

OEAB
EVENT TRACKING SHEET

50-335

Plant: ST-LUCIE Unit: 1 Engineer: T. KOSHY

Event: 4/16/93 Morning Report: —/—/— Briefing: —

50.72#: — LER#: — PN#: —

Other Notification: —

System: ELECTRICAL Component: RELAYS

Event Description INSULATION FAILURE IN PROTECTIVE
RELAYING.

POWER

- 1 - Operation at — % of Power
- 2 - Startup at — % of Power
- 3 - Hot Standby
- 4 - Hot Shutdown
- ⑤ - Cold Shutdown
- 6 - Refueling
- 7 - Other —

SIGNIFICANCE

- A - Reactor Protection System
- B - Safety-Related Cooling System
- C - Fuel Cladding
- D - Reactor Coolant Pressure Boundary
- E - Containment
- F - Plant Power
- G - Unexpected Plant Performance
- H - Other —

CAUSE

- ① - Equipment Failure
- 2 - Design or Installation Error
- 3 - Operating Error
- 4 - Maintenance Error
- 5 - Other —

EVENT TYPE

- SIG - Significant Event
- ⑥ - Event of Interest
- OTR - Other

POTENTIAL AO Yes / No Criterion: —

Proposed by: Koshy 3/15/94
Engineer

Approved: [Signature] 3/15/94
Section Leader

Branch Chief —/—/—

NRC FILE CENTER COPY

EVENTS ASSESSMENT PANEL First Screening: —/—/— Closure: —/—/—
2-11-97 288a.trk

9404270299

4pp

x A

12
1325
E

May 03/2/94 C/S

PSE -- TBD

EVENT FOLLOW-UP ASSIGNMENT SHEET

ASSIGNMENT DATE: April 16, 1993 _____

ASSIGNED TO: KOSHY _____

PLANT & UNIT: ST. LUCIE 1 _____

EVENT DATE: April 16, 1993 _____

50.72 REPORT NO: _____

DAILY REPORT DATE: _____

OTHER REPORT: ORAL FROM PM _____

EVENT SUMMARY AND SPECIFIC FOLLOW-UP ASSIGNMENT

SAFETY GRADE RELAYS INOPERABLE DUE TO GUNK FROM INSULATION PLASTICIZER; SEE I/N 91-20 FOR CAUSE.

FOLLOW UP FOR SAFETY SIGNIFICANCE AND GENERIC IMPLICATIONS. PREPARE I/N SUPP IF APPROPRIATE.

SAFETY SIGNIFICANCE: SIGEVENT _____ AO _____ OTHER E O I _____

OR BRIEFING: _____

CLOSEOUT

The over-current relays failed the surveillance test because of a coating of green substance on the contacts. This substance originated from the internal wiring insulation. This wiring is part of the relay assembly and it had 1970 date code. Unit 2 relays with date code 1975 were free from this problem.

This failure appears to be from a slowly developing insulation degradation that could be recognized through periodic inspection or surveillance. The event was classified as EOI.

An information notice is being processed due to generic implications. A draft copy is attached.

G: EFO41635. STL.

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

February XX, 1994

NRC INFORMATION NOTICE 94-XX: FAILURE OF AN ASEA BROWN BOVERI/WESTINGHOUSE
OVERCURRENT PROTECTIVE RELAY DUE TO ELECTRICAL
WIRE INSULATION DEGRADATION

Addressees

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

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees of a possible situation where electrical wire insulation degradation may cause failure of Asea Brown Boveri (ABB)/Westinghouse protective relays. 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 are not NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances

On April 14, 1993, at St. Lucie Unit 1 a non-safety related ABB/Westinghouse model CO-9 overcurrent protective relay failed to operate during calibration testing. The relay's instantaneous trip unit was coated with a green substance. The green substance was coming from the relay's internal wiring. Electrical tests indicated that the substance was insulating the relay's instantaneous contacts and prevented relay operation even at twice the normal trip current.

The relay's internal wiring was manufactured by Philadelphia Insulated Wire and had polyvinylchloride (PVC) insulation. The wiring was black with white lettering which identified it as 105°C, 18 AWG, manufactured by the Philadelphia Insulated Wire Co. The licensee also inspected all ABB/Westinghouse protective relays and found many of the relays contaminated with the green substance.

The relays in which the PVC wiring was identified were ABB/Westinghouse models CO-7, CO-9, KC-4, COM-5, CV-2, and CVE. Most Unit 1 relays which had the green substance contamination had 1970 date codes. The licensee rewired or replaced all relays which had the PVC insulated internal wiring.

Discussion

The licensee performed a laboratory analysis and identified the green substance as a copper chelate of the polyester plasticizer from the PVC insulation on the relay internal wiring.

Wiring of the 14 AWG and 18 AWG sizes with the copper chelate contamination, manufactured by Philadelphia Insulated Wire Co., was identified within the ABB/Westinghouse relays. The replacement wiring had cross linked polyethylene insulation. The licensee also replaced the relay coils because the coil lead wiring was not identifiable and could have been PVC insulated. The Unit 2 relays were inspected and many had PVC insulated internal wiring. No evidence was found of any copper chelate contamination. Most Unit 2 relays had 1975 date codes and had less time in service than the Unit 1 relays. This indicated that the PVC breakdown phenomena was likely time dependent. The laboratory evaluation also indicated that overheating of the wiring could have caused the release of the plasticizer.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact one of the technical contacts listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

Brian K. Grimes, Director
Division of Operating Reactor Support
Office of Nuclear Reactor Regulation

Technical contacts: G. MacDonald, RII
(404) 331-5576

M. Shymlock, RII
(404) 331-5596

Attachment:

List of Recently Issued NRC Information Notices

With one exception

OGCB:DORS
TJKim
02/08/94

EELB:DE
02/11/94

EELB:DE
02/11/94

EELB:DE
CBerlinger
02/14/94

DE:NRR
WHodges
02/18/94

OGCB:DORS
ACHaffee
02/24/94

Tech Ed
02/08/94

OGCB:DORS
AKugler
02/11/94

DORS:NRR
BKGrimes
02/11/94

4-2/8
Cap