

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, DC 20555-0001

August 7, 2000

**NRC REGULATORY ISSUE SUMMARY 2000-12**  
**RESOLUTION OF GENERIC SAFETY ISSUE B-55, "IMPROVED**  
**RELIABILITY OF TARGET ROCK SAFETY RELIEF VALVES"**

ADDRESSEES

All holders of operating licenses for nuclear power reactors, except those licensees who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

INTENT

The U.S. Nuclear Regulatory Commission (NRC) is issuing this regulatory issue summary (RIS) to notify addressees about the staff's resolution of Generic Safety Issue (GSI) B-55, "Improved Reliability of Target Rock Safety Relief Valves." This RIS does not transmit any new requirements or staff positions. No specific action or written response is required.

BACKGROUND INFORMATION

Target Rock safety relief valves (SRVs) are currently installed in the main steam systems of 22 boiling-water reactors (BWRs). There have been several occurrences of improper operation of these SRVs both in spuriously opening and blowing down the reactor coolant and in opening at pressures significantly above technical specification requirements. There are two different designs of Target Rock SRVs. The earlier design is the three-stage SRV, which has had a history of spuriously opening and failing to reseal. This behavior was exhibited during several events which mostly occurred in the 1970s. The later design is the two-stage SRV, which is a modification of the three-stage SRV and was designed to eliminate the spurious opening and blowing down problem. Currently, there are 11 BWRs that use three-stage SRVs, and 11 BWRs that use two-stage SRVs.

GSI B-55 was prioritized by the NRC staff as a "medium" priority issue on the basis of concerns about the three-stage SRVs. Beginning in 1978, two-stage SRVs were installed in several BWRs and during operation and surveillance testing, these two-stage SRVs had problems with opening at pressures exceeding the technical specification limits. As a result, the staff also included this upward setpoint drift problem in GSI B-55 for resolution.

ML003726865

## SUMMARY OF ISSUE

The BWR Owners Group (BWROG), General Electric Company (GE), and the individual licensees undertook several actions to improve the performance of three-stage and two-stage SRVs. For the three-stage SRVs, licensees began implementing GE Service Information Letter (SIL) 196, Supplement 3, which recommended increasing the SRV setpoints to raise the simmer margin between the normal reactor pressure and the SRV setpoints. Licensees also began implementing more frequent maintenance and testing of the three-stage valves. These activities were aimed at reducing the three-stage pilot valve seat leakage and have been shown to be effective through successful operating experience over many years. For the two-stage SRVs, the primary cause of the upward setpoint drift problem was determined to be corrosion bonding of the pilot valve disk to its seat. To reduce or counteract the corrosion bonding, several design improvements were developed and implemented, and three different modifications were ultimately found to significantly improve performance. These three modifications are (1) the installation of ion beam implanted platinum pilot valve disks, (2) the installation of Stellite 21 pilot valve disks, and (3) the installation of additional pressure actuation switches. The ion beam implanted platinum and Stellite 21 pilot valve disks have improved the performance of the two-stage SRVs by reducing the corrosion bonding of the pilot valve disks to their seats. Additional pressure actuation switches counteract the effects of corrosion bonding by actuating the SRVs at the proper setpoints with external air power.

As a result of the actions that have been taken by BWROG and the individual BWR licensees to improve the performance of Target Rock SRVs, the staff has closed GSI B-55. The issue closeout is documented in a memorandum from S.J. Collins, Director, NRC Office of Nuclear Reactor Regulation to W.D. Travers, NRC Executive Director for Operations, dated December 17, 1999, which may be found in the NRC Agencywide Documents Access and Management System (ADAMS) under Accession Number ML993620214. In summary, the staff determined that the BWROG and the licensees have significantly improved the performance of the three-stage and two-stage Target Rock SRVs and that they are continuing to evaluate and improve the performance of the SRVs, as necessary, with sufficient resources. Therefore, the staff found that no new requirements were necessary as a result of this generic issue. If, in the future, the staff finds that actions need to be taken to improve the performance of these SRVs, the existing quality assurance, maintenance rule, and codes and standards regulations (i.e., 10 CFR Part 50, Appendix B; 10 CFR 50.65; and 10 CFR 50.55a) provide the staff with regulatory mechanisms for pursuing additional improvements, if needed, on a plant-specific basis.

