Elevator Code and Code Changes Including Video & Audio Communication (VAM)

Be Schindler. Be Safe.
Safety is in our hands.

Schindler

Elevator Types and Function

TRACTION

- Lifted by cables or belts, over a sheave attached to a motor above the elevator shaft.

- Machine Room Less (MRL) - motor located in the shaft overhead. The controls located on the cab and through out the hoistway

- Machine Room - either directly over top of the hoistway, or off to the side. Controls are in a controller cabinet in the machine room.

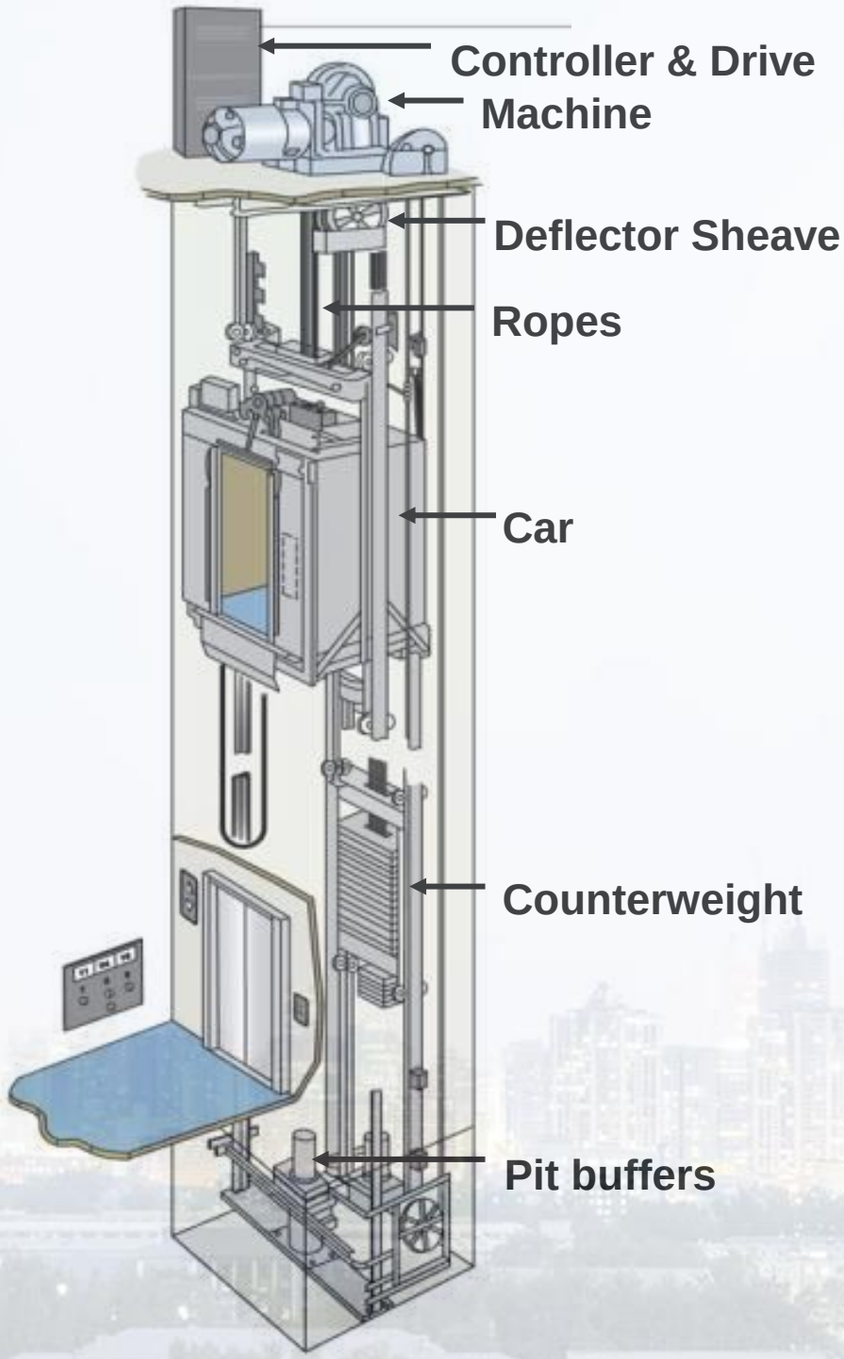
Traction Elevators

Basic Components
- Counterweight
- Machine & Sheave(s)
- Ropes or belts
- Controller & Drive system
- Car

Types
- Geared
- Gearless

Pre-engineered applications
- Traditional overhead
- Machine room less (MRL)
- Low Rise & Mid Rise

