Proposed Change 1515

Code Reference(s): NBC15 Div.B 3.1.9.3.
Subject: Penetrations
Title: Penetrations by Single Conductor Metal Sheathed Cables with Combustible Jacketting
Description: This proposed change deletes Sentence 3.1.9.3.(3) to remove the permission for single conductor metal sheathed cables with combustible jacketting that are more than 25 mm in overall diameter to penetrate a fire separation required to have a fire-resistance rating without being incorporated in the assembly when tested.

Related Proposed Change(s): PCF 544, PCF 1499, PCF 1500, PCF 1501, PCF 1502, PCF 1505, PCF 1506, PCF 1508, PCF 1517, PCF 1523, PCF 1526, PCF 1576

PROPOSED CHANGE

3.1.9.3. Penetration by Wires, Cables and Outlet Boxes

1) Optical fibre cables and electrical wires and cables in totally enclosed noncombustible raceways are permitted to penetrate an assembly required to have a fire-resistance rating without being incorporated in the assembly at the time of testing as required by Article 3.1.9.2.

2) Except as permitted by Sentence (3), totally enclosed non-metallic raceways conforming to Article 3.1.5.23., optical fibre cables, and electrical wires and cables, single or grouped, with combustible insulation, jackets or sheathes that conform to the requirements of Clause 3.1.5.21.(1)(a) and that are not installed in totally enclosed noncombustible raceways are permitted to penetrate an assembly required to have a fire-resistance rating without being incorporated in the assembly at the time of testing as required by Article 3.1.9.2., provided the overall diameter of the single or grouped wires or cables, or the raceways is not more than 25 mm.

3) Single conductor metal sheathed cables with combustible jacketting that are more than 25 mm in overall diameter are permitted to penetrate a fire separation required to have a fire-resistance rating without being incorporated in the assembly at the time of testing as required by Article 3.1.9.2., provided the cables are not grouped and are spaced a minimum of 300 mm apart.

4) Combustible totally enclosed raceways that are embedded in a concrete floor slab are permitted in an assembly required to have a fire-resistance rating without being incorporated.
in the assembly at the time of testing as required by Article 3.1.9.2., provided the concrete cover between the raceway and the bottom of the slab is not less than 50 mm.

Combustible outlet boxes are permitted in an assembly required to have a fire-resistance rating without being incorporated in the assembly at the time of testing as required by Article 3.1.9.2., provided the opening through the membrane into the box is not more than 0.016 m².

RATIONAL

Problem

Currently, Sentence 3.1.9.3.(3) allows single conductor metal sheathed cables with combustible jacketing that are more than 25 mm in overall diameter to penetrate a fire separation required to have a fire-resistance rating (FRR), with no upper limit on the overall cable diameter and no limits on the opening size, without being incorporated in the assembly when determined the FRR. For this permission to apply, the cables must not be grouped and must be spaced at least 300 mm apart.

However, a series of large openings spaced at least 300 mm apart could affect the FRR of the fire separation. In addition, where the diameter of the openings surrounding the penetrating cables is larger than that of the cables themselves, fire and smoke could spread from one fire compartment to an adjacent fire compartment through the concealed space of the fire separation.

With the current wording of the Sentence, the permitted single conductor metal sheathed cables with combustible jacketing could present a fire risk. The lack of protection measures in the Sentence could prevent a fire separation from retarding the spread of fire for the required period of time, which could compromise the safety of persons and lead to an uncontrolled fire.

Justification - Explanation

Sentence 3.1.9.3.(3) allows penetrations by single conductor metal sheathed cables with combustible jacketing without any protection of the penetrations whatsoever. The current wording of the Sentence allows penetrations by cables with an overall diameter of more than 25 mm and does not provide an upper limit on the overall diameter. While the cables cannot be grouped and must be spaced at least 300 mm apart, they can be installed in the same location as other penetrating items, making the openings even larger.

In addition, the Sentence does not limit the diameter of the unprotected openings for the passage of the cables. Since the opening diameter is larger than the cable diameter and a fire stop tested in accordance with CAN/ULC-S115, “Fire Tests of Firestop Systems,” is not required, fire and smoke could easily spread from one fire compartment to an adjacent fire compartment through the concealed space of the fire separation.

With its current wording, this Code provision allows penetrations that will readily spread fire and large amounts of smoke from one fire compartment to an adjacent fire compartment, which could compromise the safety of the occupants and lead to an uncontrolled fire and the loss of the entire building.
Impact analysis

By deleting Sentence 3.1.9.3.(3), the risk of fire and smoke spread associated with single conductor metal sheathed cables with combustible jacketing is eliminated. Numerous fire stop systems tested to CAN/ULC-S115 are currently available in Canada for penetrations of fire separations and are being applied in the industry. Therefore, this proposed change will result in no or little increase in cost. The benefit of the proposed change is the removal of a potentially serious hazard, such that proven, tested systems are used instead.

Enforcement implications

This proposed change can be enforced by the infrastructure currently available to enforce the Code.

Who is affected

Building owners, engineers, architects, contractors, regulators, and manufacturers of fire stop systems.

OBJECTIVE-BASED ANALYSIS OF NEW OR CHANGED PROVISIONS

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