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Contrôles - Réceptions - Expertises

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April 27, 1971.

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DÉPARTEMENT SÉCURITÉ NUCLÉAIRE

Nuclear Safety 02/017
02/018.

Dr. Clifford K. BECK
Deputy Director of Regulation
U.S. ATOMIC ENERGY COMMISSION

WASHINGTON D.C. 20545 - U.S.A.

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Dear Dr. Beck,

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After writing to you yesterday concerning the use of grouted tendons in prestressed concrete containment structures, I take further liberty by inquiring about another problem, which has been presented to the owners of the Doel and Tihange P.W.R. power stations. This problem has been studied for some time, but no satisfactory answer has evolved up to now.

The question is whether the U.S.A.E.C. has ever investigated the consequences of a rupture, or valve opening or failure to close, affecting the vapor phase of a Westinghouse pressurizer? If the answer is positive, I should appreciate a very general description of these consequences and their safety implications.

The difficulty occurs because the pressurizer water level would rise, due to boiling in the core, hence neither the low level signal, nor the associated safety injection signal would be actuated.

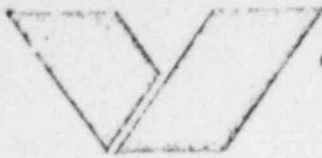
Safety injection could be actuated by a high containment pressure signal. However

- if the escaping vapor is released in the pressurizer relief tank, the pressure rise in the containment could be substantially delayed,
- in the case of a rupture affecting the pressurizer, the vapor and water could be released in an open containment building, since building isolation is actuated either by a safety injection signal or by a high containment pressure signal.

The containment building can be open in at least two instances: in the course of pressure equalization, and during outside ventilation at hot shut down. Other instances could also occur, but generally involve small apertures.

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Hence, it could be anticipated that neither safety injection nor containment isolation is actuated, at least until after a high radioactive release signal has closed the ventilation or pressure equalization ducts.

A further problem arises since the flow of the charging pumps would be minimized by the high pressurizer level signal; the discharge flow would contribute to the loss of coolant, without affecting the pressurizer water level.

I should also appreciate to know if the largest rupture diameter, to be considered in the vapor phase of a pressurizer, is the diameter of the largest pipe? A manway is provided in the upper part of the pressurizer.

Again, I like to express my greatest thankfulness for your continued attention to our problems.

Sincerely yours

H. DOPCHIE
Directeur.