Custom Applications
- Traditional Adjacent
- Traditional Basement



Elevator Types and Function

HYDRAULIC

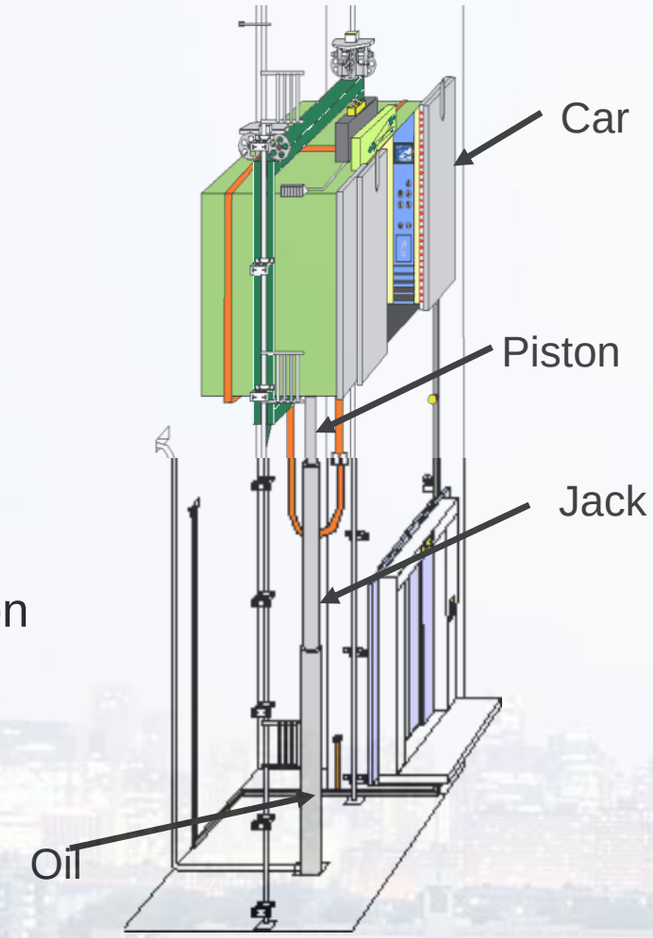
- Lifted by means of a piston underneath or beside the elevator. To go up, a pump pushes oil into the cylinder, pushing the piston (which pushes the elevator) up. To go down, a valve opens and oil flows back into the reservoir, using the gravity.

- A hydraulic fluid (oil) tank is located in a machine room along with the controller either adjacent or remote from the hoistway.

Hydraulic elevators

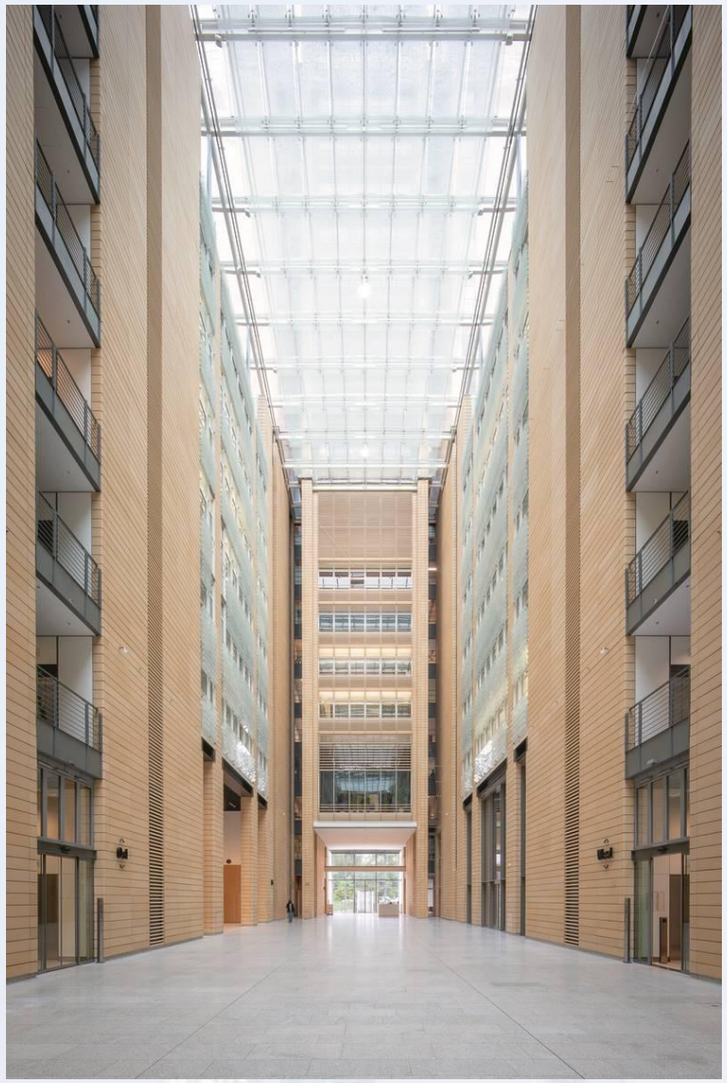
Major Components
–Jack
–Pump
–Valve
–Reservoir

