



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

May 2, 1991

TO: ALL POWER REACTOR LICENSEES AND HOLDERS OF CONSTRUCTION PERMITS

SUBJECT: GI-23, "REACTOR COOLANT PUMP SEAL FAILURES" AND ITS POSSIBLE EFFECT ON STATION BLACKOUT (GENERIC LETTER 91-07)

The staff published a notice in the Federal Register (56 FR 16130) on April 19, 1991, soliciting public comments on Generic Issue (GI)-23, "Reactor Coolant Pump Seal Failures." This letter informs licensees of the possible effect of GI-23 on their responses to the station blackout (SBO) rule (Section 50.63 of Title 10 of the Code of Federal Regulations [10 CFR 50.63]).

Reactor coolant pump (RCP) seals and their supporting systems have experienced degradations and failures, some of which have been of sufficient severity to be classified as small break loss of coolant accidents (SBLOCAs). Preliminary analyses by the NRC indicated that the RCP seal failures could dominate the overall probability of a core melt caused by SBLOCA. As a result, the staff established GI-23 to provide for the evaluation of the adequacy of current licensing requirements relating to RCP seal integrity and to determine if the U. S. Nuclear Regulatory Commission (NRC) should take any further action.

In resolving the SBO issue (USI A-44), the NRC staff considered the relationship of this issue with other NRC generic issues, including GI-23. In determining estimates of core damage frequency for SBO events in NUREG/CR-3226, "Station Blackout Accident Analyses," the staff assumed that the RCP seals would leak at a rate of 20 gallons per minute (gpm) per pump. During the final resolution of the station blackout issue and the development of the Nuclear Management and Resources Council (NUMARC) Report 87-00, "Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors," NUMARC and the staff agreed to assume that RCP seal leakage during an SBO would be no greater than 25 gpm per pump. Further, NUMARC and the staff agreed that if the final resolution of GI-23 results in higher RCP leakage rates, then the SBO analyses would have to be reevaluated.

The SBO rule became effective on July 21, 1988, and the NRC received responses from all licensees addressing the SBO rule by April 21, 1989. Licensees may have analyzed their reactor coolant inventories for the SBO conditions using the specific guidance provided in NUMARC Report 87-00 of 25 gpm for RCP seal leakage for pressurized water reactors (PWRs) and 18 gpm for boiling water reactors (BWRs). These leak rates could be greater if the seals failed during the SBO event.

The preliminary results of the staff's studies for GI-23 indicate that the pump seal leak rates could be substantially higher than those assumed for the resolution of the SBO issue. The staff determined that RCP seal leakage could exceed 25 gpm and lead to core uncovering during an SBO in any of the PWRs and in any of the four BWRs (Millstone Unit 1, Oyster Creek, Nine Mile Point Unit 1,

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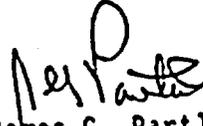
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and Big Rock Point) that do not have an AC-independent makeup capability.

Having made these findings, the staff is soliciting public comments on its current understanding of GI-23. One possible outcome may be that seal cooling be provided by an independent cooling system during off-normal plant conditions involving the loss of all seal cooling, such as could occur during an SBO. This recommendation, if adopted, would apply to all PWRs and might apply to the above-mentioned BWRs, which do not have AC-independent makeup capabilities for their reactor coolant systems. Therefore, utilities should recognize that such a recommendation could affect their analyses and actions addressing conformance to the SBO rule.

This generic letter consists of information only and does not require specific action or written response. Therefore, an Office of Management and Budget (OMB) clearance number is not necessary. If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.

Sincerely,


James G. Partlow
Associate Director for Projects
Office of Nuclear Reactor Regulation

Technical Contacts: Chu-Yu Liang, NRR
(301) 492-0878

Paul Gill, NRR
(301) 492-3265

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and Big Rock Point) that do not have an AC-independent makeup capability.

Having made these findings, the staff is soliciting public comments on its current understanding of G-20. One possible outcome may be that seal cooling be provided by an independent cooling system during off-normal plant conditions involving the loss of all seal cooling, such as could occur during an SBO. This recommendation, if adopted, would apply to all PWRs and might apply to the above-mentioned BWRs, which do not have AC-independent makeup capabilities for their reactor coolant systems. Therefore, utilities should recognize that such a recommendation could affect their analyses and actions addressing conformance to the SBO rule.

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original signed by James G. Partlow

James G. Partlow
Associate Director for Projects
Office of Nuclear Reactor Regulation

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(301) 492-0878

Paul Gill, NRR
(301) 492-3265

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*See previous concurrence

Reviewed by J. Main*, Technical Editor, on January 29, 1991.

Ok as revised

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See memo Minners to Jordon (CRGR) Dated 2/5/91.