(2)

March 27, 1972

E. G. Case, Director
Division of Reactor Standards

PRAIRIE ISLAND PLANT, UNITS ~~1 AND 2,~~ DOCKET NOS. 50-282 AND 50-306
AND KEWAUNEE PLANT, DOCKET NO. 50-305

Your April 26, 1971 memos to me requesting additional information for Prairie Island and Kewaunee included requests for consideration of acceptance strength pressure tests of the shield buildings, which are part of the containment system for these plants. The requests suggested that the tests should be representative of conditions that would exist for a combined LOCA and DBE.

Applicants' calculations for LOCA conditions are as follows. During a loss-of-coolant accident, the free standing steel containment (inside the shield building) has a calculated peak pressure and temperature of 42.6 psig and 260°F, respectively. The containment design pressure and temperature is 46 psig and 268°F, respectively. The shield building has a conservatively calculated peak positive pressure of 0.4 psig, due to heat transferred from the uninsulated steel containment shell. Thermal stresses in the concrete wall of the shield building due to a large temperature gradient following a LOCA (165°F inside and -35°F outside) are the largest component of the combined stresses in the shield building due to a combined LOCA and DBE.

The applicants for the subject plants have responded in amendments that a strength test of the shield building near the expected peak accident pressure of 0.4 psig is not necessary since stresses in concrete and steel reinforcing bars would be very small compared to allowable stresses.

Reactor Projects has reviewed the necessity for an acceptance strength pressure test of the shield building with your Structural Branch (Memo Kintner to DeYoung, March 9, 1972) and has concluded that a strength test need not be run, but that a pressure test of shield building penetration seals should be made at a pressure slightly above the calculated peak accident pressure in the shield building.

The Division of Reactor Licensing agrees with the position of DRS Structural Engineering Branch for Prairie Island and Kewaunee. Our understanding of this position is that:

1. An acceptance strength pressure test is not required for the reinforced concrete secondary containment building surrounding the steel primary containment shell.

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2. An initial and periodic functional pressure test is required for the seals of penetrations through the concrete secondary containment at a pressure of 125% of the conservatively calculated peak accident pressure in the secondary containment plus a margin for pressure measurement error.

3. The structural analysis for the reinforced concrete secondary containment should provide adequate assurance that for conservatively calculated loss-of-coolant accident conditions the concrete secondary containment structure will not fail in a manner such that it could damage the free standing steel shell.

We intend to apply the above position in our evaluation of Prairie Island, Kewaunee, and other plants having the dual containment concept. Please advise me by March 31, 1972 if you don't agree with this position.

P. A. Morris, Director
Division of Reactor Licensing

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