Types
–Holeless: Single or Dual Piston
–Roped Hydraulic



Market	Low-rise building
Capacity	2,100 to 5,000 pounds
Travel height	Up to 50'
Stops	Max 6 stops
Speed	100-150 fpm
Applications	Dual-jack

Summary of Vertical Transportation Types and Applications



- Machine Room Less (MRL) Traction passenger and service elevators. Low/Mid/High Rise

- Gearless Overhead Traction passenger and service elevators. High Rise

- Hydraulic passenger and service elevators. Low Rise

- Escalators. Low Rise/Commercial/Transit

State of Ohio Elevator Inspections

- The State of Ohio Elevator Department performs all new acceptance and alteration inspections, followed by two inspections per year on most elevators and other vertical public transportation devices in the state of Ohio.

- To keep your elevator certificate of operation current, the state of Ohio requires that all public elevators, dumbwaiters, LULA elevators, stairlifts, platform lifts, and material lifts undergo an annual safety test.
  - New testing requirements for door reopening device(s) and sequence operation.

- Most units also require a Five-Year Full Load Test.

State of Ohio Elevator Inspections

- The elevator owner/representative is responsible for overseeing the corrections of all violations; however, your elevator maintenance contract may cover repair of some or all violations. You should contact your elevator maintenance company to determine who is responsible: you, the elevator maintenance company or both.

- Resources available on the State of Ohio Website –
  - Oil Log
  - Firefighters Operation Service Log
  - Change of Address Form
  - Properly Removing an Elevator from Service
  - Accident Report
  - Pre-Inspection / Violation Check List
  - Elevator Fees

State of Ohio Elevator Inspections

Preparing for your AHJ Elevator Inspection

Tips for building owners

This is a general guide to assist you in preparing for your Authority Having Jurisdiction (AHJ) Elevator Inspection.
Your specific local State and Municipal
Please consult your local AHJ for specifi

To help prepare for your AHJ Eleva

Elevator Lobbies

- ☐ Firefighters Service Phase I instru
- ☐ "In Case of Fire" signage is near

Inside Elevator Cab

- ☐ All cab interior lightbulbs are wo
- ☐ The elevator phones reach a 24/
- ☐ The elevator alarm button inside
- ☐ Firefighters Service Phase II instru
- ☐ All Braille and key switch bezels a

Machine Room

- ☐ There is a machine room danger
- ☐ The elevator machine room doo
- ☐ All machine room lightbulbs are
- ☐ Machine room lighting is equipp
- ☐ The monthly firefighters service t

  (Most standard Schindler cont

  Please contact your local Schindler account manager if you are unsure how to perform this test.)

Steps to ensure that you have an updated Certificate of Operation

	Yes	No
Is your annual AHJ fee paid? (Most AHJ's require that the building owner pay an annual fee. This fee is generally not included in your Schindler contract)		
Was an annual Category 1 safety test was scheduled in the last year?		
Was a Category 5 safety test was scheduled in the last 5 years? (if applicable)		
Were your last inspection reports' violations cleared by the local AHJ? (if applicable)		

If the answer is **"Yes"** to all, you should have likely been issued a certificate.

If the answer is **"No"** to any, and you still do not have a Certificate of Operation, please consult with your local AHJ or Schindler account manager for guidance.

Your local Schindler team can assist you with questions about your inspection.

2.2.2.5-Pit Sump Pumps and/or Drains

2.2.2.5 In elevators provided with Firefighters' Emergency Operation, a drain or sump pump shall be provided. The sump pump/drain shall be required to remove a minimum of 11.4 m3/h (3,000 gal/h) per **single hoistway or multiple hoistway.**

COMMENT: This revision clarifies that the volume of water removal is on a per pit basis and not a per elevator in the hoistway basis.

Simplistic design providing cost savings to the building owner.

2.8.2.4-Testing and Maintenance of FAIDs

2.8.2.4 In jurisdictions enforcing the NBCC or NFPA 72, a means for testing and maintaining fire alarm initiating devices without having to enter the hoistway shall be permitted. When this means is provided, it shall comply with either (a) or (b) below.

