with the large containment free volume. These systems coupled with the internal structure which promotes convective mixing will provide assurance of uniform mixing of any hydrogen released following a LOCA without the containment recirculation system.

Based on the above information, this amendment request would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

Therefore, based on the above, the requested license amendment does not present a Significant Hazard.