

Section 40. The National Fire Protection Association (NFPA) Standard 130, Standard for Fixed Guideway Transit and Passenger Rail Systems, 2010 edition, is amended as follows:

1.3.4 This standard (~~((shall apply))~~) applies as a basis for fixed guideway transit and passenger rail systems (~~((where))~~) if nonelectric and combination electric/other (such as diesel) vehicles are used. (~~((Where))~~) If such vehicles are not passenger-carrying vehicles or are buses (~~((or trolley coaches))~~), the standard (~~((shall))~~) does not apply to those vehicles, but (~~((shall))~~) does apply to the fixed guideway transit and passenger rail system in which such vehicles are used.

3.2.2* Authority Having Jurisdiction (AHJ). ~~An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.~~ The fire chief or other designated authority charged with the administration of the fire code, or a duly authorized representative.

4.4.1 Emergency power assumptions. The emergency power requirements addressed in this standard assume a fire or other emergency event within the station or trainway concurrent with a power outage of the primary source of electrical power unrelated to the event within the transit system.

4.6* Fire Scenarios. Design scenarios shall consider the location and size of a fire or a fire-related emergency and shall be approved.

5.1.1.1.1 Fixed guideway transit and passenger rail stations are classified as Group A, Division 3 occupancies in accordance with the 2009 Seattle Building Code and 2009 Seattle Fire Code.

5.1.1.1.2 Enclosed fixed guideway transit and passenger rail stations shall be posted with the occupancy load in accordance with Section 1004.3 of the 2009 Seattle Fire Code.

5.1.1.4 Fixed guideway transit and passenger rail stations shall comply with the applicable provisions of Section 1113 of the 2009 Seattle Building Code.

5.2.1 Safeguards During Construction. During the course of construction or major modification of any structure, provisions of ~~((NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations-))~~ Chapter 14 of the 2009 Seattle Fire Code and Chapter 33 of the 2009 Seattle Building Code ~~((shall-))~~ apply.

5.2.2.1 Building construction for all new enclosed stations shall be not less than Type I or Type II or combinations of Type I and Type II noncombustible construction as defined in Chapter 6 of the 2009 Seattle Building Code ~~((NFPA 220, in accordance with the requirements of NFPA 101, Chapter 12-))~~, for the station configuration, or as determined by an engineering analysis of potential fire exposure hazards to the structure.

5.2.2.2 Other types of construction ~~((as defined in NFPA 220 shall be-))~~ is permitted for open stations in accordance with the provisions of ~~((NFPA 101, Chapter 12-))~~ Chapter 6 of the 2009 Seattle Building Code, for corresponding station configurations.

5.2.3.1.1* Stair and Escalator Enclosure. Stairs and escalators regularly used by passengers for circulation during normal revenue service in enclosed stations equipped throughout with an automatic sprinkler system ~~((shall not be-))~~ are not required to be enclosed if the station is constructed in accordance with Chapter 7 of the 2009 Seattle Building Code. All required exit stairs shall be enclosed in accordance with Chapter 10 of the 2009 Seattle Building Code.

5.2.3.3 Ancillary Spaces. Fire resistance ratings of separations between ancillary occupancies shall be established ~~((as required by NFPA 101))~~ in accordance with Chapter 7 of the 2009 Seattle Building Code ~~((NFPA 251-))~~.

5.3.1 Smoke control system. A smoke control system shall be provided in underground fixed guideway transit and passenger rail stations in accordance with Section 909 of the 2009 Seattle Fire Code. Smoke control shall restrict movement of smoke to the general area of fire origin and non-occupied exhaust areas and maintain tenability in the means of egress.

~~((5.4.11 Emergency Power. Emergency power in accordance with Article 700 of NFPA 70, and Chapter 4 of NFPA 110 shall be provided for enclosed stations-))~~

5.4.11* Emergency Power Supply System (EPSS). Underground and enclosed stations shall be provided with a Class 2 , Type 60, Level 1 Emergency Power Supply System (EPSS) in accordance with Article 700 of NFPA 70 and Chapter 4 of NFPA 110.

A.5.4.11 The class defines the minimum time, in hours, that the Emergency Power Supply System (EPSS) is designed to operate at its rated load without being refueled or recharged. The type defines the maximum time, in seconds, that the EPSS will permit the load terminals of the transfer switch to be without acceptable electrical power. NFPA 110 recognizes two levels of EPSS equipment installation, performance and maintenance. Level 1 systems shall be installed where failure of the EPSS to perform could result in loss of human life or serious injuries.