(a) The means provided for air sampling shall comply with 2.8.3.1.4.

(b) The means provided by enclosing a fire alarm initiating device within a protective space shall comply with the following:

(1) Hoistway penetration for access panels used for installing, testing, and servicing fire alarm initiating devices shall comply with 2.1.1.1.3.

(2) Access panels shall be rated and listed for the application for which they are installed and shall have a maximum width of 400 mm (16 in.) and maximum height of 400 mm (16 in.). Access panels shall not swing into the hoistway.

(3) Access panel doors shall be self-closing and self locking. The key shall be Group 2 Security (see Section 8.1).

(4) The space that houses the detection device(s) shall be furnished with protective guards (cages) that will prevent accidental contact by a person or object with moving equipment within the hoistway. No part of the protective guards (cages) shall be removable from outside the hoistway or from within the space between the access panel and the protective guards (cages).

2.8.2.4-Testing and Maintenance of FAIDs (cont.)

2.8.2.4

(5) Protective guards (cages) shall separate the rest of the hoistway from the space containing the fire alarm initiating device. The guard (cage) shall be noncombustible openwork material that shall reject a ball 6 mm (0.25 in.) in diameter and be made from material equal to or stronger than 1.110 mm (0.0437 in.) diameter wire. The guard (cage) shall be supported so that when subjected to a force of 450 N (100 lbf) applied over an area 100 mm × 100 mm (4 in. × 4 in.) at any location, the deflection shall not reduce the clearance between the guard (cage) and any elevator equipment in the hoistway below 25 mm (1 in.).

(6) Protective guards (cages) shall be installed so that all required hoistway running clearances and beveling requirements are maintained. In no case shall the protective guards (cages) extend more than 400 mm (16 in.) inside the hoistway.

(7) Prior to installation of fire alarm initiating devices or other fire detection systems in hoistways, layout drawings indicating acceptable installation locations for access panels and protective guards (cages) shall be coordinated with the elevator installer.

These changes allow access to panels for maintenance and testing of fire alarm initiating devices (FAIDs) in the hoistway – reducing the need for car top access.

New design that can provide cost savings to the building owner.

8.13 – Signs, Plates and Tags

2.16.3.3 has been deleted from the prior code and an entirely new Section 8.13 has been added to the code describing the requirements for Signs, Plates and Tags. See the examples in the next several slides which by no means describe all the references to 8.13 scattered throughout the code. There are too many instances where 8.13 applies to show them all, just be aware that there are many affected requirements.

SECTION 8.13 SIGNS, PLATES, AND TAGS When referenced, Section 8.13 covers the standard materials and properties for safety signs and permanent plates used on devices within the scope of this Code.

