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

December 31, 1987

NRC INFORMATION NOTICE NO. 87-66: INAPPROPRIATE APPLICATION OF COMMERCIAL-GRADE COMPONENTS

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 inappropriate application of commercial-grade components within qualified Class 1E electrical panels and to identify the differences in the quality and qualified life expectancy between a particular manufacturer's nuclear-grade and commercial-grade relays.

It is expected that recipients will review this 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:

During a September 16-October 3, 1986 NRC inspection at the Sequoyah Nuclear Plant, Units 1 and 2, it was revealed that the licensee had replaced previously qualified equipment with components and parts of commercial-grade, without providing adequate documentation of their qualifications and dedication. The items selected by the NRC inspectors included two Agastat time-delay relays from one Class 1E panel. Both relays were Agastat model number 7012PD relays. The manufacturer's markings on these two relays indicate that they were neither manufactured nor controlled as qualified Class 1E components, because the model number is not preceded by an "E." The licensee was unable to identify or produce the procurement documents for these relays; consequently, the inspectors presumed that these components had not been supplied or dedicated as qualified devices. Therefore, the qualification of the panel was deemed "indeterminate," since the components may not have been capable of performing their intended function.

During an NRC inspection on May 11-22 and June 1-5, 1987 at the Joseph M. Farley Nuclear Plant, Units 1 and 2, it was revealed that the licensee had allowed commercial-grade components to be purchased for Class 1E panels without adequate evidence of component qualification. As a result, hardware items were installed in safety-related applications where they may not have been capable of performing their intended function. One example at Farley was the installation of a commercial-grade Agastat relay in a Class 1E panel. The Agastat model number on the relay was not prefixed by an "E"; hence, the relay was not considered Class 1E-qualified by the manufacturer nor was it found to have been dedicated by the licensee for Class 1E application.

The NRC requested and received information from the Amerace Corporation of Union, New Jersey, concerning the projected qualified life of its nuclear grade (E series) Agastat and commercial-grade electrical relays. Amerace indicated that its typical 7000 nuclear grade E series electrical-pneumatic timing relays have a projected qualified life of 10 years from date of manufacture or 25,000 operations, whichever occurs first. Its commercial-grade 7000 series relays have a 2-year projected qualified life.

Discussion:

The relays discussed above are all electrical-pneumatic Amerace Agastat timing relays. These relays are being used here as an example of how degradation of a qualified component or system can occur if a licensee does not implement adequate controls in procuring replacement components. There are no apparent physical form, fit, or function differences between the commercial-grade and nuclear-grade Agastat relays. However, there are several very distinct differences in the design, manufacturing, testing, and modification controls that are imposed by Amerace for the two different relay series, as discussed below:

Commercial-Grade 7000 Series Relays

1. No design change or configuration controls are required.

2. Functionability product testing is neither as comprehensive nor as documented as for the comparable E7000 series testing.

3. Internal component substitutions are not documented or controlled, and parts that can be rejected for the E7000 series can be utilized in the 7000 series.

4. Commercial-grade relays are assembled and manufactured at facilities in Mexico, Canada, Belgium, and Union, New Jersey.

5. Undocumented field modification of the 7000 series relays is allowed by the distributors as they deem necessary.

6. Amerace does not project a qualified life expectancy longer than two years for these relays.

Nuclear-Grade E7000 Series Relays

1. The design, manufacture, modification, and testing are performed only at the Union, New Jersey facility under a 10 CFR Part 50 Appendix B and ANSI N-45.2 program.

2. Amerace imposes in-process manufacturing inspections that are more stringent than for its commercial-grade series.

3. Design and configuration traceability control is in place for each piece-part.

4. The projected qualified life expectancy is 10 years or 25,000 operations.

5. Only the E7000 series relay is tested and analyzed to comply with the requirements of the applicable IEEE and ANSI standards.

6. Final functionability tests are performed to encompass all operational parameters for each E7000 series relay.

The NRC staff learned of these differences during a vendor inspection and subsequent discussions with Amerace personnel. These types of differences in a manufacturer's product should be readily discernible by a licensee's pre-award survey and procurement program actions, regardless of the type of replacement component purchased.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the technical contact listed below or the Regional Administrator of the appropriate Regional Office.

