IN THE MATTER OF:

THE TECHNICAL STANDARDS AND SAFETY ACT, 2000, S.O. 2000, c. 16 (the “Act”)
- and -
ONTARIO REGULATION 223/01
(Codes and Standards Adopted by Reference) made under the Act
- and -
ONTARIO REGULATION 209/01 (Elevating Devices) made under the Act

Subject: Adoption of CAN/CSA-Z185-M87 (R2001) Safety Code for Personnel Hoists,
CAN/CSA-Z256-M87 (R2006) Safety Code for Material Hoists, and

Sent to: All Elevating Device Contractors

The Director of Ontario Regulation 209/01 (Elevating Devices) pursuant to section 4 of Ontario Regulation 223/01 (Codes and Standards Adopted by Reference) hereby provides notice that the Elevating Devices Code Adoption Document dated June 1, 2001 (CAD) published by the Technical Standards & Safety Authority, as amended, is further amended as follows;

1.0 Change to Definitions

Part I, General, 1. Definitions of the CAD is amended by adding the following:

common-mode failure, means the result of an event(s) which because of dependencies, causes a coincidence of failure states of components in two or more separate channels of a redundancy system, leading to the defined system failing to perform its intended function.

software system failure, means a behaviour of the software, including its support (host) hardware, that is not in accordance with the intended function.

solid-state device, means an element that can control current flow without moving parts.

2.0 Change to General Technical Requirements

2.1 Part II, General Technical Requirements of the CAD is amended by adding the following:

4.(c) except the requirements of 4.(b) are not applicable to Construction Hoists.

3.0 Change to Part VI Construction Hoists

3.1 Part VI, Construction Hoists section 31.(1) of the CAD is revoked and replaced with the following:

31.(1) Every construction hoist shall conform to the following:
a) workers’ rail-guided construction hoists shall conform to CAN/CSA-Z185-M87 (R2001) Safety Code for Personnel Hoists;


3.2 Part VI, Construction Hoists section 35. of the CAD is renumbered as 35.(1)

3.3 Part VI, Construction Hoists section 35.(2) is added as follows:

35.(2) In addition to the requirements of 31.(1)(a), workers’ rail-guided construction hoists shall conform to the following:

a) Clause 14.4.2 of CAN/CSA-Z185-M87 (R2001) shall be replaced with the following;
   The occurrence of a single ground or a software system failure or the failure of
   i) a switch which does not have contacts that are positively separated;
   ii) a contactor;
   iii) a relay; or
   iv) a solid state device;
   shall not render any electrical protective device ineffective.

b) Redundant software systems used to satisfy the requirements of a) shall have a level of diversification sufficient to avoid common mode failures.

c) Clause 18.1.1(c) of CAN/CSA-Z185-M87 (R2001) shall be replaced with:
   Control equipment incorporating solid state devices and/or software systems in operating and control circuits shall be tested in accordance with the testing requirements of EN 12016:2004 by exposing it to interference levels at the test values specified for “safety circuits.” The interference shall not render any electrical protective device ineffective and shall not cause the car to move. If enclosure doors or suppression equipment must remain installed to meet the above requirements, warning signs to that effect shall be posted on the control equipment.

d) The normal terminal stopping device and final terminal stopping devices shall not control the same controller devices unless two or more separate and independent controller devices are provided, two of which shall complete both the driving-machine motor and the driving machine brake circuits in either direction of travel.

e) Workers’ construction hoists employing a two- or three-phase alternating-current driving machine motor, which is not driven from a direct current source through a static inverter, shall be provided with a means to inhibit the flow of alternating-current in each phase.
3.4 Part VI, Construction Hoists section 35.(3) is added as follows:

35.(3) In addition to the requirements of 31.(1)(b), workers’ rope-guided construction hoists shall conform to the following:

a) The occurrence of a single ground or a software system failure or the failure of
   i) a switch which does not have contacts that are positively separated;
   ii) a contactor;
   iii) a relay; or
   iv) a solid state device;

   shall not render the, deadman control switch, the limit switches which prevent overtravel, or the automatic friction brake ineffective.

