Egress Door Locking Arrangements

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Objectives/Topics

1. Egress door operational requirements
2. Exceptions to egress door operational requirements
3. Egress door control systems
4. Stairway doors and building reentry
Egress Door
Operational Requirements
Egress Door Operations

New construction
- Section 1010

Existing construction
- Section 1104.7 Doors - General
  - Locks and latches shall comply with Sections 1010.1.9 through 1010.1.11.4
Door operation provisions in Chapter 10 that apply to existing buildings

- Door operations (general): 1010.1.9
- Hardware mounting height: 1010.1.9.2
- Locks and latches: 1010.1.9.4
- Bolt locks: 1010.1.9.5
- Unlatching: 1010.1.9.6
- Panic and fire exit hardware: 1010.1.10
- Door access and control systems: 1010.1.9.9 – 1010.1.11
Egress Door Operations

No existing provisions for the following special door operations:

- Power operated
- Special purpose horizontal sliding, accordion or folding
- Security grilles
- Turnstiles

See Section 1101.6 – Previous codes

See Section 1101.5 – Compliance with NFPA 101
Door Locking Arrangements
Egress Door Locks and Latches

Requirements for egress door operation:

- Readily openable without the use of a key, special knowledge or effort
- Release (unlock and unlatch) with a single operation
- Hardware height: 34” to 48” above floor
Egress Door Locks and Latches

Opening force:

- Locks and latches to release with an applied force of not more than a 15-pounds

- Exterior doors
  - Set in motion with $\leq 30$ pounds of force
  - Swing to full-open with $\leq 15$ pounds of force
    - 50 pounds for existing buildings

- Interior doors
  - Open with $\leq 5$ pounds of force
  - Exception for fire-doors in new, and all doors with closers in existing

1010.1.3 & 1104.8
Egress Door Locks and Latches

Panic hardware or fire exit hardware

- Required in
  - Groups A and E with ≥ 50 occupants
  - Group H
  - Electrical rooms with switch gear ≥ 1200A & > 6 feet wide
Egress Door Locks and Latches

Panic Hardware
- Listed to UL 305
- Actuating portion must extend at least $\frac{1}{2}$ of the door leaf
- Maximum unlatching force of 15 pounds
- No other locks or latches permitted unless integral to panic hardware
Panic Hardware Actuator
Egress Door Locks and Latches

Panic hardware?
Egress Door Locks and Latches

• Panic vs. Fire Exit Hardware
  − Fire exit hardware is a type of panic hardware listed for use on fire door assemblies
  − Panic hardware listed to UL 305
  − Fire exit hardware listed to UL 10C & UL 305
UL 10C Testing of Fire Door Assemblies

#STANDARDSMATTER
#FIRESAFETY
Panic Hardware: No Other Locks or Latches
• Touch sensing exit devices
  - Request to Exit Hardware listed to UL 294
  - Panic hardware must be listed to UL 305
Egress Door Locks and Latches

Gates serving the means of egress
- Shall comply with egress door requirements
  - Width, swing, operation, hardware, etc.
Egress Door Locks and Latches

Gates serving the means of egress

- Exception:
  - Panic hardware not required on gates surrounding stadiums where:
    - Under constant supervision
    - Dispersal areas provided between fence and stadium space (3 ft²/occupant)
    - Dispersal areas located at least 50 ft. from stadium
Exceptions to Door Release Operations
Egress Door Release Exceptions

• Key-operated lock exception applies to:
  – Group A having an occupant load of 300 or less
  – Groups B, F, M, S
  – Places of religious worship

1010.1.9.4 (2)
Key-operated lock exception:

- Allowed on the main door(s)
- Locking device is readily distinguishable as locked

1010.1.9.4 (2)
Key-operated lock exception:

- Sign posted on or adjacent to door on egress side:
  - THIS DOOR TO REMAIN UNLOCKED WHEN THIS SPACE IS OCCUPIED.
  - Letters one-inch high on a contrasting background
- Revocable by the code official for due cause

1010.1.9.4 (2)
Section 1010.1.9.2 Hardware height

“Locks used only for security purposes and not for normal operation are permitted at any height.”

