

**Notice of Safety Advisory 2000-1 - Addressing safety concerns involving Model B1 relays, manufactured by General Railway Signal (GRS), between the years 1960 and 1985, and their potential to stick and remain in the energized position. ALSTOM Signaling, Inc., which has acquired GRS, estimates that approximately 2,000,000 relays are affected worldwide.**

On May 11, 2000, FRA published a Notice of Safety Advisory 2000-1 in the Federal Register (Vol. 65, No. 92), addressing safety concerns with a particular relay. It reads as follows:

In a Safety Notice issued on August 18, 1995, GRS stated that it had received reports of ten incidents of a residual screw in the armature of a Type B1 relay not releasing from the lower core head surface within the specified time. GRS stated that this condition could develop in any application using one or more B1 relays. FRA is concerned about potential malfunctions in such relays which are critical to signal systems and their impact on safety if they do not operate within specified parameters.

In its Safety Notice, GRS concluded that:

1. The condition arises from the transfer of material from the cadmium-tin plated core head to the copper-silicon residual screw, which can cause the residual screw to adhere to the core head.
2. Any B1 relay manufactured by GRS between January 1960 and December 1985 incorporating residual screw Part No. 20360-012-00 (Catalog No. P62-255) could develop this condition.
3. The condition is more likely to occur in B1 Relays normally in the energized position used in one or more of the following circumstances:
  - a. High temperature, i.e. ambient temperatures above 100 degrees Fahrenheit (38 degrees Celsius) on a regular basis; and/or
  - b. Number of operations of the B1 Relay is less than four (4) times per day.

In order to avoid this condition, GRS recommended that all B1 Relays manufactured between January 1960 and December 1985 incorporating screw Part No. 20360-012-00 should be modified by replacing the residual screw in accordance with instructions provided by GRS.

FRA has determined that the safety of railroad employees and the general public compels the issuance of this Safety Advisory. Occurrences of GRS B1 Type relay failures have caused FRA serious concern about the safety of certain relays. The relays of concern were first identified by General Railway Signal, now ALSTOM Signaling, in a Safety Notice issued August 18, 1995. Any B1 relay manufactured by GRS between January 1960 and December 1985 incorporating residual screw Part No. 20360-012-00 (Catalog No. P62-255) could develop the condition of concern. The condition arises from the transfer of material from the cadmium-tin plated core head to the copper-silicon residual screw, which can cause the residual screw to adhere to the core head, not allowing the armature to release from the lower core head surface within the specified time. The GRS recommended corrective

action was to clean the relays, replace the residual screw, and in some cases replace the relay cores and bracket.

In July of 1999, after B1 relay failures were reported on the signal system of Washington Metropolitan Area Transit Authority, the FRA notified the Association of American Railroads, the American Public Transit Association, and the American Short Line and Regional Railroad Association, making those associations aware of the potential safety issue and asking that they bring the matter to the attention of their members.

### **Recommended Action**

Subsequent to the July 1999 industry notification, additional reports of B1 relay failures have been reported to FRA. Due to these reports FRA is issuing this Safety Advisory, to again make all users of B1 relays aware of the potential problem and its recognized solution. While FRA is not at this time requiring immediate inspection and repair or replacement of all such relays, FRA strongly recommends that railroads accelerate B1 relay inspection and testing programs so that all B1 relays have been inspected (and repaired or replaced, if necessary) as soon as possible. FRA further recommends that all inspection and testing forces be made aware of this problem and especially of the likelihood that the condition is more likely to occur in B1 relays normally in the energized position and used in high temperature on a regular basis, or in which the number of operations of the relay is less than four times per day. (See GRS Safety Notice.).

FRA notes that present railroad safety regulations at title 49 of the Code of Federal Regulations require periodic testing of each relay affecting the safety of train operations (49 CFR 236.106) and each relay affecting the proper functioning of grade crossing warning systems (49 CFR 234.263). FRA further notes that 49 CFR sections 236.11 and 234.207 require that when any essential component of a signal system or highway rail crossing warning system fails to perform its intended signaling function or is not in correspondence with known operating conditions, the cause shall be determined and the faulty component adjusted, repaired, or replaced without undue delay. Therefore, if the B1 relay fails to perform as intended, pursuant to section 236.11 and 234.207, it must be replaced.

Copies of the Safety Notice issued by GRS, will be made available through the Regional Signal & Train Control Specialist or through the Signal & Train Control Division at FRA Headquarters, at 202-493-6325.

Issued in Washington, D.C. by George Gavalla, FRA Associate Administrator for Safety.