TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

84 SEP 7 P2:18

August 31, 1984

U.S. Nuclear Regulatory Commission
Region II
ATTN: James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

Dear Mr. O'Reilly:

INSPECTION AND ENFORCEMENT BULLETIN 84-03 - REFUELING CAVITY WATER SEAL - BROWNS FERRY NUCLEAR PLANT

Enclosed is our response to IE Bulletin 84-03 dated August 24, 1984. Even though unit 3 is the only unit currently in a refueling outage, we are providing a complete response for all three Browns Ferry units at this time. If you have any questions, please call Jim Domer at FTS 858-2725.

To the best of my knowledge, I declare the statements contained herein are complete and true.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

David L. Lambert

David L. Lambert
Nuclear Engineer

Enclosure
cc (Enclosure):
U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Mr. R. C. DeYoung, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. R. J. Clark
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Browns Ferry Project Manager
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ENCLOSURE
RESPONSE TO IE BULLETIN 84-03
REFUELING CAVITY WATER SEAL
BROWNS FERRY NUCLEAR PLANT UNITS 1, 2, AND 3

We have performed the evaluation required by the subject bulletin for Browns Ferry Nuclear Plant to evaluate the potential for and the consequences of the refueling cavity seal failure such as occurred at the Haddam Neck Plant on August 21, 1984. The water seal between the reactor cavity and the drywell is provided by the refueling bulkhead, the drywell to reactor well bellows seal, and the refueling bellows seal. The refueling bellows seal is a cylindrical one piece stainless steel bellows seal. One end is welded to the reactor vessel and the other end is welded to the refueling bulkhead plate. The refueling bulkhead plate is a flat circumferential plate rigidly fixed to the inside of the drywell. It contains eight ventilation duct hatches which are open when the reactor cavity is drained down but are closed with an O-ring seal (tongue and groove) that is bolted and hydrostatically held in place during refueling when the reactor cavity is flooded. There are also main steam line plugs with pneumatic seals but these are backed up by an O-ring that is held in place by hydrostatic pressure. The drywell to reactor well bellows seal is a cylindrical one piece stainless steel bellows seal. It is welded to the drywell shell and the reactor well steel liner. The drywell to reactor well bellows seal and the refueling bellows seal are monitored by a leak detection circuit which alarms in the control room. The ventilation duct hatches in the refueling bulkhead plate are checked for leaks during the initial flood up of the reactor well at the beginning of a refueling outage.

Constructed as it is, the refueling cavity water seal for Browns Ferry could not experience a gross failure similar to that at Haddam Neck where the failure was due to lack of interference between the seal annulus and opening, thus allowing significant displacement of the seal. The seal boundaries at Browns Ferry are all steel and are either welded, bolted or held in place by hydrostatic pressure, such that they cannot be displaced. Failure of the active components (pneumatic seal steamline plugs) would create only a minor leakage path since the plugs are held in by hydrostatic pressure. Gross failure of the refueling bellows or the drywell to reactor well bellows would require structural failure of welded steel passive components and is considered highly unlikely.

In the event of a gross failure of one of the seals with the spent fuel storage pool (SFSP) gates open and no operator action, neither the fuel in the core nor the SFSP would become uncovered. A fuel bundle in transit between the core and SFSP or in the fuel prep machine in the up position could become uncovered without operator actions. It is a relatively simple operation to lower the bundle from either of these positions. Consequences of uncovering a fuel bundle would be the same as those that might have occurred at the Haddam Neck Plant, i.e., possible high radiation levels, fuel cladding failure, and release of radioactivity

into secondary containment. Normal operating instructions specify makeup methods to the SFSP on low level indications and emergency operating instructions specify makeup methods to the reactor vessel. As a minimum, Standby Coolant is available to provide makeup ($\geq$4250 gpm). Failure of active seal components will not exceed this makeup rate.

To conclude, we believe the event described in the subject bulletin has little applicability to Browns Ferry. However, we plan to revise operating instructions to include directions for unexpected cavity/SFSP drainage during fuel handling operations by September 30, 1984.