- Important to understand intent per IFC commentary
- **Example:** unframed glass door serving a mall tenant space with a floor-level lock
  - Used only when not open for business
  - Not required for normal operation of the door
Automatic Flush Bolts
Manual Flush or Surface Bolts
Egress Door Release Exceptions

Automatic flush bolts

- Allowed on egress doors used in pairs
- The door leaf having the flush bolts must not have a doorknob or surface-mounted hardware
Holds open inactive leaf until active leaf closes

– Necessary where automatic flush bolts are used on fire rated door pairs
Egress Door Release Exceptions

Manual flush bolts or surface bolts

1010.1.9.5
Egress Door Release Exceptions

Manual flush bolts or surface bolts prohibited except for: (1)

- Non-egress doors of individual dwelling and sleeping units
- Inactive leaf of a door-pair serving storage or equipment rooms
**Egress Door Release Exceptions**

**Manual flush bolts or surface bolts prohibited except for: (2)**

- Groups B, F, or S occupancies serving < 50 occupants
  - Permitted on the inactive leaf of door-pairs (not required for egress)
  - Inactive leaf free of operating hardware
- Doors in fully sprinklered (NFPA 13) Groups B, F, or S occupancies serving
  - Same as above, but no occupant limits

1010.1.9.5
Egress Door Release Exceptions

Manual flush bolts or surface bolts prohibited except for: (3)

- Patient care rooms in Group I-2
  - Self-latching bolts permitted on the inactive leaf where:
    - Inactive leaf is not required for egress
    - No operating hardware on inactive leaf

1010.1.9.5
Egress Door Release Exceptions

- Doors from Group R individual dwelling or sleeping units with occupant load of ≤ 10
  - Permitted to have a night latch, dead bolt or security chain that’s operable from the inside without use of a key or tool
Egress Door Release Exceptions

§326B.106 GENERAL POWERS OF COMMISSIONER: Double-cylinder locks

- Double-cylinder deadbolt locks shall not be prohibited in the following when used exclusively as a residential dwelling:
  - Existing single-family homes
  - Existing townhouses
  - Existing first floor duplexes

MS 326B.106, Subd.4(g)
Egress Door Release Exceptions

- Doors serving unoccupied roofs
  - May be locked to prevent building entry
Locking in Educational Occupancies

[BE] 1010.1.4.4 Locking arrangements in educational occupancies

- Applies to Groups E and B educational occupancies
- Allows classrooms, offices & similar areas to have locking arrangements to prevent entry:
  - Capable of being unlocked from the access side
  - Door is operable for egress per Section 1010.1.9
  - No modifications to panic, fire door, or door closing hardware
  - Remote operation of locks is permitted
Examples of Door Security/Barricade Devices
To comply with 1010.1.9 for door operation, a security or barricade device must:

- Not require a key, special knowledge or effort
- Release the door with a single operation
- Be mounted 34” to 48” above floor level
Locking in Educational Occupancies

Examples of compliant security/barricade devices
Door Control Systems
Door Control Systems

[BE] 1010.1.9.9 Sensor release of electrically locked egress doors

- Previously called “Access-controlled egress doors”
- Typically applies to electromagnetically locked doors
- Does not inhibit egress
- Controls the access-side only

Section 1010.1.9.9
[BE] 1010.1.9.9 Sensor release of electrically locked egress doors

- Allowed in any occupancy except Group H
- Sensor installed on the egress side arranged to detect an approaching occupant, causing door to unlock
- Manual release switch must directly interrupt power to the lock independent of all other electronics
Sensor Release Egress Doors

Motion Sensor – Releases Magnetic Lock

Magnetic Locking Device

Section 1010.1.9.9
Sensor Release Egress Doors

Section 1010.1.9.9
Door Control Systems

[BE] 1010.1.9.9 Sensor release of electrically locked egress doors

- Doors must release on:
  o Fire alarm actuation or sprinkler water flow (where present)
  o Loss of power to system or lock
- Locking system units listed to UL 294 – *Standard for Access Control System Units*
Door Control Systems

[BE] 1010.1.9.10 Door hardware release of electrically locked egress doors

- Previously called “electromagnetically locked egress doors”
- Door secured with an electromagnetic lock
- Door releases for egress via use of listed request-to-exit (RX) hardware
[BE] 1010.1.9.10 Door hardware release of electrically locked egress doors

- Allowed in any occupancy except Group H
- Loss of power to the electric locking system releases the door
- Interconnection to fire protection systems are not required
- Locking system units listed to UL 294 – *Standard for Access Control System Units*
1010.1.9.8 Delayed egress door locks

- Allows for a 15-second delay before egress is permitted
- Irreversible unlocking process begins with 15 lbs. force applied for 1 second
- Local alarm at door
- Door releases in 15 seconds (30 seconds where approved)
  - Manual reset only
1010.1.9.8 Delayed egress door locks