5.4.11.4 The following systems shall be connected to the emergency power supply system:

~~((1)Emergency lighting~~

~~(2)Protective signaling systems~~

~~(3)Emergency communication system~~

~~(4)Fire command center))~~

(1) Exit signs and means of egress illumination

(2) Elevator car lighting.

(3) Emergency voice/alarm communications systems.

(4) Automatic fire detection systems.

(5) Fire alarm systems.

(6) Power and lighting for the fire command center.

(7) Lighting for mechanical rooms.

(8) Electrically powered fire pumps.

(9) Ventilation and automatic fire detection equipment for smoke proof enclosures.

(10) Smoke control systems.

(11) A selected elevator in each bank of elevators in accordance with Seattle Building Code Section 3016.7. A bank of elevators is a group of elevators or a single elevator controlled by a

common operating system---all elevators that respond to a single call button constitute a bank of elevators. All elevators shall be transferable to emergency power.

5.5.1 General. The provisions for means of egress for a station shall comply with (~~Chapter 7 and Chapter 12 of NFPA 101~~) Chapter 10 of the 2009 Seattle Building Code, except as herein modified.

5.5.1.3.3 Every required stairway in enclosed stations serving floor levels more than 30 feet (9144 mm) below its level of exit discharge, except those regularly used by passengers shall comply with the requirements for a smokeproof enclosure in Section 1020.1.7 of the 2009 Seattle Building Code.

5.5.5.1 The occupant load for a station shall be based on whichever is greater:

(1) ~~T~~(+)he train load of trains simultaneously entering the station on all tracks in normal traffic direction plus the simultaneous entraining load awaiting a train or;

(2) The number of occupants computed at the rate of one occupant per unit of area as follows:

? 7 sq. ft. for underground structures

? 15 sq. ft. for surface structures and elevated structures.

5.5.5.5 (~~Where~~) If an area within a station is intended for use by other than passengers or employees, the occupant load for that area shall be determined in accordance with the provisions of Chapter 10 of the 2009 Seattle Building Code (~~NFPA 101~~) as appropriate for the class of occupancy.

5.5.6.1 Platform Evacuation Time. There shall be sufficient egress capacity to evacuate the platform occupant load as defined in 5.5.2.8 from the station platform in 4 minutes or less, but in no case shall the required egress width (excluding escalators) be less than prescribed by Section 1005 of the 2009 Seattle Building Code.

5.5.6.3.2.4 * Escalators (~~(shall not)~~) may account for (~~(more than)~~) up to one half of the required means of egress capacity at any one level for purposes of calculating platform evacuation time if the following criteria are met:

(1) The escalators are capable of being remotely brought to a stop in accordance with the requirements of 5.5.2.1(3)(b), 5.5.2.1(4), and 5.5.2.1(5).

(2) A portion of the means of egress capacity from each station level is comprised of stairs.

5.5.6.3.2.5 (~~Escalators shall be permitted to account for more than one half of the required means of egress capacity at any one level where the following criteria are met:~~

~~(1) The escalators are capable of being remotely brought to a stop in accordance with the requirements of 5.5.2.1(3)(b), 5.5.2.1(4), and 5.5.2.1(5).~~

~~(2) A portion of the means of egress capacity from each station level is comprised of stairs.~~

~~(3)) For enclosed stations, at least one enclosed exit stair or exit passageway shall provide continuous access from the platforms to (~~(the)~~) a public way.~~

~~(5.5.6.3.3 Elevators. 5.5.6.3.3.1 Elevators meeting the requirements of sections 5.5.6.3.3.2 through 5.5.6.3.3.4 shall be permitted to account for part of the means of egress capacity in stations. 5.5.6.3.3.2 Capacity and Numbers. Where elevators are counted as contributing to the means of egress capacity, the following shall apply:~~

~~(1) They shall comprise no more than 50 percent of the required egress capacity.~~

~~(2) * At least one elevator shall be considered out of service, and one elevator shall be reserved for fire service.~~

~~(3) * The capacity of each elevator shall be the carrying capacity of the elevator within 30 minutes.~~

