INDIANA & MICHIGAN ELECTRIC COMPANY

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AEP:NRC:0898A

Donald C. Cook Nuclear Plant Unit Nos. 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
REFUELING CAVITY WATER SEAL
(IE BULLETIN 84-03)

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

To Whom It May Concern:

This letter is in response to IE Bulletin No. 84-03, "Refueling Cavity Water Seal". The following presents our review and conclusions of the likelihood and consequences of a refueling seal failure.

Gross Seal Failure

The refueling cavity seal arrangement at the Donald C. Cook Nuclear Plant is a one piece seal inserted in a nominal two inch annular opening between the reactor vessel flange and the refueling cavity wall. This arrangement is different than that depicted in Figure 1 of NRC IE Bulletin 84-03 (Attachments 1, 2, and 3).

Inflation of the seal at normal pressure (15-30 psig) results in a slight downward force on the seal which tends to draw it into the annulus. Overpressurization would have a tendency to increase this downward force, but the rigid annulus configuration at Cook, and the rigidity of the seal rubber, prevent the 4 inch section of the seal from being pulled through the 2 inch annulus opening. In addition, the annulus configuration offers more surface contact with the cavity wall than the Haddam Neck design. In discussions with the Presray Corporation, manufacturer of both the Cook and Haddam Neck refueling cavity seals, it was determined that the upper section of the Cook seal is wider than the type used at the Haddam Neck plant. Also, the seal used at Cook has a greater rubber hardness, a 60 durometer, versus Haddam Necks 40 durometer, seal.

The Cook arrangement has been used during each refueling on both units since 1977, and at no time have there been signs of seal failure. Minor leakage has occurred; however, this has been controlled by increasing the seal inflation pressure, and by using a silicone rubber sealer (RTV).

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Other utilities have also utilized single seal arrangements functionally identical to ours without experiencing any significant problems. For example, Commonwealth Edison's Zion Plant has reported successful use of an inflatable seal during several recent refuelings. Of particular interest is the experience at TVA's Sequoyah Plant, where a Presray rubber seal is used in a 2 1/8 inch annulus. Conversations with TVA indicate that a test program using a segment of spare seal in an annulus mock-up demonstrated the adequacy of the passive portion of the seal. The deflated segment of seal was tested up to a maximum of 18.5 psi (1.5 times the normal hydrastatic pressure of the refueling pool).

Based on the above review, we conclude that failure of the active seal component (i.e., the inflated lower portion of the rubber seal) will not result in a gross seal failure or gross leakage because of the passive seal component (i.e., the solid wedge-shaped upper portion of the rubber seal), and we believe the gross failure of the refueling cavity seal in a manner cited in IE Bulletin No. 84-03 to be highly improbable.

Consequences of Seal Leakage

If the active portion of the refueling cavity seal were to fail, it is our belief, based on engineering judgement, that the passive portion of the seal would limit leakage to a value less than the makeup capacity, 4500 gallons per hour. Under such conditions, the operator would have several hours to start the makeup water (a relatively simple operation) without danger of uncovering either the fuel in the vessel, the fuel in the spent fuel pool, or fuel that was in transit.

Emergency Procedures

In the event that seal leakage should occur, procedures are in place for actions to be taken. These procedures are available at the site.

Conclusion

A gross failure of the reactor cavity refueling seal is considered to be an unlikely event for the D. C. Cook Nuclear Plant because of the design of the seal. Additionally, emergency procedures exist should seal leakage occur.