Note: Requirements only apply to the circuits in which the deadman control switch, the limit switches which prevent overtravel, or the automatic friction brake are used and not to the devices themselves.

b) Redundant software systems used to satisfy the requirements of i) shall have a level of diversification sufficient to avoid common mode failures.

c) Control equipment incorporating solid state devices and/or software systems in operating and control circuits shall be tested in accordance with the testing requirements of EN 12016:2004 by exposing it to interference levels at the test values specified for “safety circuits.” The interference shall not render the Deadman Control Switch, Limit Switches, or the Automatic Friction Brake ineffective and shall not cause the cage to move. If enclosure doors or suppression equipment must remain installed to meet the above requirements, warning signs to that effect shall be posted on the control equipment.


3.5 Part VI, Construction Hoists section 35.(4) is added as follows:

35.(4) In addition to the requirements of 31.(1)(c), material construction hoists shall conform to the following:

a) Clause 15.3.2 of CAN/CSA-Z256-M87 (R2006) shall be replaced with the following;

   The occurrence of a single ground or a software system failure or the failure of
   i) a switch which does not have contacts that are positively separated;
   ii) a contactor;
   iii) a relay; or
   iv) a solid state device;

   shall not render any electrical protective device ineffective.

b) Redundant software systems used to satisfy the requirements of a) shall have a level of diversification sufficient to avoid common mode failures.

c) Clause 19.1.3 of CAN/CSA-Z256-M87 (R2006) shall be replaced with:

   Control equipment incorporating solid state devices and/or software systems in operating and control circuits shall be tested in accordance with the testing requirements of EN 12016:2004 by exposing it to interference levels at the test values specified for “safety circuits.” The interference shall not render any electrical protective device ineffective and shall not cause the car to move. If enclosure doors or suppression equipment must remain installed to meet the above requirements, warning signs to that effect shall be posted on the control equipment.
d) The normal terminal stopping device and final terminal stopping devices shall not control the same controller devices unless two or more separate and independent controller devices are provided, two of which shall complete both the driving-machine motor and the driving machine brake circuits in either direction of travel.

e) Material construction hoists employing a two- or three-phase alternating-current driving machine motor, which is not driven from a direct current source through a static inverter, shall be provided with a means to inhibit the flow of alternating-current in each phase.

4.0 Effective Date

This Code adoption Document Amendment is effective September 1, 2007.

Roland Hadaller, P.Eng.,
Director, Ontario Regulation 209/01 (Elevating Devices)

5.0 Background

Due to changes in technology, Construction Hoists have begun to incorporate solid-state devices and software systems into safety circuits replacing traditional hard-wired switches and relays. The CAN/CSA-Z185, CAN/CSA-Z256, and ANSI A10.22 standards are silent with regards to the use of these technologies, and therefore additional rules are required to ensure the continued safe operation of Construction Hoists. With the acknowledgement of designs which incorporate software systems and solid state controls in safety circuits, electromagnetic interference from radio frequency transmitters and cell phones is a hazard which must be ruled out by electromagnetic compatibility testing where required.


The ANSI A10.22-2007 American National Standard for Rope-Guided and Nonguided Worker’s Hoists is available from the American National Standards Institute, 25 West 43rd Street, 4th floor, New York, NY 10036, telephone: 1-212-642-4900 or online webstore.ansi.org

The EN 12016:2004 Electromagnetic Compatibility – Product Family Standard for Lifts, Escalators and Passenger Conveyors is available from BSI British Standards, 389 Chiswick High Road, London, W4 4AL, United Kingdom, telephone +44 (0)20-8996-9001, or online www.bsonline.bsi-global.com

This Order has been developed in consultation with the Construction Hoist Industry