~~5.5.6.3.3.3 Holding Area. Elevators counted as contributing to the means of egress capacity shall be accessed via holding areas or lobbies that shall be designed as follows:~~

~~(1) The holding areas or lobbies shall be separated from the platform by a smoke-tight fire separation having a fire-resistance rating of at least 1 hour, but not less than the time required to evacuate the holding area occupant load.~~

~~(2) At least one stair shall be accessible from the holding area.~~

~~(3) The holding area shall be sized to accommodate one person per 0.46 m² (5 ft²).~~

~~(4) If the holding area includes portions of the platform, the area within 460 mm (18 in.) of the trainway shall not be considered in the calculation.~~

~~(5) Upon activation of smoke control in the platform or adjacent trainway areas, the holding area shall be pressurized to a minimum of 25 Pa (or 0.051 in. of water gauge).~~

~~(6) The holding area shall be provided with emergency voice alarm devices with two-way communication to the system operations control center.~~

~~5.5.6.3.3.4 Design Features. Elevators counted as contributing to the means of egress capacity shall be designed as follows:~~

~~(1) Shaft enclosures shall be constructed as smoketight fire separations having a 2-hour fire resistance rating.~~

~~(2) * The design shall limit water flow into the shaft.~~

~~(3) No more than two elevators used for means of egress or fire department access shall share the same machine room.~~

~~(4) Machine rooms shall be separated from each other by fire separations having a minimum fire resistance rating of 2 hours.~~

~~(5) The elevators shall be connected to emergency power.~~

~~(6) * During emergency evacuation, the elevators shall travel only between the incident platform level and a point of safety.--))~~

~~5.5.6.3.4.3 Emergency exit gates shall comply with Chapter 10 of the 2009 Seattle Building Code. ((be in accordance with NFPA 101.--)) and the clear width of the exit walkway shall be maintained.~~

~~5.5.6.3.5.2 Turnstile-type fare collection equipment shall be permitted in accordance with ((NFPA 101--)) Chapter 10 of the 2009 Seattle Building Code and shall account for a capacity of 25 ppm for egress calculations.~~

~~5.6.1 Stations shall be provided with a system of emergency lighting in accordance with ((NFPA 101--)) Section 1006 of the 2009 Seattle Building Code, except as otherwise noted herein.~~

5.6.2 Means of egress shall be provided with a system of emergency lighting in accordance with Chapter 10 of the 2009 Seattle Building Code ~~((Section 7.9 of NFPA 101))~~, except as otherwise noted in this standard.

5.7.3.1 An automatic sprinkler ~~((protection))~~ system shall be provided ~~((in))~~ throughout all areas of enclosed fixed guideway transit and passenger rail stations ~~((used for concessions, in storage areas, in trash rooms, and in the steel truss area of all escalators and other similar areas with combustible loadings, except trainways))~~.

~~((5.7.3.1.1 Sprinkler protection shall be permitted to be omitted in areas of open stations remotely located from public spaces.))~~

5.7.3.4 Other fire suppression systems, if approved, ~~((shall be permitted to))~~ may be substituted for automatic sprinkler systems ~~((in the areas listed in 5.7.3.1))~~.

5.7.4.1.1 ~~((Class of service shall be determined by the authority having jurisdiction. (See A.5.7.4.30))~~ Elevated transit stations shall be equipped throughout with a Class I standpipe system.

5.7.4.2.1 Hydraulic design information signs shall be provided at each fire department connection indicating the residual inlet pumping pressure(s) required for the hydraulically most remote and/or other selected hose connection outlet location(s).

5.7.4.3* Fire department connections for fire department use in supplying the standpipe system shall be located ~~((as follows:))~~ in accordance with Seattle Fire Department Administrative Rule 9.03.09, Automatic Sprinkler and Standpipe Systems and any future revisions of this rule adopted by the fire code official.

~~((1. within 30.5 m (100 ft) of vehicular access and~~

~~2. within operating distance of fire hydrants as determined by the local authority having jurisdiction)).~~

5.7.6.1 Underground stations shall be provided with a fire command center in accordance with NFPA 72 and Section 509 of the 2009 Seattle Fire Code .

