DMB

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November 5, 1984
EF2-70038

Mr. James G. Keppler
Regional Administrator
Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr. Keppler:

Reference: (1) Fermi 2
NRC Docket No. 50-341

(2) NRC IE Bulletin 84-03
"Refueling Cavity Water Seal,"
August 24, 1984

Subject: Response to NRC IE Bulletin 84-03
"Reactor Cavity Water Seal"

This letter provides Detroit Edison's response to Reference 2. NRC-IE Bulletin 84-03, "Reactor Cavity Water Seal," requested that Detroit Edison evaluate the potential for and consequence of a failure of the reactor cavity water seal. The attached report addresses these concerns.

This is Detroit Edison's final report on this item. If you have questions concerning this matter, please contact Mr. Lewis Bregni, (313) 586-5083.

Sincerely,

Wayne H. Jens

cc: Mr. P. M. Byron
Mr. M. D. Lynch
Mr. R. C. DeYoung
USNRC Document Control Desk

NOV 13 1984



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Mr. James G. Keppler
EF2-70038

I, WAYNE H. JENS, do hereby affirm that the foregoing statements are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.

Wayne H. Jens.

WAYNE H. JENS
Vice President - Nuclear Operations

On this 5th day of November, 1984, before me personally appeared on Wayne H. Jens, being first duly sworn and says that he executed the foregoing as his free act and deed.

James J. Morgan

Notary Public

JAMES J. MORGAN
Notary Public, Oakland County, MI
My Commission Expires Jan. 3, 1987
acting in Monroe County, Michigan

THE DETROIT EDISON COMPANY

FERMI 2

NUCLEAR OPERATIONS ORGANIZATION

USNRC LICENSING

DOCKET NO. 50-341

# RESPONSE TO NRC-IE BULLETIN NO. 84-03

## REFUELING CAVITY WATER SEAL

NOVEMBER 1984

Detroit Edison Response to I&E Bulletin 84-03

NRC REQUIREMENT:

Evaluate the potential for and consequences of a refueling cavity water seal failure and provide a summary report of these actions. Such evaluations should include consideration of: gross seal failure; maximum leak rate due to failure of active components such as inflated seals; makeup capacity; time to cladding damage without operator action; potential effect on stored fuel and fuel in transfer; and emergency operating procedures.

DETROIT EDISON RESPONSE:

Description of the Fermi 2 Refueling Cavity Water Seal

At Fermi 2, the refueling cavity water seal consists of the refueling bellows, the refueling bulkhead, and the drywell seal bellows. The refueling bellows assembly connects the reactor vessel flange to the refueling bulkhead and consists of a cylindrical, one-piece stainless steel bellows. The refueling bulkhead is a flat, circumferential plate which bridges the gap between the refueling bellows and the drywell shell. It contains eight 12-inch ventilation ducts and two 30-inch manways equipped with watertight covers which are bolted closed for refueling outages. The drywell seal bellows assembly extends from the drywell shell out to the reactor cavity wall and consists of a cylindrical, one-piece stainless steel bellows. All seal boundaries consist of welded steel and contain no active components. The refueling and drywell seal bellows are monitored by a leak detection circuit. A 5 gallon per minute leak past either bellows will activate an alarm in the main control room.

The refueling bellows assembly consists of a Type 304 stainless steel bellows, a backing plate, a spring seal and a removable guard ring. The refueling bellows consists of a cylindrical, one piece stainless steel assembly. The backing plate surrounds the outer circumference of the bellows to protect it and is equipped with a tap for testing and for monitoring leakage. The self-energizing spring seal is located in the area between the bellows and the backing plate. This seal is designed to limit water loss in the event of a bellows rupture by yielding to make a tight fit to the backing plate when subjected to full hydrostatic pressure. The guard ring attaches to the assembly and protects the inner circumference of the bellows.

The drywell seal is a one piece stainless steel cylindrical bellows seal. It is welded to the drywell shell and reactor well steel liner.

A. Potential for a Refueling Cavity Water Seal Failure

1. Gross Failure: As described above, the refueling bellow spring seal is designed to limit water loss in the event of a refueling bellows rupture by yielding to make a tight fit to the backing plate when subjected to full pressure. This feature would limit the effects of a failure such as the one described in Bulletin 84-03.

2. Failure of Active Components: As described above, all bellows seal boundaries consist of welded steel and contain no active components. Therefore, Fermi 2 is not susceptible to the type of failure described in Bulletin 84-03.

B. Consequences of a Refueling Cavity Water Seal Failure

General consequences: By design, fuel in both the reactor vessel and the spent fuel pool storage racks is below the level of the refueling bellows. In the event of a bellows failure, neither the fuel in the reactor vessel nor fuel in the spent fuel pool would become uncovered. During refueling operations, a single fuel bundle in transit between the reactor vessel and the spent fuel pool storage racks may be located above the level of the refueling bellows. Alarm Response Procedures for "high refueling and/or drywell seal bellows leakage" require the operator to place the fuel bundle in a safe condition before suspending refueling operations. The safe condition refers to either the reactor vessel or the spent fuel pool below the level of the refueling bellows.

2. Time to Clad Damage Without Operator Action

a. Stored Fuel (Vessel or Fuel Pool): As discussed above, refueling bellows failure would not result in water level falling below the top of the active fuel. Fermi 2 does not have a fuel transfer tube or any other mechanism which could drain the fuel pool as a result of a bellows failure.

b. Fuel in Transit: At any time, only one fuel bundle will be in transit between the reactor vessel and the spent fuel pool. Fermi 2 procedures require that this fuel bundle be expeditiously restored to either the reactor vessel or spent fuel pool in the event of a loss of water from the refueling cavity.

3. Emergency Operating Procedures: Alarm Response Procedures require that fuel bundles in transit be placed in either the reactor vessel or spent fuel pool if there is indication of leakage past the refueling bellows. Additionally, numerous methods exist to supply makeup water to the refueling cavity. These include: Control Rod Drive Pumps, Low Pressure Coolant Injection, Core Spray, Condensate Pumps and RHR Service Water Pumps.