Charles E. Rossi

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

Technical Contact: Joseph J. Petrosino, NRR
(301) 492-4316

Attachment:
List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES 1987

Information Notice No.	Subject	Date of Issuance	Issued to
87-28, Supp. 1	Air Systems Problems at U.S. Light Water Reactors	12/28/87	All holders of OLs or CPs for nuclear power reactors.
87-65	Plant Operation Beyond Analyzed Conditions	12/23/87	All holders of OLs or CPs for nuclear power reactors.
87-64	Conviction for Falsification of Security Training Records	12/22/87	All nuclear power reactor facilities holding an OL or CP and all major fuel facility licensees.
87-35, Supp. 1	Reactor Trip Breaker Westinghouse Model DS-416, Failed to Open on Manual Initiation From the Control Room	12/16/87	All holders of OLs or CPs for nuclear power reactors.
87-63	Inadequate Net Positive Suction Head in Low Pressure Safety Systems	12/9/87	All holders of OLs or CPs for nuclear power reactors.
87-62	Mechanical Failure of Indicating-Type Fuses	12/8/87	All holders of OLs or CPs for nuclear power reactors.
87-61	Failure of Westinghouse W-2-Type Circuit Breaker Cell Switches.	12/7/87	All holders of OLs or CPs for nuclear power reactors.
87-60	Depressurization of Reactor Coolant Systems in Pressurized-Water Reactors	12/4/87	All holders of OLs or CPs for PWRs.

OL = Operating License
CP = Construction Permit

Nuclear-Grade E7000 Series Relays

1. The design, manufacture, modification, and testing are performed only at the Union, New Jersey facility under a 10 CFR Part 50 Appendix B and ANSI N-45.2 program.

2. Amerace imposes in-process manufacturing inspections that are more stringent than for its commercial-grade series.

3. Design and configuration traceability control is in place for each piece-part.

4. The projected qualified life expectancy is 10 years or 25,000 operations.

5. Only the E7000 series relay is tested and analyzed to comply with the requirements of the applicable IEEE and ANSI standards.

6. Final functionability tests are performed to encompass all operational parameters for each E7000 series relay.

The NRC staff learned of these differences during a vendor inspection and subsequent discussions with Amerace personnel. These types of differences in a manufacturer's product should be readily discernible by a licensee's pre-award survey and procurement program actions, regardless of the type of replacement component purchased.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the technical contact listed below or the Regional Administrator of the appropriate Regional Office.

Original Signed by
Charles E. Rossi

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

Technical Contact: Joseph J. Petrosino, NRR
(301) 492-4316

Attachment:
List of Recently Issued NRC Information Notices

*See previous concurrences

*VIB:DRIS	*VIB:DRIS	*GCB:DOEA:NRR	*GCB:DOEA:NRR	*TECH EDITOR	D:DOEA:NRR
JPetrosino	JStone	SMackay	CBerlinger	AThomas	CERossi
12/23/87	12/23/87	12/23/87	12/23/87	12/23/87	12/29/87

Discussed changes in final notice with Petrosino and E. Baker (acting for Stone) by phone on 12/29/87 and received concurrence in changes CER

Nuclear-Grade E7000 Series Relays

1. The design, manufacture, modification, and testing are performed only at the Union, New Jersey, facility under a 10 CFR Part 50 Appendix B and ANSI N-45.2 program.

2. TAC imposes in-process manufacturing inspections that are more stringent than its commercial-grade series.

3. Design and configuration traceability control is in place for each piece-part.

4. The projected qualified life expectancy is 10 years or 25,000 operations.

5. Only the E7000 series relay is tested and analyzed to comply with the requirements of IEEE-323, IEEE-344, and ANSI C37.98.

6. Final functionability tests are performed to encompass the entire operational parameter for each E7000 series relay.

The NRC staff learned of these differences during a TAC vendor inspection and subsequent discussions with TAC personnel. These types of differences in a manufacturer's product should be readily discernible by a licensee's pre-award survey and procurement program actions, regardless of the type of replacement component purchased. These examples reflect a failure on the part of these licensees to adequately implement pre-award survey, procurement, and commercial component dedication programs. Licensee's should take appropriate measures to ensure that Class 1E-qualified replacement components are either procured as Class 1E-qualified components, or that the basis for using a commercial-grade component in a safety-related application is adequate.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the technical contact 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

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12/23/87	12/23/ 87	12/23/87	12/23/87	12/23/87	12/ /87

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NAME	:JPetrosino*	:JStone	:SMackay	:CHBerlinger	:A. THOMAS	:CERossi	:
DATE	:12/23/87	:12/23/87	:12/23/87	: / /87	:12/23/87	: / /87	:

* The Amerace Corporation QA Director and Chief Engineer concurred by telephone.