

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
WASHINGTON, D.C. 20555

July 17, 1985

IE INFORMATION NOTICE NO. 85-58: FAILURE OF A GENERAL ELECTRIC TYPE AK-2-25  
REACTOR TRIP BREAKER

Addressees:

All nuclear power reactor facilities designed by Babcock and Wilcox Company (B&W) and Combustion Engineering (CE) and holding an operating license (OL) or construction permit (CP).

Purpose:

This information notice is to alert recipients of a potentially significant problem pertaining to the failure of a General Electric (GE) - type AK-2-25 reactor trip breaker. It is expected that recipients will review the information for applicability to their facilities and consider actions, if appropriate, to preclude a similar problem occurring at their facilities. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

The Rancho Seco Nuclear Power Generating Station was completing a refueling outage and preparing to restart. During the outage, the licensee installed refurbished reactor trip breakers (RTBs). On June 5, 1985, one of the dc RTBs failed to trip open when its undervoltage trip attachment (UVTA) was actuated during a test. Although the UVTA had de-energized, its armature had not moved out of the energized position (a sketch of an RTB with all components in their normal positions is shown in Attachment 1). Investigation revealed that the trip paddle, which is the mechanical interface between the armature and the trip shaft of the RTB, had jammed against the armature, and as a result the RTB would not trip. Subsequently, when the shunt trip coil was actuated, the trip paddle associated with the UVTA rotated about 45° clockwise to a position above the armature (See Attachment 1). In this position the armature cannot engage the trip paddle when the UVTA is de-energized, and the RTB would not trip. Further investigation revealed that the clearance between the roller rivet and armature within the UVTA was significantly greater than the specified allowable range. This increased downward displacement was sufficient to allow the trip paddle to interfere with the armature. Preliminary information also indicates that the UVTA rivet-armature clearances may have been excessive for all five of the other RTBs installed at the plant.


The RTBs used at B&W- and CE-designed reactor facilities are the GE-type AK-2-25 breaker. The licensee had sent the Rancho Seco RTBs to GE-Atlanta for

refurbishment, which included installing a new lubricant in critical bearings in the front frame of the RTB. Subsequent to their refurbishment, the RTBs were tested at B&W-Lynchburg and certified as acceptable for service as safety-related reactor trip breakers. Incoming receipt inspection of the RTBs at Rancho Seco consisted of only a visual review; no functional test nor verification of critical parameters was conducted before installation.

At Rancho Seco, the licensee has now developed procedures to perform checks of the critical parameters of the breakers, as required for safety-related equipment. These procedures are based on guidance recently provided by B&W to its customers. It is our understanding that CE has not issued similar guidance. The UVTA rivet-armature clearance is a difficult measurement to perform properly and may require a special tool. Further, although not mentioned in previous vendor information, the measurement should be made with the UVTA armature down in the energized position. The manufacturer's representative is providing onsite assistance to the licensee. A B&W engineer also is assisting at the site. The licensee has identified the failure mechanism, completed appropriate corrective action, and satisfactorily tested all RTBs before withdrawing control rods and resuming power operations.

The refurbishment of the RTBs is one of the major items of the long-term program developed by the B&W Owners Group and the CE Owners Group to assure that the RTBs will function in a highly reliable manner. The failure experienced at Rancho Seco is the first reported failure of a refurbished RTB and is of a different failure mechanism than previously experienced. The NRC is currently assessing the generic applicability of this failure.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the Regional Administrator of the appropriate regional office or this office.

  
Edward L. Jordan, Director  
Division of Emergency Preparedness  
and Engineering Response  
Office of Inspection and Enforcement

Technical Contact: J. T. Beard, NRR  
(301) 492-7465

R. N. Singh, IE  
(301) 492-8985

Attachments:

1. Undervoltage Trip Device Coil De-energized
2. List of Recently Issued Information Notices

LIST OF RECENTLY ISSUED  
 IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
85-57	Lost Iridium-192 Source Resulting In The Death Of Eight Persons In Morocco	7/16/85	All power reactor facilities holding an OL or CP; fuel facilities; and material licensees
85-56	Inadequate Environment Control For Components And Systems In Extended Storage Or Layup	7/15/85	All power reactor facilities holding an OL or CP
85-55	Revised Emergency Exercise Frequency Rule	7/15/85	All power reactor facilities holding an OL or CP
85-54	Teletherapy Unit Malfunction	7/15/85	All NRC licensees authorized to use teletherapy units
85-53	Performance Of NRC-Licensed Individuals While On Duty	7/12/85	All power reactor facilities holding an OL or CP
85-52	Errors In Dose Assessment Computer Codes And Reporting Requirements Under 10 CFR Part 21	7/10/85	All power reactor facilities holding an OL or CP
85-51	Inadvertent Loss Or Improper Actuation Of Safety-Related Equipment	7/10/85	All power reactor facilities holding an OL or CP
85-50	Complete Loss Of Main And Auxiliary Feedwater At A PWR Designed By Babcock & Wilcox	7/8/85	All power reactor facilities holding an OL or CP
85-49	Relay Calibration Problem	7/1/85	All power reactor facilities holding an OL or CP

OL = Operating License  
 CP = Construction Permit