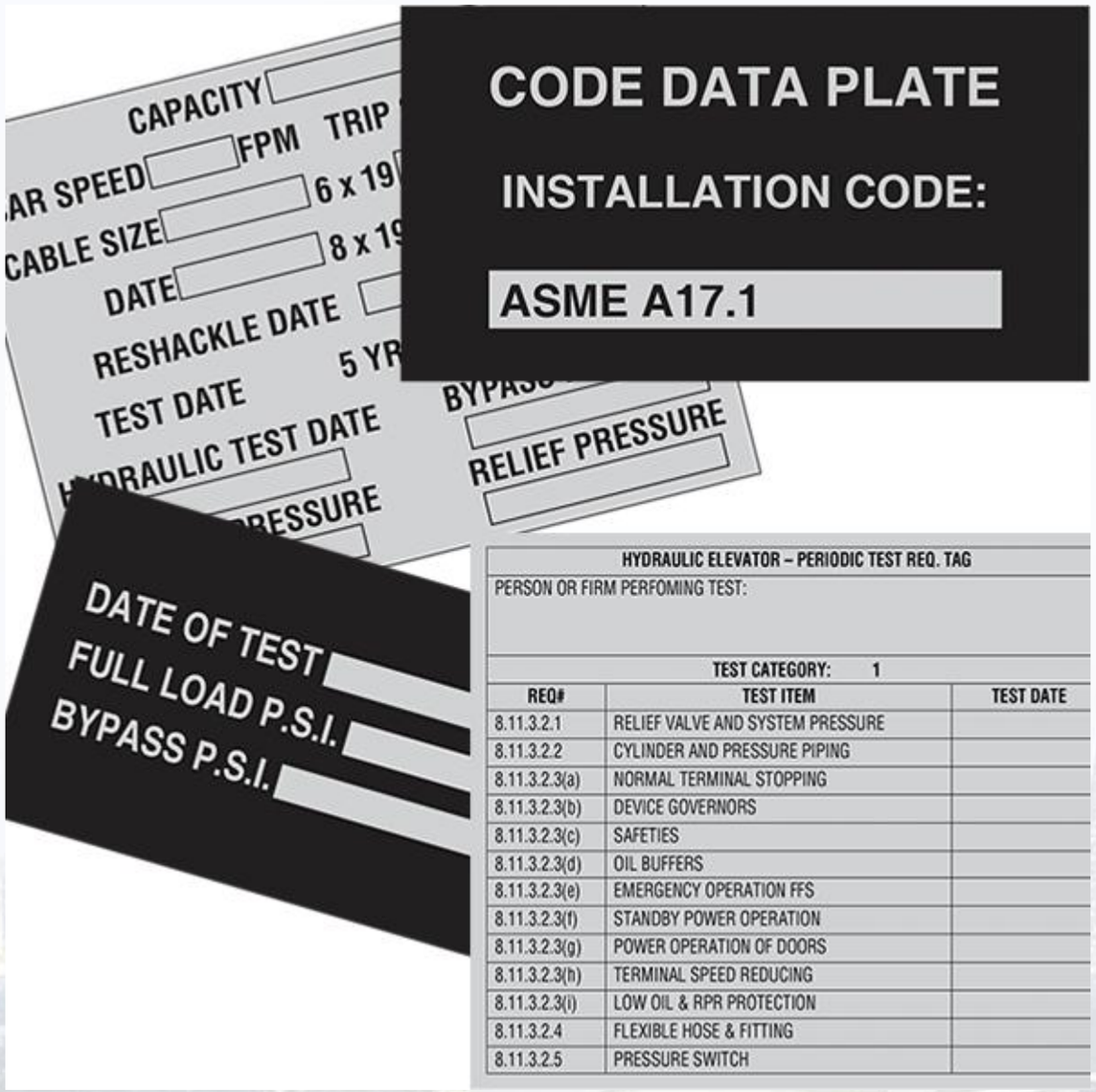
8.13 – Signs, Plates and Tags (cont.)

8.13.1 Permanent Plates

Data plates and capacity plates shall

(a) be made of metal or other durable materials designed to last the life of the equipment. Stick-on foil or paper labels shall not be permitted.

(b) be securely attached to prevent removal when subjected to a force of 65 N (15 lb). In addition, adhesive-attached plates shall conform to the requirements of UL 969 or CAN/CSA C22.2, whichever is applicable.



8.13 – Signs, Plates and Tags (cont.)

8.13.1.1 All lettering and figures required by Code shall either:

(a) be engraved, etched, or cast such that the letters and figures shall remain permanently and readily legible

(b) conform to either of the following:

(1) the characters shall be raised or depressed from the plate surface face so as to remain legible even if painted over.

(2) be provided with a transparent covering that will protect the Code-required data. This covering shall prevent contaminants (such as paint, adhesives, oil, and grease) from permanently adhering to the data plate parent surface. The covering shall be durable enough to withstand the process of contaminant removal.

2.16.5.1 – Signs Required in Freight Elevators

2.16.5 Signs Required in Freight Elevator Cars

2.16.5.1 Signs Required. Signs complying with 8.13.2, in addition to the capacity and data plates required by 2.16.3.1, shall be provided inside the car and shall be located in a conspicuous position and permanently and securely fastened to the car enclosure, subject to the requirements of 2.16.5.1.1 through 2.16.5.1.3.

8.13.2 Signs

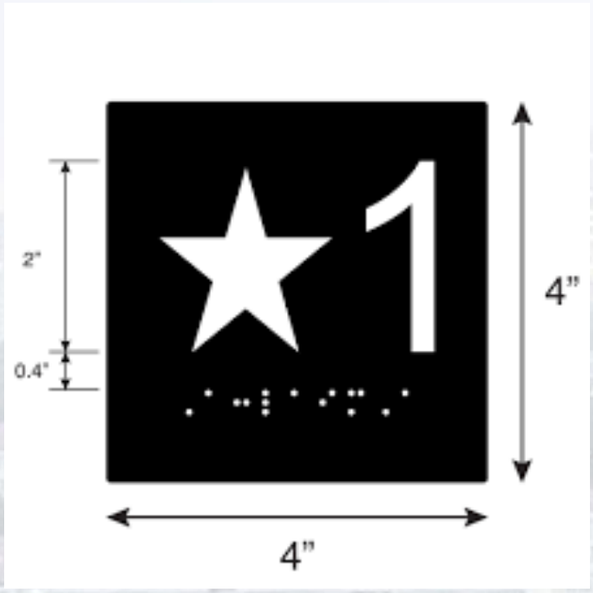
The sign shall conform to the requirements of ANSI Z535.2 or CAN/CSA C22.2-Z321, shall be made of a durable material, and shall be securely fastened.

