1. ORDER TO CONTRACTORS

1.1 When carrying out inspection and examination of elevators, at regular intervals, the contractor shall ensure that all safety related relays and contactors are in safe operating condition and will remain so until the next scheduled inspection and examination, as required in subsections 23(3)(a) and 23(4) of O. Regulation under the Elevating Devices Act.

1.2 On each elevator equipped with HORN or ARMOR controllers having relays marked CD or CDL in the car door contact circuit, and relays marked HD or HDL in the hall door interlocks circuits, and on any other controller, for which the contractor establishes that the relays in the car door and/or hall door circuits cannot be positively maintained in safe operating condition as required in 1.1 above (e.g., residual magnetization, unreliable springs, etc.);

The contractor maintaining such an elevator shall, not later than September 30, 1996, take the following actions:

(a) Ensure that the relays are replaced with relays of a design which can be maintained in safe operating condition, as required in 1.1 above, or

(b) Carry out such wiring changes in the controller to ensure that simultaneous failures of relays in the car door and hall door circuits could not cause the car to leave a landing with car or hall or both doors open, as illustrated in the enclosed diagram, supplied by Schindler Elevator, to be used for ARMOR/HORN controllers.

1.3 If the work required in Order 1.2 above, items (a) and (b) does not constitute a part of the contractor’s maintenance contract, and the authorization from the owner to complete the work cannot be obtained, the contractor shall inform the Technical Standards Division immediately (to the attention of N.L. Benn, Chief Inspector, Re: Director’s Ruling 108/93), indicating the elevator installation numbers and the scope of work proposed by the contractor.

2. BACKGROUND

2.1 This Ruling #108/93 was originally issued in 1993 following a report from Schindler Elevator Corporation on an incident where an elevator ran with both landing and car doors open, due to simultaneous failure (residual magnetization) of both, CDL and HDL relays in the closed position, allowing the main directional relays U and D to pick-up while the doors were open (as illustrated in the diagram on Hard Copy).
2.2 In another incident on an ARMOR elevator during October, 1995 a person was injured, when struck by the car door header, while stepping from the car to the landing. The car moved in the down direction with both doors open due to the failure of relays marked CD and HD, as reported by Schindler Elevator Corporation.

2.3 Other controller makes, equipped with relays that cannot be positively maintained in safe operating condition, could also initiate similar incidents.

2.4 All the incidents are related to elevators that were installed before the requirement in Clause 3.12.9(d) of CSA-B44-M90 Code came into force, which now requires that the car shall not be permitted to restart should these type of failures occur.

2.5 For that reason, regular inspections and maintenance of all relays in safety circuits for the purpose of identifying any wear and tear that could affect their safe operation, is of paramount importance for maintaining the elevator in safe operating condition as required in subsection 23(4) of O. Regulation under the Elevating Devices Act.

2.6 Furthermore, wiring changes, such as those illustrated in the enclosed diagram, which is proposed by Schindler Elevator Corporation for HORN and ARMOR controllers, should further minimize the affect of relay failures on the safety of elevators.
FIELD ENGINEERING LETTER # 44

HORN / ARMOR CONTROLLERS - NEED FOR CIRCUIT CHANGE

An incident has been reported recently where an elevator installed about 25 years ago moved with both hall and car doors open. The cause of this incident was the simultaneous failure of two relays HDL and CDL (also called HD and CD in some circuitry) due to magnetization. These two relays are fed through the hall door locks and car gate switch in series.

Contacts from the above relays are used to activate U and D relays to run the elevator. Since redundancy check of the back up components was not a code requirement prior to 1994, the failure was not detected until both relays failed. The potential safety problem can be corrected by a simple wiring change by deleting CDL/CD and HDL/HD contacts from U and D circuit and feeding them directly through the door locks and car gate switch. A typical circuit is shown below. Variations to this circuit may be found on some controllers. However, the principle remains the same i.e. U and D relays should be fed through hall doors and car door locks to ensure that car will move out side the door zone only when the doors are closed.

A field engineering letter with a similar concern was issued in 1992. In that letter the reference was only to HDL and CDL relays. However, we have found that there are controllers where the relays with the same function are called HD and CD.