Issue #2
Draft for Public Review

July 2021

A17.1-20XX/B44-XX, Safety Code for Elevators and Escalators
(Proposed Revisions of ASME A17.1-2019/CSA B44:19)

TENTATIVE
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ASME Codes and Standards
Record 08-1345

Revise A17.1-2019 as follows:

8.6.3.10 Replacement of Hydraulic Jack, Plunger, and Cylinder, Tanks, and Anticreep Leveling Device

8.6.3.10.4 A tank replacement shall be classified as an alteration and shall comply with 8.7.3.29 3.24.

8.6.3.10.5 An anti-creep leveling device replacement shall be classified as an alteration and shall comply tested to determine conformance with 8.7.3.31.3 8.10.3.4.2(a).

Rationale:
· To define tank replacement as a Replacement. Note: For an Alteration; 8.7.3.29 requires conformance to 3.24.
· To define anti-creep device replacement as a Replacement. Note: For an Alteration; 8.7.3.31.3 requires conformance to 3.26.3.1.

8.6.3.11 Replacement of Valves, and Pressure Piping, and Fittings.

(a) Where any valves, pressure pipings, or fittings are replaced, replacements shall conform to Section 3.19 with the exception of except for 3.19.4.6. (When changing valves, pressure piping, or fittings to a different type, see 8.7.3.24.) The unit shall be tested in accordance with 8.10.3.4.3(a).

(b) A Replacement control valves must conform to the Code under which it was installed. 8.6.1.1.2. (When changing control valve to a different type, see 8.7.3.24.) Relief valves shall be tested in accordance with 8.10.3.4.3(b)

Rationale: To differentiate replacement of identical components from those of a different design, which is an Alteration.

When replacement with same occurs the requirements of 8.6.3.11 apply. Testing requirements are included to add the requirement that was omitted in the 2000 code (1006.4: This required testing and for the valve required 1005.2a, which is a Relief Valve Test comparable to 8.6.5.14.1) and to assure identical replacements operate in the manner intended. Bring greater clarity to 8.6.3.11 replacement, and provide a reference to the alteration requirement 8.7.3.24.

Title consistent with Section 3.19.

8.6.3.16 Replacement of Driving Machine or Controller

8.6.3.16.1 Replacement of the Complete Driving Machine.

(a) Where an electric elevator driving machine (see Section 1.3) is replaced, it shall be considered an alteration and shall conform to 8.7.2.25.1 except, the replacement driving machine shall be permitted to conform to the code under which the original machine was installed, or altered if:

(l) the driving machine is replaced with equipment approved by the original equipment elevator manufacturer as being equivalent to the original make and model or,
(2) the replaced driving machine is certified by a licensed professional engineer as being equivalent to the original make and model and able to meet the original design criteria of the elevator system.

(b) Where an electric elevator driving machine is replaced in accordance with 8.6.3.16.1(a)(1) or 8.6.3.16.1(a)(2) it shall be inspected and tested in accordance with the requirements specified in 8.10.2.4.1(a).

Rationale: To allow for direct replacement of machines and to provide inspection and testing requirements. The intention is to allow exception to the alteration requirement only when the same type machine with the same form, fit and function is used.

8.6.3.16.2 Replacement of Controller

(a) Where an elevator controller is replaced, with either:

(1) a motion controller,
(2) an operation controller,
(3) a motion and operation controller, or
(4) a door controller

it shall be considered an alteration and shall conform to 8.7.2.27.4 or 8.7.3.31.5 as applicable.

(b) Where a controller specified in (a) is replaced with equipment equivalent to the original make and model, due to:

(1) damage or loss, and
(2) for the purpose of matching other equipment in the group

it shall be permitted to conform to the code under which the original controller was installed or last altered, and shall be inspected and tested in accordance with the requirements specified in 8.10.2.4.1(b) or 8.10.3.4.1(a) as applicable.

Rationale:
Allow for the direct replacement of a controller, with an identical and available controller, when the original controller has been damaged. (Example: Controller destroyed by fire or water). The controller will need to meet the Code to which it was originally installed or last altered.

8.7.1.7 Repairs and Replacements. Repairs and replacements shall conform to 8.6.2 and 8.6.3

8.7.2.27.4 Controllers. When the replacement of the controller does not meet the requirements of 8.6.3.16.2(b), it will be an alteration and meet the following requirements (a)...

8.7.3.31.5 Controllers. When the replacement of the controller does not meet the requirements of 8.6.3.16.2(b), it will be an alteration and meet the following requirements (a)...

Rationale: Adding a requirement providing references in Alterations when the change would be designated as a Replacement and provide the appropriate Requirement.
8.10.2.4 Inspection and Test Requirements for Replacements

8.10.3.4 Inspection and Test Requirements for Replacements

Rationale: To acknowledge that there are tests in these sections for specific replacements.

**8.10.2.4.1**

(a) Where a driving machine is replaced (see 8.6.3.16.1), tests shall be performed as specified in 8.10.2.2.2(o), and (u) through (z), (cc)(1), (cc)(2), (cc)(3) [except (cc)(3)(c), unless required as installed or last altered], (dd), and (kk); and 8.10.2.2.1(q).

Tests as specified in requirements 8.10.2.2.2(cc)(3) and (jj) are required if these features were present when the unit was installed or last altered.

Rationale: To provide inspection and testing requirements for the direct replacement of an Electric elevator driving machine.

(b) Where a controller is replaced (see 8.6.3.16.2); tests shall be performed, if these features were present when the unit was installed or last altered, as specified in 8.10.2.2.1(c), (j), (l)(5), (q), and (t); 8.10.2.2.2(r), (s), (t), (v), (aa), (bb), (ff), (gg), (ji) and (kk); 8.10.2.2.6; and 8.10.2.2.3(o). All electric protective devices shall be tested for proper operation.

Rationale: To provide inspection and testing requirements for the direct replacement of an Electric elevator controller with a spare due to a controller loss.

**8.10.3.4.1**

(a) Where a controller is replaced (see 8.6.3.16.2); tests shall be performed, for those features that were present when the unit was installed or last altered, as specified in 8.10.2.2.1(l)(5), and 8.10.2.2.2(q), (s), (t)(1), (t)(2), (t)(4), and (l); and 8.10.2.2.1(t), and 8.10.2.2.3(o). All electrical protective devices shall be tested for proper operation.

Rationale: To provide inspection and testing requirements for the direct replacement of a hydraulic controller with a spare due to a controller loss.

**8.10.3.4.2**

(a) Where an anti-creep leveling device is replaced, it shall be tested to determine conformance with 3.26.3.1.

Rationale: To provide inspection and testing requirements for the replacement of an anti-creep leveling device.

**8.10.3.4.3**

(a) Where any valves, pressure piping, or fittings are replaced, replacements shall be tested in accordance with 8.6.5.14.1.

(b) A replacement control valve shall have their relief valve tested in accordance with 8.6.5.14.1.
Rationale: To provide inspection and testing requirements for the replacement of valves, pressure piping, or fittings; and relief valves.
Revise A17.1 as follows:

2.19.3.3 Marking Plate Requirements. The emergency brake shall be provided with a marking plate indicating the manufacturer, the model number, the range of total masses (car with attachments and its load) for which it is permitted to be used, the range of speeds at which it is set to operate, and the criteria such as rail lubrication requirements that are critical to the performance.

Rationale: Based on collaboration between the A17 Mechanical Design Committee and the A17 Inspections committee the determination was that the data plate technical data entries are not useful to elevator personnel. The emergency brake should be labeled for identification purposes, but adequacy of application should be demonstrated by acceptance test and periodic tests. Furthermore, the MCP should cover emergency brake maintenance and repair procedures in lieu of location on the data plate.
Revise ASME A17.1-2019/CSA B44-19 as follows:

Rationale: As a result of a ballot comment noting the Alternative Test results were being referenced in the incorrect 8.6.1.2.2 location, this proposal is to require Alternative Test results to be located in 8.6.1.4.1(c)(5) by adding the following language:

8.6.1.4.1 On-Site Maintenance Records

...  
(c)  

(5) Written records where required by 8.6.11.10.4.

8.6.4.20.11 Emergency Brake

(a) Emergency Brake and Ascending Car Overspeed Protection. For passenger elevators and all freight elevators, the emergency brake shall be tested for compliance with 2.19.3.2. Verify the setting of the ascending car overspeed detection means.

(b) Emergency Brake and Unintended Car Movement Protection. Test the unintended car movement protection and the emergency brake in the down direction with 125% of rated load at the landing above the bottom landing.

(c) Alternative Test Method for Emergency Brakes. The alternative test methods shall comply with 8.6.11.10 and the following:

(1) Any method of verifying conformity of the emergency brake with the applicable Code requirements (see 2.19.3.2) shall be permitted, including the testing method of the emergency brakes with or without any load in the car, provided that when applied the method verifies that the emergency brake performs or is capable of performing in compliance with 8.6.4.20.11(a) and 8.6.4.20.11(b).

(2) A test tag as required in 8.6.1.7.2 shall be provided.

8.6.11.10 Category 5 Tests Without Load Via Alternative Test Methodologies

8.6.11.10.1 Where Permitted. Alternative test methods without load are permitted for Category 5 testing subject to approval by the authority having jurisdiction of

(a) car and counterweight safeties per 8.6.4.20.1

(b) oil buffers per 8.6.4.20.3

(c) driving-machine brakes per 8.6.4.20.4, and

(d) braking system, traction, and traction limits per 8.6.4.20.10 results

(e) emergency brake per 8.6.4.20.11

NOTE: See Section 8.10, Note (2).

8.6.11.10.3 Alternative Test Method Procedure. The alternative test method shall

(a) include requirements to obtain and verify car and counterweight masses if necessary for the test

(b) have a procedure document that

(1) defines the permissible equipment range and limitations regarding use
(2) establishes monitoring and calibration criteria for tools or measuring devices as appropriate
(3) defines the test setup procedure
(4) provides instructions on how to interpret results and correlate the results to pass–fail criteria
(c) describe how to correlate no-load test results with previously acquired full-load and no-load results if necessary for the test method
(d) be included in the maintenance control program [see 8.6.1.2.1(a)]
(e) include the information required by 8.6.1.2.2(b)(5) where applicable, and
(f) require a report conforming to 8.6.11.10.4

8.6.11.10.4 Alternative Test Method Report. The alternative test method report shall
(a) identify the alternative test tool (make/model) used to perform the test
(b) identify the company performing the tests, names of personnel conducting and witnessing the tests, and testing dates
(c) contain all required printouts or record of tests required to demonstrate compliance to the testing requirement requirements that were gathered during an acceptance test
(d) identify which results from the baseline test are to be used for future compliance evaluation if necessary for the test method
(e) record the car and counterweight masses that were obtained per 8.6.11.10.3(a) during the acceptance test and during any subsequent Category 5 test if required by test method
(f) contain all subsequent Category 5 results with pass–fail conclusions regarding Code compliance
(g) remain on site or shall be available to elevator personnel and the authority having jurisdiction.

Rationale: There are virtually no differences in the testing methods of a driving-machine brake and an emergency brake. The allowance to use alternative testing on the driving-machine brake should be also provided for testing the emergency brake.
Record 16-861

Revise A17.1-2016 as follows:

**3.24.3.3 Means for Checking Liquid Level.** Tanks shall be provided with means for checking the liquid level. Such means shall be readily accessible (see Section 1.3) without the removal of any cover or other part.

Rationale: To simplify checking the liquid level.
2.26.5 System to Monitor and Prevent Automatic Operation of the Elevator With Faulty Door Contact Circuits

Means shall be provided to monitor the position of power-operated car doors that are mechanically coupled with the landing doors while the car is in the landing zone, in order (a) to prevent automatic operation of the car if the car door is not closed (see 2.14.4.11), regardless whether the portion of the circuits incorporating the car door contact or the interlock contact of the landing door coupled with the car door, or both, are closed or open, except as permitted in 2.26.1.6
(b) to prevent the power closing of the doors during automatic operation if the car door is fully open and any of the following conditions exist:
   (1) the car door contact is closed or the portion of the circuit, incorporating this contact is bypassed
   (2) the interlock contact of the landing door that is coupled to the opened car door is closed or the portion of the circuit, incorporating this contact is bypassed (see 2.27.3.3.9)
   (3) the car door contact and the interlock contact of the door that is coupled to the opened car door are closed, or the portions of the circuits incorporating these contacts are bypassed

Revised Rationale:
To add clarity to the code via a reference in 2.26.5 that points to an exception to a portion of the requirement that exists in another section of the code.

2.27.3.3 Phase II Emergency In-Car Operation.

...  
2.27.3.3.9 Requirement 2.26.5(b)(2) shall not apply when the elevator is on Phase II Emergency In-Car Operation.

Rationale:
To allow the firefighters, only when on Phase II Emergency In-Car Operation, to maintain maximum control of the elevator by being able to close the car door in the event that a faulty hoistway door contact is falsely indicated due to the car and hoistway doors being decoupled. Here the problem is not a faulty door contact but a mechanical problem with the hoistway door coupling means. In this scenario the firefighter is stuck in the car with the car door fully open, with the hoistway door fully closed and with the hoistway door interlock contact made up but not faulty. Under this proposal, if the door close button remains active, the firefighter is able to clear the fault with continuous pressure on the door close button to close the car door. With both doors now closed, the firefighters will be able to evaluate the situation and exercise their judgement, i.e., continue using the elevator noting an issue with the hoistway/car door coupling at one floor or move to a safe floor to exit the elevator. If a faulty hoistway door contact existed on any operation prior to calling for Phase II In-Car Operation, the elevator would be shut down and not available for Phase II In-Car Operation in the first place.
For the door coupling issue that this proposal addresses, the faulty door contact monitor would detect the problem on any operation other than Phase II In-Car Operation the first time the elevator stops at the floor with the defective door coupling means. The only way to recover the car is to be on Phase II In-Car Operation and use the door close button to fully close the car
door. This is only possible if the decoupling problem occurs while on Phase II In-Car Operation. In that case the apparent faulty door contact is not overridden or ignored but cleared. Under this proposal the faulty door contact monitoring function will remain active at all times. Instead it is the disabling the door close button after the condition is detected when on Phase II In-Car Operation that is at issue. If the car doors are open in any scenario the car will not run. In addition, a faulty car door contact will still be detected on Phase II In-Car Operation.
2.26.4.2 Electrical equipment shall comply with requirements of 2.26.4.2.1 through 2.26.4.2.4 be listed/certified and labeled/marked. CSA B44.1/ASME A17.5 defines the scope and applicable requirements for this listing/certification.

2.26.4.2.1 The following shall be listed/certified and labeled/marked in accordance with requirements of CSA B44.1/ASME A17.5

(a) motor controllers
(b) motion controllers
(c) operation controllers
(d) assemblies containing (a), (b), or (c)

2.26.4.2.2 Operating devices shall be listed/certified and labeled/marked to:

(a) CSA B44.1/ASME A17.5, or
(b) the approved product safety standard or code applicable to the country where the equipment is installed (e.g., Canada or the USA)

2.26.4.2.3 Electrical equipment that is not an electrical protective device, does not perform any other safety function(s) and it is not described in 2.26.4.2.1, and 2.26.4.2.2 is not required to be listed/certified if:

(a) the equipment does not include any component operating at voltage greater than 30 V rms or 42.4 V peak.
(b) the equipment is located entirely in a Class 2 circuit in accordance with CSA C22.1, Part 1 or NFPA 70, as applicable, and is supplied with a certified/listed Class 2 power supply/transformer, and
(c) failure of the equipment shall not render an electrical protective device ineffective.

2.26.4.2.4 Electrical equipment not covered by 2.26.4.2.1, 2.26.4.2.2, or 2.26.4.2.3 shall be listed/certified and labeled/marked to the approved safety standard or code applicable to the country where the equipment is installed (e.g., Canada or the USA).

Rationale: Requirement 2.26.4.2 has been a source of concern for some readers. Some have interpreted the clause to mean that ALL electrical equipment must be listed/certified and labeled/marked using CSA B44.1/ASME A17.5. The second sentence of the clause was an attempt to help the reader understand when CSA B44.1/ASME A17.5 is applicable, but there is still ambiguity within the current 2.26.4.2 wording as related to the scope of CSA B44.1/ASME A17.5.

The scope of CSA B44.1/ASME A17.5 indicates that is intended to apply to electrical equipment for elevators, escalators, moving walks, dumbwaiters, material lifts, and elevating devices for persons with physical disabilities, including

(a) motor controllers,
(b) motion controllers,
(c) operation controllers,
(d) operating devices; and
(e) all other electrical equipment not listed/certified and labelled/marked according to another product safety standard or code.

CSA B44.1/ASME A17.5 does not include appropriate requirements for every imaginable type of component that exists, and was never intended to be applied to devices for which component standards already exist, only for the specific elevator type equipment enumerated in (a) through (d) and to devices for which no safety standard currently exists, as indicated in (e).

Requirement 1.5 of CSA B44.1/ASME A17.5 also includes a statement that the standard does not apply to devices rated for connection to extra-low-voltage Class 2 supply circuits. Many have interpreted this to mean that any component rated 30 V rms or less need not comply with CSA B44.1/ASME A17.5 (or any other standard).

In reality, requirement 1.5 applies only to devices that are in extra-low-voltage Class 2 circuits, which are very specifically defined in the Canadian and National Electrical Codes, and require very special installation considerations, including separation of Class 2 circuits from all other circuits. Furthermore, even when a circuit is a Class 2 circuit, if failure of the circuit or a device in the circuit will introduce a life hazard (such as rendering an EPD ineffective), it must be treated as a Class 1 circuit (see C22.1 rule 16-010), and any the requirements for Class 1 circuits are applicable, including the need for devices to be listed/certified.

This proposal expands requirement 2.26.4.2 to encompass all of these considerations, which will more clearly communicate the requirements for listing/certification of electrical equipment. The base requirement is that electrical equipment shall be listed/certified and labeled/marked. The new requirements 2.26.4.2.1 through 2.26.4.2.3 clarify which devices must comply with CSA B44.1/ASME A17.5, which devices must comply with other approved component standards applicable to the country where the equipment is installed (for example, Canada or the USA), and which devices are not required to be listed/certified.

Expanding requirement 2.26.4.2 as proposed will result in a more uniform understanding of the listing/certification requirement for all stakeholders, and reduce the likelihood that non-compliant devices will be used in low voltage circuits that could affect the safety of an elevator system.
Record 18-2573

Proposed Revision to A17.1, Requirement 8.10.4.1.2(m) Handrail Speed Monitor:

8.10.4.1.2 Internal Inspection and Tests

(m) Handrail Speed Monitor. The handrails operating mechanism shall be visually inspected for condition and the handrail speed monitor device shall be tested (6.1.6.4 or 6.2.6.4) (Items 8.13 and 10.13).

The person or firm installing the equipment shall provide a written checkout procedure and demonstrate that the handrail speed monitor device (6.1.6.4 and 6.2.6.4) will activate an alarm without any intentional delay and the device will shut down the unit when a speed deviation of 15% or more is continuous within a 2 s to 6 s range.

Verify that the handrail speed monitoring device requires a manual reset or the person or firm installing the equipment shall provide a written checkout procedure and demonstrate that it automatically resets only once in 24 hours of operation and then requires manual reset.

Rationale: To require a written checkout procedure to verify the handrail speed monitor complies with 6.1.6.4 and 6.2.6.4.
Proposed Revision to A17.1, 2.24 and 8.6 Driving-Machine Brake(s):

2.24.8.5 Driving Machine Brake Data or Marking Information Plates. The brake setting and method of measurement shall be provided on the driving machine on a data plate complying with 8.13.1 or a marking plate complying with 8.13.3 and shall be readily visible after installation. The following information shall be conveyed on the data or marking plate:

(a) the type of brake (see 2.24.8.7)

(b) for ‘Type A’ brakes

(1) adjustments on the brake that affect the brakes holding capacity or decelerating capacity and
(2) method of measuring these adjustments to verify the brakes correct holding capacity and decelerating capacity (see 2.24.8.3).

(c) for ‘Type B’ brakes; “Brake Holding and Decelerating Capacity Not Field Adjustable – See Onsite Documentation for Method to Verify”.

Any unique or product specific procedures or methods for the adjustment or method of measurement of Type B driving machine brakes shall be included in the on-site documentation [see 8.6.1.2.2(b)(6)] with sufficient detail to ensure that testing can be accomplished by elevator personnel.

2.24.8.7 Identification, Classification and Seals on Driving Machine Brakes

2.24.8.7.1 Identification. Driving machine brakes shall be identified as either ‘Type A’ or ‘Type B’, and the identification shall be included on the brake marking plate (see 2.24.8.5(a)).

2.24.8.7.2 Classification. Driving machines brakes shall be classified based on their ability to field adjust the brake holding capacity or decelerating capacity as follows:

(a) ‘Type A’, driving machine brake refers to a brake where the brake holding capacity or decelerating capacity can be adjusted on site (see 2.24.8.3).

(b) ‘Type B’, driving machine brake refers to a brake where the brake holding capacity or decelerating capacity is not field adjustable (see 2.24.8.3).

2.24.8.7.3 Seals

(a) All seals shall be of a type that shall be broken if there is a

(1) change to the adjustment of brake holding capacity or decelerating capacity of a ‘Type A’ brake or
(2) replacement of a ‘Type B’ brake.

(b) Seals used on:

(1) Type A” brakes shall have a unique identifier and shall meet the requirements defined for an adjustment seal
(2) Type B’ brakes shall have a unique identifier, unless the brake is marked with a unique serial number and shall meet the documentation requirements defined for an adjustment seal
(c) For ‘Type A’ brakes, the adjustment(s) shall be sealed to prevent readjustment once the correct holding capacity or decelerating capacity of the driving machine brake has been established.

(d) For ‘Type B’ brakes, a seal shall be provided at a suitable location which would require the seal to be broken in the event the non-adjustable type B brake is replaced.

(e) Provisions shall be made to enable affixing seals after tests. Note: Factory applied seals meeting the requirements of (a) to (d) are acceptable.

(f) Adjustments that do not affect the brake holding capacity or decelerating capacity do not need to be sealed.

(g) The method to seal the adjustment shall not alter the structural integrity of any component or assembly.

8.6.1.2.2 On-site Documentation. The documents …

(b) Procedures for inspections and tests not described in ASME A17.2 and procedures or methods required for elevator personnel to perform maintenance, repairs, replacements, and adjustments, as follows:

(6) Unique or product-specific procedures or methods required for the adjustment or method of measurement of Type B driving machine brakes
(7) Unique or product-specific procedures or methods required to maintain, repair, replace, inspect, or test equipment, such procedures or methods shall be provided by the manufacturer or installer. These procedures and any unique devices required by the procedures for inspection and testing shall be accessible on-site to elevator personnel [see 8.11.1.7]

8.6.3.16 Replacement of Driving Machine Brake.
When a driving machine brake is replaced it shall conform to 2.24.8.2 through 2.24.8.7. See also 8.6.4.6.2.

8.6.4.6 Brakes
8.6.4.6.1 The driving-machine brake shall be maintained to ensure proper operation, including, but not limited to, the following:
(a) residual pads (antimagnetic pads)
(b) lining and running clearances
(c) pins and levers
(d) springs
(e) sleeves and guide bushings
(f) disks and drums
(g) brake coil and plunger
(h) holding and decelerating capacities (See 2.24.8.3)
8.6.4.6.2 If any part of the driving-machine brake is changed or adjusted that can affect the holding capacity or decelerating capacity of the brake when required (see 2.24.8.3), it shall be adjusted or replaced as applicable (see 2.24.8.7 and 8.6.3.16) and checked by means that will verify its proper function, and holding capacity and decelerating capacity. A test complying with 8.6.4.20.4 shall be performed.

8.6.4.20.4 Driving-Machine Brake(s). For passenger elevators and all freight elevators, the driving-machine brake shall be tested for compliance with applicable requirements, in accordance with (a) or, subject to approval by the authority having jurisdiction, with (b). For elevators installed under ASME A17.1-2000/CSA B44-00 and later editions, have the brake setting verified in accordance with the data on the brake marking plate. Upon completion of the test, the means of adjusting the holding capacity shall be sealed, if applicable (see 2.24.8.7.3), to prevent changing the adjustment without breaking the seal. The seal shall bear or otherwise attach the identification of the person or firm that installed it. (See also 8.6.1.7.2, Periodic Test Record.)

Rationale: Revised driving machine brake data and marking plate requirements to address adjustable and non-adjustable brakes and to agree with 8.6.4.6.2. Added classifications for adjustable brakes and non-adjustable brakes. Added different methods of sealing adjustable and non-adjustable brakes. Revised 8.6.1.2.2 onsite documentation requirements to include unique or product specific procedures or methods required for non-adjustable brakes and to agree with 8.11.1.7. Revised 8.6.4.20.4 to address non-adjustable brakes. Revised 8.6.4.6.1 and clarified 8.6.4.6.2 for driving machine brakes related to holding and decelerating capacity (see 2.24.8.3). 2.24.8.3 clearly requires that the driving machine brake must be capable of decelerating the empty car in the up direction within defined parameters. This has been in A17.1/B44 since 2000. Capacity has a common definition that includes “the amount that something can produce”.
Record 20-2624

**General rationale:** Currently, there are no requirements in A17.1/B44 that address connecting an elevator control to the Internet. This proposal enhances safety by adding cyber-security requirements to limit access to elevator control systems via the Internet. The proposal also defines what control elements are permitted and not permitted to be accessed if the elevator control were connected to the Internet. The proposal also provides guidance to users of this code to use the cyber threat risk assessment of the referenced IEC 62443 series of standards to determine if additional requirement enhancements (REs) are necessary for the needs of their assets.

Proposed revisions to A17.1-2019/B44:19:

**SECTION 1.3 DEFINITIONS:**

...  
listed/certified: process, equipment or materials accepted for inclusion in a publication by a certifying organization.

NOTE: The means for identifying listed/certified equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed/certified unless it is also labeled/marketed. The authority having jurisdiction uses the system employed by the listing/certifying organization to identify a listed/certified product.

**Rationale:** The word “process” in this definition is needed to be consistent with the proposal in 8.14.1(a)(1).

...

Remote Interaction Operation (RIO): any operation where signals are exchanged between an elevator and off-site systems.

**Rationale:** To add a definition for remote interaction operation to ensure there is a common understanding of the term as it is referenced in the RIO proposal for this interactive functional operation.

...

Security Level Rated: An elevator control system, or component that is rated to a security level in accordance with the applicable requirements in IEC 62443-2-4, 62443-3-3, 62443-4-1, and 62443-4-2.

**Rationale:** Added for use in specifying a prescriptive parameter for the security level under section 8.14. Basis of the definition taken from IEC 62443-4-2.
2.26.1.7.1 Executable software used in performing one or more of the functions listed below shall have a unique software identifier (USI) for each software version. Changes in executable software for any of the following functions shall require a new USI:

... 
(o) any operating mode restricted to Group 1 (8.1.2)  
(p) restricted Opening of Car Doors (2.14.5.7)  
(q) the additional requirements for passenger overload in the down direction (2.16.8)  
(r) a function, device or means that is required by the code to be manually reset

2.26.1.7.2 Software-based parameters are permitted and shall not modify the USI when adjusted or selected in the field. See also 8.14.1(b).

Rationale: To point to the requirements for the means to permit on-site software download or to modify parameters of executable software requiring a USI and to add additional critical software functions not covered in the current code.

2.26.9.3 Protection Against Failures

2.26.9.3.1 The occurrence of a single ground; the failure of any single magnetically operated switch, contactor, or relay; the failure of any single device that limits the leveling or truck zone; the failure of any single solid-state device not a part of a software system; or a failure of a software system in circuits not in conformance with 2.26.9.3.2(b), shall not:

... 
(f) render ineffective the means in 8.14.1(b) that prevents changes to executable software or its related parameters.

Rationale: To require single failure protection of the means that will prevent changes to executable software or safety related parameters

2.26.13 Remote Interaction Operation (RIO)

When RIO is provided, requirements 2.26.13.1 through 2.26.13.5 shall apply (see also 8.14):

2.26.13.1 When RIO is provided: A sign conforming to 8.13.2 shall be provided in letters not less than 25 mm (1 in.) high on the outside surface of the elevator controller or not less than 6 mm (0.25 in.) high at the inspection and test panel if provided stating, “REMOTE INTERACTION OPERATION PROVIDED”.

Rationale: Provide notification to on-site elevator personnel that RIO functionality is provided.
2.26.13.2 RIO shall only be permitted to perform the following actions on elevators on automatic operation:

(a) register a car or hall call to cause a car to move to a non-secured floor,
(b) activate, deactivate, or set the state of features, operations or functions associated with automatic or group automatic operation subject to the limitations identified in 2.26.13.3, 2.26.13.4 and 2.26.13.5, and
(c) remove the car from group automatic operation, except as limited by 2.26.13.3 and 2.26.13.4.

**Rationale:** To identify actions RIO is permitted to perform when an elevator is on automatic operation.

NOTE 1: [2.26.13.2(b)] Examples of features include but are not limited to: parking the elevator, door dwell time, actuating sabbath or penthouse operation, actuation or deactivation of the automatic car lighting power saving feature (see 2.14.7.2.2) and changing the car parking floor. The ICC A117.1 minimum door dwell time requirement is an example of a limit specified in a referenced standard.

NOTE 2: [2.26.13.2(b)] Documentation should be provided to confirm the request to remove service to any floor prior to using RIO for this function (see 8.6.11.16).

**Rationale:** To specify the possible interactive functions of RIO during automatic operation and help to prevent miscommunication of requested changes to secured floor(s) between authorized persons in the building with those utilizing RIO.

2.26.13.3 RIO shall not enable, disable, override, reset or interfere with any of the following:

(a) Hoistway Access Operation (2.12.7.3)
(b) Inspection Operation (2.26.1.4)
(c) Emergency or Standby Power System (2.27.2)
(d) Firefighters’ Emergency Operation and Signaling (2.27.3, 2.27.4, 2.27.5, 2.27.6, and 2.27.10)
(e) Occupant Evacuation Operation (2.27.11)
(f) Operation of Elevators Under Earthquake Emergency Conditions (8.4.10.1)
(g) Operation in leveling or truck zone (2.26.1.6)
(h) any operating mode restricted to Group 1 (8.1.2)
(i) Any operation established by a non-momentary switch in the car or on site.
(j) designated attendant operation (see Section 1.3. See also 2.27.5)
(k) power operated car and hoistway door or panel closing speed or force (see 2.13.3 and 2.13.4)

**Rationale:** To specify restrictions for RIO for electric elevators
Note (2.26.13.3(i)): Where elevator status information is displayed on the status of the automatic operation of the elevators in other building information systems, such as building management systems or traffic displays, the information should be consistent on all systems.

Rationale: To provide guidance that there should not be conflict in the information displayed in other building information systems, such as building management systems or traffic displays, on the status of the automatic operation of the elevators.

2.26.13.4 RIO shall not interfere with, modify, reset, render ineffective, nor render inoperative:
(a) any electrical protective device (2.26.2)
(b) the System to Monitor and Prevent Automatic Operation of the Elevator with Faulty Door Contact Circuits (2.26.5)
(c) Protection Against Traction Loss (2.20.8.1)
(d) Broken Suspension Member detection means (2.20.8.2)
(e) Suspension Member Residual-Strength detection means (2.20.8.3)
(f) Normal Terminal Stopping (2.25.2)
(g) in-car door open buttons (2.13.3.3.2)
(h) car door reopening devices (2.13.5, 2.13)
(i) Restricted Opening of Car Doors (2.14.5.7)
(j) the additional requirements for passenger overload in the down direction (2.16.8)
(k) any safety device or means incorporated through application of ASME A17.7 motions control parameters.
(l) a function or device that is required by the code to be manually reset
(m) software system or software in circuits used to comply with requirements in 2.26.9.3.2 and 2.26.9.4
(o) Inspection Operation with Open Door Circuit (2.26.1.5)

Rationale: To specify restrictions for RIO for electric elevators.

2.26.13.5 RIO shall be designed to prohibit activation, deactivation, setting, or resetting the state of features, operations or functions associated with automatic or group automatic operation that would violate any requirements of this code or reference standards (see Section 9).

Rationale: To specify design criteria on RIO
**Note (2.26.13.5):** Where RIO is utilized and the elevator is connected to an elevator management system, the status and initiated functions of automatic operation should be consistent between these systems.

**Rationale:** To provide guidance that there should not be conflict in the information displayed in other building information systems, such as building management systems or traffic displays, on the status of the automatic operation of the elevators.

2.26.13.6 RIO shall be restricted to and utilized by Elevator or Authorized Personnel only.

**Rationale:** To specify personnel restrictions when utilizing RIO.

### 3.26.1 Operating Devices and Control Equipment

Operating devices and control equipment shall conform to Section 2.26, except as modified by the following:

... 


**Rationale:** To specify requirements for RIO for hydraulic elevators

### 3.26.11.1

Executable software used in performing one or more of the following functions shall have a USI for each software version. Changes in executable software for any of the following functions shall require a new USI:

... 

(m) anti-Creep Releveling (3.26.3)
(n) plunger follower (3.18.2.7)
(o) any operating mode restricted to Group 1 (8.1.2)
(p) restricted Opening of Car Doors (2.14.5.7)
(q) a function, device or means that is required by the code to be manually reset

**Rationale:** To add safety relevant functions to executable software requiring a USI and to add additional critical software functions not covered in the current code.

### 3.26.11.2

Software-based parameters are permitted and shall not modify the USI when adjusted or selected in the field. See also 8.14.1(b).

**Rationale:** To point to the requirements for the means to permit on-site software download or to modify parameters of executable software requiring a USI.
3.26.12 Remote Interaction Operation (RIO)

3.26.12.1 When remote interaction is provided, in addition to applicable functions indicated in 2.26.13.3, RIO shall not enable, disable, override, reset, or interfere with any of the following operations:

(a) Auxiliary Power Lowering Operation (3.26.10)
(b) Anti-Creep Releveling (3.26.3)
(c) Recycling Operation (3.26.7)

3.26.12.2 When remote interaction is provided, in addition to the applicable functions indicated in 2.26.13.4, RIO shall not interfere with, modify, reset, render ineffective, nor render inoperative:

(a) Low Oil Protection (3.26.9)
(b) Phase Reversal Protection (3.26.5)
(c) plunger gripper electrical actuation means (3.17.3.2.1)
(d) plunger follower (3.18.2.7)
(e) pressure sensing means (3.26.8)

**Rationale:** To specify restrictions for RIO for hydraulic elevators.

SECTION 5.2 LIMITED-USE/LIMITED-APPLICATION ELEVATORS

... 

5.2.1.26 Operating Devices and Control Equipment. Operating devices and control equipment shall conform to Section 2.26, except as modified by the following:

... 

(f) Remote interaction operation is prohibited (2.26.13)

**Rationale:** To exclude RIO use on LULA applications until such time that the LULA Committee develops requirements, limitations, etc., for the application of RIO.

5.5.1 Electric Sidewalk Elevators

... 

5.5.1.25 Operating Devices and Control Equipment. Operating devices and control equipment shall conform to Section 2.26, except as modified by 5.5.1.25.1 through 5.5.1.25.45. Where the top opening is located in an area exterior to the building, all electrical equipment on the car shall be weatherproof.

... 

5.5.21.25.5 Remote interaction operation is prohibited (2.26.13)

**Rationale:** To exclude RIO use on Sidewalk Elevators until such time that the Hand and Sidewalk Elevator Committee develops requirements, limitations, etc., for the application of RIO.
SECTION 5.6 - ROOFTOP ELEVATORS

5.6.1.25 Operating Devices and Control Equipment.
Operating devices and control equipment shall conform to Section 2.26, except as modified by 5.6.1.25.1 through 5.6.1.25.56.

5.6.1.25.6 Remote interaction operation is prohibited (2.26.13)

Rationale: To exclude RIO use on Roof Top Elevators until such time that the Hand and Sidewalk Elevator Committee develops requirements, limitations, etc., for the application of RIO.

SECTION 5.9 - MINE ELEVATORS

5.9.26 Operating Devices and Control Equipment

5.9.26.3 Remote Interaction Operation. Remote interaction operation is prohibited (2.26.13)

Rationale: To exclude RIO use on Mine Elevators until such time that the Mine Elevator Committee develops requirements, limitations, etc., for the application of RIO.

5.10.1 Electric Elevators Used for Construction

5.10.1.21 Operating Devices and Control Equipment
5.10.1.21.1 Applicable Requirements
(a) Operating devices and control equipment on elevators with a car speed of up to 1.75 m/s (350 ft/min) shall conform to Section 2.26, except that 2.26.1.6, 2.26.2.14, 2.26.4.4, and 2.26.12 and 2.26.13 do not apply. See 5.10.1.21.3 regarding temporary wiring requirements.

(d) Remote interaction operation is prohibited (2.26.13).

Rationale: To exclude RIO use on Electric and hydraulic Elevators Used for Construction until such time that the Elevator Used for Construction Committee develops requirements, limitations, etc., for the application of RIO.
SECTION 7.2 ELECTRIC DUMBWAITERS WITHOUT AUTOMATIC TRANSFER DEVICES

7.2.12 Operating Devices and Control Equipment Operating devices of power dumbwaiters shall be the automatic or continuous-pressure type. Operating devices and control equipment shall comply with Section 2.26, except as modified by 7.2.12.1 through 7.2.12.410

7.2.12.41 Remote interaction operation is prohibited (2.26.13)

Rationale: To exclude RIO use on Electric Dumbwaiters Without Automatic Transfer Devices until such time that the Dumbwaiter and ATD Committee develops requirements, limitations, etc., for the application of RIO.

SECTION 7.5 ELECTRIC MATERIAL LIFTS WITHOUT AUTOMATIC TRANSFER DEVICES

7.5.12 Operating Devices and Control Equipment

7.5.12.1 Type A material lift operating devices and control equipment shall conform to Section 2.26, except as modified by 7.5.12.1.1 through 7.5.12.1.256

7.5.12.1.26 Remote interaction operation is prohibited (2.26.13).

Rationale: To exclude RIO use on Type A Electric Material Lifts Without Automatic Transfer Devices until such time that the Dumbwaiter and ATD Committee develops requirements, limitations, etc., for the application of RIO.

7.5.12.2 Type B material lift operating devices and control equipment shall conform to Section 2.26, except as modified by 7.5.12.2.1 through 7.5.12.2.345

7.5.12.2.35 Remote interaction operation is prohibited (2.26.13).

Rationale: To exclude RIO use on Type B Electric Material Lifts Without Automatic Transfer Devices until such time that the Dumbwaiter and ATD Committee develops requirements, limitations, etc., for the application of RIO.
SECTION 7.6 HYDRAULIC MATERIAL LIFTS WITHOUT AUTOMATIC TRANSFER DEVICES

…

7.6.8.1 Operating Devices and Control Equipment.
Operating devices and control equipment shall conform to Section 2.26 as specified by 7.5.12, except as modified by the following:

…

(g) Remote interaction operation is prohibited (2.26.13).

Rationale: To exclude RIO use on Hydraulic Material Lifts Without Automatic Transfer Devices until such time that the Dumbwaiter and ATD Committee develops requirements, limitations, etc., for the application of RIO.

Section 8.3 ENGINEERING TESTS, TYPE TESTS, AND CERTIFICATION
Section 8.3 covers
(a) type of tests and certification of

…

(b) engineering tests of

…

(8) cybersecurity for elevators as required in 8.14 (see 8.3.16)

…

8.3.16 Engineering Test for Cybersecurity
An internet connected or connectivity enabled device interfaced (directly or indirectly) to an elevator controller, or an elevator controller connected to the internet shall be tested to ensure conformance with Security Level specified in 8.14.1(a)(1) and 8.14.1(a)(2) rating in accordance with the applicable requirements in IEC 62443-3-3 and IEC 62443-4-2.

Rationale: To define the engineering test required in 8.14.1 for cybersecurity for elevator components.
8.6.1.2.2 On-Site Documentation. The following documents specified in 8.6.1.2.2(a), (b), and (c) shall be written and permanently kept on-site in the machine room, machinery space, control room, control space, or in the means necessary for test (2.7.6.4) in hard copy for each unit for elevator personnel.

The documentation specified in 8.6.1.2.2(d) shall be on-site and available to the specified personnel:

(a) Up-to-date wiring diagrams detailing circuits of all electrical protective devices (see 2.26.2) and critical operating circuits (see 2.26.3). Where RIO is provided, circuits relevant to 2.26.2, 2.26.3, 3.26.4 and 3.26.6 shall be provided on the diagrams (see 2.26.13 and 3.26.12).

(b) Procedures for inspections and tests not described in ASME A17.2 and procedures or methods required for elevator personnel to perform maintenance, repairs, replacements, and adjustments, as follows:

\[ \ldots \]

(d) Written procedures for the following:

\[ \ldots \]

(3) the procedures for the means to prevent software or parameter changes to executable software. (see 8.14.1(b)).

(4) the procedures for the means to disable RIO actions and connectivity by elevator, authorized, and emergency personnel (see 8.14.1(a)(2)).

\[ \ldots \]

(g) The elevator manufacturer or supplier of installed internet capable device and internet capable elevator controller shall provide on-site documentation for cybersecurity maintenance and inspection requirements for the internet capable equipment in accordance with the applicable requirements of IEC 62443.

**Rationale:** to require on-site procedures for the means to accept executable software having a USI and related parameters, the one or more means to disable RIO actions and connectivity, and for cybersecurity maintenance and inspection.

8.6.3.1 Replacement Parts. Replacements shall be made with parts of at least equivalent material, strength, and design. An internet connected or connectivity enabled device that is interfaced (directly or indirectly) to an elevator controller, or an elevator controller is connected to the internet, shall conform to 8.14.1.

**Rationale:** To ensure replacement of internet connected or connectivity enabled device(s) or elevator controller(s) meets the requirements of 8.14.1.
8.6.4.23 **Executable Software Verification.** Where executable software for functions listed in
2.26.1.7.1 or 3.26.11.1 has changed as the result of repair or replacement, requiring a new USI,
the related safety function(s) shall be tested on-site for the applicable installation and logged in
the repair and replacement record [see 8.6.1.2.2(e)].

8.6.5.18 **Executable Software Verification.** Where executable software for functions listed in
3.26.11.1 has changed as the result of repair or replacement, requiring a new USI, the related
safety function(s) shall be tested on-site for the applicable installation and logged in the repair
and replacement record [see 8.6.1.2.2(e)].

**Rationale:** to separately specify executable software verification for electric and hydraulic
elevators.

8.6.11 Special Provisions

... 8.6.11.4.2 A written cleaning procedure shall be made and kept on the premises where the
elevator is located and shall be available to the authority having jurisdiction. Instructions shall
include directions for authorized personnel to remove power from the elevator.

**Rationale:** To enhance existing requirement that cleaning procedures must include instructions
to secure elevator from all automatic operation.

8.6.11.16 **Remote Interaction Operation.**

A documented time and date stamped record to confirm each change to secure access to floor(s)
made through RIO shall be required prior to changes. Changes to secured access floor(s) shall be
confirmed to the authorized personnel. The confirmation shall include a warning of possible
stranded occupants, which shall be acknowledged by the authorized personnel. These records
shall be either hard copy or electronic format, retained for the most recent 5yrs from the date of
occurrence; and made available to the authority having jurisdiction and to elevator personnel
servicing the equipment.

**NOTE (8.6.11.16):** The building should include procedures to have authorized personnel using
RIO check that no one is on a locked-out floor before the personnel use RIO to disable hall calls.
The procedure is facilitated by a message informing the authorized personnel that the floor is
being disabled.

**Rationale:** In order to ensure that occupants are not stranded on a floor where hall calls become
disabled by authorized personnel through RIO, a message should be sent to the authorized
personnel by the elevator system that the floor will be disabled. The authorized personnel have to
acknowledge this message and is expected to check that the floor is unoccupied before disabling
the hall calls.
8.7.2.27.10 Remote Interaction Operation. Where there is an alteration to or the addition of Remote Interaction Operation, the alteration shall conform to the requirements in 2.26.9.3.1, 2.26.9.4, 2.26.13, 8.14.1, and 8.6.11.16.

Rationale: To specify the requirements that apply when Remote Interaction Operation is added to or altered on an existing electric elevator system.

8.7.3.31.14 Remote Interaction Operation. Where there is an alteration to or the addition of Remote Interaction Operation, the alteration shall conform to the requirements in 2.26.9.3.1, 2.26.9.4, 3.26.1(j), 8.14.1, and 8.6.11.16.

Rationale: To specify the requirements that apply when Remote Interaction Operation is added to or altered on an existing hydraulic elevator system.

8.7.3.31.15 Internet connectivity enabled devices or elevator controllers. Where there is an alteration to or the addition of an internet connected or connectivity enabled device that is interfaced (directly or indirectly) to an elevator controller, or where an elevator controller is connected to the internet, it shall conform to 8.14.1.

Rationale: To ensure that the alteration of internet connected, or connectivity enabled device(s) of elevator controller(s) meet the requirements of 8.14.1.

8.10.2.2.2 Machine Rooms, Machinery Spaces, and Control Rooms/Spaces

... (uu) Verify conformance with 2.26.13. See also 8.6.1.2.2(d)(4).
(ww) Verify conformance with 8.14.1. See also 8.6.1.2.2(g).

8.10.3.2.2 Machine Rooms, Machinery Spaces, and Control Rooms/Spaces

... (kk) Verify conformance with 3.26.12. See also 8.6.1.2.2(d)(4)
(ll) Verify conformance with 8.14.1. See also 8.6.1.2.2(g).

8.10.2.3.2 Inspection and Test Requirements for Altered Installations

... (ss) Verify conformance with 2.26.13. See also 8.6.1.2.2(d)(4).
(tt) Verify conformance with 8.14.1. See also 8.6.1.2.2(g).
8.10.3.3.2 Inspection and Test Requirements for Altered Installations

... (qq) Verify conformance with 3.26.12. See also 8.6.1.2.2(d)(4) (hh) Verify conformance with 8.14.1. See also 8.6.1.2.2(g).

Rationale: to provide acceptance inspection for RIO and 8.14.1.

8.11.2.1.2 Machine Rooms, Machinery Spaces, and Control Rooms/Spaces

... (pp) Verify conformance with 2.26.13. See also 8.6.1.2.2(d)(4) (qq) Verify conformance with 8.14.1. See also 8.6.1.2.2(g).

8.11.3.1.2 Machine Rooms, Machinery Spaces, and Control Rooms/Spaces

... (ee) Verify conformance with 3.26.12. See also 8.6.1.2.2(d)(4) (ff) Verify conformance with 8.14.1. See also 8.6.1.2.2(g).

Rationale: to provide periodic inspection for RIO and 8.14.1.
SECTION 8.14 CYBERSECURITY FOR ELECTRIC ELEVATORS IN PART 2 AND
HYDRAULIC ELEVATORS IN PART 3.

8.14.1 Where an internet connected or connectivity enabled device is interfaced (directly or indirectly) to an elevator controller, or an elevator controller is connected (directly or indirectly) to the internet, all points of connectivity to the internet (physical ports or wireless ports or conduits) for the device or elevator controller shall have security features. Security features shall comply with 8.14.1(a) and 8.14.1(b), unless the elevator’s use, configuration or environment requires an increased level of cybersecurity protection be provided (see note 8.14.1):

a) Such device(s) or elevator controller(s) shall have cybersecurity protection that conforms to sound engineering practice, conform to requirements 8.14.1(a)(1) and 8.14(a)(2), and:

(1) shall have a listed/certified secure product development life cycle process to the relevant requirements of IEC 62443-4-1 and be engineering tested to demonstrate compliance with the requirements of 8.14.1(a)(1)(a) and 8.14(a)(1)(b);
(-a) emergency communication systems shall be security level rated to a minimum of SLC-1, (see 2.7.8.4 and 2.27.1.1),
(-b) except for emergency communications systems, be security level rated to a SLC-2 or higher rating that conforms to the applicable requirements in IEC 62443-2-4, 62443-3-3, 62443-4-1, and 62443-4-2, and conforms to the requirements of SR 1.1 RE 2 for multifactor authentication for untrusted users and networks specified in these standards.

NOTE [(8.14.1)(a)(1)]: The cybersecurity requirements specified under 8.14.1(a)(1) are minimum requirements. Specialized building, structures, or use environment, e.g., government facilities, critical care facilities etc., may require that the application of the facility be considered to determine if higher levels of cybersecurity or complete isolation from the internet are required. For example, protection against cyber threats that could result in a denial of elevator service may be necessary. See note in section 4.2 in IEC 62443-3-3 for guidance on cyber risk (threat) assessment.

Rationale to NOTE [(8.14.1(a)(1)]: To alert users of this code to review the risk of cyber threats to help determine the appropriate measures for their particular asset needs.

(2) except for emergency communications systems, be provided with a manual means on-site, that is not self-resetting and that is accessible to elevator, authorized, and emergency personnel to disable the actions permitted by 2.26.13.2 and to disable connectivity as permitted in 8.14.1.

Rationale: To provide one or more manual means to disable RIO actions and connectivity.
(b) Where executable software is used in conjunction with any operation, means or a device listed in 2.26.1.7.1 and 3.26.11.1, the security features used to satisfy 8.14.1 shall include a means that will prevent changes to the executable software via a remote source. Only on-site elevator personnel shall initiate changes to executable software delivered remotely utilizing the means. This means shall conform to 8.14.1(b)(1) through 8.14.1(b)(5):

1. the means shall only allow changes to the executable software when the elevator controller is not in automatic operation and a stop switch is actuated;
2. be accessible to elevator personnel only with a key that is group 1 security (see section 8.1);
3. be located in machinery spaces outside the hoistway or spaces within sight of the hoistway, or a machine room, or a control space outside the hoistway, or a control room, or at an inspection and test panel (see also 2.8.1);
4. be portably connected or permanently attached to the device, or elevator controller, or within the inspection and test panel (see also 8.6.4.23); and
5. shall prevent parameter changes to any of the functions, means or device listed in 2.26.1.7.1, 3.26.11.1 unless the on-site elevator personnel initiates change to executable software delivered remotely utilizing the means.

**Rationale:** To add requirements for a means that is accessible only to elevator personnel on-site that will prevent changes from a remote source of executable software requiring a USI or changes in related parameters addressed in 2.26.1.7, 3.26.11 without the use of the means by elevator personnel.

### Add new references to Section 9:

<table>
<thead>
<tr>
<th>Designation</th>
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<tbody>
<tr>
<td>IEC 62443-2-4</td>
<td>Security for industrial automation and control systems—Part 2-4: Security program requirements for IACS Service providers</td>
<td>ANSI US, Canada</td>
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<tr>
<td>IEC 62443-3-3</td>
<td>Industrial communication networks—Network and system security—Part 3-3: System security requirements and security levels</td>
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<td>Security for industrial automation and control Systems—Part 4-1: Secure Product development Lifecycle requirements</td>
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<td>Security for industrial automation and control Systems—Part 4-2: Technical security requirements for IACS components</td>
<td>ANSI US, Canada</td>
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**Rationale:** To add referenced IEC standards on cybersecurity.