5.9.1.1 Interior wall and ceiling finish materials in enclosed stations shall be either noncombustible or shall comply with Chapter 8 of the 2009 Seattle Fire Code (~~one of the following:~~

~~(1) Interior wall and ceiling finish materials shall be noncombustible materials.~~

~~(2) Interior wall and ceiling finish materials, other than textile wall coverings or foam plastic insulation, shall exhibit a flame spread index not exceeding 25 and a smoke developed index not exceeding 450, when tested by ASTM E 84.)~~

~~(5.9.1.2 Interior wall and ceiling finish materials, when tested in accordance with NFPA 286, shall comply with the following:~~

~~(1) Flames shall not spread to the ceiling during the 40 kW (135 kBtu/hr) exposure.~~

~~(2) During the 160 kW (545 kBtu/hr) exposure, the following criteria shall be met:~~

~~(a) Flame shall not spread to the outer extremities of the sample on the 2.45 m x 3.7 m (8 ft x 12 ft) wall.~~

~~(b) The peak heat release rate shall not exceed 800 kW (2730 kBtu/hr).~~

~~(c) Flashover shall not occur.~~

~~(3) The total smoke released throughout the test shall not exceed 1000 m² (10,764 ft².)~~

5.9.2.1 Interior finish in open stations shall comply with the requirements of (~~NFPA 101, Chapter 12~~) Chapter 8 of the 2009 Seattle Fire Code.

5.10 Rubbish Containers. Rubbish containers shall (~~be manufactured of noncombustible materials~~.) comply with Section 304 of the 2009 Seattle Fire Code.

6.2.1.2 System egress ~~((points))~~ walk surfaces shall be illuminated at a level of not less than 2.69 lx (0.25 ft-candles) or as approved by the authority having jurisdiction.

6.2.1.9* The means of egress within the trainway shall be provided with an unobstructed clear width graduating from the following:

(1) ~~610 mm (24 in.)~~ 760 mm (30 in.) at the walking surface to

(2) ~~760 mm (30 in.)~~ 910 mm (36 in.) at 1420 mm (56 in.) above the walking surface to

(3) ~~610 mm (24 in.)~~ 760 mm (30 in.) at 2025 mm (80 in.) above the walking surface

6.2.2.1 General. Exit stairs and doors shall comply with Chapter 10 of the 2009 Seattle Building Code ~~((7 of NFPA 101))~~, except as herein modified.

~~((6.2.2.2.2 For exit stairs serving underground or enclosed trainways, the width of exit stairs shall not be required to exceed 1120 mm (44 in.))~~

~~((6.2.2.5 Exit Hatches.~~

~~6.2.2.5.1 Exit hatches shall be permitted in the means of egress, provided the following conditions are met:~~

~~(1) Hatches shall be equipped with a manual opening device that can be readily opened from the egress side.~~

~~(2) Hatches shall be operable with not more than one releasing operation.~~

~~(3) The force required to open the hatch when applied at the opening device shall not exceed 130 N (30 lb).~~

~~(4) The hatch shall be equipped with a hold-open device that automatically latches the door in the open position to prevent accidental closure.~~

~~6.2.2.5.2 Exit hatches shall be capable of being opened from the discharge side to permit access by authorized personnel.~~

~~6.2.2.5.3* Exit hatches shall be conspicuously marked on the discharge side to prevent possible blockage.))~~

6.2.5.2 Lighting systems for enclosed trainways described in 6.2.5.1 shall be installed in accordance with ~~((Sections 7.8 and 7.9 of NFPA 101-))~~ Chapter 10 of the 2009 Seattle Building Code , except as otherwise noted in this standard.

6.3.3.2.11 * Emergency Power Supply System (EPSS) . Enclosed trainways shall be provided with a Class 2 , Type 60, Level 1 Emergency Power Supply System (EPSS) ~~((such that, in the event of failure of the normal supply to, or within, the system, emergency power shall be provided with emergency power-))~~ in accordance with Article 700 of NFPA 70, and Chapter 4 of NFPA 110. The supply system for emergency purposes, in addition to the normal services to the trainway, shall be one or more of the types of systems described in subsections 700.12(A) through 700.12(E) of NFPA 70.

A.6.3.3.2.11 The class defines the minimum time, in hours, that the Emergency Power Supply System (EPSS) is designed to operate at its rated load without being refueled or recharged. The type defines the maximum time, in seconds, that the EPSS will permit the load terminals of the transfer switch to be without acceptable electrical power. NFPA 110 recognizes two levels of EPSS equipment installation, performance and maintenance. Level 1 systems shall be installed where failure of the EPSS to perform could result in loss of human life or serious injuries.

6.3.3.2.11.1 The following systems shall be connected to the emergency power supply system:

~~((1)Emergency lighting~~

~~(2)Protective signaling systems~~

~~(3)Emergency communication system~~

~~(4)Fire command center))~~

(1) Exit signs and means of egress illumination

(2) Elevator car lighting.

(3) Emergency voice/alarm communications systems.

(4) Automatic fire detection systems.

(5) Fire alarm systems.

(6) Power and lighting for the fire command center.

(7) Lighting for mechanical rooms containing critical equipment.

(8) Electrically powered fire pumps.

(9) Ventilation and automatic fire detection equipment for smoke proof enclosures.

(10) Smoke control systems.

(11) A selected elevator in each bank of elevators in accordance with Seattle Building Code Section 3016.7. A bank of elevators is a group of elevators or a single elevator controlled by a common operating system---all elevators that respond to a single call button constitute a bank of elevators. All elevators shall be transferable to emergency power.

6.5.2.1 An approved fire standpipe system shall be provided ~~((in))~~ for ~~((underground))~~ fixed guideway transit and passenger rail system trainways where physical factors prevent or impede access to the water supply or fire apparatus, ~~((where))~~ if required by the authority having jurisdiction.

6.5.2.4.3 Hydraulic design information signs shall be provided at each fire department connection indicating the residual inlet pumping pressure(s) required for the hydraulically most remote and/or other selected hose connection outlet location(s).

6.5.2.6 Four-way 2.5 inch fire department connections shall be provided at all emergency access points.

6.5.2.7 Standpipes shall be sized to provide 1000 gpm. Hydraulic calculations shall be based on 500 gpm at 130 psi at the hydraulically most remote hose connection, with a simultaneous flow of 500 gpm at the next hydraulically most remote hose connection. The maximum calculated pressure at any point in the system shall not exceed 350 psi.

6.5.2.8 Standpipes shall be interconnected at all tunnel cross passageways and within the stations, with isolation valves provided for each interconnection.

6.5.2.9 Hose connection outlets shall be provided at maximum 200 feet spacing.

6.6.7.6 Tanks shall be abandoned in accordance with the provisions of Chapter 34 of the 2009 Seattle Fire Code. ~~((Annex C of NFPA 30.))~~

7.2.4 ~~((Criteria for the system reliability analysis in 7.2.3(6) shall be established and approved.))~~ The design analysis shall address the performance of the system with one fan out-of-service.

~~((7.2.4.1 The analysis shall consider as a minimum the following events:~~

~~(1) Fire in trainway or station~~

~~(2) Local incident within the electrical utility that interrupts power to the emergency ventilation system~~

~~(3) Derailment.))~~

~~((7.7.1 The design of the power for the emergency ventilation system shall comply with the requirements of Article 700 of NFPA 70.))~~

7.7.1* The emergency ventilation system shall be provided with a Class 2 , Type 60, Level 1 Emergency Power Supply System (EPSS) in accordance with Article 700 of NFPA 70, and Chapter 4 of NFPA 110.

A.7.7.1 The class defines the minimum time, in hours, for the Emergency Power Supply System (EPSS) is designed to operate at its rated load without being refueled or recharged. The type defines the maximum time, in seconds, that the EPSS will permit the load terminals of the transfer switch to be without acceptable electrical power. NFPA 110 recognizes two levels of EPSS equipment installation, performance and maintenance. Level 1 systems shall be installed where failure of the EPSS to perform could result in loss of human life or serious injuries.

~~7.7.1.1 Alternatively, the design of the power for the emergency ventilation system shall be permitted to be based upon the results of the electrical reliability analysis as per 7.2.3(6), as approved.~~

8.8.2.1 A means to allow passengers to safely board the vehicle (rescue train) from a walk surface or other suitable area under the supervision of authorized employees in case of an emergency shall be provided.

10.3.2 (~~Whenever necessary for reliable communications, a separate~~) If required by the authority having jurisdiction, an emergency responder radio (~~(network capable of two-way radio communication for fire department personnel to the fire department communication center)~~) system shall be provided in accordance with Section 510 of the 2009 Seattle Fire Code.

10.6.1.1 If required by the authority having jurisdiction, stations shall be provided with an approved Emergency Communication System in accordance with the 2010 edition of NFPA 72.