2.16.5.2 – Material and Marking of Signs

2.16.5.2 Material and Marking of Signs. Signs shall conform to 8.13.2, and the letters shall be not less than 13 mm (0.5 in.) high.

8.13.2 Signs

The sign shall conform to the requirements of ANSI Z535.2 or CAN/CSA C22.2-Z321, shall be made of a durable material, and shall be securely fastened.



2.26.1.7 – Executable Software

2.26.1.7 Executable Software

2.26.1.7.1 Executable software used in performing one or more of the functions listed below shall have a Unique Software Identifier (USI) for each software version. Changes in executable software for any of the following functions shall require a new USI:

(a) working areas in the pit (2.7.5.2) with device active [2.7.5.2.1(b)(3)]

(b) hoistway access switches (2.12.7)

(c) power operation of hoistway doors and car doors (Section 2.13)

(d) protection against traction loss (2.20.8.1)

(e) broken suspension member (2.20.8.2)

(f) suspension-member residual strength (2.20.8.3)

(g) normal terminal stopping devices (2.25.2)

(h) emergency terminal stopping means (2.25.4)

(i) operating devices and control equipment

(Section 2.26)

(j) emergency communications (2.27.1.1)

(k) emergency or standby power system (2.27.2)

2.26.1.7 – Executable Software (cont.)

2.26.1.7 Executable Software

2.26.1.7.1 Executable software used in performing one or more of the functions listed below shall have a Unique Software Identifier (USI) for each software version. Changes in executable software for any of the following functions shall require a new USI:

(l) Firefighters' Emergency Operation: automatic elevators (2.27.3 through 2.27.6)

(m) Occupant Evacuation Operation (2.27.11)

(n) emergency operation and signal devices (8.4.10)

2.26.1.7.2 Software-based parameters are permitted and shall not modify the USI when adjusted or selected in the field.

2.26.1.7.3 The control system shall include a means to view the USI(s) on-site. Examples of viewing means include, but are not limited to, one or more of the following:

(a) electronic viewing that is part of the elevator or group of elevators

(b) labeling of device

(c) labeling or tags on the control or assembly

8.6.4.23 – Executable Software Verification

8.6.4.23 Executable Software Verification. Where executable software for functions listed in 2.26.1.7.1 or 3.26.11.1 has changed as the result of repair or replacement, requiring a new USI, the related safety function(s) shall be tested on-site for the applicable installation and logged in the repair and replacement record

8.7.1.10-Executable Software Verification and Witness Test

8.7.1.10 Executable Software Verification and Witness Test. Where executable software for functions listed in 2.26.1.7.1 or 3.26.11.1 is changed as part of an alteration, the software changed shall have a new USI that shall be logged in the on-site documentation [8.6.1.2.2(e)].

8.11.2.1.2 (oo) and 8.11.3.1.2 (dd) - USI Software Match with On-Site Documentation

8.11.2.1.2(oo) The USI of the installed software matches the onsite documentation. See 2.26.1.7.1 and 8.6.1.2.2(e)

8.11.3.1.2(dd) The USI of the installed software matches the onsite documentation. See 3.26.11 and 8.6.1.2.2(e).

Executable Software Summary

This new requirement describes the conditions regarding the newly defined term executable software and the applicable requirements.

- **The USI helps to track the current software version, ensuring compliance and providing a baseline for future alterations.**
- **Manufacturers need to incorporate the USI into their designs, and contractors need to update documentation accordingly.**
- **Executive software serves as a control and supervisory system that oversees the operation of all other software programs. It ensures that the necessary functions of a product are executed effectively.**
- **New requirement regarding testing for replaced / repaired Executable Software – must be logged in the repair and maintenance records.**
  - **Additional periodic inspection requirements for USI of installed software.**

8.6.1.1.4-Maintenance of Safety Devices

8.6.1.1.4 Safety devices required by ASME A17.1/CSA B44 in 2.26.2, Table 2.26.4.3.2, 6.1.6, 6.2.6, and Section 8.3 at the time of installation; or devices provided to meet the certification requirements of ASME A17.7/CSA B44.7 at the time of installation; and/or devices required by ASME A17.3 and installed as an alteration shall be maintained.

