

PRIORITY ATTENTION REQUIRED MORNING REPORT - REGION
1993

DECEMBER 1,

Licensee/Facility:

Notification:

Usnrc Generic Communications Branch

MR Number: H-93-0039

Date: 12/01/93

Subject: PRAIRIE ISLAND - NBDF RELAY FAILURES

Reportable Event Number: N/A

Discussion:

On July 19, 1993, two Westinghouse NBDF relays failed during a routine surveillance test at Prairie Island Unit 2. NBDF relays are used extensively in the reactor protection system (RPS). These relays are normally energized. The surveillance test involved de-energizing the relays and observing whether the relay contacts change state. The relays are then re-energized. The licensee was unable to re-energize these relays.

The relays were sent to Westinghouse for failure analysis. Westinghouse concluded that overheating was the most likely cause of the material condition of the relays. The overheating was thought to have occurred as a result one or more of the following:

- extended overvoltages
- lack of cooling or air circulation

- breakdown of the varnish insulation on the coil winding
- poor manufacturing practices

The licensee stated that the relays had not been exposed to any overvoltage condition or lack of cooling and, therefore, concluded that the overheating was caused by insulation breakdown or a manufacturing error.

In late September, 1993, a third NBDF relay failed (open coil) and an additional four relays were found cracked. The licensee exercised the plunger for each of the cracked relays and verified that the armature moved freely. All cracked relays passed their surveillance tests. The licensee has identified a total of 24 cracked relays in the Unit 2 RPS. There may possibly be other damaged relays since many relays are not accessible for visual inspection.

On June 24, 1991, Westinghouse issued a 10 CFR Part 21 report concerning the potential for certain Westinghouse supplied products to malfunction due to epoxy compounds becoming semi-fluid when the coils are energized for extended periods. The components covered by the Westinghouse report included the NBDF relay. In response to the Westinghouse Part 21 notification, the NRC issued Information Notice 91-45, "Possible Malfunction of Westinghouse ARD, BFD, and NBFD relays and A200 DC and DPC 250 Magnetic Contactors," dated July 5, 1991. This notice transmitted the

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Westinghouse Part 21 notification. A supplement to this information notice is being drafted. The supplement will describe the recent NBDF relay failures at the Prairie Island plant.

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Regional Action:

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