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

INSPECTION AND ENFORCEMENT MANUAL

DEPER

TEMPORARY INSTRUCTION 2515/72

INSPECTION OF RESPONSE TO IE BULLETIN 85-02

2515/72-01 PURPOSE

To provide guidance for performing inspection of licensees' actions required by IE Bulletin 85-02 (Enclosure 1). These requirements apply to licensees of Westinghouse (W) pressurized water reactor (PWR) facilities who have not yet implemented the automatic actuation of the shunt trip coil of the reactor trip breakers (RTBs) for all automatic reactor trip signals.

2515/72-02 OBJECTIVE

To evaluate the adequacy of the corrective actions taken by the affected licensees to preclude the potential for common-mode failures regarding W DB-50/RTBs at their facilities. IE Bulletin 85-02 identifies those facilities that have not yet installed the automatic shunt trip feature.

2515/72-03 BACKGROUND

The subject bulletin describes an event which occurred at D.C. Cook Unit 2 on October 29, 1985, during which a Westinghouse DB-50 type reactor trip breaker (RTB) failed to trip open on receipt of an automatic reactor trip signal from the reactor protection system (RPS). The cause for failure was attributed to the undervoltage trip attachment (UVTA) which received an RPS trip signal, but the UVTA was unable to generate enough force to lift the circuit breaker trip lever to a point where the circuit breaker would trip open. The Unit 2 RTB that failed on October 29, 1985, identified as RTB "A", had been refurbished by the vendor only 4 months earlier and had experienced about 75 operations at the time of failure. Subsequent to the failure of RTB "A", a similar failure occurred when the redundant trip breaker RTB "B" also failed to pass the UVTA force margin test.

The significance of these two recent events renews the concern for common-mode failures that could lead to an ATWS event. Because of two separate ATWS events at Salem Unit 1 on February 22 and 25, 1983, the NRC issued IE Bulletin 83-01 on February 25, 1983. A task force also was formed to assess the generic implications of those events; subsequently, the task force actions resulted in NUREG-1000 and Generic Letter 83-28 being issued.

2515/72-04 RESPONSIBILITIES

04.01 Regional management will implement the inspection and reporting programs necessary for this TI.

04.02 The Division of Emergency Preparedness and Engineering Response (DEPER), Engineering and Generic Communications Branch (EGCB), will compile licensee responses and reports specified in this TI and document closeout of the bulletin.

2515/72-05 INSPECTION REQUIREMENTS

05.01 Verify that the licensee has provided a timely and accurate response. The response should address the required actions requested in the bulletin. Questions about adequacy of licensees' responses may be referred to EGCB, DEPER, IE for resolution in coordination with the Office of Nuclear Reactor Regulation (NRR).

05.02 Verify that the licensee has performed a test of the suspect UVTA to determine that an adequate trip force margin exists within the allotted time and under the test conditions specified in "Required Actions," Step 1, of the bulletin.

05.03 Verify that the licensee's monthly test procedure for the RPS includes a step to perform the UVTA force margin test for each RTB that is in service before any lubrication or adjustment of the UVTA. Also, verify that other actions discussed in "Required Actions," Step 2, are implemented.

05.04 Verify that any newly developed procedures regarding the "Required Actions" discussed in IEB 85-02 are in conformance with the licensees' commitments and the NRC requirements.

05.05 Verify that procedures are properly approved by the licensee before implementation.

05.06 Verify that related written instructions as specified in "Required Actions," Step 3, have been issued to the plant operating personnel and that they understand and are implementing them.

2515/72-06 REPORTING REQUIREMENTS

The regional inspector will maintain a record of the inspection data. These data will be used for assessing adequacy of licensee responses to IE Bulletin 85-02. Document your findings in the normal inspection report and forward a copy to R. L. Baer, Chief, Engineering and Generic Communications Branch, Division of Emergency Preparedness and Engineering Response, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

2515/72-07 EXPIRATION DATE

This TI expires November 5, 1986.

2515/72-08 IE CONTACT

Questions regarding this temporary instruction should be addressed to V. Thomas (301-492-4755).

2515/72-09 MODULE TRACKING SYSTEM INPUT

Record the actual inspection and reporting effort against Module No. 92703.

END

SSIN No.: 6820
OMB No.: 3150-0011
IEB 85-02

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

November 5, 1985

IE BULLETIN NO. 85-02: UNDERVOLTAGE TRIP ATTACHMENTS OF WESTINGHOUSE DB-50 TYPE REACTOR TRIP BREAKERS

Addressees:

All power reactor licensees and applicants.

Purpose:

The purposes of this bulletin are: to inform all power reactor licensees and applicants of recent reactor trip breaker reliability problems, to assure that licensees of currently operating Westinghouse power reactor facilities that have not yet installed the automatic shunt trip modification are performing undervoltage trip attachment (UVTA) force margin testing of the reactor trip breakers (RTBs), and to clarify the "OPERABILITY" requirements related to RTBs.