See 8.6.1.2.2, 8.6.1.6.1, and 8.7.1.2. The performance of safety devices installed before they were required by the edition of ASME A17.1/CSA B44 in effect in the jurisdiction at the time of installation or alteration shall, as a minimum, comply with the performance requirements in the first edition of ASME A17.1/CSA B44 in which they were required.

COMMENT: New requirement regarding maintenance of safety devices required by the specified codes and/or certifications .

8.6.1.2.3 – Defective Part

8.6.1.2.3 Where a defective part directly affecting the safety of the operation is identified, the equipment shall be taken out of service until the defective part has been adjusted, repaired, or replaced.

COMMENT: New requirement regarding defective parts and the requirement for taking out of service.

Units are required to be taken out of service by the owner and in accordance with the applicable local laws and regulations.

Nothing in this requirement empowers the elevator contractor to take a unit out of service contrary to local laws and regulations.

Always contact the AHJ and obtain their advice, in writing, before taking any specific action(s).

8.6.5.14.10 – Functional Safety of SIL Rated Devices(s)

8.6.5.14.10 Functional Safety of SIL (Safety Integrity Level) Rated Device(s). Verify that the SIL rated device(s) used to satisfy 2.26.4.3.2 and 2.26.9.3.2(b) is as identified on wiring diagrams (8.6.1.6.3) with part identification, SIL, and certification identification information.

The person or firm installing the equipment shall provide a written checkout procedure and shall demonstrate that SIL rated devices, safety functions (see Table 2.26.4.3.2), and related circuits operate as intended.

COMMENT: New requirement regarding testing for SIL Rated Devices.

2.27.1.1 - Emergency Operation and Signaling Devices

SECTION 2.27 EMERGENCY OPERATION AND SIGNALING DEVICES - ***2.27.1.1 has been revised in its entirety to provide for two-way visual and messaging as required by the IBC 2018 3001.2***

2.27.1 Car Emerg

2.27.1.1 Emergen communications

2.27.1.1.1 A comm staffed by author shall be provided

2.27.1.1.2 If the c

[2.27.1.1.3(c)] wit an alternate on- c

2.27.1.1 - Emergency Operation and Signaling Devices (cont.)

2.27.1.1

(c) On the same panel as the phone push button, a message shall be displayed that is activated by authorized personnel to acknowledge that communications are established. The message shall be permitted to be extinguished where necessary to display a new message [see (d) and (e)] or when the communications are terminated.

(d) On the same panel as the phone push button, messages shall be displayed that permit authorized personnel to communicate with and obtain responses from a trapped passenger(s), including a passenger(s) who cannot verbally communicate or hear.

(e) On the same panel as the phone push button, a message shall be displayed that is activated by the authorized personnel to indicate when help is on the way. The message shall continue to be displayed until a new message is displayed [see 2.27.1.1.4(c)] or the communications are terminated.

2.27.1.1 - Emergency Operation and Signaling Devices (cont.)

2.27.1.1

(f) The communications means shall provide on demand to authorized personnel information that identifies the building location and elevator number.

(g) The communications, once established, shall be disconnected only when authorized personnel terminate the call or a timed termination occurs. A timed termination by the communications means in the elevator, with the ability to extend the call by authorized personnel, is permitted if voice notification is sent by the communications means to authorized personnel a minimum of 3 min after communication has been established. Upon notification, authorized personnel shall have the ability to extend the call; automatic disconnection shall be permitted if the means to extend are not enacted within 20 s of the voice notification.

2.27.1.1 - Emergency Operation and Signaling Devices (cont.)

2.27.1.1

(h) The communications means shall not use a handset in the car.

(i) The communications shall not be transmitted to an automated answering system. The call shall be answered by authorized personnel.

(j) Operating instructions shall be incorporated with or adjacent to the phone push button.

(k) A means to display video to observe passengers at any location on the car floor, to authorized personnel for entrapment assessment, shall be provided.

2.27.1.1 - Emergency Operation and Signaling Devices (cont.)

2.27.1.1.4 Where the elevator rise is 18 m (60 ft) or more, a communications means within the building accessible to emergency personnel shall be provided and shall comply with the following requirements:

(c) Once the communications have been established, a message shall be displayed on the same panel as the phone push button, that is activated by emergency personnel to indicate that help is on-site. The message shall be permitted to be extinguished where necessary to display a new message [see (e)] or when the communications are terminated.

(d) Operating instructions shall be incorporated with or adjacent to the communications means outside the car. Instructions shall conform to 2.27.7.3.