Very truly yours,

M. P. Alexich
Vice President

RBK 11/27/84

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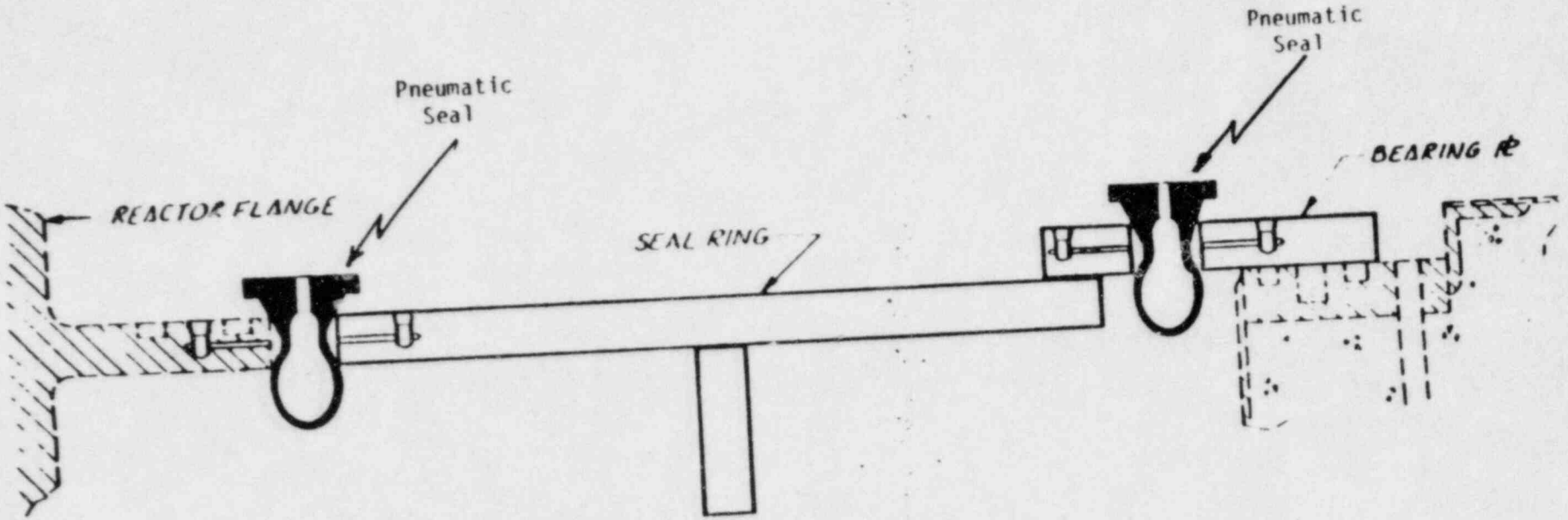
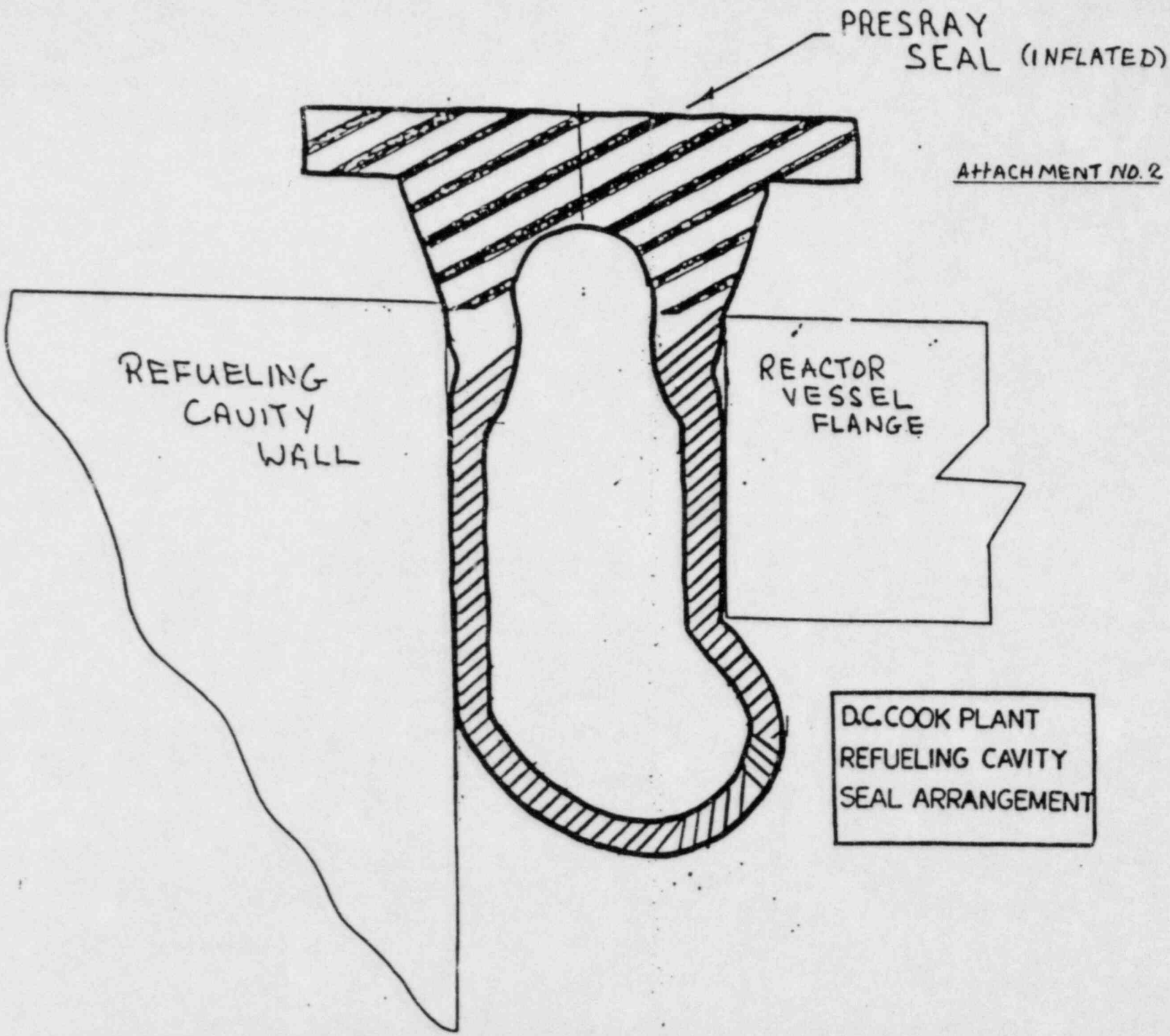