Description of Circumstances

On October 29, 1985, at 13:57 EST the D. C. Cook Nuclear Station Unit No. 2 tripped from approximately 80% of full power. The reactor trip was triggered by a spurious indicated low flow condition in loop 2. The trip signal originated from the reactor coolant pump breaker contacts. Following the reactor trip condition it was immediately discovered that the reactor trip breaker associated with Train "A" reactor protection system (RPS) did not open, and the trip function was accomplished by only the "B" train RTB (which subsequently on November 3, 1985 failed to pass the UVTA force margin test). Two of four safety-related feedwater isolation valves did not close because the actuation signal to close should have originated from contacts in the failed Train "A" circuit breaker. The remaining two feedwater isolation valves did operate properly because the train "B" reactor trip circuit breaker opened and triggered the isolation action to these two valves. Also, the feedwater regulating valve in each loop was closed by the "B" train RTB signal.

Subsequent action by the licensee included quarantining the failed Train "A" reactor trip breaker. This was facilitated by opening the circuit breakers to the motor-generators.

Investigation into the event by the licensee and Westinghouse attributed the failure of the Train "A" reactor trip breaker to a faulty undervoltage trip attachment (UVTA) which did not provide enough lifting force to the breaker trip bar. The breaker is identified as the Westinghouse Type DB-50.

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Subsequent to the October 29, 1985 incident, all RTBs at the DC Cook station were tested. UVTA trip force margin testing of the Unit 2 "B" breaker on November 3, 1985 identified degradation of the margin below the 20 ounce specified margin (i.e., the requirment for the UVTA is to exert 50 ounces of force, 30 ounces to move the trip bar and 20 ounces for margin). The significance of the degradation of the UVTA attachment of the "B" breaker, in conjunction with the failure of the "A" breaker to trip on October 29, 1985 renews concern for common mode failures that could potentially lead to an ATWS event.

Background:

As a result of the February 22 and 25, 1983 Salem anticipated transients without scram (ATWS) events, the NRC issued IE Bulletin 83-01 and formed a task force to assess the generic implications of these events. On March 11, 1983, Southern California Edison reported that three GE-manufactured RTBs on San Onofre Unit 2 and one on Unit 3 failed to open during testing of the UVTA. As a result of these failures, the NRC issued IE Bulletin 83-04.

The task force's actions resulted in the issuance of NUREG-1000, "Generic Implications of the ATWS Events at the Salem Nuclear Power Plant" and Generic Letter 83-28, delineating the procedural and plant changes required. Findings in NUREG-1000 were based, in part, on assurances that improved maintenance of the breakers would improve the reliability of the UVTAs to an acceptable level for the short term, after which the longer term corrective actions would be implemented.

The longer term corrective actions were directed by NRC Generic Letter 83-28. These actions had two major aspects related to the RTB/UVTAs: (1) the installation of a plant modification that provides for the automatic activation of the shunt trip coil of the RTB for any automatic reactor trip signal, and (2) reliability improvements in the RTB/UVTA based upon UVTA life testing by the vendor. The life test formed the basis for a UVTA replacement interval of 1250 cycles and a lubrication interval of 200 cycles.

The recent failures at D. C. Cook Unit 2 involved RTBs that were refurbished by the vendor only 4 months previously, including the installation of new UVTAs. The Unit 2 RTB "A" (that failed on October 29, 1985) had experienced only about 75 operations on the UVTA. The Unit 2 RTB "B" (that failed on November 3, 1985) had experienced about half as many operations on the UVTA. In this short time, both UVTAs suffered a serious reduction of their trip output force.

The Westinghouse specification for the DB-50 breaker specifies a minimum total force output of the UVTA to be 50 ounces. This total force output provides a force margin of 20 ounces above the maximum force required to trip the breaker. The UVTA trip force margin is measured by temporarily hanging a weight on the trip bar of the breaker and actuating (i.e., de-energizing) the UVTA. Many plants include a force margin test as part of the 18-month surveillance actions. If the weight is less than the UVTA margin, the UVTA will consistently trip the breaker. If the weight is greater than the UVTA margin, the UVTA will consistently not trip the breaker. If the weight approximates the UVTA margin, the UVTA

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will not be consistent in its ability to trip the breaker during the test. At D.C. Cook, three tests at each weight were used to assure valid test results. Testing of RTB "A" indicated that the UVTA force margin had fallen to 5 ounces or less. Testing of the RTB "B" indicated that the UVTA force margin was no longer as great as 20 ounces. If the UVTA does not have adequate margin, it is unacceptable and requires replacement or maintenance.

The root cause of the lost force margin is not known at this time; laboratory failure analysis of the failed UVTAs is being arranged. It is believed that re-lubrication may temporarily restore some of the lost force.

NRC preliminary information is that 9 Westinghouse PWRs have not yet implemented the automatic shunt trip modification. As shown in the attachment, only 3 of these plants are currently operating; namely: Kewaunee, Beaver Valley Unit 1, and Turkey Point Unit 4.