2.27.1.1 - Emergency Operation and Signaling Devices (cont.)

2.27.1.1.4 Where the elevator rise is 18 m (60 ft) or more, a communications means within the building accessible to emergency personnel shall be provided and shall comply with the following requirements:

(e) On the same panel as the phone push button, messages shall be displayed that permit emergency personnel to communicate with and obtain responses from a trapped passenger, including a passenger who cannot verbally communicate or hear.

(f) A means to display video to observe passengers at any location on the car floor, to emergency personnel for entrapment assessment, shall be provided.

2.27.1.1 - Emergency Operation and Signaling Devices (cont.)

Voice, text, and one-way video

With the Schindler VCS, elevator passengers can communicate with emergency personnel via a voice call on the Schindler SafeCall wireless elevator phone line or text-based communication on the elevator car operating panel. In addition, if needed, dispatchers can activate a one-way in-car video feed for further assessment.

How it works

- During normal operations, the car operating panel screen shows riders the floor they are on
- In the event of an emergency, riders use the phone-shaped button to place an audio call to the Schindler Customer Service Network
- If for whatever reason the Schindler operator cannot determine the occupant's status, the screen then greets the rider with on-screen prompts
- To answer the on-screen "Yes" or "No" questions, riders are guided to use the standard door-open and door-close buttons
- A one-way, in-car video feed can provide dispatchers with a visual assessment inside the elevator

What is included

The Schindler VCS package includes the hardware for the Schindler SafeCall, providing the wireless elevator phone as well as the Visual Communications System hardware that leverages the wireless connection for text and one-way video, all powered by the Schindler Ahead platform.

2.27.1.1 - Emergency Operation and Signaling Devices (cont.)

Features

- The system is fully integrated into your Schindler elevator's car operating panel for a seamless aesthetic
- Its built-in floor position indicator transforms into a 7" visual communication screen once the call button is activated
- All emergency communications are initiated with one call button
- Easy-to-understand on-screen "Yes" or "No" questions
- Uses door-open and door-close buttons for in-car passenger responses
- Low-profile, integrated one-way camera
- Additional Emergency Communication Panel available when desired or required by code

Benefits

- Secure, integrated connectivity through the proven Schindler Ahead platform, enabling options such as 24/7 equipment monitoring, real-time elevator performance data via Schindler ActionBoard, and more
- Responsive dispatching through the Schindler Customer Service Network
- Easily installed during the construction process
- Ideal for Schindler 3100, Schindler 3300, Schindler 3300 XL, or Schindler 5500 elevators
- Meets the emergency communications code requirements of IBC, A17. and CBC:
  - IBC-2018 Section 3001.2 Emergency Elevator Communication System
  - A17.1-2019 Section 2.27.1.1 Emergency Communications
  - CBC-2019

2.27.1.1 - Emergency Operation and Signaling Devices (cont.)

Emergency communication screen

Regular elevator operation position indicator screen

2.27.3.1.2 - Firefighters' Emergency Operation

2.27.3.1.2 An additional key-operated fire recall switch, with two positions that will not change position without a deliberate action by the user, marked "OFF" and "ON" (in that order), shall be permitted. **It shall be labeled "FIRE RECALL" and identify the elevator(s) it controls.**

NOTE (2.27.3.1.2): The building code or fire authority may require this switch to be at a specific location.

COMMENT: 2.27.3.1.2 has been revised to remove the requirement for this switch to be in the fire command center and to note that there may be local requirements for where this additional switch is to be located.
- 75 ft of travel – elevators are part of fire command including VAM

QUESTIONS

Cleveland / Akron:

- **Emily Elmerick -** emily.elmerick@schindler.com | 330-696-5195
- **Kaelyn Roberts -** kaelyn.roberts@schindler.com | 216-312-2536
- **Kyle Goins –** kyle.goins@schindler.com | 216-389-1184
- **Kodi Goins (GM) -** kodi.goins@schindler.com | 216-217-4388

Toledo:

- **Brad Figgins -** bradley.figgins@schindler.com | 419-480-9204
- **Corey Warren -** corey.warren@schindler.com | 419-205-8729
- **Lou Haefner (GM) -** louis.haefner@schindler.com | 419-341-0818

Columbus:

- **Emily Justice -** emily.justice@schindler.com | 614-325-9980
- **Hunter Baker -** hunter.baker1@schindler.com **|** 380-234-0636
- **Matt Eisnnicher (GM) -** matthew.eisnnicher@schindler.com | 220-219-6895

Ohio:

- **Amanda Schaub –** amanda.schaub@schindler.com | 412-215-1807

Thank you for your time!