- Prohibited in Groups A & H
  - Prohibited in Group E where the means of egress serves an assembly use area
  - Allowed in sprinklered Group A-3 courtrooms, but not at the main exit

- Fire protection requirements
  - Sprinklered building (NFPA 13), or
  - Fire alarm system with corridor smoke detection
1010.1.9.8 Delayed egress door locks

- Occupants **shall not pass through more than one** delayed egress door before entering an exit, **except for**:  
  o May pass through 2 systems with a combined delay ≤ 30 seconds in Group I-2 or I-3
  o May pass through 2 systems with a combined delay ≤ 30 seconds in Group I-1 or I-4 in fully sprinklered buildings (NFPA 13)
- Emergency lighting required on the egress side of the door
- Locking system units shall be listed to UL 294 – Standard for Access Control System Units
Door Control Systems

1010.1.9.8 Delayed egress door locks

- Door signage: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 SECONDS.
  
  o Exception: Group I (where approved) where care recipients, because of clinical needs, require restraint or containment
Door Control Systems

1010.1.9.7 Controlled egress doors in Groups I-1, I-2, R-3, or R-4 occupancies

- Formerly titled “Special locking arrangements in Group I-1, I-2, R-3, or R-4 occupancies”
- Doors are secured to prevent egress when a person’s clinical needs require their containment
1010.1.9.7 Controlled egress doors in Groups I-1, I-2, R-3, or R-4 occupancies

- Requires a sprinkler system (NFPA 13) and fire alarm system with smoke detection per Section 907

- Doors release on:
  - Fire alarm actuation for sprinkler water flow
  - Loss of power
  - Signal from fire command center, nurses station or other approved location
Door Control Systems

1010.1.9.7 Controlled egress doors in Groups I-1, I-2, R-3, or R-4 occupancies

- Clinical staff must carry keys, codes, or other means necessary to unlock doors
- 24 hour patient supervision
- Floor levels divided into at least two smoke barrier compartments
- Locking devices designed to be fail-safe from the egress side
- Locking system units listed to UL 294
1010.1.9.7 Controlled egress doors in Groups I-1, I-2, R-3, or R-4 occupancies

- Emergency lighting on both sides of door
- Occupants may only pass through one controlled egress door before entering an exit
- Procedures for controlled egress must be included in the emergency plan
1010.1.9.7 Controlled egress doors in Groups I-1, I-2, R-3, or R-4 occupancies

- Exceptions for psychiatric treatment or nursery or obstetric areas:
  - Doors not required to release on fire sprinkler or alarm activation
  - Doors not required to unlock on loss of power
  - Doors not required to unlock remotely
  - Occupants may pass through multiple controlled egress doors
Egress Door Hardware

(Magnetic Locks)

(Key Card Reader)

Controlled Egress Doors
Special detention arrangements

- Allowed for rooms or areas where occupants are temporarily restrained for security and safety
- Examples:
  - School seclusion rooms
  - Institutional occupancies
Special Detention Arrangements

Manual hold-to-lock switch required by Minn. Dept. of Education (not required by MSFC)
Locking Arrangements in Correctional Facilities
Locking arrangements within correctional facilities

- Doors may be locked to prevent egress where:
  - Doors unlock manually and unlock with at least one of the following:
    - Sprinkler water-flow (NFPA 13)
    - Activation of an approved fire alarm box
    - Signal from a constantly attended location
Door Control Systems

Maintenance

- Periodic testing required for the following door control systems:
  - Sensor release
  - Door hardware release
  - Delayed egress
  - Controlled egress
  - Special detention arrangements
Stairway Doors and Building Reentry
Stairway Doors

Interior stairway egress doors shall be operable from the stairway side, except for: (1)

- The stairway discharge door may be locked from the opposite side
- Stairways serving 4 stories or less
- Doors arranged in accordance with MBC 403.5.3
  - Doors released from fire command center
  - Two-way communication system every 5th floor
Stairway Doors

Stairway door release hardware for building reentry:

– When unlocked, fire doors must still remain latched

– Traditionally, fail-safe electromechanical hardware has been used, because:
  o Loss of power unlocks doors to allow for building reentry
Stairway Doors

- Electric strikes cannot be used to unlock fire rated doors for stairway reentry
  - Latching is not maintained when unlocked from command center
Questions

Website: https://sfm.dps.mn.gov