

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

December 15, 1989

NRC INFORMATION NOTICE NO. 89-45, SUPPLEMENT 2: METALCLAD, LOW-VOLTAGE POWER
CIRCUIT BREAKERS REFURBISHED
WITH SUBSTANDARD PARTS

Addressees:

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

Purpose:

This information notice supplement is being provided to alert addressees to the problem of potentially defective General Electric (GE) and Westinghouse (W) metalclad, low-voltage power circuit breakers and associated equipment supplied to nuclear power plants by the Satin American Corporation (SA) and its affiliate, Circuit Breaker Systems, Incorporated, both of Shelton, Connecticut, or by any of SA's representatives. Of particular concern are GE EC-type, electromechanical, overcurrent trip devices, in safety-related applications, or available for use in such applications, supplied by these organizations.

It is expected that recipients will review this information for applicability to their facilities and consider actions, if appropriate, to avoid similar problems. However, suggestions contained in this notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

NRC Information Notice (IN) No. 89-45 discussed a General Electric (GE) type AKF-2-25 metalclad, low-voltage power circuit breaker (field discharge configuration) supplied to the Quad Cities nuclear power plant by SA that was found to have been built or refurbished with nonstandard and substandard parts.

Supplement 1 to IN 89-45 discussed the NRC's findings on GE EC-type trip devices from follow-up inspections at utilities that had procured circuit breakers and related electrical equipment such as trip devices from SA. As discussed in detail in the supplement, the NRC found EC-type trip devices supplied by SA that were refurbished with nonstandard and possibly substandard parts, or old, used parts, in nonstandard combinations using questionable fabrication methods. Some of these devices had failed in service or testing.

Additional tests were conducted by utility personnel and were observed by representatives of the original manufacturer and the NRC. In these tests, the devices

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exhibited inconsistent performance including some test failures. Subsequently, the NRC obtained more of these SA-supplied trip units and had them tested and examined at the GE Apparatus Service Facility in Atlanta, Georgia. This facility is currently the sole original equipment manufacturer of EC-type trip devices. The results of this testing were also unsatisfactory, with virtually all the devices tested exhibiting out-of-specification operation of one or more of their functions in some portion of their design operating ranges. The devices were not adjustable such that they would operate within tolerance at all points within their nameplate-identified characteristic curves, and some of them failed to perform one or more of their trip functions entirely. Post-testing examination of these devices confirmed that they were rebuilt with used parts, in incorrect combinations. Some of the parts were so degraded with age that they were no longer suitable for use, and some of the unsatisfactory test results were directly attributable to the discrepancies in the conditions found. Some of the fabrication methods used could contribute to erratic operation and failure. Such latent defects would not be readily detectable during routine inspection and testing and could render the affected circuit breakers unreliable during normal operation due to spurious tripping and lack of overcurrent protection.

The SA facility in Shelton, Connecticut, suffered major damage in a fire in July 1989. The resultant destruction of records may make it difficult or impossible for SA's customers to audit the company and obtain the information necessary to assure that previously purchased equipment was in full compliance with the applicable specifications and purchase order requirements.

In order to assess the scope of the problem with regard to GE EC-type trip devices, all nuclear utilities were contacted by the Nuclear Management and Resources Council (NUMARC) at the request of the NRC to determine which utilities had purchased low-voltage electrical switchgear or related equipment from SA that was used or available for use in safety-related applications. Information thus obtained indicated that about 40 utilities had purchased equipment of the types in question in the last 5 or 6 years, much of which was purchased as commercial grade equipment and was used in or available for use in nonsafety-related applications only. Of the NUMARC respondents, several utilities initially reported that they had GE AK-type circuit breakers containing EC-type overcurrent trip devices supplied by SA which were possibly used in safety-related applications. These utilities subsequently contacted the NRC.


All licensees thus far identified that have GE EC-type trip devices installed in safety-related circuit breakers have committed to acceptable courses of action to replace the suspect trip devices or to consult with GE in reviewing and determining the suitability of the trip devices for continued use.

As a result of the NRC's continuing inspections of the types of equipment in question at licensed facilities, the NRC has identified additional SA-supplied equipment that may be defective. NRC inspections of SA-supplied Westinghouse low-voltage switchgear at several plants, including type DB-25 and DS-416 circuit breakers at the Cooper Nuclear Station and the Zion Nuclear Power Station respectively, have identified apparent irregularities when compared to the original equipment. Specifically, apparent differences in pole shaft and spring-pin configuration, wiring type, frame finish, and nameplates were observed.

It is possible, therefore, that this and other equipment supplied by SA may not be suitable for service without additional operability reviews in consultation with the original equipment manufacturer.

The NRC is interested in obtaining information on circuit breakers and related pieces of equipment that have been found with deficiencies such as those described in IN 89-45, Supplement 1 thereto, and this supplement. Documentation, in as much detail as practicable, of any such deficiencies noted, especially in recent procurements and in cases of possible improper servicing or refurbishment, is important. Licensees may communicate information of this type by telephone to the technical contacts listed below.

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 NRR project manager.


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

Technical Contacts: S. D. Alexander, NRR
(301) 492-0995

U. Potapovs, NRR
(301) 492-0984

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
89-86	Type HK Circuit Breakers Missing Close Latch Anti-Shock Springs.	12/15/89	All holders of OLs or CPs for nuclear power reactors.
89-85	EPA's Interim Final Rule on Medical Waste Tracking and Management	12/15/89	All medical, academic, industrial, waste broker, and waste disposal site licensees.
89-84	Failure of Ingersoll Rand Air Start Motors as a Result of Pinion Gear Assembly Fitting Problems	12/12/89	All holders of OLs or CPs for nuclear power reactors.
89-83	Sustained Degraded Voltage on the Offsite Electrical Grid and Loss of Other Generating Stations as a Result of a Plant Trip	12/11/89	All holders of OLs or CPs for nuclear power reactors.
89-82	Recent Safety-Related Incidents at Large Irradiators	12/7/89	All NRC licensees authorized to possess and use sealed sources at large irradiators.
89-59, Supp. 1	Suppliers of Potentially Misrepresented Fasteners	12/6/89	All holders of OLs or CPs for nuclear power reactors.
89-81	Inadequate Control of Temporary Modifications to Safety-Related Systems	12/6/89	All holders of OLs or CPs for nuclear power reactors.
89-80	Potential for Water Hammer, Thermal Stratification, and Steam Binding in High-Pressure Coolant Injection Piping	12/1/89	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
CP = Construction Permit

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