REQUIRED ACTIONS FOR LICENSEES OF CURRENTLY OPERATING WESTINGHOUSE PWR FACILITIES THAT HAVE NOT YET IMPLEMENTED THE ACTUATION OF RTB SHUNT TRIB COIL ON ALL AUTOMATIC REACTOR-TRIP SIGNALS

1. Perform a test of the UVTA of each RTB that is in service to determine that adequate force margin exists, as soon as practical, but not to exceed 7 days of receipt of this bulletin. With a weight of 20 ounces attached to the trip bar, the UVTA by itself must trip the RTB three times in succession. This test shall be performed with the UVTA and breaker in "as found" conditions, prior to any lubrication or other maintenance. Any occurrence of a force margin less than 20 ounces defines an unacceptable UVTA.

2. Modify the monthly test procedure for the Reactor Protection System to add conducting the UVTA force margin test, prior to any lubrication or adjustment of the UVTA, for each RTB that is in service. This test is normally conducted on one RTB each month, i.e., two months between tests on the same RTB. If an RTB fails the UVTA force margin test, the redundant RTB is to be similarly tested within 8 hours. This procedural modification should be in place for the next such test after receipt of this bulletin and remain in force, until the automatic shunt trip modification is fully implemented.

3. Provide written instructions to the plant operating staff, within 7 days of receipt of this bulletin, requiring that:

   (a) The content of this bulletin be reviewed by each licensed operator at the start of his/her next duty shift.

   (b) A reactor trip breaker shall be declared INOPERABLE, if the UVTA either does not successfully pass the force margin test or otherwise may not be capable of performing its intended safety function.

   (c) Plant operation with either RTB INOPERABLE shall continue only as provided for in the plant Technical Specifications.

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(d) The NRC is to be notified via the emergency notification system within 4 hours of any RTB being declared inoperable.

4. Provide a written report to the NRC within 30 days of receipt of this bulletin, which discusses the specific actions taken pursuant to this bulletin and the results thereof.

Should a licensee determine that any action requested by this bulletin jeopardizes overall plant safety, the NRC should be notified of that fact and provided with appropriate justification for not implementing the requested action. Such notification shall be made within 7 days of receipt of this bulletin.

The written reports shall be submitted to the appropriate Regional Administrator under oath or affirmation under provisions of Section 182a, Atomic Energy Act of 1954, as amended. Also, the original copy of the cover letters and a copy of the reports shall be transmitted to the U.S. Nuclear Regulatory Commission, Document Control Desk, Washington, DC 20555 for reproduction and distribution.

This request for information was approved by the Office of Management and Budget under a blanket clearance number 3150-0011. Comments on burden and duplication may be directed to the Office of Management and Budget, Reports Management, Room 3208, New Executive Office Building, Washington, D. C. 20503.

If you have any questions regarding this matter, please contact the Regional Administrator of the appropriate NRC Regional Office of one of the technical contacts listed below.

James M. Taylor, Director
Office of Inspection and Enforcement

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

V. Thomas, IE
(301) 492-4755

Attachments:
1. Facilities Without Automatic Shunt Trip Installed
2. List of Recently Issued IE Bulletins

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FACILITIES WITHOUT AUTOMATIC SHUNT TRIP INSTALLED

FACILITY	REMARKS
1. Kewaunee	Install in February 1986
2. Beaver Valley	Install in May 1986
3. Turkey Point 4	Install in January 1986
4. Sequoyah 2	Currently S/D; install Spring 1986 startup
5. Sequoyah 1	Currently S/D; will install before startup
6. North Anna 1	Currently S/D; will install before startup
7. Byron 1	Currently S/D; will install before startup
8. Zion 2	Currently S/D; will install before startup.
9. Cook 2	Will install prior to startup

Attachment 2
IEB 85-02
November 5, 1985

LIST OF RECENTLY ISSUED IE BULLETINS

Bulletin No.	Subject	Date of Issue	Issued to
85-01	Steam Binding of Auxiliary Feedwater Pumps	10/30/85	All nuclear power facility licensees and CP holders.
84-03	Refueling Cavity Water Seal	8/24/84	All power reactor facilities holding an OL or CP except Fort St. Vrain
84-02	Failures Of General Electric Type HFA Relays In Use In Class 1E Safety System	3/12/84	All power reactor facilities holding an OL or CP
84-01	Cracks In Boiling Water Reactor Mark I Containment Vent Headers	2/3/84	All BWR facilities with Mark I containment and currently in cold shutdown with an OL for Action and All other BWRs with an OL or CP for information
83-08	Electrical Circuit Breakers With An Undervoltage Trip Feature In Use In Safety-Related Applications Other Than The Reactor Trip System	12/28/83	All power reactor facilities holding an OL or CP
83-07 Sup. 2	Apparently Fraudulent Products Sold By Ray Miller, Inc.	12/09/83	Same as IEB 83-07
83-07 Sup. 1	Apparently Fraudulent Products Sold By Ray Miller, Inc.	10/26/83	Same as IEB 83-07

OL = Operating License
CP = Construction Permit

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