Figure 1 - Haddam Neck Refueling Cavity Water Seal

ATTACHMENT 1
IEB 84-03
August 24, 1984

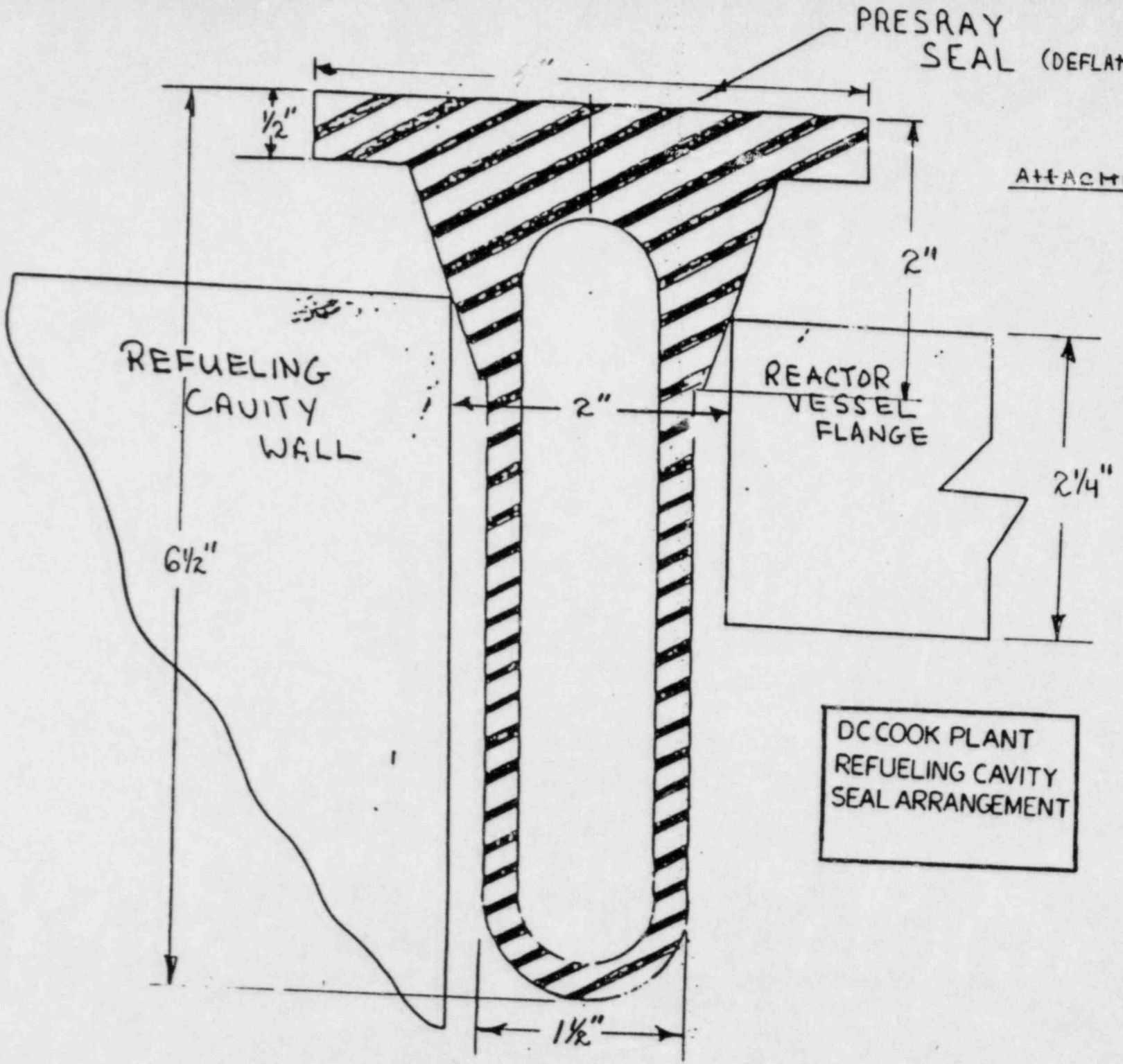


ATTACHMENT NO. 2

D.C. COOK PLANT
REFUELING CAVITY
SEAL ARRANGEMENT

TPT 101-1

ATTACHMENT NO. 3



DC COOK PLANT
REFUELING CAVITY
SEAL ARRANGEMENT