

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555

June 24, 1988

NRC INFORMATION NOTICE NO. 88-44: MECHANICAL BINDING OF SPRING RELEASE DEVICE
IN WESTINGHOUSE TYPE DS-416 CIRCUIT BREAKERS

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is being provided to alert addressees to potential problems resulting from the mechanical binding of the spring release device (SRD) in Westinghouse type DS-416 metal clad circuit breakers. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

On May 25, 1988, the South Texas Project Unit 1 (STP-1 or licensee) performed a loss-of-offsite power test. During this test, two Class 1E electrical circuit breakers failed to reclose as required during load sequencing. Subsequent investigation by the licensee identified the failed breakers as Westinghouse type DS-416 metal clad breakers. These DS-416 electrical breakers are located in main 480-Vac load centers and are tie and feeder breakers for 480-Vac components.

The breaker has an SRD that initiates the sequence for the breaker closing. The SRD is attached to the breaker housing and is comprised of a coil housing that is attached to the breaker casing, a closing coil, and a lever that is attached to the coil housing. The lever travels up and down through a window (a punched out opening) in the breaker casing. When the breaker is signaled to close, the coil is energized and the lever is designed to move up and make contact with the spring release latch that mechanically releases the breaker closing springs. These SRDs also are used in Westinghouse type DS-420 and DS-206 circuit breakers.

Discussion:

The licensee's preliminary investigation indicates that the breakers failed to reclose because the closing coils had overheated and burned out. The licensee

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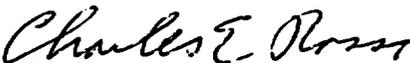
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believes that the coils burned out as a result of mechanical binding between the lever and the edge of the breaker casing window. The licensee physically inspected and electrically tested 28 other DS-416 breakers installed in Unit 1 and 18 breakers installed in Unit 2 as of June 16, 1988, and identified 10 additional cases where the lever and the edge of the breaker casing window were making contact.

Although the root cause of the binding has not been determined, the licensee has taken several steps to alleviate the problem. The licensee has replaced the SRD in the STP-1 breakers that indicated signs of possible binding and has verified that the clearances between the lever and the casing are sufficient to preclude further binding. In addition, the licensee has extensively briefed the STP control room personnel on this binding problem. It should be noted that although the SRD may bind, it is still possible to manually trip the breaker closing springs by pushing the "CLOSE" button located at the circuit breaker.

The licensee has contacted Westinghouse for assistance in determining the root cause of the binding. The NRC will remain cognizant of any new developments and await the results of the South Texas and Westinghouse investigation. The NRC will issue a further generic communication if warranted by the availability of additional information or if additional regulatory action is deemed necessary.

No specific action or written response is required by this information notice. 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.


Charles E. Rossi, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

Technical Contacts: Kamal Naidu, NRR
(301) 492-0980

Jaime Guillen, NRR
(301) 492-1170

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED
 NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-43	Solenoid Valve Problems	6/23/88	All holders of OLs or CPs for nuclear power reactors.
88-42	Circuit Breaker Failures Due to Loose Charging Spring Motor Mounting Bolts	6/23/88	All holders of OLs or CPs for nuclear power reactors.
88-41	Physical Protection Weaknesses Identified Through Regulatory Effectiveness Reviews (RERs)	6/22/88	All holders of OLs or CPs for nuclear power reactors.
88-40	Examiners' Handbook for Developing Operator Licensing Examinations	6/22/88	All holders of OLs or CPs for nuclear power reactors.
88-39	LaSalle Unit 2 Loss of Recirculation Pumps With Power Oscillation Event	6/15/88	All holders of OLs or CPs for BWRs.
88-38	Failure of Undervoltage Trip Attachment on General Electric Circuit Breakers	6/15/88	All holders of OLs or CPs for nuclear power reactors.
88-37	Flow Blockage of Cooling Water to Safety System Components	6/14/88	All holders of OLs or CPs for nuclear power reactors.
88-36	Possible Sudden Loss of RCS Inventory During Low Coolant Level Operation	6/8/88	All holders of OLs or CPs for PWRs.
88-35	Inadequate Licensee Performed Vendor Audits	6/3/88	All holders of OLs or CPs for nuclear power reactors.
88-34	Nuclear Material Control and Accountability of Non-Fuel Special Nuclear Material at Power Reactors	5/31/88	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
 CP = Construction Permit

believes that the coils burned out as a result of mechanical binding between the lever and the edge of the breaker casing window. The licensee physically inspected and electrically tested 28 other DS-416 breakers installed in Unit 1 and 18 breakers installed in Unit 2 as of June 16, 1988, and identified 10 additional cases where the lever and the edge of the breaker casing window were making contact.

Although the root cause of the binding has not been determined, the licensee has taken several steps to alleviate the problem. The licensee has replaced the SRD in the STP-1 breakers that indicated signs of possible binding and has verified that the clearances between the lever and the casing are sufficient to preclude further binding. In addition, the licensee has extensively briefed the STP control room personnel on this binding problem. It should be noted that although the SRD may bind, it is still possible to manually trip the breaker closing springs by pushing the "CLOSE" button located at the circuit breaker.

The licensee has contacted Westinghouse for assistance in determining the root cause of the binding. The NRC will remain cognizant of any new developments and await the results of the South Texas and Westinghouse investigation. The NRC will issue a further generic communication if warranted by the availability of additional information or if additional regulatory action is deemed necessary.

No specific action or written response is required by this information notice. 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.

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D:DOEA-NRR
CERossi
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between the lever and the edge of the breaker casing window. The STP licensee physically inspected and electrically tested 28 other DS-416 breakers installed in Unit 1 and 18 breakers installed in Unit 2 as of June 16, 1988, and identified ten additional cases where the lever and the edge of the breaker casing window were making contact.

Although the licensee has not determined the root cause of the binding, it has taken several steps to alleviate the problem. The licensee has replaced the SRD in the STP-1 breakers that indicated signs of possible binding and has verified that the clearances between the flapper and the housing are sufficient to preclude further binding. In addition, the licensee has extensively briefed the STP control room personnel on this binding problem. It should be noted that although the SRD may bind, it is still possible to manually trip the breaker closing springs.

The licensee has contacted Westinghouse for assistance in determining the root cause of the binding. The NRC will remain cognizant of any new developments and await the results of the South Texas and Westinghouse investigation. The NRC will issue further generic communication if a determination is made that this binding is a generic problem and that regulatory action is required.

No specific action or written response is required by this information notice. 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.

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