## Backfit Discussion

This RIS requests no action or written response. Consequently, the staff did not perform a backfit analysis.

## Federal Register Notification

A notice of opportunity for public comment was not published in the *Federal Register* because this RIS is informational, and the public was afforded numerous opportunities to comment in meetings with the BWR Owners Group as the matter was being studied, and at the NRC staff's presentation to the Advisory Committee on Reactor Safeguards on October 1, 1999, on the proposed resolution of GSI B-55.

If there are any questions about this matter, please contact the person listed below or the appropriate Office of Nuclear Reactor Regulation project manager for a specific nuclear power plant.

**/RA/Charles E. Ader FOR**

David B. Matthews, Director  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Attachment: List of Recently Issued NRC Regulatory Issue Summaries

Technical contact: Gary Hammer, NRR  
301-415-2791  
E-mail: [cgh@nrc.gov](mailto:cgh@nrc.gov)

If there are any questions about this matter, please contact the person listed below or the appropriate Office of Nuclear Reactor Regulation project manager for a specific nuclear power plant.

**/RA/Charles E. Ader FOR**

David B. Matthews, Director  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Attachment: List of Recently Issued NRC Regulatory Issue Summaries

Technical contact: Gary Hammer, NRR  
301-415-2791  
E-mail: cgh@nrc.gov

Distribution: EMEB:RF JShapaker FCherny HVandermolen  
PUBLIC REXB r/f  
DOCUMENT NAME: C:\Accession No. ML003726865.wpd

\* See previous concurrence

INDICATE IN BOX: "C"=COPY W/O ATTACHMENT/ENCLOSURE, "E"=COPY W/ATT/ENCL, "N"=NO COPY

OFFICE	EMEB:DE	C	TECH:ED	N	EMEB:DE	C	EMEB:DE	C	RES:DSARE		DD:DE		D:DE	
NAME	GHammer *		BCalure *		DTerao *		Elmbro *		FEltawila*		RWessman*		JStrosnider*	
DATE	5 / 25 /00		5 / 18 /00		5 / 26 /00		6 / 9 /00		6/14/00		6/20/00		6/21/00	

OFFICE	ADPT		OGC		REXB:DRIP		D:DRIP	
NAME	BSheron*		BPoole*		LMarsh*		DMatthews	
DATE	6/22/00		8/1/00		8/2 /00		8/ 7 /00	

OFFICIAL RECORD COPY

LIST OF RECENTLY ISSUED  
NRC REGULATORY ISSUE SUMMARIES

Regulatory Issue Summary No.	Subject	Date of Issuance	Issued to
2000-11	NRC Emergency Telecommunications System	6/30/2000	All holders of operating licenses for nuclear power reactors
2000-10	Technical Information of Facilitate Public Access to the U.S. NRC Agencywide Documents Access and Management System (ADAMS)	6/30/2000	All NRC licensees
2000-09	Standard Review Plan for Licensee Requests to Extend the Time Periods Established for Initiation of Decommissioning Activities	06/26/2000	All material licensees regulated in accordance with 10 CFR Parts 30, 40, and 70
2000-08	Voluntary Submission of Performance Indicator Data	03/29/2000	All holders of OLs for nuclear reactors, except for those licensees who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel
2000-07	Use of Risk-Informed Decisionmaking in License Amendment Reviews	03/28/2000	All holders of OLs for nuclear reactors, except for those licensees who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel
2000-06	Consolidated Line Item Improvement Process for Adopting Standard Technical Specifications Changes for Power Reactors	03/20/2000	All holders of OLs for nuclear reactors, except for those licensees who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel