

Public Review Draft  
November 2007

Proposed Revisions for  
ASME A17.1a-200x ADDENDA  
To  
ASME A17.1-2007, Safety Code for Elevators and Escalators

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ASME Codes and Standards

TN 02-04

**Revise ASME A17.1 as follows for the following reasons:**

1. Recognition that testing is a requirement [ASME A17.1S-2005, requirements 8.6.1.2.1(a)(1) & 8.11.1.1.2(b)] performed by maintenance personnel and witnessed by an inspector [ASME A17.1S-2005, requirement 8.11.1.1.2(a)].
2. No revisions have been made to the testing requirements other than editorially relocating them from Section 8.11 to Section 8.6.
3. Requirements that are not being revised are not included in this proposal.
4. With the requirement for a maintenance control program this revision requires maintenance testing to be done and reports prepared even in jurisdictions that do not perform inspections.
5. This proposal is based on the requirements in ASME A17.1-2004 including Addenda ASME A17.1a-2005 and Supplement ASME A17.1S-2005. Any further revisions or additions to the periodic testing requirements in Section 8.11 which are being balloted or approved and not yet published will be incorporated in the relocation of the periodic test requirements to Section 8.6.
6. Coordination of revisions and terminology in ASME A17.1 and ASME A17.2.
7. Recommend that the inspection and testing frequency should be established based on risk.
8. Provide guidelines for using monitoring to assist with inspections.
9. ASME to renumber any Sections and cross references that have been added to Code after this proposal was drafted.
10. This proposal is to reflect all TN's that have been approved at the time of publication.

REQUIREMENTS	REASONS
<p align="center"><b>SECTION 8.11  PERIODIC INSPECTIONS AND WITNESSING OF  TESTS</b></p>	<p>Testing requirements relocated to 8.6.</p>
<p>Requirement 8.11 covers periodic inspections and tests of existing installations.</p> <p><i>NOTES):</i>  (1) <i>Compliance with certain requirements is verifiable through review of design requirements, engineering, or type tests.</i>  (2) See "General" in Preface, for assignment of responsibilities.</p>	
<p><b>8.11.1 General Requirements for Periodic Inspections and Witnessing of Tests</b></p>	<p>Relocated to 8.6.</p>
<p><b>8.11.1.1 Persons Authorized to Make Periodic Inspections and Witness Tests.</b> The inspector shall meet the qualification requirements of the ASME QEI-1. Inspectors and inspection supervisors shall be certified by an organization accredited by ASME in accordance with the requirements of ASME QEI-1. This requirement does not apply to Canadian jurisdictions.</p>	<p>Relocated to 8.6.1.2.4.</p>
<p><b>8.11.1.1.1 Periodic Inspections.</b>  (a) Periodic inspections shall be made by an inspector employed by the authority having jurisdiction or by a person authorized by the authority having jurisdiction.</p>	<p>To require a written record of the inspection.</p>

REQUIREMENTS	REASONS
<p>(b) The <b>inspector</b> shall submit a signed written report to the authority having jurisdiction containing the following information:</p> <ol style="list-style-type: none"> <li>(1) date of inspection(s);</li> <li>(2) components or systems that have not been inspected.</li> <li>(3) code deficiencies noted during the inspection and a statement as to corrective action taken, if any.</li> </ol>	
<p><b>8.11.1.1.2 Periodic Tests</b></p> <p>(a) Periodic tests as required in Section 8.6 shall be witnessed by an inspector employed by the authority having jurisdiction, or by persons authorized by the authority having jurisdiction.</p> <p>(b) The <b>inspector</b> shall submit a signed written report to the authority having jurisdiction containing the following information:</p> <ol style="list-style-type: none"> <li>(1) date of test(s);</li> <li>(2) type of test(s) performed;</li> <li>(3) detailed results of the test(s) including but not limited to, speed, governor trip speed, safety slide distance, relief valve setting, escalator/moving Walk brake torque setting, etc.;</li> <li>(4) code deficiencies noted during the test; and</li> <li>(5) statement as to any corrective action taken.</li> </ol>	<p>Clarification of location of testing requirements.</p> <p>To require a written record of the test(s).</p> <p>Requirements incorporated in 8.6.1..</p>
<p><b>8.11.1.2 Applicability of Inspection Requirements.</b></p> <p>Inspections required by 8.11.2 through 8.11.5 are to determine that the existing equipment conforms with the following applicable Code requirements:</p> <ol style="list-style-type: none"> <li>(a) the Code at the time of installation;</li> <li>(b) the Code effective as applicable to and for each alteration;</li> <li>(c) the ASME A17.3 Code, if adopted by the authority having jurisdiction.</li> </ol> <p><i>NOTES (8.11.1.2):</i></p> <p>(1) <i>The Guide for the Inspection and Testing of Elevators, Escalators and Moving Walks, ASME A17.2 (see Preface, ASME Elevator Publications) is a guide for inspections.</i></p> <p>(2) <i>References to "Items" and "Parts", are indicated in parentheses as a convenient reference to the applicable inspection procedures in ASME A17.2.</i></p>	<p>Testing requirements relocated to 8.6 and clarification of reference.</p>
<p>8.11.1.5  Making Safety Devices Ineffective.</p> <p>No person shall at any time make any required safety device or electrical protective device ineffective, except where necessary during inspections. Such devices shall be restored to their normal operating condition in conformity with the applicable requirements prior to returning the equipment to service (see 2.26.7).</p>	<p>Relocated to 8.6.1.7.3.</p>
	<p>Relocated to 8.6.1.7.2.</p>

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<p><b>8.11.2 Periodic Inspection of Electric Elevators.</b>  All references to Items are to Items in ASME A17.2, Guide for the Inspection and Testing of Elevators, Escalators and Moving Walks</p>	<p>Testing requirements relocated to 8.6.</p>
<p><b>8.11.2.1 Periodic Inspection Requirements.</b> Inspectors shall include the following when identifying components or systems or both that shall be inspected.  <i>NOTES:</i>  (1) For inspection frequency, see 8.11.1.3.  (2) QEI certified inspectors and inspector supervisors have the knowledge and experience to recognize potential code deficiencies and to focus their inspections where necessary.</p>	<p>Coordination with language in the ASME A17.2 Inspectors' Guide. Recognition that QEI CEI and CES have the expertise to properly focus inspections based on the condition of the equipment.</p>
	<p>Relocated to 8.6.4.18.</p>
	<p>Relocated to 8.6.4.18.1.</p>
	<p>Relocated to 8.6.4.18.2.</p>
	<p>Relocated to 8.6.4.18.3.</p>
	<p>Relocated to 8.6.4.18.4.</p>
	<p>Relocated to 8.6.4.18.5.</p>
	<p>Relocated to 8.6.4.18.6.</p>
	<p>Relocated to 8.6.4.18.7.</p>
	<p>Relocated to 8.6.4.18.8.</p>
	<p>Relocated to 8.6.4.18.9.</p>
	<p>Relocated to 8.6.4.19.</p>
	<p>Relocated to 8.6.4.19.1.</p>
	<p>Relocated to 8.6.4.19.2.</p>
	<p>Relocated to 8.6.4.19.3.</p>
	<p>Relocated to 8.6.4.19.4.</p>
<p><b>Table 8.11.2.3.4 relocated to Table 8.6.4.19.4</b></p>	
	<p>Relocated to 8.6.4.19.5.</p>
	<p>Relocated to 8.6.4.19.6.</p>
	<p>Relocated to 8.6.4.19.7.</p>
	<p>Relocated to 8.6.4.19.8.</p>
<p>(</p>	<p>Relocated to 8.6.4.19.9.</p>
	<p>Relocated to 8.6.4.19.10.</p>
<p><b>8.11.3 Periodic Inspection of Hydraulic Elevators</b>  All references to Items are to Items in ASME A17.2, Guide for the Inspections and Testing of Elevators, Escalators and Moving Walks.</p>	<p>Testing requirements relocated to 8.6.</p>
<p><b>8.11.3.1 Periodic Inspection Requirements.</b> Inspectors shall include the following when identifying components or systems or both that shall be inspected.  <i>NOTES:</i>  (1) For inspection frequency, see 8.11.1.3.  (2) QEI certified inspectors and inspector supervisors have the knowledge and experience to recognize potential code deficiencies and to focus their inspections</p>	<p>Coordination with language in the ASME A17.2 Inspectors' Guide. Recognition that QEI CEI and CES have the expertise to properly focus inspections based on the condition of the equipment.</p>

<b>REQUIREMENTS</b>	<i>REASONS</i>
where necessary.	
	Relocated to 8.6.5.12.
	Relocated to 8.6.5.12.1
	Relocated to 8.6.5.12.2.
	Relocated to 8.6.5.12.3.
	Relocated to 8.6.5.12.4.
	Relocated to 8.6.5.12.5.
	Relocated to 8.6.5.13.
	Relocated to 8.6.5.13.1.
	Relocated to 8.6.5.13.2.
	Relocated to 8.6.5.14.
	Relocated to 8.6.5.14.1.
	Relocated to 8.6.5.14.2.
	Relocated to 8.6.5.14.3.
	Relocated to 8.6.5.14.4
<p><b>8.11.4 Periodic Inspection of Escalators and Moving Walks.</b>  All references to Items are to Items in ASME A17.2, Guide for Inspection of Elevators, Escalators and Moving Walks</p>	<p>Testing requirements relocated to 8.6. Coordination with language in the ASME A17.2 Inspectors' Guide. Recognition that QEI CEI and CES have the expertise to properly focus inspections based on the condition of the equipment.</p>
<p><b>8.11.4.1 Periodic Inspection and Test Requirements</b>  Inspectors shall include the following when identifying components or systems or both that shall be inspected:  <i>NOTES:</i>  (1) <i>For inspection frequency, see 8.11.1.3.</i>  (2) QEI certified inspectors and inspector supervisors have the knowledge and experience to recognize potential code deficiencies and to focus their inspections where necessary.</p> <p>(a) General Fire Protection (Items 7.1 and 9.1);  (b) Geometry (Items 7.2 and 9.2);  (c) Handrails (Items 7.3 and 9.);  (d) Entrance and Egress (Items 7.4 and 9.4);  (e) Lighting (Items 7.5 and 9.5);  (f) Caution Signs (Items 7.6 and 9.6);  (g) Combplate (Items 7.7 and 9.7);  (h) Deck Barricade Guard (Items 7.8 and 9.8);  (i) Steps and Treadway (Items 7.9 and 9.9);  (j) Operating Devices (Items 7.10 and 9.10);  (k) Skirt Obstruction Devices (Item 7.11);  (l) Handrail Entry Device (Items 8.13 and 9.13);  (m) Egress Restriction Device (Items 7.13 and 9.13);  (n) Speed (Items 7.14 and 9.14);  (o) Balustrades (Items 7.15 and 9.15);  (p) Ceiling Intersection Guards (Items 7.16 and 9.16);  (q) Skirt Panels (Items 7.17 and 9.17);  (r) Outdoor Protection (Items 7.18 and 9.18);</p>	<p>Coordination with language in the ASME A17.2 Inspectors' Guide. Recognition that QEI CEI and CES have the expertise to properly focus inspections based on the condition of the equipment.</p>

REQUIREMENTS	REASONS
<p>(s) Machinery Space Access, Lighting, Receptacle, and Condition (for remote machine rooms only) (Items 2.1 and 4.1);</p> <p>(t) Additional Stop Switch(es) (Items 2.2 and 4.2);</p> <p>(u) Controller and Wiring (Items 2.3 and 4.3)</p> <p>(v) Code Data Plate (2.23.20 (Items 8.14 and 10.14).</p>	
	Relocated to 8.6.8.15.
	Relocated to 8.6.8.15.1.
	Relocated to 8.6.8.15.2.
	Relocated to 8.6.8.15.3.
	Relocated to 8.6.8.15.4.
	Relocated to 8.6.8.15.5.
	Relocated to 8.6.8.15.6.
	Relocated to 8.6.8.15.7.
	Relocated to 8.6.8.15.8.
	Relocated to 8.6.8.15.9.
	Relocated to 8.6.8.15.10.
	Relocated to 8.6.8.15.11.
	Relocated to 8.6.8.15.12.
	Relocated to 8.6.8.15.13.
	Relocated to 8.6.8.15.14.
	Relocated to 8.6.8.15.15.
	Relocated to 8.6.8.15.16.
	Relocated to 8.6.8.15.17.
	Relocated to 8.6.8.15.18.
	Relocated to 8.6.8.15.19.
Fig. 8.11.4.2.19(e) relocated to Fig. 8.6.8.15.19(e).	
	Relocated to 8.6.8.15.20.
	Relocated to 8.6.8.15.21.
	Relocated to 8.6.8.15.22.
<p><b>8.11.5 Periodic Inspection of Other Equipment</b>  For recommended inspection frequency (see 8.11.1.3).</p>	Testing requirements relocated to 8.6.
<p><b>8.11.5.1 Sidewalk Elevator.</b> Sidewalk elevators shall be subject to the applicable, periodic inspections specified in 8.11.2 and 8.11.3. The inspection requirements shall apply to the corresponding requirements in 5.5. Any additional requirements for this equipment shall also be checked during these inspections.</p>	Test requirements relocated to 8.6.7.5.1.
<p><b>8.11.5.2 Private Residence Elevators and Lifts.</b>  Private residence elevators and lifts should be subject to the periodic inspections specified in 8.11.2 and 8.11.3. The inspection requirements shall apply to the corresponding requirements in 5.3 and 5.4. Any additional requirements for this equipment should also be checked during these inspections.</p>	Test requirements relocated to 8.6.7.3.1.
<p><b>8.11.5.3 Hand Elevators.</b> Hand elevators shall be</p>	Test requirements relocated to 8.6.6.3.1.

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<p>subject to the applicable, periodic inspections specified in 8.11.2.  The inspection requirements shall apply to the corresponding requirements in 4.3. Any additional requirements for this equipment shall also be checked during these inspections.</p>	
<p><b>8.11.5.4 Dumbwaiters.</b> Dumbwaiters shall be subject to the applicable periodic inspections specified in 8.11.2 and 8.11.3.  The inspection requirements shall apply to the corresponding requirements in Part 7. Any additional requirements for this equipment shall also be checked during these inspections.</p>	<p>Test requirements relocated to 8.6.9.1.1.</p>
<p><b>8.11.5.5 Material Lifts and Dumbwaiters With Automatic Transfer Devices.</b> Material lifts and dumbwaiters with automatic transfer devices shall be subject to the applicable periodic inspections specified in 8.11.2 and 8.11.3. The inspection requirements shall apply to the corresponding requirements in Part 7. Any additional requirements for this equipment shall also be checked during these inspections.  The inspection requirement shall apply to the corresponding requirements in Part 7. Any additional requirements for this equipment shall also be checked during these inspections.</p>	<p>Test requirements relocated to 8.6.9.2.1.</p>
<p><b>8.11.5.6 Special Purpose Personnel Elevators.</b> Special purpose personnel elevators shall be subject to the applicable inspections specified in 8.11.2 and 8.11.3. The inspection requirements shall apply to the corresponding requirements in 5.7. Any additional requirements for this equipment shall also be checked during these inspections.</p>	<p>Test requirements relocated to 8.6.7.7.1.</p>
<p><b>8.11.5.7 Inclined Elevators.</b> Inclined elevators shall be subject to the applicable periodic inspections specified in 8.11.2 and 8.11.3.  The inspection requirements shall apply to the corresponding requirements in 5.1. Any additional requirements for this equipment shall also be checked during these inspections</p>	<p>Test requirements relocated to 8.6.7.1.1.</p>
<p><b>8.11.5.8 Shipboard Elevators.</b> Shipboard shall be subject to the applicable periodic inspections specified in 8.11.2 and 8.11.3.  The inspection requirements shall apply to the corresponding requirements of 5.8. Any additional requirements for this equipment shall also be checked during these inspections.</p>	<p>Test requirements relocated to 8.6.7.8.1.</p>

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<p><b>8.11.5.9 Screw Column Elevators.</b> Screw column elevators shall be subject to the applicable periodic inspections specified in 8.11.2 and 8.11.3. The inspection requirements shall apply to the corresponding requirements of 4.2. Any additional requirements for this equipment shall also be checked during these inspections.</p>	<p>Test requirements relocated to 8.6.6.2.1.</p>
<p><b>8.11.5.10 Rooftop Elevators.</b> Rooftop elevators shall be subject to the applicable periodic inspections specified in 8.11.2 and 8.11.3. The inspection requirements shall apply to the corresponding requirements of 5.6. Any additional requirements for this equipment shall also be checked during these inspections.</p>	<p>Test requirements relocated to 8.6.7.6.1.</p>
<p><b>8.11.5.11 Rack and Pinion Elevators.</b> Rack and pinion elevators shall be subject to the applicable periodic inspections specified in 8.11.2 and 8.11.3. The inspection requirements shall apply to the corresponding requirements of 4.1. Any additional requirements for this equipment shall also be checked during these inspections</p>	<p>Test requirements relocated to 8.6.6.1.1.</p>
<p><b>8.11.5.12 Limited-Use/Limited-Application Elevator.</b> Limited-use/limited-applications elevators shall be subject to the applicable periodic inspections specified in 8.11.2 and 8.11.3. The inspection requirements shall apply to the corresponding requirements of 5.2. Any additional requirements for this equipment shall also be checked during these inspections.</p>	<p>Test requirements relocated to 8.6.7.2.1.</p>
<p><b>8.11.5.13 Elevators used for Construction</b></p>	
<p><b>8.11.5.13.1 Inspection Requirements.</b> Inspections shall include the items specified in 8.11.2.1 for electric elevators and 8.11.3.1 for hydraulic elevators, except that the requirements of 5.10 shall apply where they are different from those in Parts 2 and 3.</p>	
	<p>Relocated to 8.6.7.10.1.</p>
	<p>Relocated to 8.6.7.10.2.</p>
	<p>Relocated to 8.6.7.10.3.</p>
<p style="text-align: center;"><b>SECTION 8.6  MAINTENANCE, REPAIR, REPLACEMENT AND  TESTING</b></p>	
<p>Requirement 8.6 applies to maintenance, repairs replacements and testing.  NOTES:  (1) See 8.7 for alteration requirements.</p>	

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(2) See "General" in Preface, for assignment of responsibilities.	
<b>8.6.1.1.2</b> Maintenance, repairs, replacements and tests shall conform to 8.6 and the (a) Code at the time of ....	To include tests.
<b>8.6.1.2.1</b> A written Maintenance Control Program shall be in place to maintain the equipment in compliance with the requirements of 8.6. (a) The Maintenance Control Program shall consist of but not be limited to (1) examinations, and maintenance of equipment at scheduled intervals in order to ensure that the installation conforms to the requirements of 8.6. The maintenance procedures and intervals shall be based on (a) equipment age, condition, and accumulated wear (b) design and inherent quality of the equipment (c) usage (d) environmental conditions (e) improved technology (2) cleaning, lubricating, and adjusting applicable components at regular intervals and repairing or replacing all worn or defective components where necessary to maintain the installation in compliance with the requirements of 8.6. (3) Tests of equipment at scheduled intervals (8.6.1.7) in order to ensure that the installation conforms to the requirements of 8.6.. (b) The instructions for locating the Maintenance Control Program shall be provided in or on the controller along with instructions on how to report any corrective action that might be necessary to the responsible party. (c) The maintenance records required by 8.6.1.4 shall be kept at a central location. (d) The Maintenance Control Program shall be accessible to the elevator personnel and shall document compliance with 8.6.	To require the test schedule to be part of the maintenance control program.
<b>8.6.1.3 Maintenance Personnel.</b> Maintenance, repairs, replacements and tests shall be performed only by elevator personnel (see 1.3).	To include testing.
<b>8.6.1.7 Periodic Tests</b> The frequency of periodic tests shall be established by the authority having jurisdiction as required by 8.11.1.3. <i>NOTE: Recommended intervals for periodic tests can be found in Appendix N.</i> <b>8.6.1.7.1 Periodic tests shall be witnessed by an inspector</b> employed by the authority having jurisdiction or by a person authorized by the authority having jurisdiction. The inspector shall conform to the requirements in 8.11.1.1. <b>8.6.1.7.2</b> A test tag with the test date, the requirement number requiring the test, and the name of the person or	

<b>REQUIREMENTS</b>	<i>REASONS</i>
<p>firm performing the test shall be installed in the machine room for all Category 1 and 5 tests for electric elevators and Category 1, 3, and 5 tests for hydraulic elevators.</p> <p>8.6.1.7.3 No person shall at any time make any required safety device or electrical protective device ineffective, except where necessary during tests. Such devices shall be restored to their normal operating condition in conformity with the applicable requirements prior to returning the equipment to service (see 2.26.7).</p> <p>8.6.1.7.4 All references to “Items” and “Parts” are to Items in A17.2 Guide for the Inspection and Testing of Elevator, Escalators and Moving Walks.</p>	
<p><b>8.6.2.3 Repair of Speed Governors.</b> Where a repair is made to a speed governor that effects the tripping linkage or speed adjustment mechanism, the governor shall be checked in conformance with 8.6.4.19.2. Where a repair is made to the governor jaws or associated parts that effect the pull-through force, the governor pull-through force shall be checked in conformance with 8.6.4.19.2(b). A test tag shall be attached, indicating the date the pull-through test was performed.</p>	Reference updated.
<p><b>8.6.4 Maintenance and Testing of Electric Elevators</b></p>	
<p><b>8.6.4.2.2</b> Governor wire rope shall not be lubricated after installation. If lubricants have been applied to governor ropes, they shall be replaced, or the lubricant removed, and the governor and safety shall be tested as specified in 8.6.4.19.2 (b) and 8.6.4.18.2.</p>	Reference updated.
<p><b>8.6.4.3.3</b> If lubricants other than those recommended by the manufacturer are used, a safety test conforming to 8.6.4.19.1 shall be made to demonstrate that the safety will function as required by 2.17.3.</p>	Reference updated.
<p><b>8.6.4.3.5</b> Rust-preventive compound such as paint, mixtures of graphite and oil, and similar coatings shall not be applied to the guiding surfaces, unless recommended by the manufacturer of the safety. Once applied, the safeties shall be checked as specified in 8.6.4.19.1.</p>	Reference updated.
<p><b>8.6.4.18 Periodic Test Requirements - Category 1</b>  NOTE: For test frequency, see 8.11.1.3.</p>	Relocated from 8.11.2.2.
<p><b>8.6.4.18.1 Oil Buffers.</b> Car and counterweight buffers shall be tested to determine conformance with the applicable plunger return requirements (Item 5.9.2.1).</p>	Relocated from 8.11.2.2.1.
<p><b>8.6.4.18.2 Safeties</b>  (a) Examinations. All working parts of car and counterweight safeties shall be examined to determine</p>	Relocated from 8.11.2.2.2.

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<p>that they are in satisfactory operating condition and that they conform to the applicable requirements of 8.7.2.14 through 8.7.2.28 (see 2.17.10 and 2.17.11; Division 112). Check the level of the oil in the oil buffer and the operation of the buffer compression-switch on Type C safeties.</p> <p>(b) Tests. Safeties shall be subjected to the following tests with no load in the car.</p> <p>(1) Type A, B, or C governor-operated safeties shall be operated by tripping the governor by hand with the car operating at the slowest operating speed in the down direction.</p> <p>In this test, the safety shall bring the car to rest promptly. In the case of Type B safeties, the stopping distance is not required to conform to 2.17.3.</p> <p>In the case of Type C safeties, full oil buffer compression is not required.</p> <p>In the case of Type A, B, or C safeties employing rollers or dogs for application of the safety, the rollers or dogs are not required to operate their full travel [Item 2.29.2.1].</p> <p>(2) Governor-operated wood guide-rail safeties shall be tested by tripping the governor by hand with the car at rest and moving the car in the down direction until it is brought to rest by the safety and the hoisting ropes slip on traction sheaves or become slack on winding drum sheaves [Item 2.29.2.1].</p> <p>(3) Type A and wood guide-rail safeties without governors which are operated as a result of the breaking or slackening of the hoisting ropes shall be tested by obtaining the necessary slack rope to cause it to function [Item 2.29.2.1].</p>	
<p><b>8.6.4.18.3</b> Governors shall be operated manually to determine that all parts, including those which impart the governor pull-through tension to the governor rope, operate freely [Item 2.13.2.1(a)].</p>	<p>Relocated from 8.11.2.2.3.</p>
<p><b>8.6.4.18.4 Slack-Rope Devices on Winding Drum Machines.</b> Slack-rope devices on winding drum machines shall be operated manually and tested to determine conformance with the applicable requirements (Item 2.20.2.1).</p>	<p>Relocated from 8.11.2.2.4.</p>
<p><b>8.6.4.18.5 Normal and Final Terminal Stopping Devices.</b> Normal and final terminal stopping devices shall be examined and tested to determine conformance with the applicable requirements (2.25) (Items 3.5.2.1 and 3.6.2.1).</p>	<p>Relocated from 8.11.2.2.5.</p>
<p><b>8.6.4.18.6 Firefighters' Emergency Operation.</b> Firefighters' emergency operation shall be tested to determine conformance with the applicable requirements</p>	<p>Relocated from 8.11.2.2.6.</p>

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(Division 6).	
<p><b>8.6.4.18.7 Standby or Emergency Power Operation.</b> Operation of elevators equipped with standby or emergency power shall be tested to determine conformance with the applicable requirements (Item 1.17.2.1). Tests shall be performed with no load in the car.</p>	Relocated from 8.11.2.2.7.
<p><b>8.6.4.18.8 Power Operation of Door System.</b> The closing forces of power operated hoistway door systems shall be tested to determine conformance with the applicable requirements (Item 1.10.2).</p>	Relocated from 8.11.2.2.8.
<p><b>8.6.4.18.9 Broken Rope, Tape, or Chain Switch.</b> Where a rope, tape, or chain is used to connect the motion of the car to the machine room normal limit, the switch that senses failure of this connection shall be tested for compliance with 2.26.2.6 (Item 3.26.1.1).</p>	Relocated from 8.11.2.2.9.
<p><b>8.6.4.19 Periodic Test Requirements - Category 5</b>  NOTE: For test frequency, see 8.11.1.3.</p>	Relocated from 8.11.2.3.
<p><b>8.6.4.19.1 Car and Counterweight Safeties.</b> Types A, B, and C car safeties, except those operating on wood guide rails, and their governors, shall be tested with rated load in the car. Counterweight safety tests shall be made with no load in the car. Tests shall be made by tripping the governor by hand at the rated speed. The following operational conditions shall be checked [Item 2.29.2.1]:</p> <p>(a) Type B safeties shall stop the car with the rated load within the required range of stopping distances for which the governor is tripped [Item 2.29.2.1].</p> <p>(b) For Type A safeties and Type A safety parts of Type C safeties, there shall be sufficient travel of the safety rollers or dogs remaining after the test to bring the car and its rated load to rest on safety application at governor tripping speed.</p> <p>A metal tag shall be attached to the safety-releasing carrier in a permanent manner, giving the date of the safety test, together with the name of the person or firm who performed the test.</p>	Relocated from 8.11.2.3.1.
<p><b>8.6.4.19.2 Governors</b></p> <p>(a) The tripping speed of the governor and the speed at which the governor overspeed switch, where provided, operates shall be tested to determine conformance with the applicable requirements and the adjustable means shall be sealed [Item 2.13.2.1].</p> <p>(b) The governor rope pull-through and pull-out forces shall be tested to determine conformance with the applicable requirements, and the adjustment means shall</p>	Relocated from 8.11.2.3.2.

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be sealed [Item 2.13.2.1].	
<p><b>8.6.4.19.3 Oil Buffers</b></p> <p>(a) Car oil buffers shall be tested to determine conformance with the applicable requirements by running the car with its rated load onto the buffer at rated speed, except as specified in 8.6.4.19.3(b) and (c) [Item 5.9.2.1]. Counterweight oil buffers shall be tested by running the counterweight onto its buffer at rated speed with no load in the car, except as specified in 8.6.4.19.3(b) and (c) [Item 5.9.2.1].</p> <p>(b) For reduced stroke buffers, this test shall be made at the reduced striking speed permitted [Item 5.9.2.1].</p> <p>(c) This test is not required where a Type C safety is used (see 8.6.4.19.1).</p> <p>(d) In making these tests, the normal and emergency terminal stopping devices shall be made temporarily inoperative. The final terminal stopping devices shall remain operative and be temporarily relocated, if necessary, to permit full compression of the buffer during the test.</p> <p>(e) After completion of the test, a metal tag, indicating the date of the test, together with the name of the person or firm who performed the test, shall be attached to the buffer [Item 5.3.2(b)].</p>	Relocated from 8.11.2.3.3.
<p><b>8.6.4.19.4 Braking System.</b> For passenger elevators and all freight elevators, the brake shall be tested for compliance with applicable requirements. Place the load as shown in Table 8.6.4.19.4 in the car and run it to the lowest landing by normal operating means. The driving machine shall safely lower, stop, and hold the car with this load. Freight elevators of class C-2 loading shall sustain and level the elevator car (Item 2.17.2.1).</p>	Relocated from 8.11.2.3.4.
<p><b>Table 8.6.4.19.4</b> (Relocated current table 8.11.2.3.4)</p>	
<p><b>8.6.4.19.5 Emergency and Standby Power Operation.</b> Operation of elevators equipped with emergency or standby power shall be examined and tested for conformance with the applicable requirements (Item 1.17.2.1). Passenger elevators and freight elevators permitted to carry passengers (see 2.16.4) shall be tested with 125% of rated load [see 2.16.8(f)].</p>	Relocated from 8.11.2.3.5.
<p><b>8.6.4.19.6 Emergency Terminal Stopping and Speed Limiting Devices.</b> Emergency terminal speed limiting devices, where provided, shall be tested for conformance with applicable requirements [2.25.4; and Item 5.3.2.1]. For static control elevators, emergency terminal stopping devices, when provided, shall be tested for conformance with applicable requirements [2.25.4] (Item 2.28.2.1).</p>	Relocated from 8.11.2.3.6.

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<p><b>8.6.4.19.7 Power Opening of Doors.</b> Determine that power opening of car and hoistway doors only occurs when the car is at rest at the landing, or in the landing zone, except, in the case of static control, check that power shall not be applied until the car is within 300 mm (12 in.) of the landing (Item 1.10.2).</p>	<p>Relocated from 8.11.2.3.7.</p>
<p><b>8.6.4.19.8 Leveling Zone and Leveling Speed.</b> Check that the leveling zone does not exceed the maximum allowable distance. Check that the leveling speed does not exceed 0.75 m/s (150 ft/min). For static control elevators, the person or firm installing or maintaining the equipment shall provide a written checkout procedure and demonstrate that the leveling speed with the doors open is limited to a maximum of 0.75 m/s (150 ft/min) and that the speed limiting (or speed monitor) means is independent of the normal means of controlling this speed [Item 1.10.2(b)].</p>	<p>Relocated from 8.11.2.3.8.</p>
<p><b>8.6.4.19.9 Inner Landing Zone.</b> For static control elevators, check that the zone in which the car can move with the doors open is not more than 75 mm (3 in.) above or below the landing (Item 1.10.2.1).</p>	<p>Relocated from 8.11.2.3.9.</p>
<p><b>8.6.4.19.10 Emergency Stopping Distance.</b>  Counterweight traction elevators shall be tested for traction drive limits to ensure that</p> <p>(a) During an emergency stop initiated by any of the electrical protective device(s) listed in 2.26.2 (except 2.26.2.13), except buffer switches for oil buffers used with Type C car safeties] at the rated speed in the down direction, with passenger elevators and freight elevators permitted to carry passengers carrying 125% of their rated load, or with freight elevators carrying their rated load, cars shall stop and safely hold the load; and</p> <p>(b) if either the car or the counterweight bottoms on its buffers or becomes otherwise immovable:</p> <p>(1) the ropes shall slip in the drive sheave and not allow the car or counterweight to be raised; or</p> <p>(2) the driving system shall stall and not allow the car or counterweight to be raised.</p>	<p>Relocated from 8.11.2.3.10.</p>
<p><b>8.6.5 Maintenance and Testing of Hydraulic Elevators</b></p>	
<p><b>8.6.5.1.1 Cleaning.</b> Pressure tanks shall be thoroughly cleaned internally at least every 3 years and prior to the test required by 8.6.5.13.</p>	<p>Reference updated.</p>
<p><b>8.6.5.2 Piston Rod.</b> Piston rods of roped-hydraulic elevators shall be thoroughly cleaned prior to the test required by 8.6.5.13.</p>	<p>Reference updated.</p>

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<p><b>8.6.5.3 Water-Hydraulic Plungers.</b> Plungers of water-hydraulic elevators shall be thoroughly cleaned to remove any buildup of rust and scale prior to the test required by 8.6.5.13.</p>	<p>Reference updated.</p>
<p><b>8.6.5.7 Record of Oil Usage.</b> For systems where the part of cylinder and/or piping is not exposed for visible examination, a written record shall be kept of the quantity of hydraulic fluid added to the system and emptied from leakage collection containers and pans. The written record shall be kept in the machine room. When the quantity of the hydraulic fluid loss cannot be accounted for, the test specified in 8.6.5.12.1 and 8.6.5.12.2 shall be made.</p>	<p>References updated.</p>
<p><b>8.6.5.12 Periodic Test Requirements - Category 1</b>  <i>NOTE: For test frequency, see 8.11.1.3.</i></p>	<p>Relocated from 8.11.3.2.</p>
<p><b>8.6.5.12.1 Relief Valve Setting and System Pressure Test.</b> The relief valve setting shall be tested to determine that it will bypass the full output of the pump before the pressure exceeds 150% of the working pressure and that the system will withstand this pressure. It shall be sealed if the relief valve setting is altered or if the seal is broken (Item 2.31).</p>	<p>Relocated from 8.11.3.2.1.</p>
<p><b>8.6.5.12.2 Cylinders and Pressure Piping.</b> This test shall be performed after the relief valve setting and system pressure test in 8.6.5.12.1.  (a) Cylinders and pressure piping which are exposed shall be visually examined.  (b) Cylinders and pressure piping which are not exposed shall be tested for leakage, which cannot be accounted for by the visual examination in 8.6.5.12.2(a) (Item 2.36.2).  The duration of the test shall be for a minimum of 15 min (Item 2.36.2)</p>	<p>Relocated from 8.11.3.2.2.</p>
<p><b>8.6.5.12.3 Additional Tests.</b> The following tests shall also be performed:  (a) Normal and Final Terminal Stopping Devices (8.6.4.18.5) (Item 3.5)  (b) Governors (8. 6.4.18.3) (Item 2.13)  (c) Safeties (8. 6.4.18.2)  (d) Oil Buffers (8. 6.4.18.1) (Items 3.29 and 5.8)  (e) Firefighter's Emergency Operation (8. 6.4.18.6) (Items 6.3 and 6.4);  (f) Standby or Emergency Power Operation [8. 6.4.18.7) (Item 1.17)  <i>NOTE Absorption of regenerated power (2.26.10) does not apply to hydraulic elevators.</i>  (g) Power Operations of Door System (8. 6.4.18.8) (Items 4.6 and 4.7)</p>	<p>Relocated from 8.11.3.2.3.</p>

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(h) Emergency Terminal Speed Limiting Device and Emergency Terminal Stopping Device (3.25.2) (Item 3.6). (i) Low Oil Protection Operation (3.26.9) (Item 2.23.2)	
<b>8.6.5.12.4 Flexible Hose and Fitting Assemblies.</b> Flexible hose and fitting assemblies shall be tested at the relief valve setting pressure for a minimum of 30 s. Any signs of leakage, slippage of hose fittings, damage to outer hose covering sufficient to expose reinforcement, or bulging, or distortions of the hose body is cause for replacement. A metal tag indicating the date of the test and the name of the person or firm who performed the test shall be attached to the hose assembly in a permanent manner (Item 2.34).	Relocated from 8.11.3.2.4.
<b>8.6.5.12.5 Pressure Switch.</b> The pressure switch and its related circuits shall be tested for conformance with applicable requirements (3.26.8) (Item 2.37).	Relocated from 8.11.3.2.5.
<b>8.6.5.13 Periodic Test Requirements - Category 3</b> <i>NOTE : For test frequency, see 8.11.1.3.</i>	Relocated from 8.11.3.3.
<b>8.6.5.13.1 Unexposed Portions of Pistons.</b> Piston rods of roped hydraulic elevators shall be exposed, thoroughly cleaned, and examined for wear or corrosion. The piston rods shall be replaced if at any place the diameter is less than the root diameter of the threads (Item 5.11).	Relocated from 8.11.3.3.1.
<b>8.6.5.13.2 Pressure Vessels.</b> Pressure vessels shall be checked to determine conformance with the applicable requirements, thoroughly cleaned, internally examined, and then subjected to a hydrostatic test at 150% of the working pressure for 1 min (3.24.4) (Item 2.33).	Relocated from 8.11.3.3.2.
<b>8.6.5.14 Periodic Test Requirements - Category 5</b> <i>NOTE : For test frequency, see 8.11.1.3.</i>	Relocated from 8.11.3.4.
<b>8.6.5.14.1</b> Governors, safeties, and oil buffers, where provided, shall be inspected and tested as specified in 8.6.4.19.1, 8.6.4.19.2, and 8.6.4.19.3 at intervals specified by the authority having jurisdiction. Where activation is allowed or required both by overspeed and slack rope, the safety shall have both means of activation tested.	Relocated from 8.11.3.4.1.
<b>8.6.5.14.2</b> Coated ropes shall be required to have a magnetic flux test capable of detecting broken wires, in addition to a visual examination.	Relocated from 8.11.3.4.2.
<b>8.6.5.14.3</b> Wire rope fastenings shall be examined in	Relocated from 8.11.3.4.3.

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accordance with Item 3.23 of A17.2. Fastenings on roped hydraulic elevators utilizing pistons that are hidden by cylinder head seals shall also be examined, even if it is temporarily necessary to support the car by other means and disassemble the cylinder head.	
<b>8.6.5.14.4</b> A plunger gripper, where provided, shall be examined and tested per 8.10.3.2.5(n).	Relocated from 8.11.3.4.4
<b>8.6.6 Maintenance and Testing of Elevators With Other Types of Driving Machines</b>	
<b>8.6.6.1.1 Rack and Pinion Elevator Periodic Test.</b> Rack and pinion elevators shall be subject to the applicable periodic tests specified in 8.6.4.18, 8.6.4.19, and 8.6.5.12 through 8.6.5.14. The test requirements shall apply to the corresponding requirements of 4.1. Any additional requirements for this equipment shall also be checked during these tests.	Test requirements relocated from 8.11.5.11.
<b>8.6.6.2.1 Screw Column Elevator Periodic Test.</b> Screw column elevators shall be subject to the applicable periodic tests specified in 8.6.4.18, 8.6.4.19, and 8.6.5.12 through 8.6.5.14. The test requirements shall apply to the corresponding requirements of 4.2. Any additional requirements for this equipment shall also be checked during these tests.	Test requirements relocated from 8.11.5.9.
<b>8.6.6.3.1 Hand Elevator Periodic Test.</b> Hand elevators shall be subject to the applicable, periodic tests specified in 8.6.4.18 and 8.6.4.19. The test requirements shall apply to the corresponding requirements in 4.3. Any additional requirements for this equipment shall also be checked during these tests. The driving-machine brake required by 4.3.19.2 shall be tested with both empty car and rated load in the car.	Test requirements relocated from 8.11.5.3.
<b>8.6.7 Maintenance and Testing of Special Application Elevators</b>	
<b>8.6.7.1.1 Periodic Test.</b> Inclined elevators shall be subject to the applicable periodic tests specified in 8.6.4.18, 8.6.4.19, and 8.6.5.12 through 8.6.5.14. The test requirements shall apply to the corresponding requirements in 5.1. Any additional requirements for this equipment shall also be checked during these tests.	Test requirements relocated from 8.11.5.7.
<b>8.6.7.2.1 Periodic Test.</b> Limited-use/limited-applications elevators shall be subject to the applicable periodic tests specified in 8.6.4.18, 8.6.4.19, and 8.6.5.12 through 8.6.5.14. The test requirements shall apply to the corresponding requirements of 5.2. Any additional requirements for this equipment shall also be checked during these tests.	Test requirements relocated from 8.11.5.12.

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<p><b>8.6.7.3.1 Periodic Test.</b> Private residence elevators and lifts should be subject to the periodic tests specified in 8.6.4.18, 8.6.4.19, and 8.6.5.12 through 8.6.5.14. The test requirements shall apply to the corresponding requirements in 5.3. Any additional requirements for this equipment should also be checked during these tests.</p>	<p>Test requirements relocated from 8.11.5.2.</p>
<p><b>8.6.7.4.1 Periodic Test.</b> Private residence inclined elevators and lifts should be subject to the periodic tests specified in 8.6.4.18, 8.6.4.19, and 8.6.5.12 through 8.6.5.14. The test requirements shall apply to the corresponding requirements in 5.4. Any additional requirements for this equipment should also be checked during these tests.</p>	<p>Test requirements relocated from 8.11.5.2.</p>
<p><b>8.6.7.5.1 Periodic Test.</b> Sidewalk elevators shall be subject to the applicable, periodic tests specified in 8.6.4.18, 8.6.4.19, and 8.6.5.12 through 8.6.5.14. The test requirements shall apply to the corresponding requirements in 5.5. Any additional requirements for this equipment shall also be checked during these tests.</p>	<p>Test requirements relocated from 8.11.5.1.</p>
<p><b>8.6.7.6.1 Periodic Test.</b> Rooftop elevators shall be subject to the applicable periodic tests specified in 8.6.4.18, 8.6.4.19, and 8.6.5.12 through 8.6.5.14. The test requirements shall apply to the corresponding requirements of 5.6. Any additional requirements for this equipment shall also be checked during these tests.</p>	<p>Test requirements relocated from 8.11.5.10.</p>
<p><b>8.6.7.7.1 Periodic Test.</b> Special purpose personnel elevators shall be subject to the applicable tests specified in 8.6.4.18, 8.6.4.19, and 8.6.5.12 through 8.6.5.14. The test requirements shall apply to the corresponding requirements in 5.7. Any additional requirements for this equipment shall also be checked during these tests.</p>	<p>Test requirements relocated from 8.11.5.6.</p>
<p><b>8.6.7.8.1 Periodic Test.</b> Shipboard shall be subject to the applicable periodic tests specified in 8.6.4.18, 8.6.4.19, and 8.6.5.12 through 8.6.5.14. The test requirements shall apply to the corresponding requirements of 5.8. Any additional requirements for this equipment shall also be checked during these tests.</p>	<p>Test requirements relocated from 8.11.5.8.</p>
<p><b>8.6.7.9.4 Periodic Test.</b> Mine elevators shall be subject to the applicable periodic tests specified in 8.6.4.18, 8.6.4.19, and 8.6.5.12 through 8.6.5.14. The test requirements shall apply to the corresponding requirements of 5.9. Any additional requirements for this equipment shall also be checked during these tests.</p>	<p>Test requirements added for mine elevators.</p>
<p><b>8.6.7.10.1 Periodic Test Requirements - Category 1.</b>  For electric elevators, test as specified in 8.6.4.18.1</p>	<p>Test requirements relocated from 8.11.5.13.2.</p>

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<p>through 8.6.4.18.5.  For hydraulic elevators, test as specified in 8.6.5.12.1, 8.6.5.12.2, 8.6.5.12.3(a) through (d), and 8.6.5.12.4.  Where permanent doors have been installed, test as specified in 8.6.4.18.8.</p>	
<p><b>8.6.7.10.2 Periodic Test Requirements - Category 3.</b>  For hydraulic elevators, test as specified in 8.6.5.13.</p>	<p>Test requirements relocated from 8.11.5.13.3.</p>
<p><b>8.6.7.10.3 Periodic Test Requirements - Category 5.</b>  For electric elevators, test as specified in 8.6.4.19.1 through 8.6.4.19.4, and 8.6.4.19.6.  For hydraulic elevators, test as specified in 8.6.5.14.</p>	<p>Test requirements relocated from 8.11.5.13.4.</p>
<p><b>8.6.8 Maintenance and Testing of Escalators and Moving Walks</b></p>	
<p><b>8.6.8.15 Periodic Test Requirements - Category 1</b>  NOTE: For test frequency, see 8.11.1.3.</p>	<p>Test requirements relocated from 8.11.4.2.</p>
<p><b>8.6.8.15.1 Machine Space.</b> The machine space access, lighting, receptacles, operation, and conditions shall be examined (Items 8.1 and 10.1).</p>	<p>Test requirements relocated from 8.11.4.2.1.</p>
<p><b>8.6.8.15.2 Stop Switch.</b> The machine space stop switches shall be tested (Items 8.2 and 10.2).</p>	<p>Test requirements relocated from 8.11.4.2.2.</p>
<p><b>8.6.8.15.3 Controller and Wiring.</b> Controller and wiring shall be examined (Items 8.3 and 10.3).</p>	<p>Test requirements relocated from 8.11.4.2.3.</p>
<p><b>8.6.8.15.4 Drive Machine and Brake.</b> The drive machine and brakes shall be examined and tested, including test of the brake torque (Items 8.4 and 10.4).</p>	<p>Test requirements relocated from 8.11.4.2.4.</p>
<p><b>8.6.8.15.5 Speed Governor.</b> The mechanical speed governor, if required, shall be tested by manually operating the trip mechanism (Items 8.5 and 10.5).</p>	<p>Test requirements relocated from 8.11.4.2.5.</p>
<p><b>8.6.8.15.6 Broken Drive Chain Device.</b> Operation of the broken drive chain device, on the drive chain, shall be tested by manually operating the actuating mechanism (Items 8.6 and 10.6).</p>	<p>Test requirements relocated from 8.11.4.2.6.</p>
<p><b>8.6.8.15.7 Reversal Stop Switch.</b> The reversal stop switch (to prevent reversal when operating in the ascending direction) shall be tested by manually operating it to determine that it functions properly (Items 8.7 and 10.7).  If the device cannot be manually operated, the person or firm maintaining the equipment shall provide a written check-out procedure and demonstrate the device complies with the requirements of the Code.</p>	<p>Test requirements relocated from 8.11.4.2.7.</p>

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<p><b>8.6.8.15.8 Broken Step Chain or Treadway Device.</b>  The broken or slack step chain or treadway device shall be tested by manual operation (Items 8.8 and 10.8).</p>	<p>Test requirements relocated from 8.11.4.2.8.</p>
<p><b>8.6.8.15.9 Step Upthrust Device.</b> The operation of the step upthrust device shall be tested by manually displacing the step, causing the device to operate (Items 7.9 and 8.9).</p>	<p>Test requirements relocated from 8.11.4.2.9.</p>
<p><b>8.6.8.15.10 Missing Step or Pallet Device.</b> The missing step or pallet device shall be tested by removing a step or pallet and verifying that the device will properly function (Items 8.10 and 10.10).</p>	<p>Test requirements relocated from 8.11.4.2.10.</p>
<p><b>8.6.8.15.11 Step or Pallet Level Device.</b> The step, or pallet level device shall be tested by simulating an out of level step or pallet and verifying tht the device functions properly (Items 8.11 and 10.11).</p>	<p>Test requirements relocated from 8.11.4.2.11.</p>
<p><b>8.6.8.15.12 Steps, Pallet, Step or Pallet Chain, and Trusses.</b> The steps, pallet, step or pallet chain, and trusses shall be visually examined for structural defects, mechanical condition, and buildup of combustible materials (Items 8.12 and 10.12).</p>	<p>Test requirements relocated from 8.11.4.2.12.</p>
<p><b>8.6.8.15.13 Handrail Safety Systems.</b> The handrail operating system shall be visually examined for condition. The handrail entry device, and the stopped handrail or handrail speed monitoring device, shall be tested by disconnecting of handrail motion sensor (Items 8.13 and 10.13).</p>	<p>Test requirements relocated from 8.11.4.2.13.</p>
<p><b>8.6.8.15.14</b> For outdoor escalators and moving walks that require heaters, test the heaters for condition and operation (Items 8.3 and 10.3).</p>	<p>Test requirements relocated from 8.11.4.2.14.</p>
<p><b>8.6.8.15.15 Permissible Stretch in Escalator Chains.</b> Escalators shall have periodic examination of the clearance between successive steps to detect wear or stretch of the step chains. The clearance shall not exceed 6 mm (0.25 in.) (item 7.9).</p>	<p>Test requirements relocated from 8.11.4.2.15.</p>
<p><b>8.6.8.15.16 Disconnected Motor Safety Device.</b> Operation of the device shall be tested and verified (see 6.1.6.3.10 or 6.2.6.3.8) (Item 8.6 or 10.6).</p>	<p>Test requirements relocated from 8.11.4.2.16.</p>
<p><b>8.6.8.15.17 Response to Smoke Detectors (6.1.6.8 or 6.2.6.7) (Items 8.15 and 10.15)</b></p>	<p>Test requirements relocated from 8.11.4.2.17.</p>
<p><b>8.6.8.15.18 Comp-Step or Comb-Pallet Impact Device</b></p>	<p>Test requirements relocated from 8.11.4.2.18.</p>
<p><b>8.6.8.15.19 Step/Skirt Performance Index</b></p>	<p>Test requirements relocated from 8.11.4.2.19 and (f)</p>

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<p>(a) The escalator skirt shall not be cleaned, lubricated, or otherwise modified in preparation for testing. The escalator instantaneous step/skirt index measurements [6.1.3.3.7(a)] shall be recorded at intervals no larger than 150 mm (6 in.) from each side of two distinct steps along the inclined portion of the escalator, where the steps are fully extended. Test steps shall be separated by a minimum of 8 steps.</p> <p>(b) A load of 110 N (25 lbf) shall be laterally applied from the step to the adjacent skirt panel. The applied load shall not deviate from 110 N (25 lbf) by more than <math>\pm 11</math> N (2.5 lbf). The load shall be distributed over a round or square area not less than 1 940 mm<sup>2</sup> (3 in.<sup>2</sup>) and not more than 3 870 mm<sup>2</sup> (6 in.<sup>2</sup>).</p> <p>(c) No vertical load exceeding 220 N (50 lbf) shall be applied to the test step and adjacent steps.</p> <p>(d) The coefficient of friction shall be measured with the test specimen conforming to the requirements of 6.1.3.3.7(b) sliding in the direction of the step motion under a 110 N (25 lbf) normal force at the operating speed of the escalator and shall be measured with devices having sensitivity better than <math>\pm 2.2</math> N (0.5 lbf). The direction of step motion shall be the direction of normal operation. If the escalator is operated in both directions, the down direction shall be used for the test.</p> <p>(e) For both the coefficient of friction measurement and the loaded gap measurements, the center of the applied load shall be between 25 mm (1 in.) and 100 mm (4 in.) below the nose line of the steps. The center of the applied load shall be not more than 250 mm (10 in.) from the nose of the step. See Fig. 8.6.8.15.19(e).</p> <p>(f) The step/skirt performance index shall conform to the requirements in 6.1.3.3.7 and 8.6.8.3 (Item 7.17).</p>	<p>editorially clarified.</p>
<p>Fig. 8.6.8.15.19(e) relocated from Fig. 8.11.4.2.19(e).</p>	
<p><b>8.6.8.15.20 Clearance Between Step and Skirt (Loaded Gap).</b> Escalators installed under ASME A17.1d-2000 shall be tested as follows (Item 7.17):</p> <p>(a) Loaded gap measurements shall be taken at intervals not exceeding 300 mm (12 in.) in transition region (6.1.3.6.5) and before the steps are fully extended. These measurements shall be made independently on each side of the escalator.</p> <p>(b) The applied load shall not deviate from 110 N (25 lbf) by more than <math>\pm 11</math> N (2.5 lbf) (6.1.3.3.5). The load shall be distributed over a round or square area no less than 1 940 mm<sup>2</sup> (3 in.<sup>2</sup>) and no more than 3 870 mm<sup>2</sup> (6 in.<sup>2</sup>).</p> <p>(c) For the loaded gap measurements, the center of the applied load shall be between 25 mm (1 in.) and 100 mm (4 in.) below the nose line of the steps. The center of the applied load shall be not more than 250 mm (10 in.) from the nose of the step. See Fig. 8.6.8.15.19(e).</p>	<p>Test requirements relocated from 8.11.4.2.20</p>

REQUIREMENTS	REASONS
<p><b>8.6.8.15.21</b> Inspection control devices shall be tested and inspected to determine conformance with the requirements of 6.1.6.2.2 for escalators and 6.2.6.2.2 for moving walks.</p>	<p>Test requirements relocated from 8.11.4.2.21</p>
<p><b>8.6.8.15.22 Step Lateral Displacement Device (6.1.6.3.14).</b> For curved escalators, manually test the device.</p>	<p>Test requirements relocated from 8.11.4.2.22</p>
<p><b>8.6.9 Maintenance and Testing of Dumbwaiters and Material Lifts</b></p>	
<p><b>8.6.9.1.1 Periodic Test.</b> Dumbwaiters shall be subject to the applicable periodic tests specified in 8.6.4.18 and 8.6.5.12.  The test requirements shall apply to the corresponding requirements in Part 7. Any additional requirements for this equipment shall also be checked during these tests. On winding drum machines, the slack-rope devices required by 2.26.2.1 shall be permitted to be tested as specified in Item 2.18. The driving-machine brake shall be tested to determine conformance with 7.2.10 (Item 2.18).</p>	<p>Test requirements relocated from 8.11.5.4.</p>
<p><b>8.6.9.2.1 Periodic Test.</b> Material lifts and dumbwaiters with automatic transfer devices shall be subject to the applicable periodic tests specified in 8.6.4.18 and 8.6.5.12. The test requirements shall apply to the corresponding requirements in Part 7. Any additional requirements for this equipment shall also be checked during these tests.  The test requirement shall apply to the corresponding requirements in Part 7. Any additional requirements for this equipment shall also be checked during these tests.</p>	<p>Test requirements relocated from 8.11.5.5.</p>

Revise ASME A17.1, Table N1 as follows:

**NONMANDATORY TABLE N1 RECOMMENDED INSPECTIONS AND TESTS INTERVALS IN "MONTHS"**

Reference Section	Equipment Type	Periodic Inspections		Periodic Tests					
		Requirement	Interval	Category 1		Category 3		Category 5	
				Requirement	Interval	Requirement	Interval	Requirement	Interval
8.11.2	Electric elevators	8.11.2.1	6	8.6.4.18	12	N/A	N/A	8.6.4.19	60
8.11.3	Hydraulic elevators	8.11.3.1	6	8.6.5.12	12	8.6.5.13	36	8.6.5.14	60
8.11.4	Escalators and moving walks	8.11.4.1	6	8.6.8.15	12	N/A	N/A	N/A	N/A
8.11.5.1	Sidewalk elevators	8.11.2.1,	6	8.6.4.18,	12	8.6.5.13	36	8.6.4.19,	60
		8.11.3.1		8.6.5.12				8.6.5.14	
8.11.5.2	Private residence elevators	8.11.2.1,	12	8.6.4.18,	12	8.6.5.13	36	8.6.4.19,	60
		8.11.3.1		8.6.5.12				8.6.5.14	
8.11.5.3	Hand elevators	8.11.2.1	6	8.6.4.18	12	N/A	N/A	8.6.4.19,	60
								8.6.5.14	
8.11.5.4	Dumbwaiters	8.11.2.1,	12	8.6.4.18,	12	8.6.5.13	36	8.6.4.19,	60
		8.11.3.1		8.6.5.12				8.6.5.14	
8.11.5.5	Material lifts and dumbwaiters with automatic transfer devices	8.11.2.1,	12	8.6.4.18,	12	8.6.5.13	36	8.6.4.19,	60
		8.11.3.1		8.6.5.12				8.6.5.14	
8.11.5.6	Special purpose personnel elevators	8.11.2.1,	6	8.6.4.18,	12	8.6.5.13	36	8.6.4.19,	60
		8.11.3.1		8.6.5.12				8.6.5.14	
8.11.5.7	Inclined elevators	8.11.2.1,	6	8.6.4.18,	12	8.6.5.13	36	8.6.4.19,	60
		8.11.3.1		8.6.5.12				8.6.5.14	
8.11.5.8	Shipboard elevators	8.11.2.1,	6	8.6.4.18,	12	8.6.5.13	36	8.6.4.19,	60
		8.11.3.1		8.6.5.12				8.6.5.14	
8.11.5.9	Screw-column elevators	8.11.2.1,	6	8.6.4.18,	12	8.6.5.13	36	8.6.4.19,	60
		8.11.3.1		8.6.5.12				8.6.5.14	
8.11.5.10	Rooftop elevators	8.11.2.1,	6	8.6.4.18,	12	8.6.5.13	36	8.6.4.19,	60
		8.11.3.1		8.6.5.12				8.6.5.14	
8.11.5.12	Limited-use/limited-application elevators	8.11.2.1,	6	8.6.4.18,	12	8.6.5.13	36	8.6.4.19,	60
		8.11.3.1		8.6.5.12				8.6.5.14	
8.11.5.13	Elevators used for construction	8.11.2.1,	3	8.6.4.18,	12	8.6.5.13	36	8.6.4.19,	60
		8.11.3.1		8.6.5.12				8.6.5.14	

GENERAL NOTE: Factors such as the environment, frequency of usage and type of usage, quality of maintenance, age and condition, remote monitoring (see Table N2) etc., related to the equipment should be taken into account by the authority having jurisdiction prior to establishing the inspection and test intervals. It is recommended that a risk analysis, using the methodology of ISO/TS 14798, be utilized to establish the intervals of inspections and tests for components and systems of the equipment. Where a risk analysis is not performed, the intervals specified in Table N1 are recommended for periodic tests (see 8.6) and periodic inspections (see 8.11).

**Add a new Table N2 to ASME A17.1, as follows:**

**TABLE N2 GUIDELINES ON USE OF MONITORING TO PROVIDE INSPECTION DATA**

Introduction to Monitoring:

Table N2 is intended to give guidance on the practical application of monitoring for inspections. It is intended to provide information as to where monitoring is or is not practical based on current technology. It is not intended to be all-inclusive or limit the use of monitoring to the identified items.

Monitoring function can be accomplished in two ways.

1. Overlay monitoring – Overlay monitoring is accomplished by adding a stand-alone monitoring system to an existing elevator installation. This monitoring system would connect to the elevator control system to, monitor various signal points, and report their status. Using its internal processing the stand alone monitoring system could determine normal signal status and report any monitored abnormal behavior.
2. Integral monitoring – Integral monitoring is built in to the elevator control system. This allows better access to the functions of the elevator control system. This type monitoring can report abnormal operation of a more inclusive variety than is practical with the overlay monitoring system.

Both of the above-described systems must conform to all code requirements when interfacing to elevator/escalator control points.

The application of monitoring to elevator/escalator inspection is a practical approach to supplementing on-site inspections.

All elevator/escalator devices that have an electrical contact can usually be monitored and the operation of the contact can be transmitted to a remote site for storage or viewing. Adding devices that will locally monitor the function and transmit the results to a remote site may also monitor other functions of the elevator/escalator. Such a device to monitor another function could be a tachometer to monitor the speed of the elevator. This could be set to trigger an alert or message if the device detected an abnormal condition.

The data collected by the monitoring system can be reported to a central data collection and storage site. This communications link can be via the in-car phone or other device. If the in-car phone is used, the monitor reporting modem must be secondary in priority to the communications requirements in 2.27.1.

<b>NONMANDATORY TABLE N2 GUIDELINES ON USE OF MONITORING TO PROVIDE INSPECTION DATA</b>					
<b>A17.1</b>	<b>A17.2</b>	<b>Item</b>	<b>Device May Be Monitored. (NOTE: On Site Observation or Local Actuation, May be Necessary)</b>	<b>Visual Inspection</b>	<b>Comments</b>
<b>Periodic Inspection Electric Elevators</b>					
<b>8.11.2.1.1</b>		<b>Inside Car</b>			
	1.1	Door Reopening Device	X		Since it does not activate on a regular interval, certain assumptions must be made.
	1.2	Stop Switches	X		
	1.3	Operating Control Devices	X		
	1.4	Car Floor and Landing Sill		X	
	1.5	Car Lighting		X	Could monitor voltage and current.
	1.6	Car Emergency Signal	X		
	1.7	Car Door or Gate		X	
	1.8	Door Closing Force	X		Could monitor current
	1.9	Power Closing of Doors or Gates	X		This gives insight to door operation.
	1.10	Power Opening of Doors or Gates	X		This gives insight to door operation.
	1.11	Car Vision Panels and Glass Car Doors		X	
	1.12	Car Enclosure		X	
	1.13	Emergency Exit		X	The switch itself could be monitored for actuation.
	1.14	Ventilation		X	Could monitor temp/air flow switch.
	1.15	Signs and Operating Device Symbols		X	
	1.16	Rated Load, Platform Area, and Data Plate		X	
	1.17	Standby or Emergency Power Operation		X	
	1.18	Restricted Opening of Car or Hoistway Doors		X	
	1.19	Car Ride	X		
	1.20	Door Monitoring Systems	X		This device could be monitored for actuation.
	1.21	Stopping Accuracy	X		
<b>8.11.2.1.2</b>		<b>Machine Room</b>			
	2.1	Access to Machine Space		X	
	2.2	Headroom		X	

**NONMANDATORY TABLE N2 GUIDELINES ON USE OF MONITORING TO PROVIDE INSPECTION DATA**

A17.1	A17.2	Item	Device May Be Monitored. (NOTE: On Site Observation or Local Actuation, May be Necessary)	Visual Inspection	Comments
	2.3	Lighting and Receptacles		X	
	2.4	Enclosure of Machine		X	
	2.5	Housekeeping		X	
	2.6	Ventilation		X	Could monitor temp and air flow switch.
	2.7	Fire extinguisher		X	
	2.8	Pipes, Wiring, and Ducts		X	
	2.9	Guarding of Equipment		X	
	2.10	Numbering of Elevators, Machines, and Disconnect Switches		X	
	2.11	Disconnecting Means and Control		X	
	2.12	Controller Wiring, Fuses, and Grounding		X	
	2.13	Static Control		X	
	2.14	Overhead Beam and Fastenings		X	
	2.15	Drive Machine Brake		X	Could monitor wear with a sensor.
	2.16	Traction Drive Machines		X	
	2.17	Gears, Bearings, and Flexible Connections		X	
	2.18	Winding Drum Machine		X	
	2.19	Belt or Chain Drive Machine		X	
	2.20	Motor Generator	X		
	2.21	Absorption of Regenerated Power	X		
	2.22	Drives from a DC Source	X		
	2.23	Traction Sheaves		X	
	2.24	Secondary and Deflector Sheaves		X	
	2.25	Rope Fastenings		X	
	2.26	Terminal Stopping Devices	X		
	2.27	Slack Rope	X		
	2.28	Governor Overspeed Switch, and Seal		X	The switch itself could be monitored for actuation.
	2.29	Car and Counterweight Safeties		X	
	2.30	Code Data Plate		X	
<b>8.11.2.1.3</b>		<b>Top Of Car</b>			
	3.1	Top of Car Stop Switch	X		
	3.2	Car-Top Light and Outlet		X	

**NONMANDATORY TABLE N2 GUIDELINES ON USE OF MONITORING TO PROVIDE INSPECTION DATA**

A17.1	A17.2	Item	Device May Be Monitored. (NOTE: On Site Observation or Local Actuation, May be Necessary)	Visual Inspection	Comments
	3.3	Top-of-Car Operating Device and Platform	X		The top of car operating devices could be monitored for actuation.
	3.4	Top-of-Car Clearance and Refuge Space		X	
	3.5	Top Counterweight Clearance		X	
	3.6	Car, Overhead and Deflector Sheaves		X	
	3.7	Normal Terminal Stopping Devices	X		
	3.8	Final Terminal Stopping Devices	X		
	3.9	Broken Rope, Chain, or Tape Switch		X	The switch itself could be monitored for actuation.
	3.10	Car Leveling Devices		X	The switch itself could be monitored for actuation.
	3.11	Crosshead Data Plate		X	
	3.12	Top Emergency Exit		X	The switch itself could be monitored for actuation.
	3.13	Counterweight and Counterweight Buffer		X	
	3.14	Counterweight Safeties		X	
	3.15	Floor and Emergency Identification Numbering		X	
	3.16	Hoistway Construction		X	
	3.17	Hoistway Smoke Control		X	
	3.18	Pipes, Wiring and Ducts		X	
	3.19	Windows, Projections, Recesses, and Setbacks		X	
	3.20	Hoistway Clearances		X	
	3.21	Multiple Hoistways		X	
	3.22	Traveling Cables and Junction Boxes		X	
	3.23	Door and Gate Equipment		X	
	3.24	Car Frame and Stiles		X	
	3.25	Guide Rails Fastening and Equipment		X	
	3.26	Governor Rope		X	
	3.27	Governor Releasing Carrier		X	
	3.28	Wire Rope Fastening and Hitch Plate		X	
	3.29	Wire Suspension and Compensating Ropes	X		
<b>8.11.2.1.4</b>		<b>Outside Hoistway</b>			

**NONMANDATORY TABLE N2 GUIDELINES ON USE OF MONITORING TO PROVIDE INSPECTION DATA**

A17.1	A17.2	Item	Device May Be Monitored. (NOTE: On Site Observation or Local Actuation, May be Necessary)	Visual Inspection	Comments
	4.1	Car Platform Guard		X	
	4.2	Hoistway Doors		X	
	4.3	Vision Panels		X	
	4.4	Hoistway Door Locking Devices		X	If this device has an electrical switch, it may be monitored for actuation.
	4.5	Access to Hoistway		X	
	4.6	Power Closing of Hoistway Doors		X	
	4.7	Sequence Operation		X	
	4.8	Hoistway Enclosure		X	
	4.9	Elevator Parking Devices	X		
	4.10	Emergency and Access Hoistway Openings		X	If this device has an electrical switch, it may be monitored for actuation.
	4.11	Separate Counterweight Hoistway		X	
	4.12	Standby Power Selection Switch		X	The switch itself could be monitored for actuation.
<b>8.11.2.1.5</b>		<b>Pit</b>			
	5.1	Pit Access, Lighting, Stop Switch, and Condition		X	The switch itself could be monitored for actuation.
	5.2	Bottom Clearance and Runby		X	
	5.3	Car and Counterweight Buffer	X	X	The switch itself could be monitored for actuation.
	5.4	Final Terminal Stopping Device – Can be monitored, but local activation required	X		
	5.5	Normal Terminal Stopping Devices	X		
	5.6	Traveling Cables		X	
	5.7	Governor-Rope Tension Devices		X	
	5.8	Compensating Chains, Ropes, and Sheaves		X	
	5.9	Car Frame and Platform		X	
	5.10	Car Safeties and Guiding Members		X	
<b>8.11.2.1.6</b>		<b>Firefighters Service</b>			If this device has an electrical switch, it may be monitored for actuation.
<b>Periodic Inspection of Hydraulic Elevators</b>					
<b>8.11.3.1.</b>		<b>Inside Car</b>			

**NONMANDATORY TABLE N2 GUIDELINES ON USE OF MONITORING TO PROVIDE INSPECTION DATA**

A17.1	A17.2	Item	Device May Be Monitored. (NOTE: On Site Observation or Local Actuation, May be Necessary)	Visual Inspection	Comments
<b>1</b>					
	1.1	Door Reopening Device	X		Since it does not activate on a regular interval, certain assumptions must be made.
	1.2	Stop Switches	X		
	1.3	Operating Control Devices	X		
	1.4	Car Floor and Landing Sill		X	
	1.5	Car Lighting		X	Could monitor voltage and current.
	1.6	Car Emergency Signal	X		
	1.7	Car Door or Gate		X	
	1.8	Door Closing Force	X		
	1.9	Power Closing of Doors or Gates	X		This gives insight to door operation.
	1.10	Power opening of Doors or Gates	X		This gives insight to door operation.
	1.11	Car Vision Panels and Glass Car Doors		X	
	1.12	Car Enclosure		X	
	1.13	Emergency Exit	X	X	The switch itself could be monitored for actuation.
	1.14	Ventilation		X	Could monitor temp/air flow switch.
	1.15	Signs and Operating Device Symbols		X	
	1.16	Rated load, Platform Area, and Data Plate		X	
	1.17	Standby or Emergency Power Operation		X	
	1.18	Restricted Opening of Car or Hoistway Doors		X	
	1.19	Car Ride	X		
	1.20	Door Monitoring System	X		
	1.21	Stopping Accuracy	X		Could monitor sensors.
<b>8.11.3.1.2</b>		<b>Machine Room</b>			
	2.1	Access to Machine Space		X	
	2.2	<i>Headroom</i>		X	
	2.3	<i>Lighting and Receptacles</i>		X	

**NONMANDATORY TABLE N2 GUIDELINES ON USE OF MONITORING TO PROVIDE INSPECTION DATA**

A17.1	A17.2	Item	Device May Be Monitored. (NOTE: On Site Observation or Local Actuation, May be Necessary)	Visual Inspection	Comments
	2.4	Enclosure of Machine		X	
	2.5	Housekeeping		X	
	2.6	Ventilation		X	Could monitor temp and air flow switch.
	2.7	Fire Extinguisher		X	
	2.8	Pipes Wiring and Ducts			
	2.9	Guarding of Equipment		X	
	2.10	Numbering of Elevators, Machines, and Disconnect Switches		X	
	2.11	Disconnecting Means and Control		X	
	2.12	Controller Wiring, Fuses, and Grounding		X	
	2.13	Hydraulic Power Unit		X	
	2.14	Relief Valves	X		
	2.15	Control Valve	X		Some valve data can be collected.
	2.16	Tanks		X	
	2.17	Flexible Hydraulic Hose and Fittings		X	
	2.18	Supply Line and Shutoff Valve		X	
	2.19	Hydraulic Cylinders and Fluid Loss Record		X	
	2.20	Pressure Switch		X	The switch itself could be monitored for actuation.
	2.21	Governor Overspeed Switch and Seal		X	The switch itself could be monitored for actuation.
	2.22	Recycling Operation		X	
<b>8.11.3.1.3</b>		<b>Top of Car</b>			
	3.1	Top of Car Stop Switch	X		
	3.2	Car Top Light and Outlet		X	
	3.3	Top of Car Operating Device	X		The switch itself could be monitored for actuation.
	3.4	Top of Car Clearance and Refuge Space		X	
	3.5	Normal Terminal Stopping Device	X		
	3.6	Emergency Terminal Speed Limiting Device	X		The switch itself could be monitored for actuation.
	3.7	Anti-creep Leveling Device	X		The switch itself could be monitored for actuation.

**NONMANDATORY TABLE N2 GUIDELINES ON USE OF MONITORING TO PROVIDE INSPECTION DATA**

A17.1	A17.2	Item	Device May Be Monitored. (NOTE: On Site Observation or Local Actuation, May be Necessary)	Visual Inspection	Comments
	3.8	Speed Test	X		Continuously.
	3.9	Top Emergency Exit		X	If this device has an electrical switch, it may be monitored for actuation.
	3.1	Floor and Emergency Identification Number		X	
	3.11	Hoistway Construction		X	
	3.12	Hoistway Smoke Control		X	
	3.13	Pipes, Wiring, and Ducts		X	
	3.14	Windows, Projections, Recesses and Setbacks		X	
	3.15	Hoistway clearances		X	
	3.16	Multiple Hoistways		X	
	3.17	Traveling Cables and junction Boxes		X	
	3.18	Door and Gate Equipment		X	If this device has an electrical switch, it may be monitored for actuation.
	3.19	Car Frame, Guides and Stiles		X	
	3.20	Guide Rails, Fastening and Equipment		X	
	3.21	Governor, Safety, Ropes and Counterweight		X	If this device has an electrical switch, it may be monitored for actuation.
	3.22	Governor Rope		X	
	3.23	Wire Rope Fastening and Hitch Plate		X	
	3.24	Suspension Rope		X	
	3.25	Slack Rope Device		X	
	3.26	Traveling Sheave		X	
	3.27	Counterweight		X	
<b>8.11.3.1.4</b>		<b>Outside the Hoistway</b>			
	4.1	Car Platform Guard		X	
	4.2	Hoistway Doors		X	
	4.3	Vision Panels		X	
	4.4	Hoistway Door Locking Device		X	If this device has an electrical switch, it may be monitored for actuation.
	4.5	Access to Hoistway		X	
	4.6	Power Closing of Hoistway Doors	X		If this device has an electrical

**NONMANDATORY TABLE N2 GUIDELINES ON USE OF MONITORING TO PROVIDE INSPECTION DATA**

A17.1	A17.2	Item	Device May Be Monitored. (NOTE: On Site Observation or Local Actuation, May be Necessary)	Visual Inspection	Comments
					switch, it may be monitored for actuation.
	4.7	Sequence Operation	X		
	4.8	Hoistway Enclosure		X	
	4.9	Elevator Parking Device	X		If this device has an electrical switch, it may be monitored for actuation.
	4.10	Emergency Doors in Blind Hoistway		X	If this device has an electrical switch, it may be monitored for actuation.
	4.11	Standby or Emergency Power Selection Switch	X		The switch itself could be monitored for actuation.
<b>8.11.3.1.5</b>		<b>Pit</b>			
	5.1	Pit Access, Lighting, Stop Switch, and Condition		X	The switch itself could be monitored for actuation.
	5.2	Bottom Clearance and Runby		X	
	5.3	Plunger and Cylinder		X	
	5.4	Car Buffer	X		If this device has an electrical switch, it may be monitored for actuation.
	5.5	Normal Terminal Stopping Devices	X		
	5.6	Traveling Cables		X	
	5.7	Car Frame and Platform		X	
	5.8	Guiding Members		X	
	5.9	Supply Piping		X	
	5.10	Car Safety		X	If this device has an electrical switch, it may be monitored for actuation.
	5.11	Governor Rope Tension Device		X	If this device has an electrical switch, it may be monitored for actuation.
<b>8.11.3.1.6</b>		<b>Firefighters Service</b>	X		
<b>Periodic Inspection of Escalators and Moving Walks</b>					
<b>8.11.4</b>	4.1	General Fire Protection		X	
	4.2	Geometry		X	
	4.3	Entrance and Egress		X	
	4.4	Lighting		X	
	4.5	Caution Signs		X	

**NONMANDATORY TABLE N2 GUIDELINES ON USE OF MONITORING TO PROVIDE INSPECTION DATA**

A17.1	A17.2	Item	Device May Be Monitored. (NOTE: On Site Observation or Local Actuation, May be Necessary)	Visual Inspection	Comments
	4.6	Combplate		X	
	4.7	Deck barricade Guard		X	
	4.8	Steps and Treadway		X	
	4.9	Operating Devices	X		
	4.10	Skirt Obstruction devices		X	If this device has an electrical switch, it may be monitored for actuation.
	4.11	Handrail Entry Device		X	If this device has an electrical switch, it may be monitored for actuation.
	4.12	Egress Restriction Device		X	
	4.13	Speed	X		
	4.14	Balustrades		X	
	4.15	Ceiling Intersection Guards		X	
	4.16	Skirt Panels		X	
	4.17	Outdoor Protection		X	
	4.18	Machinery Space Access, Lighting, Receptacle and Condition		X	
	4.19	Additional Stop Switches	X		
	4.20	Controller and Wiring		X	
	4.21	Operating Devices			See 4.9.
	4.22	Code Data Plate		X	
<b>8.11.5</b>		See Referenced Sections			

## TN 02-45

### SECTION 8.4 ELEVATOR SAFETY REQUIREMENTS FOR SEISMIC RISK ZONE 2 OR GREATER

Section Requirement 8.4 applies to all electric elevators with counterweights, and direct acting or roped ~~plunger~~ hydraulic elevators where applicable, where such elevators are installed in buildings that are designed and built to the requirements of, and located in, seismic risk zone 2 or greater as defined by the building code (see 1.3.3-4).

*Rationale: Conforms to current definitions.*

#### 8.4.5 Guiding Members and Position Restraints ~~Car Frames and Platforms~~

##### 8.4.5.1 Location ~~Guiding Members and Position Restraints.~~

Upper and lower position restraints attached to the car frame shall be provided. The distance between the upper and lower position restraints shall be not less than the height of the car frame. Separate position restraints are not required where such restraints are an integral part of the guiding member.

##### 8.4.5.2 ~~Design of Car Frames, Guiding Members, and Position Restraints~~

...{*Note: No change to 8.4.5.2.1 up to and including 8.4.10.1.4*}

*Rationale: Titles revised to more accurately depict components and concept affected by requirement.*

#### 8.4.11 Hydraulic Elevators

Requirement 8.4.11 applies to all direct-acting hydraulic elevators and roped hydraulic elevators.

For roped hydraulic elevators other than those defined by Section 1.3 (Definitions), the requirements, formulas and specified methods of calculation of loads and the resulting stresses and deflections do not generally apply and shall be modified to suit the specific conditions and requirements in each case.

*Rationale: All possible configurations cannot be covered by the code. The most common types have been evaluated. A statement similar to that of 8.2.2.1 indicates how other cases should be considered.*

*Rationale for clarity: The hydraulic elevator section has been revised to more closely follow the order of the electric elevator section of the Earthquake Code. Certain requirements have been renumbered with no change in wording.*

8.4.11.1 Horizontal Car and Counterweight Clearances. Where hydraulic elevators are provided with counterweights, clearances shall conform to 8.4.1.

*Rationale:*

*Note: 8.4.11.1 through 8.4.11.3 renumbered as 8.4.11.11 through 8.4.11.13. The hydraulic elevator section has been revised to more closely follow the order of the electric elevator section of the Earthquake Code. Certain requirements have been renumbered with no change in wording.*

*Former 8.4.11.4 indicated counterweights could be provided on hydraulic elevators. If they are provided, it is necessary to provide the proper clearances.*

### **8.4.11.2 Beams, Supports and Floors.**

**8.4.11.2.1 Beams and Supports.** Overhead beams for attaching hitch plates (See Figure 8.4.11, Configuration (2)) shall be anchored to prevent overturning and displacement as a result of a horizontal seismic force. The seismic force shall be of not less than that required to produce an acceleration of:

- (a) gravity (zone 3 or greater)
- (b) ½ gravity (zone 2)

**8.4.11.2.2 Floors.** Fastening means in compliance with 8.4.2.3 shall be provided to prevent hydraulic machines, control panels, and storage tanks from being overturned or displaced.

*Rationale:*

*Note: 8.4.11.1 through 8.4.11.3 renumbered as 8.4.11.11 through 8.4.11.13. The hydraulic elevator section has been revised to more closely follow the order of the electric elevator section of the Earthquake Code. Certain requirements have been renumbered with no change in wording.*

*Requirement 8.4.2 for electric elevators is the basis for proposed 8.4.11.2. 8.4.2 has been revised to specify components unique to the hydraulic elevator.*

### **8.4.11.3 Guarding of Equipment**

**8.4.11.3.1 Rope Retainers.** Rope retainers provided on traveling sheaves and deflecting sheaves, in accordance with 3.18.1.2.6, shall comply with 8.4.3.1.2 through 8.4.3.1.4.

*Rationale:*

*Note: 8.4.11.1 through 8.4.11.3 renumbered as 8.4.11.11 through 8.4.11.13. The hydraulic elevator section has been revised to more closely follow the order of the electric elevator section of the Earthquake Code. Certain requirements have been renumbered with no change in wording.*

*Proposed 8.4.11.3 is added for roped hydraulic elevators. Additional requirements for snag points were not included. Due to the lower heights and speeds of the hydraulic elevators, in comparison to its traction counterpart, it is expected much smaller clearances could be accommodated before any guarding would be necessary.*

**8.4.11.4 Car Enclosures, Car Doors and Gates, and Car Illumination.** Requirement 8.4.4 does not apply to hydraulic elevators.

*Rationale: Reference Inquiry 95-25. Counterweighted hydraulic elevators above 150 fpm are not commercially available.*

**8.4.11.5 Guiding Members and Position Restraints.** Guiding Members and Position Restraints shall conform to 8.4.5 and 8.4.11.5.1

*Rationale: 8.4.11.5 has been added as a direct requirement for hydraulic elevators. Current code only refers to guiding members and position restraints required for hydraulic elevators through former 8.4.11.7 (Information on "Hydraulic" Elevator Layouts)*

**8.4.11.5.1 Traveling Sheave Position Restraints Location.** Position restraints attached to the traveling sheave shall be provided for roped hydraulic elevators. Separate position restraints are not required where such restraints are an integral part of the guiding means.

**8.4.11.5.2 Design.** Position restraints and their attachments to the traveling sheave shall be designed to withstand a horizontal seismic force. The seismic force shall be not less than that required to produce an acceleration of:

- (a) ½ gravity (zone 3 or greater)
- (b) ¼ gravity (zone 2)

on ½ the weight of the driving member of the hydraulic jack plus the weight of the traveling sheave and its attachments.

*Rationale: 8.4.11.5.1 and its sub-requirements have been added to address roped hydraulic elevators.*

**8.4.11.6 Car and Counterweight Safeties.** Requirement 8.4.6 does not apply to hydraulic elevators.

*Rationale: Hydraulic elevators do not approach speed application requirement (700 FPM, 3.5 m/s) listed in 2.17.17.*

**8.4.11.7 8.4.11.4 Counterweights.** Where counterweights are provided, they shall conform to 8.4.7.

*Rationale: Counterweights are extremely rare but not prohibited on hydraulic elevators.*

**8.4.11.8 8.4.11.5 Guide Rails, Guide Rail Supports, and Fastenings.** Guide rails, guide rail supports, and their fastenings shall conform to the following, whichever is more restrictive:

- (a) Where car safeties are provided, 3.17.2 shall apply.
- (b) Seismic load application:
  - (1) Requirement 8.4.8 shall apply.
  - (2) The load on the car side of direct-plunger hydraulic elevators shall be as determined by 8.4.8.3(a) and (b).
  - (3) Requirement 8.4.8.9 shall not apply.

**8.4.11.9 Hydraulic Jacks.** The attachment of above ground hydraulic jacks to the building structure shall be capable of withstanding the inertia effect of their masses without permanent deformation when subjected seismic forces acting separately. The seismic force shall be of not less than those required to produce an acceleration of:

- (a) gravity horizontally and ½ gravity vertically (zone 3 or greater)
- (b) ½ gravity horizontally and ¼ gravity vertically (zone 2).

*Rationale: Requirement 8.4.9 has been revised to specify components unique to hydraulic elevators.*

**8.4.11.10 Emergency Operation and Signaling Devices.** Requirement 8.4.10 does not apply to hydraulic elevators.

*Rationale: Reference Inquiry 95-25. Counterweighted hydraulic elevators above 150 fpm are not commercially available.*

**8.4.11.11 8.4.11.4 Machinery Rooms and Machinery Spaces.** Where buildings are designed with expansion joints, the machine room and the hoistway shall be located on the same side of an expansion joint.

*Rationale: Requirement renumbered for clarity. See "Rationale for Clarity" at beginning of section.*

**8.4.11.12 8.4.11.2 Overspeed Valve.** Hydraulic elevators not provided with car safeties complying with 3.17.2 or a plunger gripper conforming to 3.17.3 shall be provided with an overspeed valve(s) conforming to 3.19.4.7.

*Rationale: Requirement renumbered for clarity. See "Rationale for Clarity" at beginning of section.*

**8.4.11.13 8.4.11.3 Piping Pipe Supports.** Piping supports to restrain transverse motion shall be provided near changes in direction and particularly near valves and joints and shall comply with 8.4.2.3. Horizontal spans shall be supported at intervals not to exceed those specified in Table 8.4.11.3 8.4.11.13. ...{Note: No change to rest of 8.4.11.13}

*Rationale: Requirement renumbered for clarity. See "Rationale for Clarity" at beginning of section.*

**Table 8.4.11.13 8.4.11.3 Pipe Support Spacing**  
{Note: No change to Table other than renumbering}

**8.4.11.14 8.4.11.7 Information on Elevator Layouts.** The following information is required on elevator layout drawings:

The ~~regarding~~ horizontal seismic forces imposed on the guide rail faces by the ~~position restraints of the traveling sheave and the lower position restraints of the car or the counterweight (where provided), shall be is required on elevator layout drawings. The forces are to be determined as shown in 8.4.11.14.1 and 8.4.11.14.2 specified in 8.4.11.7.1 and 8.4.11.7.2.~~

**8.4.11.14.1 8.4.11.7.1** Force normal to axis (x-x) of the rail (see 8.4.8.9):  
...{Note: No change to rest of 8.11.14.1}

**8.4.11.14.2 8.4.11.7.2** Force normal to axis (y-y) of the rail (see 8.4.8.9):

...  
where

$F$  = seismic force, N (lbf)

For car and counterweight lower position restraints:

$W$  = total weight of car plus 40% of rated capacity, or the total weight of the counterweight, kg (lb)

$W_P$  = plunger weight, kg (lb) (for direct-acting hydraulic elevators)

or

$W_P$  = 0 (for elevators provided with counterweights and roped hydraulic elevators)

For traveling sheave position restraints where guided on rails separate from car:

$W$  = 1.5 x (weight of traveling sheave plus guide attachments), kg (lbs)

$W_P$  = plunger weight, kg (lb) (for roped hydraulic elevators)

~~Where counterweights are provided, the horizontal seismic forces imposed on the guide rails by the lower position restraints shall be determined by the formulas in 8.4.8.9.1 and 8.4.8.9.2.~~

*Rationale: Provisions for elevators provided with counterweights, roped hydraulic elevators and traveling sheaves have been included in the existing formulas. For counterweights and roped hydraulic elevator cars, the formulas given in 8.4.8.9.1 and 8.4.8.9.2 should prevail. By making  $W_p = 0$  for these two cases, 8.4.8.9.1 and 8.4.8.9.2 are recreated.*

*For traveling sheaves guided on separate rails, only the plunger weight and added sheave weight needs to be considered. The traveling sheave position restraints are assumed to be in line with the sheave center of gravity. The 1.5 factor is including in determining W for traveling sheave calculations to reposition the center of gravity accordingly. Wp is handled as with direct acting elevators.*

*For traveling sheaves riding on car guide rails, the sheave will always be above the car's upper guide restraints. Due to its location and the lower weight expected for this assembly, the weight of the traveling sheave and plunger is ignored for this case.*

## 8.4.12 Design Data and Formulas for Elevators

**8.4.12.1 Maximum Weight Per Pair of Guide Rails.** The following formulas shall be used to determine the maximum allowable weight per pair of guide rails.

### 8.4.12.1.1 Force Normal to (x-x) Axis of Rail (See 8.4.8.9)

(a) No intermediate tie brackets (car and counterweight rails):

(1) Traction elevators, roped hydraulic elevators, (or hydraulic elevator counterweight rails, (where provided):

...

(2) Direct-acting hydraulic Hydraulic elevators (car guide rails only) or separately guided traveling sheaves:

...

{Note: No change to rest of 8.4.12.1.1}

### 8.4.12.1.2 Force Normal to (y-y) Axis of Rail (See 8.4.8.9)

(a) No intermediate tie brackets (car and counterweight rails):

(1) Traction elevators, roped hydraulic elevators, (or hydraulic elevator counterweight rails, (where provided):

...

(2) Direct-acting hydraulic Hydraulic elevators (car guide rails only) or separately guided traveling sheaves:

...

(b) One intermediate tie bracket located midway between main counterweighted guide-rail brackets:

...

(c) Two intermediate tie brackets approximately equally spaced between main counterweighted guide-rail brackets:

...

Where

$l$  = distance between main car or counter-weight guide rail brackets, mm (in.)

$W$  = total weight of car plus 40% rated capacity, or the total weight of the counterweight, kg (lb)

Or

$W$  = 1.5 x total weight of traveling sheave plus guide attachments, kg (lbs) (for separately guided traveling sheaves).

$W'$  = maximum weight per pair of ~~car~~ guide rails (hydraulic direct-acting elevators and separately guided traveling sheaves), kg (lb)

$W_p$  = weight of hydraulic plunger, kg (lb)

$Z_x$  = section modulus of rail about (x-x) axis, mm<sup>3</sup> (in.<sup>3</sup>)

$Z_y$  = section modulus of rail about (y-y) axis, mm<sup>3</sup> (in.<sup>3</sup>)

*Rationale: Added proper references for roped hydraulic elevators. Tie brackets were not considered for use on hydraulic elevators. Also see rationale for 8.4.11.14.*

**8.4.12.2 Required Moment of Inertia of Guide Rails.** The following formulas shall be used to determine the minimum allowable moment of inertia of guide rails.

**8.4.12.2.1 Force Normal to (x-x) Axis of Rail (See 8.4.8.9)**

(a) Traction elevators, roped hydraulic elevators (or hydraulic elevator counterweight rails, (where provided):

...

(b) Direct-acting hydraulic Hydraulic elevators (car guide rails only) or separately guided traveling sheaves:

....

**8.4.12.2.2 Force Normal to (y-y) Axis of Rail (See 8.4.8.9)**

(a) Traction elevators, roped hydraulic elevators, (or hydraulic elevator counterweight rails, (where provided):

...

(b) Direct-acting hydraulic Hydraulic elevators (car guide rails only) or separately guided traveling sheaves:

...

Where

$l$  = distance between main car and counterweight guide rail brackets, mm (in.)

$E$  = modulus of elasticity for steel =  $2.068 \times 10^5$ MPa ( $30 \times 10^6$ psi)

$I_x$  = moment of inertia of rail about (x-x) axis, mm<sup>4</sup> (in.<sup>4</sup>)

$I_y$  = moment of inertia of rail about (y-y) axis, mm<sup>4</sup> (in.<sup>4</sup>)

$W$  = total weight of car plus 40% rated capacity, or the total weight of the counterweight, kg (lb)

Or

$W$  = 1.5 x total weight of traveling sheave plus guide attachments, kg (lbs) (for separately guided traveling sheaves)

$W_p$  = weight of hydraulic plunger, kg (lb)

$\Delta$  = maximum allowable deflection at center of rail span, mm (in.), based on Table 8.4.12.2.

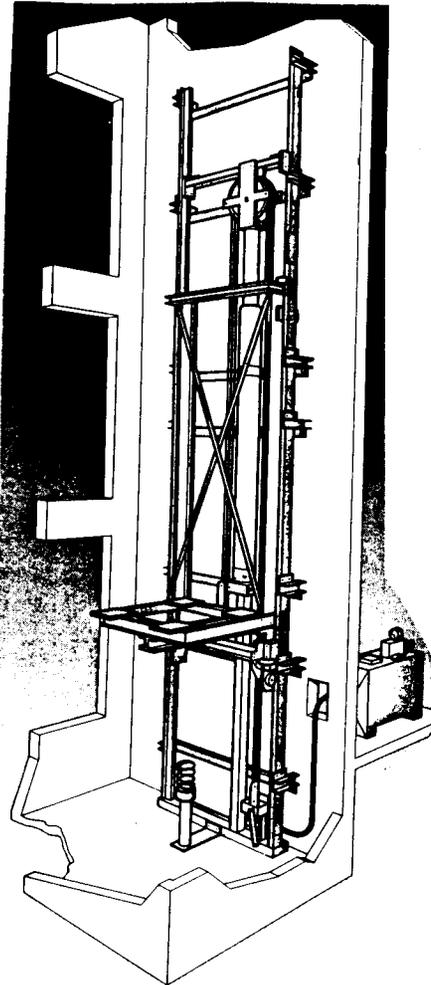
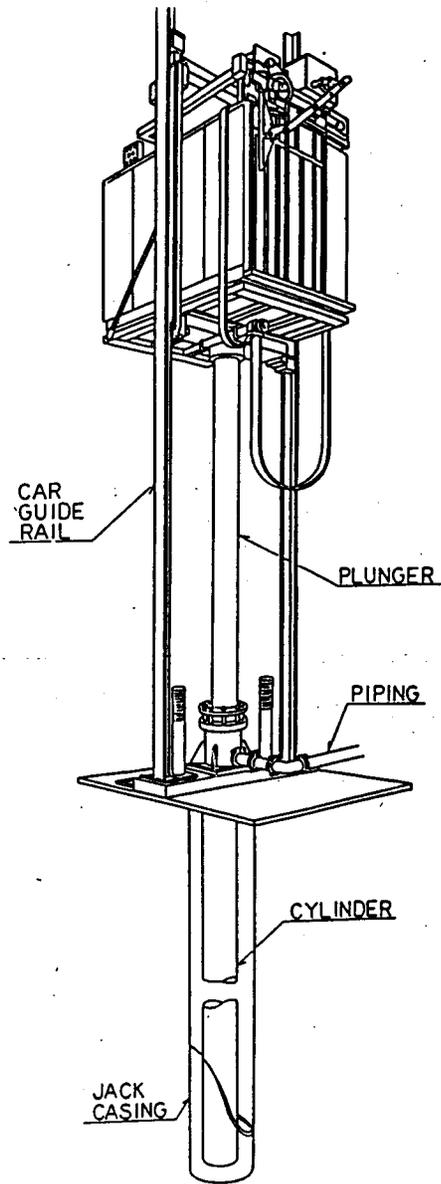
{Note: No change to Table 8.4.12.2.}

*Rationale: Added proper references for roped hydraulic elevators. Also see rationale for 8.4.11.14.*

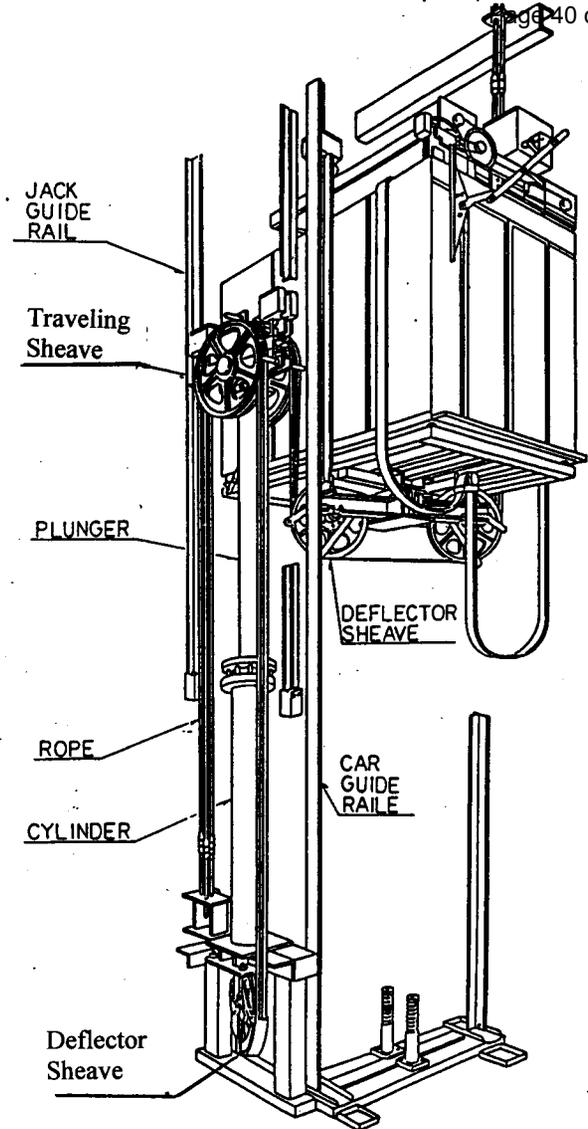
{Note: No change to 8.4.13 and remainder of section.}

1:2 ROPED

[2:4] ie 1:2 ROPED



Configuration (1a) as shown  
Configuration (1b) Dual Jack Arrangement  
(2<sup>nd</sup> jack and traveling sheave not shown)



Configuration (2)

Figure 8.4.11

**TN 02-2281**

Proposed Revision to Requirement 2.7.3.4.5 as follows:

**2.7.3.4.5** Doors are not required at openings in machine room or control room floors for access to machinery spaces outside the hoistway, provided the access opening is provided on all four sides with a standard railing conforming to 2.10.2, one side of which is arranged to slide or swing to provide access to the ladder or stairs leading to the space. Trap doors, where provided, shall have a standard railing conforming to 2.10.2 or guard wings on all open nonaccess sides.

Renumber current 2.7.3.4.6 as 2.7.3.4.7 and add New Requirement 2.7.3.4.6 (Requirement number is based on ASME A17.1 S-2005) as follows:

**2.7.3.4.6** Access openings located in the machinery space floor, secondary level floor, machine room floor, control space floor, or control room floor for access into the hoistway shall be provided with doors which shall be kept closed and locked. Keys to unlock the access doors shall be of Group 1 Security (see 8.1).

Proposed Revision to Requirement 8.1.2 as follows:

Group 1 covers access or operation of equipment restricted to elevator personnel. This key shall not be part of a master key system.

NOTE: See the following:

(a) Requirement 2.2.4.4(e), pit access doors.

(b) Requirement 2.7.3.4.6, access openings in machinery space floor, etc.

~~(c)~~ Requirement 2.7.3.4.67(c), hoistway access doors.

Renumber remainder of 8.1.2

**RATIONALE:** Since non-elevator personnel have access to machine rooms etc., any access into the hoistway from such space must be additionally protected from access by such non-elevator personnel. This requirement ensures that non-elevator personnel would only have supervised access to the elevator hoistway even from an elevator equipment area that they are permitted to enter.

**TN 02-2347**

Proposed revision to A17.1S-2005 and A17.1a-2005

**2.12.2.4.1** Interlock contacts shall be positively opened by the locking member or by a member connected to and mechanically operated by the locking member, and the contacts shall be maintained in the open position by the action of gravity, or by a restrained compression spring, or by both, or by means of the opening member (see 2.26.2.14). Contacts shall be open when the hoistway door interlock is unlocked. If the contacts are maintained in the open position by other than the locking member, the interlock shall be located such that the contacts cannot ~~manually be manually~~ closed ~~by hand~~ from the car or landing when the doors are open. The electrical contact bridging means shall withstand a separating force of 200 N (45 lbf) in any direction from the locking member.

**2.14.2.6(c)** be manually openable ~~by hand~~ from the hoistway side

**2.14.5.7 Manual Opening of Car Doors.** Car doors shall be so arranged that when the car is stopped within the unlocking zone (see 2.12.5.3) and power to the door operator is cut off, they and the mechanically related hoistway door, if any, shall be manually movable ~~by hand~~ from inside the car. The force required at the edge of sliding doors to move them shall not exceed 330 N (75 lbf).

**2.26.1.1 Types of Operating Devices.** All operating devices shall be of the enclosed electric type. Rope or rod operating devices actuated manually ~~directly by hand~~, or rope operating devices actuated by wheels, levers, or cranks, shall not be used.

**7.4.13.2.5** Requirement 2.11.6 does not apply. When the car is within the unlocking zone the material lift hoistway doors shall be manually openable ~~by hand~~ from within the car.

**8.3.2.5.5 Tests for Lateral Movement.** The following tests shall be made for lateral movement.

(a) *Spring-Return-Type Buffers.* The lateral movement at the top of the fully extended plunger shall be accurately measured, the upper end of the plunger being manually moved ~~by hand~~ from its extreme right to its extreme left position. One-half of the total movement measured shall be considered as being the true lateral movement at the top of the plunger and shall not exceed 5 mm/m (0.06 in./ft) of buffer stroke.

**8.6.4.12.1** Governors shall be examined to ensure that all seals are intact and manually operated ~~by hand~~ to determine that all moving parts, including the rope-grip jaws and switches, operate freely.

**8.10.2.2(bb)(2)(a)** Type A governor-operated safeties shall be tested by operating the car at its rated speed in the down direction and manually tripping the governor jaws ~~by hand~~. A test shall also be made of the inertia application of the safety to determine conformance with 2.17.8.1...

**8.10.5.2 Private Residence Elevators and Lifts.** Private residence elevators and lifts shall be subject to acceptance inspections and tests specified in 8.10.1 through 8.10.3. The inspection and test requirements shall apply to the corresponding requirements in 5.3 and 5.4. Any additional requirements for this equipment should also be checked during these inspections and tests.

Before an inclined elevator is put into service, a test of the car safety shall be made with rated load in the car. Governor operation of instantaneous-type safeties shall be tested at rated speed by manually tripping the governor ~~by hand~~. Where speed governors are located on the car or chassis, testing shall be performed by obtaining sufficient slack rope to cause the safety to function.

**8.11.2.2.2(b)**

(1) Type A, B, or C governor-operated safeties shall be operated by manually tripping the governor ~~by hand~~ with the car operating at the slowest operating speed in the down direction.

In this test, the safety shall bring the car to rest promptly.

In the case of Type B safeties, the stopping distance is not required to conform to 2.17.3.

In the case of Type C safeties, full oil buffer compression is not required.

In the case of Type A, B, or C safeties employing rollers or dogs for application of the safety, the rollers or dogs are not required to operate their full travel [Item 2.29.2.1].

(2) Governor-operated wood guide-rail safeties shall be tested by manually tripping the governor ~~by hand~~ with the car at rest and moving the car in the down direction until it is brought to rest by the safety and the hoisting ropes slip on traction sheaves or become slack on winding drum sheaves (Item 2.29.2.1).

**8.11.2.3.1 Car and Counterweight Safeties.** Types A, B, and C car safeties, except those operating on wood guide rails, and their governors, shall be tested with rated load in the car. Counterweight safety tests shall be made with no load in the car. Tests shall be

made by manually tripping the governor by hand at the rated speed. The following operational conditions shall be checked (Item 2.29.2.1):

**Rationale:**

It was intended that certain devices be activated by means other than automatic operation for the purpose of testing and, conversely be reset by means requiring intervention by a person rather than by automatic means. The use of the phrase "by hand" was not intended to be taken literally as meaning that only a human hand may be used to "manually trip" or "manually reset" a device or component. The changing of the wording in the requirements allows for the use of devices other than the human hand to activate or reset a device safely.

While the generalized term "tripped by hand" was intended to convey a performance requirement that the governor be designed to allow for manual activation, it was also intended that the method of hand tripping the numerous designs of governors in the marketplace be done safely and without causing equipment damage. It was intended that hand tripping be applied to a stationary or relatively slow moving means and not to any components rotating at the same speed as the governor sheave.

Manual tripping or manual resetting may also be done from a location remote from the device by authorized persons or elevator personnel in areas and by means not readily accessible to the public.

**TN 02-2917**

Add requirement 5.9.20.1 to A17.1:

**5.9.20.1 Suspension and Compensating Means and Governor Ropes.** When elevator suspension or compensating means or governor ropes will be exposed to an environment that will cause corrosion, surface pitting, or loss of cross-sectional area, the wire ropes shall be constructed of electro-galvanized or other type of corrosion resistant material suitable for the environment and application.

Rationale: To require corrosion resistant ropes in mines where subjected to a hostile environment. Although many mine elevator hoistways are suitable for use of standard wire ropes, others are extremely wet. Standard ropes corrode rapidly which can result in an unsafe condition caused by corrosion fatigue and corrosion embrittlement. Corrosion does not include surface discoloration from rust that can be cleaned with a wire brush, provided that the rope does not show any evidence of pitting or loss of cross-sectional area.

**TN 02-3211**

Add requirement 8.6.7.9.4 to A17.1.

**8.6.7.9.4 Suspension, Compensating Means and Governor Ropes.** When elevator suspension, ~~or compensating means~~ or governor ropes show deterioration caused by corrosion, the replacement wire ropes shall be constructed of electro-galvanized or other types of corrosion resistant material suitable for the environment and application. The installation shall conform to 8.7.2.21 for suspension ropes and 8.7.2.19 for governor ropes.

Where emergency replacement of wire ropes is required, non-corrosion resistant wire ropes shall be permitted to be installed for temporary use. These emergency replacement non-corrosion resistant wire ropes shall be replaced by corrosion resistant wire ropes within one year of installation.

**Rationale:** To require corrosion resistant ropes ~~or other suspension means~~ in mines where subjected to a hostile environment.

**Note:** These editorial changes are for clarification purposes only and do not change the intent of the proposed requirement. The words “These emergency replacement” were added to clarify that not all elevator ropes need to be replaced within one year. The word “means” was struck out to eliminate confusion and clarify that this requirement only applies to wire rope.

**TN 02-3536**

A17.1, 8.11.2.3.5 Emergency and Standby Power Operation

REVISE AS FOLLOWS:

Operation of elevators equipped with emergency or standby power shall be inspected and tested for conformance with the applicable requirements (item 1.17.2). ~~Passenger elevators and freight elevators permitted to carry passengers (see 2.16.4) shall be tested with 125% of rated load [see 2.16.8(f)].~~

*Rationale – editorial*

REVISE AS FOLLOWS: for Electric Traction elevators

A17.1 – 2000, 8.10.2.3 Inspection and Test Requirements for Altered Installations

8.10.2.3.2(j): Add (q) to references so section reads:

(j) Where an alteration increases the rated speed (8.7.2.17.2), Travel (8.7.2.17.1), Rated load, (8.7.2.4) Type of Service, (8.7.2.16.1), Class of loading (8.7.2.16.2), or from freight to passenger (8.7.2.16.3) tests shall be performed as specified in 8.10.2.2.1(c), (p), (q), and (s); 8.10.2.2.2(l), (m), (o), (t), (u), (v), (w), (y), (aa), (bb), (cc), and (dd); 8.10.2.2.3(d), (e), (g), (h), (i), (k), (m), (n), and (cc); 8.10.2.2.4(e); and 8.10.2.2.5(b) through (e) and (j).

*Rationale - For existing installations with Traction elevators undergoing Alterations, re-testing on Standby or Emergency Power is required under: 8.10.2.3.2(d) if the masses of the system are increased by more than 5%, 8.10.2.3.2(g) if the rated load is increased, 8.10.2.3.2(l) for alterations of the Standby or Emergency Power System, and 8.10.2.3.2(s) for a controller change. NOTE: Since an increase in car speed requires more output HP power from the hoist motor, the requirement to re-test on Standby or Emergency Power should be a part of a speed increase alteration. A larger drive or MG set may have been installed to obtain the speed increase that imposes a greater load on the Standby or Emergency Power System. Therefore, as part of this TR, 8.10.2.3.2(j) “increase in speed” should be revised to include a reference to 8.10.2.2.1(q). To require standby or emergency power testing for all alterations that may change the power requirements.*

Identify other alterations that require testing of systems.

REVISE AS FOLLOWS: for Hydraulic elevators

A17.1 – 2000, 8.10.3.3 Inspection and Test Requirements for Altered Installations

8.10.3.3.2(j): Add (q) to references so section reads:

(j) Where an alteration: increases the rated speed (8.7.3.22.2); ; Increases Rated Load (8.7.3.20); Increases Weight of Car (8.7.3.21); Changes Travel (8.7.3.22.1); Changes Type of Service (8.7.3.17); Changes Class of loading (8.7.3.18); Changes From Freight to Passenger (8.7.3.19); tests shall be performed as specified in 8.10.3.2.1(a), (c), (g) through (k), (q), (r), (s), and (t); 8.10.3.2.2(m), (n), (x), and (y); 8.10.3.2.3(c) through (h), (o), (u), (y), and (cc); and 8.10.3.2.5(b), (d), and (l).

*Rationale - For existing installations with Hydraulic elevators undergoing Alterations, re-testing on Standby or Emergency Power is required under: 8.10.3.3.2(d) if the masses of the system are increased by more than 5%, 8.10.3.3.2(g) if the rated load is increased, 8.10.3.3.2(l) for alterations of the Standby or Emergency Power System, and 8.10.3.3.2(p) for a controller change. NOTE: Since an increase in car speed requires more output HP from the pump motor, the requirement to re-test on Standby or Emergency Power should be a part of a speed increase alteration. A larger pump and motor may have been installed to obtain the speed increase that imposes a greater load on the Standby or Emergency Power System. Therefore, as part of this TR, 8.10.3.3.2(j) “increase in speed” should be revised to include a reference to 8.10.3.2.1(q). To require standby or emergency power testing for all alterations that may change the power requirements.*

Identify other alterations that require testing of systems.

Add to 8.10.2.2.1(q) the following:

8.10.2.2.1(q)

Passenger elevators and freight elevators permitted to carry passengers shall be tested with 125% of rated load. Other freight elevators shall be tested with rated load. In addition, freight elevators with Class C2 loading shall be tested to ensure that the overload can be maintained during loading and unloading.

8.10.3.2.1(q)

(1) Passenger elevators and freight elevators shall be tested with rated load. Freight elevators with Class C2 loading shall be tested to ensure that the overload can be maintained during loading and unloading.

**Rationale:** to make sure the intent is clear after the proposed changes are made to A17.1 and to cover Class C2 loading.

## TN 03-91

**intended car movement** – controlled movement of an elevator car, including starting, leveling, running, and stopping, due to:

- a) operation control,
- b) motion control,
- c) continuous pressure on an operating device during inspection operation, inspection operation with open door circuits, or hoistway access operation.

(Note: “Stopping” includes movement of an elevator car towards rest once stopping is initiated, and any movement of an elevator car due to suspension system elasticity that occurs after the brake is set, since this movement was the result of the intended operation.)

**unintended car movement** – any movement of an elevator car that is not intended car movement resulting from a component or system failure.

*Rationale for the proposal:* Clarification of what is unintended/intended car movement, specifically with regard to hoistway access operation, bypass, and inspection operation, etc.

### 2.19.2 Protection Against Unintended Car Movement Protection

**2.19.2.1 Purpose.** Protection shall be provided with a device means to prevent detect unintended car movement (see 1.3) away from the landing with the hoistway door not in the locked position and the car door not in the closed position, and stop the car movement, as a result of failure in any of the following:

- (a) the electric driving-machine motor, brake, coupling, shaft, or gearing;
- (b) the control system;
- (c) any other component upon which the intended car movement speed of the car depends, except the suspension ropes means and the drive sheave of the traction machine.

**2.19.2.2 Where Required and Function.** All electric traction elevators shall be provided with a means device (see 2.26.2.30) that shall:

- (a) detect unintended car movement in either direction away from the landing with the hoistway door not in the locked position and the car door or gate not in the closed position.

NOTE [2.19.2.2(a)]: Freight elevators provided with combination mechanical locks and contacts on the hoistway door shall detect the closed position of the hoistway door and the closed position of the car door or gate.

(1) If the detection means requires electrical power for its functioning, then:

- (a) a loss of electrical power to the unintended movement detection and control means shall cause the immediate activation of the emergency brake as required in 2.19.2.2(b);
- (b) the occurrence of a single ground, or the failure of any mechanically operated switch that does not meet the requirements of 2.26.4.3, any single magnetically operated switch, contactor, or relay, or any single solid state device, or software system failure, shall not render the detection means inoperative.

(2) The failure of any single mechanically operated switch that does not meet the requirements of 2.26.4.3, shall not render the detection means inoperative.

(3) When a fault specified in 2.19.2.2(a)(1)(b) or 2.19.2.2(a)(2) is detected, the car shall stop at or before the next landing for which a demand was registered, and shall not be permitted to restart.

(4) Once actuated by unintended movement, the detection means shall remain actuated until manually reset, and the car shall not start or run unless the detection means is reset.

- (b) upon detection of unintended car movement, stop and hold the car, with any load up to rated load [see also 2.16.8(h)], by applying an emergency brake conforming to 2.19.3. ~~with~~ The stopped position of the car shall be movement limited in both directions, to a maximum of 1220 mm (48 in.) as measured from the landing sill to the car sill. The car shall not start or run unless the emergency brake provided for the unintended movement protection is reset.

*Rationale:* Clarification of language.

**2.19.3.2 Requirements.** The emergency brake is permitted to consist of one or more devices and shall:

- (a) function to decelerate the car by acting on one or more of the following (see also 2.19.4):
  - (1) counterweight [e.g., counterweight safety (see 2.17.4 and 2.17.7)].
  - (2) car.
  - (3) suspension or compensation ~~ropes~~ means system.

- (4) drive sheave of a traction machine.
- (5) brake drum or braking surface of the driving-machine brake, provided that the driving-machine brake surface is integral (cast or welded) with or directly attached to the driving-machine sheave. Attachments, where used, shall conform to 2.24.3 and 2.24.4.1. Welding, where used, shall conform to 8.8.
- (b) be independent of the driving-machine brake;
- (c) not be used to provide, or assist in providing the ~~normal~~ stopping of the car when on automatic operation. ~~When the emergency brake is activated during normal elevator stops, it shall only be applied to and released from a stationary braking surface; , unless applied as required in 2.19.1 and 2.19.2, or as permitted in 2.19.3.2 (e) and (f).~~
- (d) be permitted to be applied only after the car is stopped when on automatic operation, except as required in 2.19.1 and 2.19.2.
- (e) be permitted to be applied to a stationary or moving braking surface when any electrical protective device (2.26.2) is actuated;
- (f) be permitted to be applied to a stationary or moving braking surface when on continuous pressure operation (e.g. continuous pressure inspection operation, inspection operation with open door circuits, or hoistway access operation).
- ~~(g)~~ (g) not require the application of electrical power for its activation, nor be rendered inoperative by the failure of any power supply.
- (e) (h) not on its own cause the car average retardation to exceed 9.8 m/s<sup>2</sup> (32.2 ft/s<sup>2</sup>) during the stopping or slowdown phase during ascending car overspeed.
- ~~(f)~~ (i) be designed so that the factors of safety based on the maximum stresses developed in the parts subject to load during the operation of the emergency brake shall comply with the following:
- (1) Where an emergency brake is ~~activated~~ applied only when protecting against either an ascending car overspeed condition or unintended car movement with the car and hoistway doors open, the minimum factors of safety, when applied during the retardation phase of emergency braking, shall be not less than those specified in 2.17.12.1.
  - (2) Where an emergency brake is ~~activated~~ applied during as permitted in 2.19.3.2(d), (e) and (f) ~~the normal stopping of the car normal stops of the elevator~~, the minimum factors of safety, when applied during the retardation phase of emergency braking, shall be not less than those specified in 2.24.3.1 and 2.24.3.2. Degradation of the emergency brake due to wear shall be considered.
  - (3) Where an emergency brake acts on the suspension or compensation ~~rope means system~~
    - (a) the factor of safety with respect to the breaking strength of the ~~rope~~ suspension and compensation member shall not be less than 5 at any time during the retardation phase; and
    - (b) it shall be designed to prevent appreciable damage or deformation to the ~~rope~~ suspension and compensation member resulting from its activation.
- ~~(g)~~ (j) be arranged to be tested in accordance with the requirements specified in 8.10.2.

Rationale for 2.19.3.2(c)(d)(e) and (f):

*Use of emergency brake for elevator operations other than ascending car and unintended motion.*

*Although not permitted to be used to stop the elevator car on automatic operation, there are other elevator operations (e.g. continuous pressure operation) that may make use of an existing emergency brake device. Today's elevator systems are comprised mostly of ACVF traction systems. These systems may not provide inherent dynamic braking on "power off" stopping (e.g. emergency terminal speed limiting device, inspection/car emergency stop switches and other possible electrical protective safety devices). Braking assistance to the "driving machine brake" may be necessary in order to meet required code stopping performance criteria, or provide elevator personnel with responsive stopping during elevator maintenance and inspection. If used for the additional safety functions the emergency brake is required to be designed to higher factors of safety. The restricted use of the emergency brake ensures availability when required.*

The term "rope" was changed to be consistent with the proposed suspension means standard. See ballot 04-0861.

## 2.26.2 Electrical Protective Devices

When an electrical protective device is activated (operated, opened), it shall cause the electric power to be removed from the elevator driving machine motor and brake. [See also 2.26.3, 2.26.4.3, 2.26.4.4, 2.26.7, 2.26.8.3(c), 2.26.9.3, and 2.26.9.4]. Electrical protective devices shall be provided as specified in 2.26.2.1 through 2.26.2.32.

When an electrical protective device is activated (operated, opened), it shall be permitted to cause the emergency brake to apply. [See 2.19.3.]

*Rationale: To clarify when it is permissible to allow the electrical protective devices to operate the emergency brake, which in turn may allow simultaneous operation of the braking system and the emergency brake. Additional requirements clarify that the emergency brake may be applied during the stopping of the elevator while on continuous pressure operation.*

**8.6.4.17** Ascending Car Overspeed and Unintended Car Movement Protection. Devices for ascending car overspeed and unintended car movement protection shall be maintained. [See 2.19]

*Rationale: Clarification.*

**8.6.4.6.3** If any part of the emergency brake is changed or adjusted that can affect the holding capacity or decelerating capacity of the emergency brake when required (see 2.19.3), it shall be adjusted and checked by means that will verify its proper function and holding capacity.

*Rationale: To ensure continued compliance with the requirements for emergency brakes. Proposal was chosen to be consistent with maintenance requirements for driving machine brakes 8.6.4.6.2.*

**8.10.2.2.2**

(ff) Emergency brake (2.19.3.2)(Item XX)

*Rationale: To ensure continued compliance with the requirements for emergency brakes.*

**8.11.2.3.11** Emergency Brake ~~Braking System~~. For passenger elevators and all freight elevators, the emergency brake shall be tested for compliance with 2.19.3.2.

*Rationale: To ensure continued compliance with the requirements for emergency brakes.*

**TN 04-399**

Revise 2.27.2 as follows:

**2.27.2 Emergency or Standby Power System**

~~Where an emergency or standby power system is provided to operate an elevator in case of normal power supply failure, the requirements of 2.27.2.1 through 2.27.2.5 shall be complied with.~~

Elevators provided with an emergency or standby power system to operate the elevator in case the normal power supply fails, shall comply with the requirements of 2.27.2.1 through 2.27.2.5.

Note (2.27.2): Requirements for emergency or standby power systems are addressed in the building code. Requirements for health care facilities are addressed in NFPA 99 and NFPA 70, Article 517.

2.27.2.1 The emergency or standby power system shall be capable of operating the elevator(s) with rated load (see 2.16.8), at least one at a time, unless otherwise required by the building code.

2.27.2.2 The transfer between normal and emergency or standby power shall be automatic.

2.27.2.3 An illuminated signal marked "ELEVATOR EMERGENCY POWER" shall be provided in the elevator lobby at the designated level to indicate that the normal power has failed and the emergency or standby power is in effect for one or more of the cars in this group operation.

Revise 2.27.2.4 as follows:

Where the emergency or standby power system is not capable of operating all elevators simultaneously, the elevators shall conform to requirements of 2.27.2.4.1 through 2.27.2.4.5 ~~shall be conformed to.~~

2.27.2.4.1 A selector switch(es) marked "ELEVATOR EMERGENCY POWER" in red lettering a minimum of 5 mm (0.25 in.) in height, which is key-operated or under a locked cover (see 2.27.8), shall be provided to permit the selection of the elevator(s) to operate on the emergency or standby power system. The key shall be Group 3 Security (see 8.1).

2.27.2.4.2 The selector switch(es) positions shall be marked to correspond with the elevator identification number (see 2.29) and a position marked "AUTO".

2.27.2.4.3 The selector switch(es) shall be located at the designated level in view of all elevator entrances, or if located elsewhere means shall be provided adjacent to the selector switch(es) to indicate that the elevator is at the designated level with the doors in the normally open position.

Revise 2.27.2.4.4 as follows:

~~When the selector switch is in the "AUTO" position, An automatic power selection means shall be provided to select each elevator one or more at a time as follows:~~

(a) When selected, an which will return each elevator that is not on designated attendant operation, inspection operation, or Firefighters' Phase II In-Car Emergency Operation shall return to the designated level where power-operated doors shall open and remain open. The selection shall then be automatically transferred to another elevator until all elevators have been selected.

(b) When selected, elevators on designated attendant operation, inspection operation (2.26.1.4), or Firefighters' Emergency Operation (2.27.3 thru 2.27.7) shall operate in accordance with those requirements and shall remain selected until the car is stopped and the doors are open, except as specified in 2.27.2.4.4(c). ~~one or more at a time, to the recall level.~~ For cars on firefighters emergency operation, the in-car visual signal [2.27.3.1.6(h) and 2.27.3.3.8] shall not activate until the car is selected.

(c) ~~Failure of the~~ If any selected car does not ~~to~~ move for more than 20 s to 30 s, shall cause the selection ~~to~~ shall be transferred to another car, until all elevators have been selected.

~~(d) After all elevators have been selected, the process shall repeat for any cars that failed to move to give them a second opportunity.~~

Revise 2.27.2.4.5 as follows:

After all cars have been recalled, moved to a floor, or failed to move after a second opportunity, one or more of the elevators, identified by the manual selection switch(es) (2.27.2.4.1), shall be selected to remain in operation. If no elevator(s) has been manually selected (switch(es) in "AUTO" position) it shall be permissible to automatically select the elevator(s) to remain in operation. Preference shall be given to cars on Hospital Service followed by cars on Firefighters' Phase II Emergency In-Car Operation.

The manual selection switch(es) shall not override the automatic power selection until:

- (a) the automatic return sequence is complete (2.27.2.4.4); or
- (b) a "FIRE RECALL" switch is in the "ON" position (2.27.3.1).

Operation of the ~~selector switch(es)~~ manual selection switch(es) shall not cause a car to be deselected ~~power to be removed from any elevator~~ until the elevator is stopped.

~~Note: (2.27.2.4) The selector switch(es) should normally be placed in the "AUTO" position.~~

Add a new requirement 2.27.2.4.6 as follows:

A visual means, located adjacent to the manual selector switches, shall be provided to indicate which elevator(s) is currently selected.

**Rationale:**

- 1) Provide better description of the interaction between Emergency power and Fire Service, making it clear that the cars should return to the designated level (normal service or fire service) unless the smoke detector at that floor has initiated fire service.
- 2) Define the behavior of the doors at the end of the recall; they should normally be left open to allow the firefighters to account for the location and occupancy of all cars.
- 3) Specify what happens to cars on the services excluded from automatic recall.
- 4) Treat standby and emergency power for elevators with Hospital Service the same as they are treated for Phase I.
- 5) Ensure that all cars get a chance to recall or move to a floor (inspection, Fire Phase II, etc) before allowing manual selection, so that passengers can exit the car.
- 6) The current note suggesting the switch be left in AUTO was previously important because if the switch was left in another position and the power failed passengers in other cars would be trapped until an authorized person realized what was wrong. The note was also not enforceable and has been deleted in this proposal. The new approach evacuates the cars automatically no matter which position the switch is in, so the note is no longer needed.
- 7) Add an indicator to inform firefighters' which cars are currently selected.
- 8) Cars requiring manual intervention to close the door will not be able to recall but will not create an entrapment and therefore are not addressed.
- 9) To prevent people from being trapped following a power interruption.
- 10) The firefighter's light activates when the car is ready to run, so the firefighter knows that power has been restored to that car.

TN 04-1443

REVISE A17.1 REQUIREMENT 8.10.2.2.2(o):

Braking System. For passenger and all freight elevators, the brake shall be tested for compliance with the applicable requirements. Place the load as shown in Table 8.11.2.3.4 in the car and run it to the lowest landing by normal operating means. The driving machine shall safely lower, stop and hold the car with this load. Also, see 8.10.2.2.2(v)(3)(a). Freight elevators of Class C2 ~~C-2~~ loading shall sustain and level the elevator car with the maximum load shown on the freight elevator loading sign. (2.16.6~~2~~, 2.16.8, 2.24.8) (Item 2.17)

ADD TO A17.1 REQUIREMENT 8.10.3.2.2:

(z) Freight elevators of Class C2 loading shall sustain and level the elevator car with the maximum load shown on the freight elevator loading sign. (3.16.2) (Item 2.17)

REVISE A17.1 REQUIREMENT 8.11.2.3.4:

Braking System. For all passenger and all freight elevators, the brake shall be tested for compliance with the applicable requirements. Place the load as shown in Table 8.11.2.3.4 in the car and run it to the lowest landing by normal operating means. The driving machine shall safely lower, stop and hold the car with this load. Also, see 8.11.2.10(a). Freight elevators of Class C2 ~~C-2~~ loading shall sustain and level the elevator car with the maximum load shown on the freight elevator loading sign. (Item 2.17.2.1)

REVISE A17.1 TABLE 8.11.2.3.4:

<b>Class of Service</b>	<b>Not Permitted to Carry Passengers</b>	<b>Permitted to Carry Passengers</b>
Passenger	Not applicable	125% rated load
<u>Freight</u>	<u>Rated load</u>	<u>125% rated load</u>
<del>Class A</del>	<del>Rated load</del>	<del>125% rated load</del>
<del>Class B</del>	<del>Rated load</del>	<del>125% rated load</del>
<del>Class C1</del>	<del>Rated load</del>	<del>125% rated load</del>
<del>Class C2</del>	<del>Up to 150% rated load</del>	<del>Up to 150% rated load</del>
<del>Class C3</del>	<del>Rated load</del>	<del>125% rated load</del>
One Piece Load by 2.16.7	Rated load or one piece load, whichever is greater	125% rated load or one piece load, whichever is greater

ADD TO A17.1 REQUIREMENT 8.11.3.4:

8.11.3.4.5 Freight elevators of Class C2 loading shall sustain and level the elevator car with the maximum load shown on the freight elevator loading sign. (Item 2.17.2.2)

Rationale:

1) Revised A17.1 for clarification, to correct erroneous information. Class C2 freight elevators must only sustain and level loads that exceed the rated load. Also, covered testing of hydraulic elevator requirements.

**TN 05-04**

Revise A17.1, Requirements 8.7.5.3 and 8.7.5.4 as follows:

**8.7.5.3 Private Residence Elevators. ~~Reserved.~~**

8.7.5.3.1 When a building code occupancy classification of a private residence is changed in which a private residence elevator is located the elevator shall comply with the applicable requirements in Parts 2, 3, 4 or Sections ~~5.1 or 5.2.~~

**8.7.5.4 Private Residence Inclined Elevators. ~~Reserved.~~**

8.7.5.4.1 When a building code occupancy classification of a private residence is changed in which a private residence inclined elevator is located the elevator shall comply with the applicable requirements in Parts 2, 3, 4 or Sections ~~5.1 or 5.2.~~

Reason: Many private residences have been converted to convention centers, banquet facilities, museums, etc.; where the elevators are used by the general public or as a Limited-Use/Limited-Application elevator. In these cases, the more stringent safety requirements of ASME A17.1 need to be applied.

**TN 05-184**

Revise A17.1, requirement 5.2.1.27 as follows:

**5.2.1.27 Emergency Operations and Signaling Devices.**

Emergency operation and signaling devices shall conform to 2.27, except ~~2.27.3 through 2.27.8 do not apply as modified by 5.2.1.27.1. However, if firefighters' service is provided, it shall conform to 2.27.~~

**5.2.1.27.1 Phase II Emergency In-Car Operation shall not be provided.**

Rationale: LULA elevators should not be available for public use during fire emergencies. The hazard analysis conducted by LULA and Emergency Operations Committees indicates that LULA elevators should have Phase I but not Phase II operation.

**TN 05-568**

Revise A17.1, reqs. 8.7.2.27.3, 8.7.2.27.4, 8.7.3.31.4, and 8.7.3.31.5 as follows:

**8.7.2.27.3 Change in Power Supply.** Where an alteration consists of a change in power supply at the mainline terminals of the elevator motion controller or motor controller, involving one of the following, whichever is applicable:

- (a) change in voltage, frequency, or number of phases
- (b) change from direct to alternating current or vice versa
- (c) change to a combination of direct and alternating current.

Electrical equipment shall conform to 2.26.1.1, 2.26.1.2, 2.26.1.3, 2.26.1.4, 2.26.1.6, 2.26.2, 2.26.6, 2.26.7, 2.26.9, and 2.26.10. All new and modified equipment and wiring shall conform to 2.26.4.1, 2.26.4.2, and 2.26.4.3. Brakes shall conform to 2.24.8 and 2.26.8. Winding-drum machines shall be provided with final terminal stopping devices conforming to 2.25.3.5 [see also 8.7.2.17.2(b)].

**8.7.2.27.4 Controller**

- (a) Where a motion controller or operation controller is installed as part of an alteration, it shall conform to 2.25, 2.26.1.4, 2.26.1.5, 2.26.4 through 2.26.9, 2.27.2 through 2.27.8.
- (b) Where a controller for the operation of hoistway doors, car doors, or car gates is installed as part of an alteration, all new and modified equipment and wiring shall conform to 2.26.4.1 and 2.26.4.2.

**8.7.3.31.4 Change in Power Supply.** Where an alteration consists of a change in power supply at the mainline terminals of the elevator motion controller or motor controller involving

- (a) change in voltage, frequency, or number of phases;
- (b) change from direct current to alternating current, or vice versa; or
- (c) change to a combination of direct or alternating current. Electrical equipment shall conform to 3.26.1, 3.26.4, 3.26.5, and 3.26.6 (not including 2.26.4.4).

**8.7.3.31.5 Controllers**

- (a) Where a motion controller or operation controller is installed without any change in the type of operation control or motion control as part of an alteration, it shall conform to 2.26.1.4, 2.26.1.5, 2.26.4.1, 2.26.4.2, 2.26.4.3, 2.26.5, 2.26.7, 3.26.2, 3.26.3, 3.26.5, 3.26.7, 3.26.10, and 3.25.
- (b) Where a controller for the operation of hoistway doors, car doors, or car gates is installed as part of an alteration, all new and modified equipment and wiring shall conform to 2.26.4.1 and 2.26.4.2.

Rationale: To clarify the use of the "Controller" term in section 8.7 of the A17.1 code.

TN 05-781

Proposal	Rationale
<p><b>2.13.3.2 Power Closing of <u>Horizontally Sliding</u> Hoistway Doors and <u>Horizontally Sliding</u> Car Doors or Gates by Continuous-Pressure Means.</b> Horizontally <del>or vertically</del>-sliding hoistway doors with manually closed, or power-operated, or power-closed <u>horizontally sliding</u> car doors or gates shall be permitted to be closed by continuous pressure means, subject to the requirements of 2.13.3.2.1 through <del>2.13.3.2.5</del> <u>2.13.3.2.4</u>.</p> <p><del>2.13.3.2.5</del> For sequence closing of vertically sliding hoistway doors and adjacent car doors or gates, see 2.13.6.</p>	<p><i>Requirements for continuous pressure closing of vertically sliding doors have been moved to 2.13.3.4.1. The conditions when sequence operation is or is not required have been moved to 2.13.3.4.</i></p>
<p><b>2.13.3.4 Power Closing of Vertically Sliding Hoistway Doors and Vertically Sliding Car Doors or Gates by <del>Momentary Pressure or by Automatic Means.</del></b> Power closing by momentary pressure or by automatic means shall be permitted only for automatic or continuous pressure operation elevators.</p> <p><del>Vertically sliding hoistway doors used with vertically sliding power-operated car doors or gates closed by momentary pressure or automatic means, shall conform to the requirements of 2.13.3.4.1 through 2.13.3.4.5.</del></p>	<p><i>Requirements for momentary pressure closing have moved to 2.13.3.4.2.</i></p>
<p><b>General Rationale</b></p>	<p><b>General Rationale for different size objects applicable to 2.13.3.4.5 (a) and (b); and also 2.13.3.4.6 (c) and (d); and 2.13.3.4.7 (d) and (e). Written using 2.13.3.4.5 references. Substitute requirements from 2.13.3.4.6 or 2.13.3.4.7, where applicable.</b></p> <p><i>2.13.3.4.5(a) requires detection means located immediately adjacent to the landing side of the hoistway door and the car side of the car door capable of detecting a target equivalent to the head of a small size adult located from the car/landing floor to 1880 mm above the car/landing floor.</i></p> <p><i>2.13.3.4.5(b) requires the detection of a target of torso size located wholly within the confines bounded by the vertical planes established by the landing side of the doors and the car side of the doors.</i></p> <p><i>For clarification: If the horizontal distance between the sensors of the detectors placed at landing side of the hoistway door and the car side of the car door is less than 140 mm then no additional detectors are required, since those detectors would sense a torso size object located wholly within the path of the hoistway/car door, thus satisfying 2.13.3.4.5(b).</i></p> <p><i>If a person were entering or exiting the car just prior to or during door closing, the person would encounter the detection means located immediately adjacent to the landing side of the hoistway door and/or the car side of the car door as required in 2.13.3.4.5(a). Thus, the detection means stipulated in 2.13.3.4.5(b) only comes into play if the person is standing, wholly within the path of the</i></p>

<p style="text-align: center;"><b>Proposal</b></p>	<p style="text-align: center;"><b>Rationale</b></p>
	<p><i>closing doors prior to closing. To get to that position the person must have passed through the detection means stipulated in 2.13.3. 4.5(a), thus preventing closure or initiating reopen until the head and torso had passed through the 2.13.3.4.4(a) detection zones.</i></p> <p><i>For the head to be wholly within the path of the door, without the torso, the torso would be detected by the devices in 2.13.3.4.5(a). 2.13.3 4.5(b) provides protection when the horizontal distance between detectors 2.13.3.4.5(a)(1) and 2.13.3.4.5(a)(2) will no longer detect a head. Since the head is attached to the balance of the body and the body must also be located wholly within the confines bounded by the vertical planes established by the landing side of the doors and the car side of the doors (i.e. not sensed by the 2.13.3. 4.5(a) detectors), then detection of the body (i.e. torso) will insure that the head is also detected.</i></p> <p><i>Passage into the zone located wholly within the confines bounded by the vertical planes established by the landing side of the doors and the car side of the doors would have prevented closure or initiated reopen per 2.13.3.4.5(a). Thus, 2.13.3.4.5(a) prevents door closure unless the torso is fully within the confines bounded by the detectors located along vertical planes of the landing side of the hoistway door and the car side of the car door. Since the torso must be fully within this zone prior to door close detection of the torso will also protect the head.</i></p> <p><b>General Rationale concerning object size:</b></p> <p><i>Detection of the object as described is necessary in order to demonstrate the efficacy of the protection means. There is no prohibition against detecting larger or smaller objects, just as long as you can detect the object as described.</i></p> <p><b>General Rationale concerning non-human objects:</b></p> <p><i>There are large number of hypothetical non-human objects that could enter into the path of any closing door and be located such that they are not detected. Scenarios involving the consequential effects on humans were extensively analyzed and the safety issues were addressed.</i></p>
<p><del>2.13.3.4.1 A warning bell or other audible signal shall be provided on the car, which shall start to sound at least 5 s prior to the time the car door or gate starts to close and shall continue to sound until the hoistway door is substantially closed. When the doors are closed by a closing switch in the car, the 5 s time interval shall be permitted to be omitted.</del></p>	<p><i>The requirements are deleted from this section as hazards addressed by the warning devices are mitigated by new requirements for object detection and reopening.</i></p> <p><i>Warning bells do not mitigate the risks sufficiently to eliminate the need for protective devices. As such, since protective devices were necessary and mitigated the risks, there was no need to retain the warning bell, except for vertically slide-up to open hoistway and car doors with sequence operation [2.13.3.4.6(f)].</i></p>

<p style="text-align: center;"><b>Proposal</b></p>	<p style="text-align: center;"><b>Rationale</b></p>
<p><u>Vertically sliding hoistway doors with manually closed, or power-operated, or power-closed vertically sliding car doors or gates, where closed by continuous pressure means, shall conform to 2.13.3.4.1(a) through (e):</u></p> <p><u>(a) The release of the continuous pressure closing means shall cause the hoistway door, and a power operated or power-closed car door or gate to immediately initiate a reversal, and to fully reopen. Reopening by release of the continuous pressure closing means shall be permitted to be disabled when the hoistway door is within 250 mm (10 in.) of full close.</u></p>	<p><i>Similar to 2.13.3.2.1.</i></p> <p><i>Continuous pressure close, momentary pressure close, or closing initiated by automatic means are permissible methods of closing the doors. Regardless of the type of closing means, detection devices are required per requirements 2.13.3.4.5, 2.13.3.4.6, or 2.13.3.4.7.</i></p> <p><i>Requirements for continuous pressure close were selected to conform to industry norms.</i></p>
<p><u>(b) The continuous pressure closing means shall not close the hoistway door, car door, or gate at any other landing.</u></p> <p><u>(c) Any continuous pressure closing means at a landing shall close only that hoistway door and the car door or gate at the entrance where such means is located. The continuous pressure closing means shall be located where the full opening of the door that it controls is visible.</u></p> <p><u>(d) For elevators having more than one hoistway opening at any landing level, a separate continuous pressure closing means shall be provided in the car for each car door or gate and its adjacent hoistway door. The continuous pressure closing means shall be located adjacent to the door(s) or gate(s) that it controls.</u></p> <p><u>(e) Where a door close button or switch is provided, it shall be labeled "CLOSE".</u></p>	<p><i>(b), (c), and (d) similar to 2.13.3.2.2; 2.13.3.2.3; 2.13.3.2.4. In (c) the location of the closing means is clarified.</i></p> <p><i>(e) Added requirements for labeling the door close button.</i></p> <p><b>Additional Rationale related to attendant operation:</b></p> <p><i>Operation by designated attendant is permitted. Since an inattentive operator might not be aware that a person is entering or leaving the elevator, operation by designated attendant did not mitigate the risks sufficiently to eliminate the need for protective devices. As such, since protective devices were necessary, there was no need to differentiate between automatic operation and operation by designated attendant.</i></p>
<p><del>2.13.3.4.2 Sequence closing of the hoistway door and adjacent car door or gate shall be provided and shall conform to 2.13.6. Sequence closing is not required when a biparting vertically sliding hoistway door faces a biparting vertically sliding car door or gate.</del></p>	<p><i>The conditions for sequence operation have moved to 2.13.3.4.6 and 2.13.3.4.7.</i></p> <p><i>Sequence operation in the proposal is mandatory for bi-parting hoistway doors with vertical slide-up car door/gates with both continuous pressure and momentarily pressure operation. Sequence operation is optional for vertical slide-up hoistway doors with vertical slide-up car door/gates. When sequence operation is not provided, the same level of protection provided on the car door/gate is also required on the hoistway door.</i></p>
<p><u>Vertically sliding hoistway doors with power-operated vertically sliding car doors or gates shall be permitted to be closed by momentary pressure or automatic means only for automatic or continuous-pressure operation elevators.</u></p>	<p><i>Requirements similar to 2.13.3.4</i></p> <p><i>The inclusion of detectors eliminated the need to assume that the person in control of the doors would react in time to initiate reopening.</i></p>
<p><del>2.13.3.4.3 The car door or gate shall be equipped with a reopening device conforming to 2.13.5.</del></p>	<p><i>Requirements for door reopening devices have moved to 2.13.3.4.5, 2.13.3.4.6, and 2.13.3.4.7</i></p>
<p><u>Power-operated vertically sliding doors shall have a door open means conforming to the following:</u></p> <p><u>(a) A momentary-pressure door open switch or button labeled "OPEN" shall be provided at each landing and in the car which when</u></p>	<p><i>To provide users at the landing or in the car with a means to reopen a closing hoistway door or car door or gate. Clarification added that an immediate initiation to reopen is to occur. A minimum distance the doors need to reopen has been established. The intention is to open the doors</i></p>

<p style="text-align: center;"><b>Proposal</b></p>	<p style="text-align: center;"><b>Rationale</b></p>
<p><u>operated shall cause the car door or gate and hoistway door at the landing to immediately initiate a reversal, and to fully reopen or reopen by a distance of not less than 300 mm (12 in.). The markings shown in Table 2.26.12.1 do not apply.</u></p> <p><u>(b) The door open switch or button shall not open the hoistway door, car door, or gate at any other landing.</u></p> <p><u>(c) Any door open switch or button at a landing shall open only that hoistway door and the car door or gate at the entrance where such means is located. The opening switch or button shall be located adjacent to the door(s) or gate(s) that it controls.</u></p> <p><u>(d) For elevators having more than one hoistway opening at any landing level, a separate door open switch or button shall be provided in the car for each car door or gate and its adjacent hoistway door.</u></p>	<p><i>sufficiently to remove the object. Added requirements for labeling the door open button.</i></p> <p><i>Since the inertia present within the system does not allow any moving mass to instantly stop, there is no scenario where a person situated adjacent to the leading edge of a closing door cannot be struck by the door. The best possible alternative is to lower the probability. In this proposal, the arrangement of the detection means and the requirement that the doors not close or, if closing, reopen when an obstruction is detected, suggests that once the person has entered the path of the door, regardless of location of the doors, the doors will react.</i></p> <p><i>Immediate initiation of reversal is required, which suggests that the control system and motor are attempting to initiate a reversal. However due to inertia there is a time delay before the doors physically reverse direction. That time delay varies with numerous factors including door mass, speed, electro-motor force, friction, etc...</i></p> <p><i>In the current requirements, reversal is not initiated until there is physical contact with the obstruction. In this proposal, contact resulting from closing door inertia results only if a person places a body part in a position at or just in front of the leading edge of the moving panel, a low probability occurrence for body parts such as the head.</i></p>
<p><u>2.13.3.4.4 A momentary pressure switch or button shall be provided in the car and at each landing, which, when operated, shall cause the car door or gate and the hoistway door at the landing to stop or to stop and reopen. The average closing speed shall not exceed 0.3 m/s (1 ft/s) for a vertical slide-up to open hoistway door or for each panel of a vertically sliding biparting hoistway door, and shall not exceed 0.6 m/s (2 ft/s) for a vertically sliding car door or gate.</u></p>	<p><i>Requirements for door open buttons with momentary pressure operation are in 2.13.3.3.</i></p> <p><i>Requirements moved from 2.13.3.4.5.</i></p>
<p><u>2.13.3.4.5 The average closing speed shall not exceed 0.3 m/s (1 ft/s) for a vertically sliding counterweighted hoistway door or for each panel of a biparting counterbalanced hoistway door or car gate, and shall not exceed 0.6 m/s (2 ft/s) for a vertically sliding counterweighted car door or gate. Vertical slide-up to open hoistway doors with power-operated vertical slide-up to open car doors or gates without sequence operation (see 2.13.6) shall conform to 2.13.3.4.5(a) through (c), 2.13.3.4.8 and 2.13.3.4.9.</u></p>	<p><i>Moved to 2.13.3.4.4.</i></p> <p><i>There are different requirements and different object detection zones for doors with and without sequence operation. The required object detection zones and reopening requirements incorporated in 2.13.3.4.5 eliminated the need for sequence operation</i></p>
<p><u>(a) Device(s) shall be provided that detect an object in the shape of a rectangular prism measuring 170 mm (6.75 in.) high, with a base 140 mm (5.5 in.) wide and 140 mm (5.5 in.) deep, oriented with the base parallel to the floor and the width parallel to the face of the door, in the following locations:</u></p>	
<p><u>(1) Anywhere within the opening width of the hoistway door and car door or gate when located immediately adjacent to the vertical plane established by the landing side of the hoistway door and where the object is located wholly within a vertical zone extending from the</u></p>	<p><i>2.13.3.4.5(a)(1) To detect an object of small size adult head (assures that larger size body parts are also protected) located anywhere from the floor to the height of a standing tall large size adult located adjacent to the</i></p>

Proposal	Rationale
<p><u>landing floor to a horizontal plane at:</u></p> <p>(a) 1880 mm (74 in.) above the floor; or  (b) the leading edge of the door if the leading edge is less than 1880 mm (74 in) above the floor.</p>	<p><i>path of the landing side door. The prism dimensions were taken from ISO 3411-1995(E). See also general rationale for different object sizes located at 2.13.3.4</i></p>
<p>(2) <u>Anywhere within the opening width of the hoistway door and car door or gate when located immediately adjacent to the vertical plane established by the car side of the car door or gate and where the object is located wholly within a vertical zone extending from the car floor to a horizontal plane at:</u></p> <p>(a) 1880 mm (74 in.) above the floor; or  (b) the leading edge of the door if the leading edge is less than 1880 mm (74 in) above the floor.</p> <p><i>NOTE [2.13.3.4.5(a)]: See Nonmandatory Appendix ??, Figures 2.13.3.4.5 (a)(1) and 2.13.3.4.5 (a)(2).</i></p>	<p><i>2.13.3.4.5(a)(2) To detect an object of small size adult head (assures that larger size body parts are also protected) located anywhere from the floor to the height of a standing tall large size adult located adjacent to the path of the car side door or gate. The prism dimensions were taken from ISO 3411-1995(E). See also general rationale for different object sizes located at 2.13.3.4.</i></p> <p><i>According to SAE J833, the standing height from floor to the top of the head of a tall adult male in the 95 percentile with shoes was 1880 mm (74 in.).</i></p>
<p>(b) <u>Device(s) shall be provided that detect an object in the shape of a rectangular prism measuring 400 mm (16 in.) high, with a base 210 mm (8.25 in.) wide and 210 mm (8.25 in.) deep, oriented with the base parallel to the floor and the width parallel to the face of the door in the following location:</u></p> <p>(1) <u>Anywhere within the opening width of the hoistway door and car door or gate when wholly or partially located between the vertical planes established by the landing side of the hoistway door and the car side of the car door or gate, and wholly located between horizontal planes at 480 mm (19 in.) above the car floor or landing floor and at:</u></p> <p>(a) 1500 mm (59 in.) above the associated car or landing floor;  or  (b) the leading edge of the door if the leading edge is less than 1500 mm (59 in) above the floor.</p> <p><i>NOTE [2.13.3.4.5(b)]: See Nonmandatory Appendix ??, Figure 2.13.3.4.5 (b).</i></p>	<p><i>2.13.3.4.5(b) To detect an object of small size standing adult torso (assures that larger size body parts are also protected) located within the defined zone (480 mm to 1500 mm) of the landing door and car side door or gate, that may not be addressed by 2.13.4.5(a). Anthropometric data shows that the torso will fall within the defined zone. The prism dimensions were taken from ISO 3411-1995(E) and SAE J833 - R1989. See also general rationale for different object sizes located at 2.13.3.4</i></p>
<p>(c) <u>Device(s) shall be provided that detect an object in the shape of a rectangular prism measuring 50 mm (2 in.) high, with a base 95 mm (3.75 in.) wide and 125 mm (5 in.) deep, oriented with the base parallel to the floor and the width parallel to the face of the door anywhere within the opening width of the car door or gate that is located on the car floor immediately adjacent to the vertical plane established by the car side of the lower panel of the car door or gate.</u></p> <p><u>Detection device(s) shall not be required when the car door or gate is provided with:</u></p> <p>(1) <u>A means to stop the closing panel when the distance between rigid members of the panel and the car platform is not less than 50 mm (2 in.) when fully closed, and</u>  (2) <u>A non-shearing, non-crushing member on the leading edge of the panel that shall provide a minimum clearance at full compression of 50 mm (2 in.) when fully closed.</u></p> <p><i>NOTE [2.13.3.4.5(c)]: See Nonmandatory Appendix ??, Figure</i></p>	<p><i>2.13.3.4.5(c) To detect an object equal to the size of the front of shoe for a small sized adult located on the floor of the car and in the path of the car side of the car door or gate. The object thickness was estimated, the object width was from ISO 3411-1995(E) and the object depth was calculated as 1/2 the shoe length dimension from ISO 3411-1995(E).</i></p> <p><i>Detection devices are not required when the design inherently mitigates the effects of foot entrapment between the leading edge of the car door or gate and the car platform.</i></p>

Proposal	Rationale
<u>2.13.3.4.5 (c).</u>	
<u>2.13.3.4.6 Vertical slide-up to open hoistway doors with power-operated vertical slide-up to open car doors or gates with sequence operation (see 2.13.6) shall conform to 2.13.3.4.6(a) through (g), 2.13.3.4.8 and 2.13.3.4.9.</u>	<i>There are different requirements and different object detection zones for doors with and without sequence operation.</i>
<u>(a) Closing in compliance with 2.13.6.1.2 shall be provided.</u>	
<u>(b) A yellow and black diagonally striped hazard-warning of not less than 38 mm (1.5 in.) wide shall be provided along the landing side leading edge of the lowermost hoistway door panel.</u>	<i>To advise users of potential hazards.</i>
<p><u>(c) Device(s) shall be provided that detect an object in the shape of a rectangular prism measuring 170 mm (6.75 in.) high, with a base 140 mm (5.5 in.) wide and 140 mm (5.5 in.) deep, oriented with the base parallel to the floor and the width parallel to the face of the door, in the following locations:</u></p> <p><u>(1) Anywhere within the opening width of the car door or gate when located immediately adjacent to the vertical plane established by the landing side of the car door or gate and where the object is located wholly within a vertical zone extending from the car floor to a horizontal plane at:</u></p> <p><u>(a) 1880 mm (74 in.) above the floor; or</u>  <u>(b) the leading edge of the door if the leading edge is less than 1880 mm (74 in) above the floor.</u></p> <p><u>NOTE [2.13.3.4.6(c)(1)]: See Nonmandatory Appendix ??, Figure 2.13.3.4.6(c)(1).</u></p>	<p>2.13.3.4.6(c)(1) <i>To detect an object of small size adult head (assures that larger size body parts are also protected) located anywhere from the floor to the height of a standing tall large size adult located adjacent to the path of the landing side car door or gate. The prism dimensions were taken from ISO 3411-1995(E).</i></p> <p><i>According to SAE J833, the standing height from floor to the top of the head of a tall adult male in the 95 percentile with shoes was 1880 mm (74 in.).</i></p>
<p><u>(2) Anywhere within the opening width of the hoistway door and car door or gate when located immediately adjacent to the vertical plane established by the car side of the car door or gate and where the object is located wholly within a vertical zone extending from the car floor to a horizontal plane at:</u></p> <p><u>(a) 1880 mm (74 in.) above the floor; or</u>  <u>(b) the leading edge of the door if the leading edge is less than 1880 mm (74 in) above the floor.</u></p> <p><u>NOTE [2.13.3.4.6(c)(2)]: See Nonmandatory Appendix ??, Figure 2.13.3.4.5(a)(2).</u></p>	<p>2.13.3.4.6(c)(2) <i>To detect an object of small size adult head (assures that larger size body parts are also protected) located anywhere from the floor to the height of a standing tall large size adult located adjacent to the path of the car side of the car door or gate. The prism dimensions were taken from ISO 3411-1995(E). See also general rationale for different object sizes located at 2.13.3.4</i></p>
<p><u>(d) Device(s) shall be provided that detect an object in the shape of a rectangular prism measuring 400 mm (16 in.) high, with a base 210 mm (8.25 in.) wide and 210 mm (8.25 in.) deep, oriented with the base parallel to the floor and the width parallel to the face of the door in the following location:</u></p> <p><u>(1) Anywhere within the opening width of the hoistway door and car door or gate when wholly or partially located between the vertical planes established by the landing side of the car door or gate and the car side of the car door or gate, and wholly located between horizontal planes at 480 mm (19 in.) above the car floor and at:</u></p> <p><u>(a) 1500 mm (59 in.) above the car floor; or</u>  <u>(b) the leading edge of the door if the leading edge is less than</u></p>	<p>2.13.3.4.6(d) <i>To detect an object of small adult torso (assures that larger size body parts are also protected) size located anywhere from the floor to the shoulder height of a seated, squatting, or standing tall large size adult located within the path of the car door or gate. The prism dimensions were taken from ISO 3411-1995(E) and SAE J833 - R1989. See also general rationale for different object sizes located at 2.13.3.4.</i></p>

Proposal	Rationale
<p><u>1500 mm (59 in) above the floor.</u></p> <p><i>NOTE [2.13.3.4.6(d)]: See Nonmandatory Appendix ??, Figure 2.13.3.4.6(d).</i></p>	
<p><u>(e) Device(s) shall be provided that detect an object in the shape of a rectangular prism measuring 50 mm (2 in.) high, with a base 95 mm (3.75 in.) wide and 125 mm (5 in.) deep, oriented with the base parallel to the floor and the width parallel to the face of the door anywhere within the opening width of the car door or gate that is located on the car floor immediately adjacent to the vertical planes established by the car side and the landing side of the lower panel of the car door or gate.</u></p> <p><u>Detection device(s) shall not be required when the car door or gate is provided with:</u></p> <p><u>(1) A means to stop the closing panel when the distance between rigid members of the panel and the car platform is not less than 50 mm (2 in.), and</u></p> <p><u>(2) A non-shearing, non-crushing member that shall provide a minimum clearance at full compression of 50 mm (2 in.) when in contact with the stops.</u></p> <p><i>NOTE [2.13.3.4.6(e)]: See Nonmandatory Appendix ??, Figures 2.13.3.4.6(e) and 2.13.3.4.5(c).</i></p>	<p>2.13.3.4.6(e) <i>To detect an object equal to the size of the front of shoe for a small sized adult located on the floor of the car and in the path of the car side of the car door or gate. The object thickness was estimated, the object width was from ISO 3411-1995(E) and the objected depth was calculated as ½ the shoe length dimension from ISO 3411-1995(E).</i></p> <p><i>Detection devices are not required when the design inherently mitigates the effects of foot entrapment between the leading edge of the car door or gate and the car platform.</i></p>
<p><u>(f) A continuously sounding audible signal shall be provided with a sound level of 10 dBA minimum above ambient but shall not exceed 90 dBA when measured at the landing with car door or gate closed, which shall sound 5 seconds prior to car door or gate closing and continue to sound until the hoistway door is fully closed.</u></p> <p><u>(g) A flashing visual signal shall be provided that is visible from the landing with the car door or gate closed and shall light 5 seconds prior to car door or gate closing and continue to light until the hoistway door is fully closed.</u></p>	<p>2.13.3.4.6 (f) and 2.13.3.4.6 (g) <i>To provide additional warning, beyond the closing car door or gate, that a slide-up to open hoistway door is closing.</i></p> <p><i>Note that the rising lower panel of a bi-parting door, in addition to the closing car door or gate, warns users that bi-parting doors are closing, as such an audible/visual warning was not necessary.</i></p>
<p><b>2.13.3.4.7</b> <u>Vertical bi-parting hoistway doors with power-operated car doors or gates shall conform to 2.13.3.4.7(a) through (g), 2.13.3.4.8 and 2.13.3.4.9.</u></p> <p><u>(a) Closing in compliance with 2.13.6.1.2 shall be provided.</u></p>	<p><i>Sequence closing is now required for both continuous and momentarily pressure closing.</i></p>
<p><u>(b) The closing speed of each bi-parting hoistway panel shall be limited to a maximum of 0.15 m/s (0.5 ft/s) when the closing panels are 250 mm (10 in.) or less from full close.</u></p>	<p><i>To reduce the potential impact if a person has a body part between closing door panels, although contact may occur.</i></p> <p><i>Slow closing and the specified dimension were intended to give users additional time to react and remove a body part that might be located between closing bi-parting door panels.</i></p> <p><i>To give time for a user with a head size of 170 mm a time of 0.5 s (corresponding to 75 mm at 0.15 m/s) to remove head prior to contact.</i></p>
<p><u>(c) A yellow and black diagonally striped hazard-warning of not less than 38 mm (1.5 in.) wide shall be provided along the landing side leading edge of the lowermost hoistway door panel.</u></p>	<p><i>To advise users of potential hazards.</i></p> <p><i>Bi-parting panels do not have detection devices. In</i></p>

Proposal	Rationale
<p><u>(d) Device(s) shall be provided that detect an object in the shape of a rectangular prism measuring 170 mm (6.75 in.) high, with a base 140 mm (5.5 in.) wide and 140 mm (5.5 in.) deep, oriented with the base parallel to the floor and the width parallel to the face of the door, in the following locations:</u></p> <p><u>(1) Anywhere within the opening width of the car door or gate when located immediately adjacent to the vertical plane established by the landing side of the car door or gate and where the object is located wholly within a vertical zone extending from the car floor to a horizontal plane at:</u></p> <p><u>(a) 1880 mm (74 in.) above the floor; or</u>  <u>(b) the leading edge of the door if the leading edge is less than 1880 mm (74 in) above the floor.</u></p> <p><u>NOTE [2.13.3.4.7(d)(1)]: See Nonmandatory Appendix ??, Figure 2.13.3.4.7(d)(1)</u></p>	<p><i>combination with other safety means the warning strip is intended to remind users not to insert body parts between closing door panels.</i></p> <p>2.13.3.4.7(d)(1) <i>To detect an object of small size adult head (assures that larger size body parts are also protected) located anywhere from the floor to the height of a standing tall large size adult located adjacent to the path of the landing side car door or gate. The prism dimensions were taken from ISO 3411-1995(E). See also general rationale for different object sizes located at 2.13.3.4</i></p> <p><i>According to SAE J833, the standing height from floor to the top of the head of a tall adult male in the 95 percentile with shoes was 1880 mm (74 in.).</i></p>
<p><u>(2) Anywhere within the opening width of the car door or gate when located immediately adjacent to the vertical plane established by the car side of the car door or gate and where the object is located wholly within a vertical zone extending from the car floor to a horizontal plane at:</u></p> <p><u>(a) 1880 mm (74 in.) above the floor; or</u>  <u>(b) the leading edge of the door if the leading edge is less than 1880 mm (74 in) above the floor.</u></p> <p><u>NOTE [2.13.3.4.7(d)(2)]: See Nonmandatory Appendix ??, Figure 2.13.3.4.7(d)(2).</u></p>	<p>2.13.3.4.7(d)(2) <i>To detect an object of small size adult head (assures that larger size body parts are also protected) located anywhere from the floor to the height of a standing tall large size adult located adjacent to the path of the car side of the car door or gate. The prism dimensions were taken from ISO 3411-1995(E). See also general rationale for different object sizes located at 2.13.3.4.</i></p>
<p><u>(e) Device(s) shall be provided that detect an object in the shape of a rectangular prism measuring 400 mm (16 in.) high, with a base 210 mm (8.25 in.) wide and 210 mm (8.25 in.) deep, oriented with the base parallel to the floor and the width parallel to the face of the door in the following location:</u></p> <p><u>(1) Anywhere within the opening width of the car door or gate when wholly or partially located between the vertical planes established by the landing side of the car door or gate and the car side of the car door or gate, and wholly located between horizontal planes at 480 mm (19 in.) above the car floor and at:</u></p> <p><u>(a) 1500 mm (59 in.) above the car floor; or</u>  <u>(b) the leading edge of the door if the leading edge is less than 1500 mm (59 in) above the floor.</u></p> <p><u>NOTE [2.13.3.4.7(e)]: See Nonmandatory Appendix ??, Figure 2.13.3.4.7(e).</u></p>	<p>2.13.3.4.7(e) <i>To detect an object of small size adult torso (assures that larger size body parts are also protected) located anywhere from the floor to the shoulder height of a seated, squatting, or standing tall large size adult located within the path of the car door or gate. The prism dimensions were taken from ISO 3411-1995(E) and SAE J833 - R1989. See also general rationale for different object sizes located at 2.13.3.4</i></p>
<p><u>(f) Device(s) shall be provided that detect an object in the shape of a</u></p>	<p>2.13.3.4.6(f) <i>To detect an object equal to the size of the</i></p>

Proposal	Rationale
<p><u>rectangular prism measuring 50 mm (2 in.) high, with a base 95 mm (3.75 in.) wide and 125 mm (5 in.) deep, oriented with the base parallel to the floor and the width parallel to the face of the door anywhere within the opening width of the car door or gate that is located on the car floor immediately adjacent to the vertical planes established by the car side and the landing side of the lower panel of the car door or gate.</u></p> <p><u>Detection device(s) shall not be required when the car door or gate is provided with:</u></p> <p><u>(1) A means to stop the closing panel when the distance between rigid members of the panel and the car platform is not less than 50 mm (2 in.), and</u></p> <p><u>(2) A non-shearing, non-crushing member that shall provide a minimum clearance at full compression of 50 mm (2 in.) when in contact with the stops.</u></p> <p><u>NOTE [2.13.3.4.7(f)]: See Nonmandatory Appendix ??, Figure 2.13.3.4.7(f).</u></p>	<p><i>front of shoe for a small sized adult located on the floor of the car and in the path of the car side of the car door or gate. The object thickness was estimated, the object width was from ISO 3411-1995(E) and the objected depth was calculated as 1/2 the shoe length dimension from ISO 3411-1995(E).</i></p>
<p><u>(g) Device(s) shall be provided that detect an object in the shape of a rectangular prism measuring, 50 mm (2 in.) high, with a base of 250 mm (10 in.) wide and 95 mm (3.75 in.) deep, oriented with the base parallel to the floor and the width parallel to the face of the door, that is located on the car floor anywhere within the horizontal distance between the car side of the hoistway door to the vertical plane of the landing side of the car door or gate, measured at 50 mm (2 in.) above the car floor.</u></p> <p><u>Detection device(s) shall not be required when the horizontal distance from the car side of the fully open hoistway door measured at the hoistway door sill to the vertical plane of the landing side of the fully closed car door or gate measured at 50 mm (2 in) above the car floor, is less than 95 mm (3.75 in.).</u></p> <p><u>NOTE [2.13.3.4.7(g)]: See Nonmandatory Appendix ??, Figure 2.13.3.4.7(g).</u></p>	<p><i>2.13.3.4.5(h) If the distance between the closed car door and the car side sill of the open hoistway door is large enough for a person's foot to be entrapped, then an object of shoe size is to be detected.</i></p>
<p><b><u>2.13.3.4.8</u></b> <u>If an object has been detected in accordance with 2.13.3.4.5(a), (b) or (c), 2.13.3.4.6(c), (d) or (e), or 2.13.3.4.7(d), (e), (f) or (g), where applicable, the hoistway door and car door or gate shall not close, or if closing, shall cause the car door or gate and the hoistway door at the landing to immediately initiate a reversal, and to fully reopen or reopen by a distance of not less than 300 mm (12 in.).</u></p>	<p><i>To reduce the probability of contact, two provisions have been added. The first is to prohibit closing if the object is present in the detection zones. The second is that a closing door must stop and reopen when the object enters a detection zone. Physical contact is not required to initiate reopening, although contact may occur before the door reverses.</i></p> <p><i>Clarification added that an immediate initiation to reopen is to occur. A minimum distance the doors need to reopen has been established. Clarifies the zone and conditions when reopening is no longer required.</i></p> <p><i>Since the inertia present within the system does not allow any moving mass to instantly stop, there is no scenario where a person situated adjacent to the leading edge of a closing door cannot be struck by the door. The best possible alternative is to lower the probability. In this proposal, the arrangement of the detection means and the requirement that the doors not close or, if closing, reopen when an obstruction is detected, suggests that once the</i></p>

Proposal	Rationale
	<p><i>person has entered the path of the door, regardless of location of the doors, the doors will react.</i></p> <p><i>In the current requirements, reversal is not initiated until there is physical contact with the obstruction. In this proposal, contact resulting from closing door inertia results only if a person places a body part in a position at or just in front of the leading edge of the moving panel, a low probability occurrence for body parts such as the head.</i></p>
<p><u>2.13.3.4.9</u> After the door has reached its fully opened position and before door closing is initiated, the detection means used to comply with 2.13.3.4.5(a), (b) or (c), 2.13.3.4.6(c), (d) or (e), or 2.13.3.4.7(d), (e), (f) or (g), where applicable, shall be checked to assure that the device is capable of sensing the defined objects and the appropriate signal is sent to the operation control (see 1.3). If the device is incapable of sensing the defined object or sending the appropriate signal, power closing of the door(s) or gates(s) shall be rendered inoperative.</p>	<p><i>To verify that the detection devices are functional and to disable door closing if they are not. This requirement provides design flexibility while insuring that the device is functional. This requirement does not require redundant designs or to sense the failure of a particular component.</i></p>
<p><u>2.13.3.4.10</u> When building conditions would render ineffective or non-operational the detection means required by 2.13.3.4.5(a), (b) or (c), 2.13.3.4.6(c), (d) or (e), or 2.13.3.4.7(d), (e), (f) or (g), the following shall be provided in lieu of compliance with 2.13.3.4.5(a), (b) or (c), 2.13.3.4.6(c), (d) or (e), or 2.13.3.4.7(d), (e), (f) or (g):</p> <p>(a) <u>Continuous Pressure Closing of the car door or gate and hoistway door in compliance with 2.13.3.4.1.</u></p> <p>(b) Usage shall be limited to authorized personnel only. A sign in compliance with 2.16.5.2 shall be provided but shall read: <u>”THIS IS A FREIGHT ELEVATOR, NOT A PASSENGER ELEVATOR, AND NOT FOR PUBLIC USE. NO PERSONS OTHER THAN AUTHORIZED PERSONNEL ARE PERMITTED TO OPERATE THIS ELEVATOR.”</u></p> <p>(c) <u>Sequence operation in compliance with 2.13.6.1.</u></p> <p>(e) <u>The average closing speed of the car door or gate shall be limited to 0.20 m/s (0.67 ft/s)</u></p> <p><u>Note (2.13.3.4.10): Such building conditions include but are not limited to environments with high levels of particulates, environments impacted by detector emissions, large opening widths, excessive cold, wash down environments, etc.</u></p>	<p><i>To provide requirements where environmental or other job conditions make the use of detection devices impractical. Usage is specifically limited to “authorized” users.</i></p> <p><i>The proposed revisions provide clear guidelines to designers and the AHJ when situations arise when conditions prohibit the use of detection devices.</i></p>

Proposal	Rationale
<p><b>2.13.5 Reopening Device for Power-Operated <u>Horizontally Sliding</u> Car Doors or Gates</b></p> <p><b>2.13.5.1</b> Where required by <del>2.13.3.4 or</del> 2.13.4, a power-operated car door shall be provided with a reopening device that will function to stop and reopen a car door and the adjacent landing door sufficiently permit passenger transfer in the event that the car door or gate is obstructed while closing. If the closing kinetic energy is reduced to 3.5 J (2.5 ft-lb) or less, the reopening device shall be permitted to be rendered inoperative. The reopening device used shall be effective for substantially the full vertical opening of the door (see 2.13.4.2).</p> <p><b>2.13.5.2</b> For center-opening doors, the reopening device shall be so designed and installed that the obstruction of either door panel when closing will cause the reopening device to function.</p> <p><del><b>2.13.5.3</b> For vertically sliding doors or gates, reopening devices shall respond to any obstruction within the width of the opening to a point 125 mm (5 in.) maximum from each side of the opening.</del></p>	<p>All vertical door reopening devices have been moved to 2.13.3.4.</p>
<p><del><b>2.13.5.3</b> For vertically sliding doors or gates, reopening devices shall respond to any obstruction within the width of the opening to a point 125 mm (5 in.) maximum from each side of the opening.</del></p> <p><b>2.13.5.3</b> <del>2.13.5.4</del> Where Phase I Emergency Recall Operation by a fire alarm initiating device (see 2.27.3.2.3) is not provided, door reopening devices that can be affected by smoke or flame shall be rendered inoperative after the doors have been held open for 20 s. Door closing for power-operated doors shall conform to 2.13.5.</p>	<p>Editorial.</p>
<p><b>2.13.6 Sequence Operation for Power-Operated Hoistway Doors With Car Doors or Gates</b></p> <p><b>2.13.6.1 Where Required</b></p> <p><del><b>2.13.6.1.1</b> Sequence opening and closing shall be provided between hoistway doors and car doors or gates on passenger elevators and freight elevators permitted to carry passengers (see 2.16.4) when the elevator is equipped with power operated vertically sliding slideup to open type car doors or gates and</del></p> <p><del>(a) power operated vertically sliding biparting counterbalanced hoistway doors; or</del></p> <p><del>(b) power operated vertically sliding counterweighted hoistway doors that slide down to open.</del></p> <p><del><b>2.13.6.1.2</b> Sequence opening and/or closing shall be permitted for vertically sliding power operated hoistway doors and car doors or gates that are closed by continuous pressure means.</del></p> <p><del><b>2.13.6.1</b> <b>2.13.6.2</b> Operating Requirements.</del> The sequence operation of a hoistway door and adjacent power-operated vertically sliding car door or gate shall conform to <u>2.13.6.1.1 and 2.13.6.1.2</u> <del>2.13.6.2.1 and 2.13.6.2.2.</del></p> <p><del><b>2.13.6.1.1</b> <b>2.13.6.2.1</b></del> In opening, the hoistway door shall be opened at least two-thirds of its travel before the car door or gate can start to open.</p> <p><del><b>2.13.6.1.2</b> <b>2.13.6.2.2</b></del> In closing, the car door or gate shall be closed at least two-thirds of its travel before the hoistway door can start to close.</p>	<p>Deleted requirements addressed in 2.13.3.4.</p>

Proposal	Rationale
<p><b>2.14.6.2.1</b> On elevators used exclusively for freight, car doors and gates shall be either of the balanced counterweighted type that slide up or down to open, or of the biparting counterbalanced type. They shall be manually operated or power operated. <u>Where power-operated vertically sliding biparting counterbalanced or a power-operated vertically sliding counterweighted hoistway door are provided, facing car doors and gates shall be of the power operated balanced counterweighted type that slide up to open.</u></p>	<p><i>Object detection and reversal of power operated vertical freight doors require that car doors and gates be power operated and of a type which slide-up to open.</i>  <i>Clarification that power opened only doors are permitted and that power closed doors must also be power-openable.</i></p>
<p><b>2.16.4.9</b> Power-operated vertically sliding doors shall be power closed conforming to the following:  (a) requirements <del>2.13.3.2</del> or 2.13.3.4.  <del>(b) shall be provided with a reopening device conforming to 2.13.5. The reopening device shall detect obstruction in the path of closing door travel without the necessity of physical contact. This can be provided by mounting the protection device(s) on the car door itself or on the car or door jamb.</del>  (c) vertically sliding hoistway and car doors shall conform to 2.13.6.  <del>(b)(d)</del> supporting chains, cables, or ropes shall not be exposed to the car interior.  <del>(e) when closed by automatic means, shall be provided with a visual warning to function over the same period as the audible signal in 2.13.3.4.1.</del></p>	<p><i>All vertical door protection items are now addressed in 2.13.3.4. Additional requirements have also been added that supersede the deleted requirements in 2.16.4.9.</i></p>
<p><b>2.16.5.1.2</b> For freight elevators not permitted to carry passengers, the sign shall read: <u>“THIS IS A FREIGHT ELEVATOR, NOT A PASSENGER ELEVATOR, AND NOT FOR GENERAL PUBLIC USE.” NO PERSONS OTHER THAN THE OPERATOR AND FREIGHT HANDLERS ARE PERMITTED TO RIDE ON THIS ELEVATOR.</u></p>	<p><i>Freight elevators are often used by non-employees of the building or facility, such as package delivery personnel. New requirements have been added in 2.13.3.4 to protect all potential adult users.</i></p>
<p>2.16.5.2 Material and Marking of Signs. <del>The</del> Material and marking of all signs shall conform to 2.16.3.3, except that the letters shall be not less than 13 mm (0.5 in.) high.</p>	<p>Editorial clarification</p>
<p><b>2.27.3.1.6</b>  (d)(2) Elevators having power-operated vertically sliding doors provided with automatic or momentary pressure closing operation <del>per 2.13.3.4</del> shall have the closing sequence initiated without delay in accordance with <del>2.13.2.4 2.13.3.4.1, 2.13.3.4.2, 2.13.3.4.3, and 2.13.3.4.5,</del> and the car shall proceed to the designated level.  (e) Door reopening devices for power-operated doors that are sensitive to smoke or flame shall be rendered inoperative without delay. Door reopening devices not sensitive to smoke or flame (e.g., mechanically actuated devices) are permitted to remain operative.  (1) Door closing for power-operated <u>horizontally sliding doors</u> shall conform to 2.13.5.  (2) <u>Door closing for power-operated vertically sliding doors, shall conform to 2.13.6.1.2 and shall have an average closing car door or gate speed not to exceed 0.20 m/s (0.67 ft/s).</u></p>	<p><i>To address the need to close the doors in a fire situation while at the same time reducing the kinetic energy of the entire gate and door system to a value associated with the gate closing sequence operation.</i>  <i>2.27.3.1.6(e)(2). Equivalent to that currently required for vertical sliding doors during phase one operation.</i></p>
<p><b>2.27.3.3.1</b></p>	<p><i>To delete requirements for detection devices and</i></p>

Proposal	Rationale
<p>(d) The opening of power-operated doors shall be controlled only by a continuous pressure door open button. If the button is released prior to the doors reaching the normal open position, the doors shall automatically reclose. Requirements 2.13.3.3, <u>2.13.3.4.2, 2.13.3.4.5, 2.13.3.4.6, 2.13.3.4.7, 2.13.3.4.8, 2.13.3.4.9</u> <del>2.13.3.4</del>, 2.13.4.2.1(b)(2), and 2.13.4.2.1(c) do not apply.</p> <p>On cars with multiple entrances, if more than one entrance can be opened at the same landing, separate door open buttons shall be provided for each entrance.</p>	<p><i>momentary pressure operation, when the elevator is in Phase II.</i></p>

TN 05-833

*Proposed Revision to Part 7:*

## SCOPE

Part 7 applies to dumbwaiters and material lifts.

NOTE: See also Part 8 for additional requirements that apply to *dumbwaiters and material lifts*.

## SECTION 7.1 POWER AND HAND DUMBWAITERS WITHOUT AUTOMATIC TRANSFER DEVICES

Requirement 7.1 applies to all power and hand dumbwaiters without automatic transfer devices.

Where the term “elevator” is used in a referenced requirement, it shall mean dumbwaiter.

### 7.1.1 Construction of Hoistways and Hoistway Enclosures

The construction of hoistways and hoistway enclosures shall comply with 2.1, except as modified by 7.1.1.1 through 7.1.1.5 ~~4~~.

**7.1.1.1** Requirement 2.1.1.1 applies, except where dumbwaiters are installed in a private residence. In private residences, fire-resistive construction shall conform to the requirements of the building code, ~~or where no building code has been enacted, the CABO One and Two Family Dwelling Code.~~

**7.1.1.2** Requirement 2.1.2.1 does not apply. Where a hoistway extends into the top floor of a building, fire-resistive hoistway or machinery-space enclosures, where required, shall be constructed in accordance with the requirements of the building code (see 1.3).

**7.1.1.3** Requirement 2.1.3.1 does not apply. ~~Hand and power dumbwaiter machines and sheaves shall be permitted to be located inside the hoistway enclosure at the top or bottom without intervening enclosures or platforms.~~ If a floor is provided at the top of the hoistway, it shall comply with 7.1.1.4 ~~7.1.1.5~~.

**7.1.1.4** Requirement 2.1.3.2 does not apply.

**7.1.1.4** ~~7.1.1.5~~ Requirement 2.1.3.2 ~~2.1.3.3~~ does not apply. The floor shall be designed in accordance with other floors in the building. Where the dumbwaiter machine is to be supported by machine room floor, the floor shall be designed in accordance with 2.9.4 and 2.9.5.

*Requirements 7.1.2 through 7.1.6 remain unchanged.*

### 7.1.7 Machinery Spaces, Machine Rooms, Control Spaces and Control Rooms ~~Machinery Spaces~~

Machinery Spaces, machine rooms, control spaces and control rooms ~~machinery spaces~~ shall comply with 2.7, except as modified by 7.1.7.1 through 7.1.7.11.

**7.1.7.1** Requirement 2.7.1.1 applies only where a separate machinery space is provided.

**7.1.7.2** Requirement 2.7.1.2 applies only where a separate machinery space is provided.

**7.1.7.3** Dumbwaiter machine rooms shall conform to 2.7.2 or the following:

~~(a) Dumbwaiter machine and control equipment shall be permitted to be located in a room or space containing other equipment essential to the operation of the building, provided that all exposed moving parts are fully guarded. See 7.1.8.2.~~

~~(b) (a)~~ Guards on dumbwaiter equipment shall prevent accidental contact with moving parts and shall permit visual inspection without complete removal.

~~(c)~~ **(b)** Where a dumbwaiter machine is located at the bottom of the hoistway, the control equipment shall be located outside the hoistway or in a cabinet on the inside surface of the access door.

**7.1.7.4** Requirement 2.7.3.1 does not apply. A means of access to dumbwaiter machine rooms and overhead machinery spaces shall be provided, from outside the hoistway, for elevator personnel.

**7.1.7.5** Requirement 2.7.3.3 applies only where a separate machine room or control room is provided for machine and control equipment.

7.1.7.6 Access doors and openings shall conform to 2.7.3.4 except as modified by 7.1.7.6.1 and 7.1.7.6.2.

Requirement 2.7.3.4.1 applies only where a separate machine room is provided and complete bodily entry is necessary.

7.1.7.6.1 Requirements 2.7.3.4.3, 2.7.3.4.4 and 2.7.3.4.5 do not apply.

7.1.7.6.2 Requirement 2.7.3.4.6 ~~2.7.3.4.3~~ applies, except the maximum width of an access opening located not more than 1 525 mm (60 in.) above the lowest point of the hoistway, contiguous to and in vertical alignment with a hoistway entrance, shall be the lesser of 1 220 mm (48 in.) or the hoistway entrance width.

Hoistway access openings shall be provided with an electric contact that will cause interruption of power to the motor and brake when the access door is open.

7.1.7.7 Requirement 2.7.3.5 does not apply.

7.1.7.8 Requirement 2.7.4 does not apply.

7.1.7.9 Lighting, temperature and humidity shall conform to 2.7.9 except 2.7.9.2 does not apply. Where there is a machine room, it shall be provided with natural or mechanical ventilation to avoid overheating of the electrical equipment to ensure normal operation of the dumbwaiter.

~~7.1.7.9 Requirement 2.7.5.2 does not apply. Where there is a separate machine room, it shall be provided with natural or mechanical ventilation to avoid overheating of the electrical equipment to ensure normal operation of the dumbwaiter.~~

7.1.7.10 Requirement 2.7.6 does not apply.

7.1.7.11 Requirement 2.7.8.4 does not apply.

### **7.1.8 Electrical Equipment, Wiring, Pipes, Ducts, and HVAC in Hoistways and Machine Rooms**

Electrical equipment, pipes, and ducts in hoistways, machine rooms, and machinery spaces shall comply with 2.8, except as modified by 7.1.8.1 and 7.1.8.2.

7.1.8.1 Type SF or equivalent wire is not required for the wiring to the hoistway door interlock from the hoistway riser.

7.1.8.2 Requirement 2.8.1 does not apply. Dumbwaiter machine and control equipment shall be permitted to be located in a room or space containing other equipment essential to the operation of the building, provided that all exposed moving parts are guarded.

~~7.1.8.3~~ Requirement 2.8.3.3 ~~2.8.2.3~~ does not apply. Sprinklers shall be permitted in the hoistway when conforming to NFPA 13 or the NBCC, whichever is applicable (see Part 9). All sprinkler risers and returns shall be located outside the hoistway.

*Requirements 7.1.9 through 7.1.9.3 remains unchanged.*

7.1.9.4 Requirement 2.9.3.3.1 does not apply. Machines, sheaves, equipment and hitches shall be permitted to be secured to and supported by the guide rails and structural walls.

### **7.1.10 Guarding of Equipment**

Requirement 2.10 does not apply, except that the guarding of equipment shall comply with 2.10.1.

Hand and power dumbwaiter machines and sheaves shall be permitted to be located inside the hoistway enclosure at the top or bottom without intervening enclosures or platforms.

*Requirements 7.1.11 through 7.2.11 remain unchanged.*

**Requirement 7.2.12 remains unchanged except for the following:**

**Add the following requirements:**

7.2.12.29 Requirement 2.26.2.33 does not apply.

Renumber the remainder of the requirements (i.e. 7.2.12.29 through 7.2.12.37 become 7.2.12.31 through 7.2.12.39)

Requirements 7.2.13 through 7.4.8 remain unchanged.

#### **7.4.9 Machinery Spaces, Machine Rooms, Control Spaces and Control Rooms Machinery Spaces**

Machinery spaces, machine rooms, control spaces and control rooms shall conform to 2.7 except as modified in requirements 7.4.9.1 through 7.4.9.5. Requirement 2.7 does not apply to Type B Material Lifts.

7.4.9.1 Requirement 2.7.3.4.6 applies to Type A Material Lifts except the maximum width.

7.4.9.2 Requirement 2.7.4 does not apply to Type A Material Lifts.

7.4.9.3 Requirement 2.7.5 does not apply to Type A Material Lifts except Requirement 2.7.5.1 applies only to Type A Material Lifts, where a machine room is provided and full bodily entry is necessary. If maintenance or inspections of the material lift driving machine brake or an emergency brake, or of material lift motion controllers or motor controllers located in the hoistway, is to be carried out from inside the car or from the car top, a means shall be provided to prevent uncontrolled and unexpected vertical car movement that poses a hazard to maintenance or inspection personnel. If maintenance or inspections of the material lift driving machine brake or an emergency brake or of material lift motion controllers or motor controllers is to be carried out from the pit, a mechanical device shall be provided to stop the car to create a vertical clearance as required by 7.4.6.1.3. A platform located in the car, on the car, or in the hoistway shall be permitted for access to and maintenance and inspection of equipment in machinery spaces or control spaces in the hoistway and shall comply with 2.7.5.3.1 through 2.7.5.3.4.

#### **7.4.10 Equipment in Hoistways and Machine Rooms**

Electrical equipment, wiring, pipes, and ducts in hoistways and machine rooms shall conform to 2.8, except as modified by 7.4.10.1 and ~~7.4.10.3~~ 7.4.10.2.

**7.4.10.1** Type SF or equivalent wire is not required for the wiring to the hoistway door interlock from the hoistway riser.

**7.4.10.2** Requirement ~~2.8.3.3~~ 2.8.2.3 does not apply. Standard sprinkler protection conforming to NFPA 13 or the NBCC, whichever is applicable, shall be permitted to be installed in a material lift hoistway when all risers and returns are located outside the hoistway.

**7.4.10.3** Requirement 2.8.1 does not apply to Type B Material Lifts.

***Remainder of Part 7 remains unchanged.***

***Rationale:*** *The rationale for these changes are due to changes proposed to Part 2 via TR 97-81 that are not applicable to dumbwaiters or material lifts.*

**TN 05-978**

*Proposed Revision to A17.1, Requirement 2.27.3.3.1(c):*

Door open and close buttons shall be provided for power-operated doors only and located as required by 2.27.3.3.7. The door open and door close buttons shall be labeled "OPEN" and "CLOSE" and when applicable "REAR OPEN" and "REAR CLOSE" or "SIDE OPEN" and "SIDE CLOSE" in lettering a minimum of 5 mm (0.25 in.) in height with a contrasting background. The labeling shall be on or adjacent to the buttons. Requirement 2.26.12 does not apply to these buttons.

**Rationale:** *to establish requirements for the labeling of other buttons located behind the firefighters' panel.*

*Proposed Revision to A17.1, Requirement 2.27.3.3.1(d):*

The opening of power-operated doors shall be controlled only by a continuous pressure door open button. If the button is released prior to the doors reaching the normal open position, the doors shall automatically reclose. Requirements 2.13.3.3, 2.13.3.4, 2.13.4.2.1(b)(2), and 2.13.4.2.1(c) do not apply. All door open button(s) in the car shall be operational. On cars with multiple entrances, if more than one entrance can be opened at the same landing, separate door open buttons shall be provided for each entrance in conformance with 2.27.3.3.7.

**Rationale:** *to clarify that any other door open buttons in the car, are required to be functional on Phase II.*

*Proposed Revision to A17.1, Requirement 2.27.3.3.1(e):*

Open power-operated doors shall be closed only by continuous pressure on the door close button. If the button is released prior to the doors reaching the fully closed position, horizontally sliding doors shall automatically reopen, and vertically sliding doors shall automatically stop or stop and reopen. Where provided, additional door close button(s) in the car shall be operational. On cars with multiple entrances, if more than one entrance can be opened at the same landing, separate door close buttons shall be provided for each entrance in conformance with 2.27.3.3.7.

**Rationale:** *to clarify that any other close buttons in the car are to remain operational on Phase II.*

*Proposed Revision to A17.1, Requirement 2.27.3.3.1(g):*

All door reopening devices, except the door open button(s), shall be rendered inoperative. Full speed closing shall be permitted. Landing door opening and closing buttons, where provided, shall be rendered inoperative

*Proposed Revision to A17.1, Requirement 2.27.3.3.1(h):*

Every car shall be provided with a button labeled "CALL CANCEL," located as required in 2.27.3.3.7, which shall be effective during Phase II Emergency In-Car Operation. When activated, all registered calls shall be canceled and a traveling car shall stop at or before the next available landing. Button labeling shall be in lettering a minimum of 5 mm (0.25 in.) in height with a contrasting background. The labeling shall be on or adjacent to the button.

**Rationale:** *Establish the labeling requirements for the Call Cancel button.*

*Proposed Revision to A17.1, Requirement 2.27.3.3.3(a), third sentence:*

Door open buttons in the car shall remain operative.

**Rationale:** *to clarify that door open buttons which may be provided at the landing are to remain inoperative in conformance with 2.27.3.3.1(g).*

Distinguish in-car door open function from that of a door open button that may be in the hall.

*Proposed Revision to A17.1, Requirement 2.27.3.3.7, 3<sup>rd</sup> and 4<sup>th</sup> para.:*

Where rear or side doors are provided, buttons for ~~both~~ the front, ~~and~~ rear, or side doors shall be provided in the firefighters' operation panel. The door open and door close buttons for the rear entrance (where provided) shall be labeled "~~OPEN~~ REAR OPEN" and "~~CLOSE~~ REAR CLOSE". The door open and door close buttons for the side entrance (where provided) shall be labeled "SIDE OPEN" and "SIDE CLOSE"

All buttons and switches shall be readily accessible, located not more than 1800 mm (72 in) above the floor and shall be arranged as shown in Fig 2.27.3.3.7. Requirement ~~2.26.1.2~~ 2.26.12 does not apply to these buttons and switches. The front of the cover shall contain these words "FIREFIGHTERS' OPERATION" in red letters at least 10 mm (0.4 in) high.

*Proposed revision to Fig 2.27.3.3.7*

(note – to present in ballot form we will need to actually have the graphic)

Add the word 'side' in the text indicating the lower left and lower right device positions

**Rationale:** *To add labeling requirements for the buttons required behind the locked panel. To make it clear that text labels, not symbols, are to be used on buttons behind the locked cabinet. To clarify requirements for elevators with rear or side doors, and editorially correct wrong referenced requirement contained in 2.27.3.3.7 4<sup>th</sup> para.*

*Proposed revision to:*

2.27.3.1.6.(i)

3.26.9 final sentence

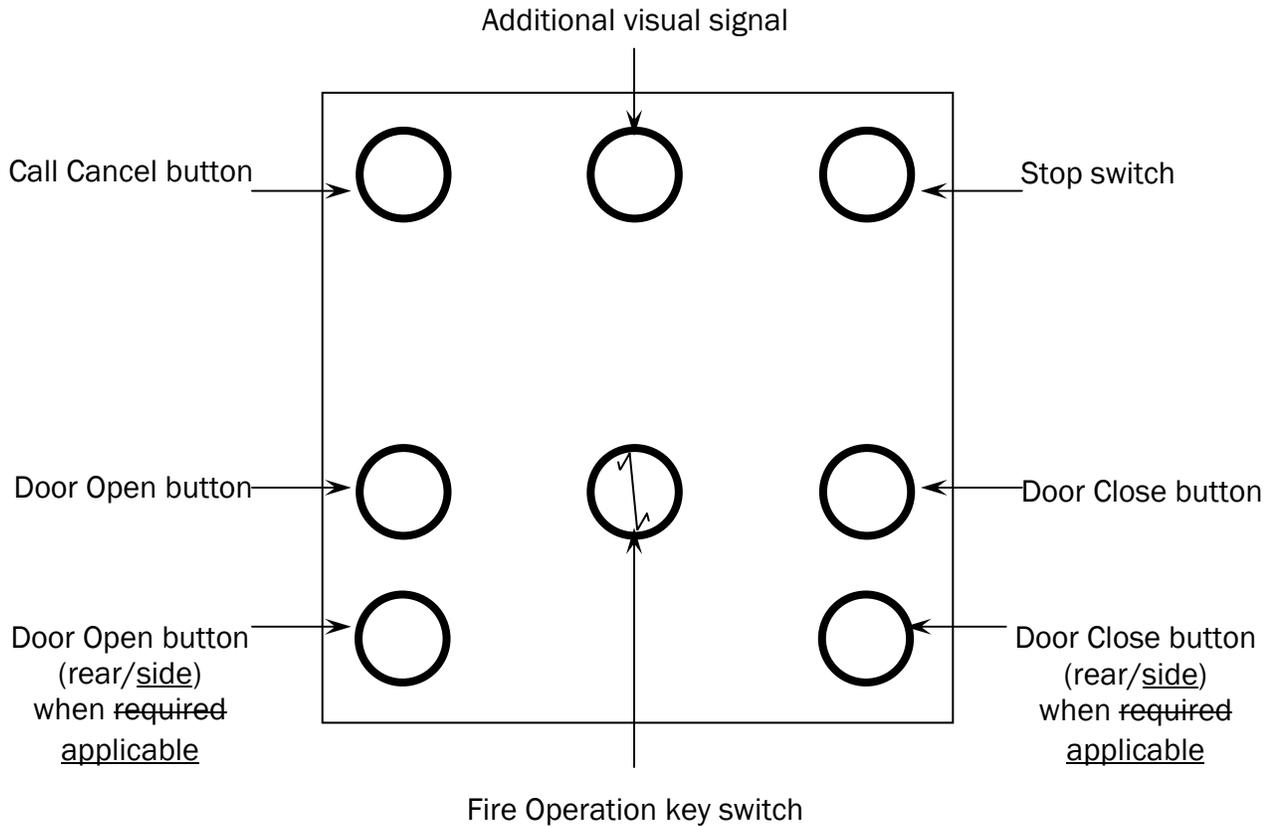
3.27.1 final sentence

3.27.2 final sentence

3.27.3. (b)

Editorial change to the word 'button' in all of these requirements - add (s) to every instance of the word button

**Rationale:** *Make button (potentially) plural - To make it clear that when the code refers to open or close buttons, it refers to rear open, side open, rear close, and side close buttons when applicable.*



GENERAL NOTES:

(a) Switches and buttons show only the location not the labeling.

~~(b) When manually operated doors are provided, door open and close buttons and instructions for their use are not required.~~

~~(c)-(b)~~ Not to scale.

Fig. 2.27.3.3.7 Panel Layout

**TN 05-1012**

*Revise 2.8.3.3.1 as follows:*

2.8.3.3.1 All risers ~~and returns~~ shall be located outside these spaces. Branch lines in the hoistway shall supply sprinklers at not more than one floor level. When the machinery space, machine room, control space, or control room is located above the roof of the building, risers, ~~return pipes~~, and branch lines for these sprinkler(s) shall be permitted to be located in the hoistway between the top floor and the machinery space, machine room, control space, or control room.

**REASON:** *To eliminate terminology not used in NFPA 13.*

**TN 05-1023**

*Proposed Revision to A17.1, Requirement 2.12.7 as follows:*

**2.12.7 Hoistway Access Switches**

**2.12.7.1 General**

**2.12.7.1.1**

When a hoistway access switch is provided it shall be located at the lowest landing for access to the pit or top landing for access to the top of the car. When two hoistway access switches are provided, one shall be located at the lowest landing and one at the top landing.

**2.12.7.1.12**

Hoistway access switches shall be provided when the rated speed is greater than 0.75 m/s (150 ft/min) at

- (a) the lowest landing ~~for access to the pit~~, when a separate pit access door is not provided; and
- (b) the top landing ~~for access to the top of the car.~~

**2.12.7.1.23**

For elevators with a speed of 0.75 m/s (150 ft/min) or less, a hoistway access switch shall be provided at the top landing when the distance from the top of the car to the landing sill exceeds 900 mm (35 in.) when the car platform is level with the landing immediately below the top landing.

***RATIONALE:*** *To clarify that access switches, whether required or provided voluntarily, should be provided at a consistent location to ensure that elevator maintenance personnel can quickly find the hoistway access switches.*

**TN 05-1216**

Proposed revision to revise requirement 8.6.1.2:

**8.6.1.2 General Maintenance Requirements**

**8.6.1.2.1** A written Maintenance Control Program shall be in place to maintain the equipment in compliance with the requirements of 8.6.

(a) The Maintenance Control Program shall consist of but not be limited to

(1) examinations, maintenance, and tests of equipment at scheduled intervals in order to ensure that the installation conforms to the requirements of 8.6. The maintenance procedures and intervals shall be based on

- (a) equipment age, condition, and accumulated wear
- (b) design and inherent quality of the equipment
- (c) usage
- (d) environmental conditions
- (e) improved technology

(2) cleaning, lubricating, and adjusting applicable components at regular intervals and repairing or replacing all worn or defective components where necessary to maintain the installation in compliance with the requirements of 8.6.

(3) all code required written procedures (e.g. check out, inspection, testing and maintenance).

(b) The instructions for locating the Maintenance Control Program shall be provided in or on the controller along with instructions on how to report any corrective action that might be necessary to the responsible party.

(c) The maintenance records required by 8.6.1.4 shall be kept at a central location.

(d) The Maintenance Control Program shall be accessible to the elevator personnel and shall document compliance with 8.6.

Rationale: Certain procedures are required by code. It is necessary for these procedures to be available to elevator personnel.

**TN 05-1217**

Revise A17.1-2004 (including A17.1a-2005), requirement 8.6.5.5.2, Oil Leakage Collection, as follows:

**8.6.5.5.2 Oil Leakage Collection of Oil Leakage.** Oil leakage collected from ~~the~~ each cylinder head seals or packing gland shall not exceed ~~20~~ 19 L (5 gal) before removal. The container shall be covered and shall not be permitted to overflow.

Reason:

1. For coordination with 3.18.3.7, Collection of Oil Leakage.
2. If the intent of the requirement is to limit collected oil leakage to 20 L, then 3.18.3.7 needs to be changed. If the intent to limit the collected oil to 5 gal, the corrected conversion to liters is  $5 \times 3.7854 = 18.927$  L.
3. Other revisions for editorial coordination.

**TN 05-1218**

Add requirement 8.6.5.13 to A17.1:

**8.6.5.13 Overspeed Valve Setting.** All elevators provided with field adjustable overspeed valves shall have the adjustment means examined to ensure the seal is intact. If the overspeed adjustment seal is not intact, compliance with 8.11.3.4.5. shall be verified and a new seal shall be installed.

Reason: To maintain the proper adjustment of overspeed valves.

**TN 05-1229**

Add 8.7.2.14.2(i)

Where an alteration consists of the installation of a car door or gate on an existing elevator car, the installation shall conform to the requirements of requirements 2.14.4, 2.14.5 and 2.14.6.

Rationale: To ensure that the installation of car doors or gates conform to the requirements of Part 2 of A17.1.

**TN 05-1264**

*Propose to revise requirement 6.1.6.3.16 as follows:*

**6.1.6.3.16 Dynamic Skirt Panel Obstruction Device.** Means shall be provided to cause the electric power to be removed from the escalator driving-machine motor and brake if an object becomes caught between the dynamic skirt panel and the dynamic skirt panel cover in the upper or lower transition zone. The device shall be of the manual-reset type. The escalator shall stop before that object reaches the balustrade with any load up to full brake rated load with the escalator running (see 6.1.3.9.3(a)(2) and (b)(2)).

*Propose to revise requirement 6.1.5.3.1(d)(5) as follows:*

(5) the maximum stopping distance with rated load in the down direction that corresponds to the minimum distance between: ~~the comb and the step when the step is positioned to activate any of the electrical protective devices required in 6.1.6.3.6, 6.1.6.3.9, 6.1.6.3.11, or 6.1.6.5.~~

a) the comb and the step when the step is positioned to activate any of the safety devices required in 6.1.6.3.6, 6.1.6.3.9, 6.1.6.3.11, 6.1.6.5, or;

b) the activation point of the Dynamic Skirt Panel Obstruction Device (6.1.6.3.16) and the entrance of the skirt panel into the balustrade.

***Rationale:*** A requirement was added to 6.1.6.3.16 to cover the maximum stopping distance.

*The dynamic skirt panel obstruction device was added to detect objects caught between the dynamic skirt panel and the dynamic skirt panel cover in the transition zone. The function is very similar to the skirt obstruction device of requirement 6.1.6.3.6. Like the skirt obstruction device this device removes power from the driving machine motor and brake. The escalator should stop before the step attached to the dynamic skirt panel reaches the comb plate. Without this revision the device may be placed at a distance from the comb plate less than the maximum stopping distance. The result would be that the object caught between the panel and panel cover will impact at the point where the panel enters the balustrade. There is no similar device or requirement for moving walks.*

**TN 05-1266**

Revise:

**2.12.7.3 Operating Requirements.** The operation of the switch shall permit movement of the car with the hoistway door at this landing unlocked or not in the closed position, and with the car door ~~or gate unlocked or~~ not in the closed position, or with the car gate not in the closed position, subject to the requirements of 2.12.7.3.1 through 2.12.7.3.8.

Revise:

**2.26.1.5.5** When the “CAR-DOOR BYPASS” switch is in the “BYPASS” position, it shall permit top -of- car and in-car inspection operation with open car door ~~(or gate)~~ interlocks or car door or gate contacts.

Revise 2.26.9.3(e):

(e) ~~render continue to make~~ ineffective any hoistway-door or car door interlock, or car door or gate electric contact, or hoistway door combination mechanical lock and electric contact when either a hoistway access switch (see 2.12.7.3) or a “BYPASS” switch (see 2.26.1.5) is ~~in turned to~~ the “OFF” position.

*Rationale:*

*(1) To include car door interlocks and hoistway door electric contacts*

*(2) To ensure that access switches and bypass switches do not render ineffective hoistway or car door interlocks or hoistway door or car door or gate electric contacts ineffective anytime the switches are in the “OFF” position, not just when they are switched from the actuated position to the “OFF” position.*

**TN 05-1579**

*Proposed Revision to A17.1, Requirement 2.4.6.2, Maximum upward movement of the car uncounterweighted traction machines:*

**2.4.6.27 ~~Top Car Clearance for Uncounterweighted Elevators~~**

The maximum upward movement of an uncounterweighted elevator above the top landing ~~top car clearance~~ shall be ~~not less~~ no more than the distance from the top landing to the point:

- a) where the driving machine operates the final terminal stopping switch (2.25.3.3.2) for a winding drum machine; or
- b) where the car operates the upper final terminal stopping device (2.25.3.3.1) plus gravity stopping distance based on 115% of the rated speed for a traction machine.

***Rationale:*** *To codify the requirements for an uncounterweighted traction elevator system. The elevator system utilizes a conventional traction hoisting machine but does not use a traditional counterweight. The changes represented in this TN are adding to changes in TN 02-02268 and do not reflect changes to the current published section.*

*Note: These requirements are coordinated with TN 02-2268.*

**TN 06-331**

*Revise Section 9.1 of ASME A17.1a-2005 as follows:*

~~ANSI/ICC/ANSI A117.1 (latest edition) Specification for making Buildings and Facilities Accessible to and Usable by the Physically Handicapped~~ Accessible and Usable Buildings and Facilities

~~CAN/CSA-B44.1/ASME A17.5 (latest edition) Standard for Elevator and Escalator Electrical Equipment~~

*Note: Reference to CAN/CSA-B44.1/ ASME A17.5 to be corrected in Preface, 2.26.4.2, 5.3.1.18.4, 6.1.7.4.2, 6.2.7.4.2, 7.3.11.5.2, 8.3.3.4.9, 8.6.3.7.1, and 8.6.3.7.2.*

NBCC (latest edition) National Building Code of Canada

UL 1037 (latest edition) Standard for Antitheft Alarms and Devices

***Rationale:*** *To update references as permitted by revisions to CSP 9 and correct titles of some of the references standard.*

**TN 06-335**

Revise Section 9.1 of ASME A17.1S-2005 as follows

16 CFR Part 1201- <del>8603</del>	Architectural Glazing Standards and Related Materials		
ANSI Z97.1- <del>1984R1994</del>	Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings		
ANSI A14.3- <del>1984</del> <u>2002</u>	Safety Requirements for Fixed Ladders		
NEMA 4- <u>250</u> (latest edition)	<u>Enclosures for Electrical Equipment (1000 Volts Maximum)</u>		
NFPA 13- <del>1985</del> (latest edition)	Installation of Sprinkler Systems		
NFPA 252- <del>1984</del> (latest edition)	Fire Tests of Door Assemblies		
UL 1784- <del>1995</del> (latest edition)	Standard for Safety for Air Leakage Tests for Door Assemblies		
<u>ANSI/UL 723</u> (latest edition)	Surface Burning Characteristics of Building Materials, Test for		
NFCC-(latest edition)	National Fire Code of Canada NRCC Canada		
<u>NFPA 265</u>	<u>Fire Test for Evaluating Room Fire Growth Contributions of Textile Wall Coverings</u> NFPA US, Canada		
NFPA 255-(latest edition)	Fire Test for Evaluating Room Fire Growth Contribution of Textile Wall Covering NFPA US, Canada		
<del>Federal Test Method</del> <u>FED-STD 191A Rev. 5 (Dec-28-1989)</u>	<del>Standard 19</del> —Federal Standard for Textile Test Methods		
<u>CAN/CSA-B311- M1979-</u> (latest edition)	Safety Code for Manlifts	CSA	Canada
<u>CAN/CSA</u> <del>CAN3-B354.1 (same as CSA-</del> Portable Elevating <u>Rolling</u> Work Platforms <del>B354)</del>		CSA	Canada
<u>CAN4-S104-M80 (R1985)</u> (latest edition)	Fire Tests of Door Assemblies	<u>ULC</u> CSA	Canada
<u>CAN/ULC-S102-</u> (latest edition)	<u>Method of Test for Surface Burning Characteristics of Building Materials And Assemblies</u>	ULC	Canada
<u>CAN/ULC-S102.2-M88 (same as Standard</u> <u>CAN/ULC-S102)</u> Method of Test for Surface Burning (latest edition)	Characteristics of Flooring, Floor Covering, and Miscellaneous <del>Materials and Assemblies</del>	ULC	Canada
<u>CAN/CGSB-12.11-M90 (same as Glass, Wired, Safety Glass</u> <u>CAN2 12.11)</u> (latest edition)		CGSB	Canada
<u>CAN/CGSB-12.12-M90 (same as Glazing, Plastic Safety Glazing Sheets</u> <u>CAN2 12.12)</u> —(latest edition)		CGSB	Canada
<u>CAN/CSA-Z321-96 (R2006)</u> (same as <u>CSA-</u> Signs and Symbols (latest edition)— <u>Z321</u> ) for the Workplace		CSA US,	Canada
<u>CSA C22.1-98(Latest Edition)</u> Canadian Electrical Code, Part I (18th edition), Safety Std. for Electrical Installations		CSA	Canada

~~A17.1a-200x, Addenda to A17.1-2007~~  
~~CSA C22.2 No. 141-M1985 (R1992)~~ Unit Equipment for Emergency Lighting CSA Canada  
(Latest Edition)

NBCC (Latest Edition) National Building Code of Canada                      NRCC                      Canada

*Revise Section 9.2 as follows:*

GSA    General Service Administration  
Federal Supply Services  
~~FSS Acquisition Management Center~~  
    ~~Environmental Programs and Engineering Policy Division (FCOE)~~  
470 East L'Enfant Plaza, SW  
Washington .....

*Revise 2.11.19.2 as follows:*

2.11.19.2 The gasketing ... defined by ANSI/UL 1784 standard ...

*Revise 2.14.2.1.1 as follows:*

2.14.2.1.1 Materials in ....ASTM E84, ANSI/UL 723, NFPA ....

*Revise 2.14.2.1.3 as follows:*

2.14.2.1.3 Napped, tufted ... NBCC and ~~National Fire Code of Canada~~ NFCC, whichever is ....

*Revise 8.3.7.3 as follows:*

8.3.7.3 Apparatus. Except as ... ~~Federal Test Method Standard~~ FED-STD 191A, Method 5903.1 (~~revised method 5902~~), or .....

***Rationale:*** To update references as permitted by revisions to CSP 9.

**TN 06-336**

*Proposed Revision to A17.1, Requirement 2.7.9.1 as follows:*

**2.7.9.1 Lighting.** Permanently installed electric lighting shall be provided in all machinery spaces, machine rooms, control spaces, and control rooms. The illumination shall be not less than 200 lx (19 fc) at the floor level, at the standing level of a working platform (see 2.7.5.3), or at the level of the standing surface when the car is in the blocked position (see 2.7.5.1). ~~The lighting control switch shall be located within easy reach of the access to such rooms or spaces. Where practicable, the light control switch shall be located on the lock-jamb side of the access door.~~ The light switch shall be located at the point of entry:

(a) for machinery spaces and control spaces; and

(b) for machine rooms and control rooms, inside the room and where practicable on the lock-jamb side of the access door.

**RATIONALE:** *To clarify the location for the light control switch in the various rooms and spaces.*

**TN 06-430**

Proposed revision to A17.1, requirements 8.6.8.1 and 8.6.9.1.

**8.6.8.1 Handrails.** Handrails shall operate at the speed specified in the applicable codes. The handrail speed monitoring device, when provided, shall cause electric power to be removed from the driving-machine motor and brake when the speed of either handrail deviates from the step speed by ~~deviation of 15% or more and is continuously within a 2 s to 6 s range.~~ Cracked or damaged handrails that present a pinching effect shall be repaired or replaced. Splicing of handrails shall be done in such a manner that the joint is free of pinching effect.

**8.6.9.1 Handrails.** Handrails shall operate at the speed specified in applicable codes. The handrail speed monitoring device, when provided, shall cause electric power to be removed from the driving-machine motor and brake when the speed of either handrail ~~deviation deviates from the treadway of by 15% or more is and continuously within a 2 s to 6 s range.~~ Cracked or damaged handrails that present a pinching effect shall be repaired or replaced. Splicing of handrails shall be done in such a manner that the joint is free of pinching effect.

RATIONAL: ~~To permit the current requirement to apply retroactively.~~ To permit the current handrail speed monitoring requirements to apply to any handrail speed monitoring device, where one is provided.

**TN 06-432**

Revise A17.1, requirement 8.6.11.1 as follows:

**8.6.11.1 Firefighters' Emergency Operation.** All elevators provided with firefighters' emergency operation shall be subjected monthly, by authorized personnel, to Phase I recall by use of the key switch, and a minimum of one-floor operation on Phase II, except in jurisdictions enforcing the NBCC. Deficiencies shall be corrected. A record of findings shall be available to elevator personnel and the authority having jurisdiction.

REASON: ~~To require the personnel that perform the test to be knowledgeable of Phase I and II Operation.~~ To clarify that the monthly operation check be done by the authorized personnel.

**TN 06-434**

Revised A17.1, requirement 8.6.10.1 as follows:

**8.6.10.1 Material lifts and Dumbwaiters Without Automatic Transfer Devices.** The maintenance of material lifts and dumbwaiters without automatic transfer devices shall conform to 8.6.1 through 8.6.3 and the applicable requirements of 8.6.

Rationale: Clarification of the intent of the requirements.

**TN 06-582**

Proposed to revise A17.1, requirement 8.5.3.2.2 as follows:

**8.5.3.2.2** At the sliding end or ends, the width or widths of the beam seat shall be capable of accommodating, without damage, at least 1.5 times story drift as obtained by either of the following:

(a) through engineering calculations

(b) by using the maximum code allowed story drift per the NEHRP ~~1997~~ 2003 Table 4.5-1 for Allowable Story Drifts. This table allows story drifts of ~~0.0375~~ 0.025  $h_{sx}$  where  $h_{sx}$  is the building story height.

Rationale: To correct a previous error.

**TN 06-793**

*Proposed Revision to A17.1, Requirement 2.11.3.2, Closing of Hoistway Doors:*

~~**2.11.3.2** Horizontally sliding doors shall be closed when the car is at a landing, except when~~

~~(a) the car is operated by a designated attendant in the car;~~

~~(b) loading or unloading;~~

~~(c) the elevator conforms to 2.27.3.2.1 and 2.27.3.2.3 through 2.27.3.2.6, Phase I Emergency Recall Operation by fire alarm initiating device; or~~

~~(d) the car is at the recall level when Phase I is in effect [see 2.27.3.1.6(a)].~~

~~**2.11.3.3**~~ **2.11.3.2** On center-opening doors, if there is an interlock on only one panel, the door closer required 2.11.3.1 shall be provided on the leading panel that operates in the opposite direction (see 2.11.11.7).

**Rationale:** *The conditions specified in 2.11.3.2 are no longer necessary, as manual recall only is no longer permitted. See approved TN 03-1854. TN 03-1854 requires all elevators to meet the requirement in deleted requirement 2.11.3.2(c) eliminating the need for this requirement. All automatic operation elevators doors are permitted to remain open at a single location, as all elevators are required to be provided with automatic Phase I recall operation. On designated attendant elevators, the doors are under the control of the attendant.*

**TN 06-791**

*Proposed Revision to A17.1, Requirement 2.14.1.7:*

**2.14.1.7 Railing and Equipment on ~~Top of Cars~~ Car Enclosure Top**

**2.14.1.7.1** A standard railing conforming to 2.10.2 shall be provided on the outside perimeter of the car enclosure top on all sides where the perpendicular distance between the edges of the car enclosure top and the adjacent hoistway enclosure exceeds 300 mm (12 in.) horizontal clearance. If the standard railing is located more than 100 mm (4 in.) from the edge of the outside perimeter of the car enclosure top, the top of the car enclosure outside of the railing shall be clearly marked. The marking shall consist of alternating 100 mm (4 in.) diagonal red and white stripes. The forces specified in 2.10.2.4 shall not deflect the railing beyond the perimeter of the car top.

The top of car enclosure, or other surface specified by the elevator installer, shall be the working surface referred to in 2.10.2.

***Rationale:*** *A person should not stand on the car top area between the standard railing and the edge of the car top perimeter. This proposal requires the same marking in this area as the refuge space where there is limited overhead space.*

**TN 06-797**

*Proposed Revision to A17.1, Requirements 2.27.8, Switch Keys:*

**2.27.8 Switch Keys**

The key switches required by 2.27.2 through 2.27.5 for all elevators in a building shall be operable by the ~~same key~~ FEO-K1 key. The keys shall be Group 3 Security (see 8.1). ~~There shall be a key for each switch provided.~~ A separate key shall be provided for each switch. These keys shall be kept on the premises in a location readily accessible to firefighters and emergency personnel, but not where they are available to the public. This key shall be of a tubular, 7 pin, style 137 construction and shall have a biting code of 6143521. The key shall be coded "FEO-K1". The possession of the "FEO-K1" key shall be limited to elevator personnel, emergency personnel, ~~and elevator equipment manufacturers,~~ and authorized personnel during checking of firefighters emergency operation (see 8.1 and 8.6.11.1).

**Rationale:** *to clarify intent and coordinate with new 8.1 (TN 03-1933).*

**TN 06-1168**

Proposed revision to A17.1, requirements 8.7.2.27.4, 8.7.2.28, 8.7.3.31.5, and 8.7.3.31.8.

**8.7.2.27.4 Controllers**

- (a) Where a controller is installed as part of an alteration, it shall conform to 2.25, 2.26.1.4, 2.26.1.5, 2.26.4 through 2.26.9, 2.27.2 through 2.27.8.
- (b) Where a controller for the operation of hoistway doors, car doors, or car gates is installed as part of an alteration, all new and modified equipment and wiring shall conform to 2.26.4.1 and 2.26.4.2.
- (c) Where a controller for the elevator operation on emergency ~~and~~ or standby power systems or firefighters' emergency operations is installed, all new and modified equipment and wiring shall conform to 2.26.4.1 and 2.26.4.2.

**8.7.2.28 Emergency Operations and Signaling Devices.**

- (a) Where an alteration is made to car emergency signaling devices, the alteration shall conform to 2.27.1.
- (b) Where an alteration is made to, or consists of the addition of, an emergency or standby power system, the installation shall conform to the requirements of 2.27.2.
- (c) Where an alteration is made to, or consists of the addition of, firefighters' emergency operation, the installation shall conform to 2.27.3 through 2.27.8.

**8.7.3.31.5 Controllers**

- (a) Where a controller is installed without any change in the type of operation control or motion control as part of an alteration, it shall conform to 2.26.1.4, 2.26.1.5, 2.26.4.1, 2.26.4.2, 2.26.4.3, 2.26.5, 2.26.7, 3.26.2, 3.26.3, 3.26.5, 3.26.7, 3.26.10, and 3.25.
- (b) Where a controller for the operation of hoistway doors, car doors, or car gates is installed as part of an alteration, all new and modified equipment and wiring shall conform to 2.26.4.1 and 2.26.4.2.
- (c) Where a controller for the elevator operation on emergency ~~and~~ or standby power systems or firefighters' emergency operations is installed, all new and modified equipment and wiring shall conform to 2.26.4.1 and 2.26.4.2.

**8.7.3.31.8 Emergency Operation and Signaling Devices**

- (a) Where an alteration is made to car emergency signaling devices, the installation shall conform to 2.27.1.
- (b) Where an alteration is made to, or consists of the addition of, an emergency or standby power system, the installation shall conform to the requirements of 2.27.2.
- (c) Where an alteration is made to, or consists of the addition of, firefighters' emergency operation, the installation shall conform to the requirements of firefighters' emergency operation in 3.27 (not including 2.27.1 and 2.27.2).

Rationale: To clarify the requirements when installing firefighters' emergency operation on existing controllers.

**TN 06-1428**

*Proposed Revision to A17.1, Requirement 2.27.3.3.7:*

**2.27.3.3.7** The “FIRE OPERATION” switch (2.27.3.3), the “CALL CANCEL” button [2.27.3.3.1(h)], the “STOP” switch [2.27.3.3.1(m)], the door open button(s), the door close button(s), the additional visual signal (2.27.3.3.8), and the operating instructions shown in Fig. 2.27.7.2, shall be grouped together at the top of a main car operating panel behind a locked cover. The fire department communication system phone jack shall be permitted to be installed in the firefighters’ operation panel. No other equipment shall be permitted in the firefighters’ operation panel.

The firefighters’ operation panel cover shall be openable by the same key that operates the “FIRE OPERATION” switch. The cover shall be permitted to open automatically when the car is on Phase I Emergency Recall Operation and at the recall level. When the key is in the “FIRE OPERATION” switch, the cover shall not be capable of being closed. When closed, the cover shall be self-locking.

Where rear doors are provided, buttons for both the front and rear doors shall be provided in the firefighters’ operation panel. The door open and door close buttons for the rear entrance shall be labeled “OPEN REAR” and “CLOSE REAR.”

All buttons and switches shall be readily accessible, located not more than 1 800 mm (72 in.) above the floor and shall be arranged as shown in Fig. 2.27.3.3.7. Requirement 2.26.1.2 does not apply to these buttons and switches. The front of the cover shall contain the words “FIREFIGHTERS’ OPERATION” in red letters at least 10 mm (0.4 in.) high.

Rationale: To allow the firefighters’ phone jack to be grouped together with the other FEO devices and prevent other devices from cluttering the panel.

**TN 07-190**

*Brake Marking Plate:*

*Add to A17.1, 8.10.2.2.2(o):*

(3) Marking plate (2.24.8.5)

*Add to A17.1, 8.11.2.3.4:*

For elevators installed under A17.1-2000/B44-00 and later editions have the brake setting verified in accordance with the data on the brake marking plate.

***Rationale:*** *To add the requirements for checking the brake marking plate and the brake setting as recommended by the Mechanical Design Committee.*

**TN 07-441**

*Proposed Revision to A17.1, Requirement 2.27.8 as follows:*

**2.27.8 Switch Keys**

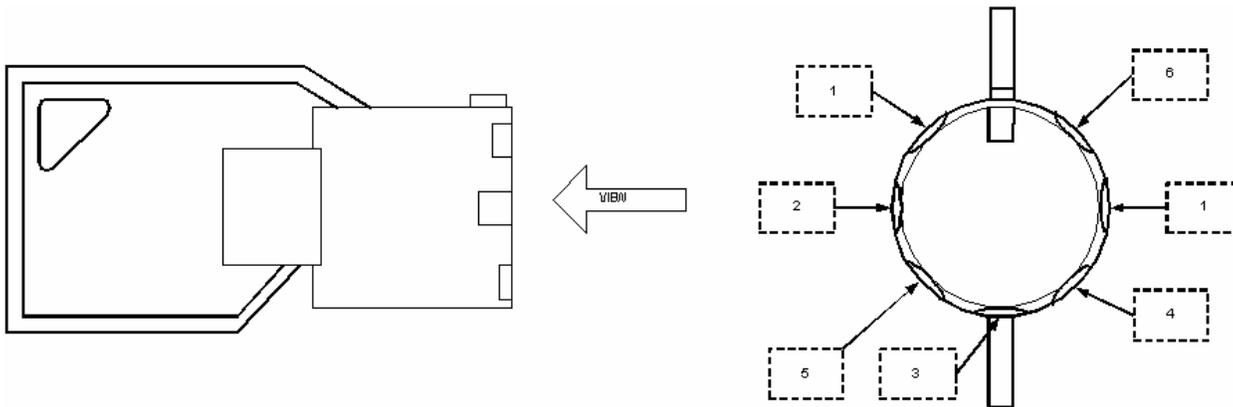
The key switches required by 2.27.2 through 2.27.5 for all elevators in a building shall be operable by the same key. The keys shall be Group 3 Security (see 8.1). There shall be a key for each switch provided. These keys shall be kept on the premises in a location readily accessible to firefighters and emergency personnel, but not where they are available to the public. This key shall be of a tubular, 7 pin, style 137 construction and shall have a biting code of 6143521 starting at the tab sequenced clockwise as viewed from the barrel end of the key. The key shall be coded "FEO-K1". The possession of the "FEO-K1" key shall be limited to elevator personnel, emergency personnel and elevator equipment manufacturers.

Where provided, a lock box, including its lock and other components, shall conform to the requirements of UL 1037 (see Part 9).

NOTE (2.27.8): Local authorities may specify additional requirements for a uniform keyed lock box and its location to contain the necessary keys.

**Rationale:** To establish a direction of implementation of the biting code, as the Committee recently became aware that there is no industry standard. To assure that the FEO-K1 keys work in all FEO-K1 cylinders regardless of manufacturer.

NOTE: This is being subjected to an expedited ballot to avoid having 2 incompatible version of the FEO-K1 key and lock being manufactured and installed.



View into the barrel of key showing biting code

**TN 07-575**

Revise A17.1 as follows:

**2.26.4.4** Control equipment shall be tested in accordance with the testing requirements of EN 12016 by exposing it to interference levels at the test values specified for “safety circuits.” The interference shall not cause any of the conditions described in 2.26.9.3(a) through (e) and shall not cause the car to move while on inspection operation.

**2.26.4.4.1** The test for voltage dips in Table 6 of EN12016 shall be permitted to be conducted by either using the times specified in Table 6, or using a voltage reduction ~~dip~~ of 30% of the nominal input voltage for 0.5 cycles at 60 Hz and a voltage reduction ~~dip~~ of 60% of nominal input voltage for 5 cycles at 60 Hz.

Note: The tests requirements for voltage dips in 2.26.4.4.1 are adjusted for 60 Hz operation.

**2.26.4.4.2** 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.

Rationale: This allows the control equipment to be tested to EN12016:1998 requirements if the test equipment will support voltage dips of fractions of cycles or by testing at 50 Hz. Alternatively, this equipment may be tested at 60 Hz for voltage dip times of 8.33 and 83.3 ms, which would be the equivalent number of cycles at 60 Hz as the 10 and 100 ms requirements, at 50 Hz. This is in line with the current language in the ISO 22200 draft.

2) Add the following information to section 9.2

BSI British Standards Institution  
389 Chiswick High Road  
London, W4 4AL England  
Telephone: 0181 996 7000  
<http://www.bsi-global.com>

**TN 06-792**

*Proposed Editorial Revision to A17.1, Section 1.3 Definitions:*

**door:** the movable portion(s) of an entrance that closes the openings. It consists of one or more solid face panels which are permitted to be equipped with a vision panel.

~~*door, folding:* a hinged door consisting of two or more panels that fold and move horizontally.~~

*door, horizontally sliding:* a door that moves horizontally.

*center-opening:* a horizontally sliding door consisting of two panels, so arranged to open away from each other.

*center-opening, multiple-speed:* a horizontally sliding door consisting of more than two panels, so arranged that the panels or groups of panels open away from each other.

*door, folding:* a hinged door consisting of two or more panels that fold, and move horizontally.

*multiple-speed:* a horizontally .....

***Rationale:*** Clarification that a folding door is a type of horizontally sliding door.

**TN 06-1220**

Editorially revised A17.1, requirement 8.6.11.5.2 as shown:

**8.6.11.5.2** The following procedure shall be utilized when starting an escalator or moving walk:

- (a) Prior to starting the unit, observe the steps or pallets and both landing areas to ensure no persons are on the unit or about to board. Run the unit away from the landing.
- (b) Verify correct operation of the starting switch.
- (c) Verify correct operation of the stop buttons.
- (d) Verify correct operation of each stop button cover alarm, if furnished.
- (e) Visually examine the steps or treadway for damaged or missing components; combplates for broken or missing teeth; skirt or dynamic skirt panels and balustrades for damage.
- (f) Verify that both handrails travel at substantially the same speed as the steps or the treadway, are free from damage or pinch points, and that entry guards are in place.
- (g) Visually verify that all steps, pallets, or the treadway is properly positioned.
- (h) Verify that ceiling intersection guards, anti-slide devices, deck barricades, and caution signs are securely in place.
- (i) Verify that demarcation lighting is illuminated, if furnished.
- (j) Check for uniform lighting on steps/tread not contrasting with surrounding areas.
- (k) Verify that the safety zone is clear of obstacles and that the landing area and adjacent floor area are free from foreign matter and slipping or tripping hazards.
- (l) Check for any unusual noise or vibration during operation.

If any of these conditions is unsatisfactory in 8.6.11.5.2(a) through (l), the unit shall be placed out of service. Barricade the landing areas and notify the responsible party of the problem.

Reason: Clarification.

**TN 07-1351**

Propose Editorial Revision as follows:

Revise 2.27.3.2.6 as follows:

**2.27.3.2.6** When a fire alarm initiating device in the machine room, control space, control room, or hoistway initiates Phase I Emergency Recall Operation, as required by 2.27.3.2.3 or 2.27.3.2.4, the visual signal [see 2.27.3.1.6(h) and Fig. 2.27.3.1.6(h)] shall illuminate intermittently only in a car(s) with equipment in that machine room, control space, control room, or hoistway. ~~When activated, a heat detector [2.27.3.2.1(d)] in the machine room, control space, or control room shall cause the visual signal [see 2.27.3.1.6(h) and Fig. 2.27.3.1.6(h)] to illuminate intermittently only in a car(s) with equipment in that machine room, control space, or control room.~~

Revise the last paragraph of 2.27.4.2 as follows:

When a fire alarm initiating device in the machine room, control space, control room, or hoistway initiates Phase I Emergency Recall Operation as required by 2.27.3.2.3 or 2.27.3.2.4, the visual signal [see 2.27.3.1.6(h) and Fig. 2.27.3.1.6(h)] shall illuminate intermittently only in a car(s) with equipment in that machine room, control space, control room, or hoistway. ~~When activated, a heat detector [2.27.3.2.1(d)] in the machine room, control space, or control room shall cause the visual signal [see 2.27.3.1.6(h) and Fig. 2.27.3.1.6(h)] to illuminate intermittently only in a car(s) with equipment in that machine room, control space, or control room.~~

Editorial Clarification: Requirement 2.27.3.2.1(d) does not exist for heat detectors therefore the above requirements are meaningless and are confusing.

**TN 07-1439**

Revise ASME A17.1-2007/CSA B44.1-07 as follows:

**1.1.4 Effective Date**

The requirements of this edition and subsequent addenda to the Code are effective as of the date noted on the ~~copyright~~ summary of changes page of this document. The authority having jurisdiction will establish the effective date for their local regulations.

REVISE ASME A17.7-2007/CSA B44.7-07 as follows:

**1.1.3 Effective Date**

The requirements of this edition and subsequent addenda to the Code are effective as of the date noted on the ~~copyright~~ summary of changes page of this document. The AHJ will establish the effective date for its local regulations.

**REASON:** To correct location where to find the effective date.

**TN 07-1484**

A17.1 Sump pumps in elevator pit Requirement 2.2.2.7

Delete requirement 2.2.2.7 (In jurisdictions enforcing the NBCC sump pumps and their control equipment shall not be installed in any elevator pit).

**Rationale:**

1. With the publication of the next code, Firefighters Emergency Operation will be mandatory on all elevators.
2. This is permitted in the A17.1 Code without any safety issue.
3. The argument for not allowing it was to not allow non-elevator people in the Hoistway. This is happening, usually under Mechanics supervision, for such things today as Smoke Detectors, Sprinklers, Cleaning of glass and hoistway ventilation equipment. It no longer makes sense to also restrict sump pumps.

Revise A17.1, 8.10.1.1.3 and 8.11.1.1 as follows:

8.10.1.1.3

The inspector shall meet the qualification requirements of the ASME QEI-1. Inspectors and inspection supervisors shall be certified by an organization accredited by ASME in accordance with the requirements of ASME QEI-1. ~~Requirement 8.10.1.1.3 does not apply in Canadian jurisdictions.~~

8.11.1.1 Persons authorized to make periodic inspections and tests

The inspector shall meet the qualification requirements of the ASME QEI-1. Inspectors and inspection supervisors shall be certified by an organization accredited by ASME in accordance with the requirements of ASME QEI-1. ~~This requirement does not apply to Canadian jurisdictions.~~

**Rationale:** supports minimum requirements for inspector qualifications as recommended by Association of Provincial Chief Elevator Inspectors.

**TN 07-1485**

Add the following requirement to A17.1:

**8.6.12.5.4 Replacement of hydraulic jack, plunger, and cylinder**

**8.6.12.5.4.1**

Where a hydraulic jack is replaced, the replacement jack shall conform to requirement [3.18](#).

**8.6.12.5.4.2**

Where a plunger is replaced, the replacement plunger shall conform to [3.18.1.2](#) and [3.18.2](#).

**8.6.12.5.4.3**

Where a cylinder is replaced, the replacement cylinder shall conform to the requirements specified in [8.7.3.23.3](#).

**8.6.12.5.5 Replacement valves, supply piping, and fittings**

**8.6.12.5.5.1**

Where a control valve is replaced it shall conform to the requirements of [3.19](#).

**8.6.12.5.5.2**

Where relief or check valves or the supply piping or fittings are replaced, the components replaced shall conform to the applicable requirements of [3.19](#).

**8.6.12.5.5.3**

Where electrically operated control valves are installed in place of existing mechanically operated valves, for rated speeds of more than 0.5 m/s (100 ft/min), retention of existing terminal-stopping devices consisting of an automatic stop valve independent of the normal control valve and operated by the movement of the car as it approaches the terminals, where provided, shall be permitted.

**8.6.12.5.6 Replacement of tanks**

Where a tank is replaced, it shall conform to the requirements of [3.24](#).

**8.6.12.5.7 Requirement of anti-creep levelling device**

Where an anti-creep levelling device is replaced, it shall conform to the requirements of [3.26.3.1](#).

Rationale: The above proposal incorporates the remaining modifications formerly in CSA B44, as an oversight they were not covered by TN 06-778 which was previously approved.

**TN 07-1486**

**Add the following requirement to A17.1, Section 9:**

Table 9.1:

NEHRP - National Earthquake Hazards Reduction Program Recommended Provisions for Seismic Regulations for New Buildings -  
FEMA

Table 9.2:

FEMA - Federal Emergency Management Agency  
PO Box 2012  
Jessup, MD 20794-2012

1-800-480-2520

<http://www.fema.gov/>

Rationale: Requirement 8.5.3.2.2(b) refers to NEHRP - 1997. This reference does not appear in Section 9. The following should be added to Section 9.

**The document year should also be editorially removed from 8.5.3.2.2(b) and placed in Section 9, per the format used for referenced documents in ASME A17.1.**

Editorial:

8.8.1(a): By welders qualified in accordance with the requirements of ~~Section 5~~ Section 4 of ANSI/AWS D1.1, ....

Rationale: The ANSI/AWS D1.1 Standard was modified and the Section numbering was changed by ANSI/AWS D1.1.

Editorial Correction:

**A17.1 Figure 8.2.2.5.1**

“Fig. 8.2.2.5.1 Turning Moment Based on Class of Loading” in the formulas and on the drawings instead of “E” should be “B”.

Editorial Correction:

Add to Section 9.1 the following reference:

Designation	Standard	Publisher	Applicable to
<u>ASME A17.7/CSA B44.7 (latest edition)</u>	<u>Performance-based safety code for elevators and escalators</u>	<u>ASME, CSA</u>	<u>US, Canada</u>