G153-25

IBC: SECTION 2703 (New), 2703.1 (New), 2703.2 (New)

Proponents: Michael Anthony, Standards Michigan, LLC, representing IEEE Education & Healthcare Facilities Committee (maanthon@umich.edu)

2024 International Building Code

Add new text as follows:

SECTION 2703
PERFORMANCE-BASED BUILDING PREMISE WIRING DESIGN FOR NON-EMERGENCY FEEDER CIRCUITS.

2703.1 Genaral. Feeder circuits identified in the NFPA 70 shall be permitted to be sized based on demonstrated load provided that sizing calculations are performed by a qualified person, as determined by the regulatory authority having jurisdiction.

2703.2 Demonstrated load. The demonstrated load shall be the historical maximum demand watt information recorded over at least a 24-month period for the same type of facility as the one in question, equated to watts per m^2.

Reason: We present this concept to the ICC community fully aware that it may be perceived as 'outside ICC jurisdiction' and will receive a smart rejection.. Our intent is to raise awareness of an ongoing discussion that began at the University of Michigan as far back as 1999. Electrical professionals there observed that at least half of our building's interior distribution transformers (numbering in the thousands across nearly 50 million square feet) were seldom loaded above 20 percent of their kVA rating throughout their lifecycle. The application of LED illumination and variable speed drives accelerated the downward trend.

We have authored multiple IEEE technical papers on this subject. We maintain collaboration with fellow design engineers (experts at NFPA and in the consulting industry) to narrow the gap between design load and observed load. More detail is found in the link below:

[Additional information: https://standardsmichigan.com/ibc-chapter-27-proposal/]

The proposed text is intended to be a placeholder. It closely mirrors the Canadian Electrical Code, which allows performance-based design discretion in sizing building interior power chains. By contrast, NEC wiring design is prescriptive, aligning with NFPA's primary mission of advancing fire safety.

Oversized power chains contribute to waste in customer-owned transformers, service panels, enclosure metal, architectural space for service rooms and switchgear, ventilation systems, sheet metal in ceiling plenums, air flow motors, illumination, egress entrance design, and more.

NFPA's own electrical experts acknowledge this issue. Despite research projects sponsored by its Research Foundation to inform technical committee members, proposals to reduce material and energy waste are routinely rejected by 'vertical incumbents'— manufacturers, testing labs, insurance, inspection entities— who benefit economically from oversized building power chains.

In summary, while NFPA has been supportive and respectful of user interests (building owners), the link provided presents more significant technical substantiation, and is respectful of the balance NFPA must maintain with other constituencies .

This proposal, at the very least, aims to broaden awareness of this obvious cost-saving opportunity. We want to find a home for it in any of the dominant standards catalogs that inform safe and sustainable building construction (e,g, ICC, NFPA, ASHRAE, IEEE, NECA, NEMA, etc.)

Cost Impact: Decrease

Estimated Immediate Cost Impact:

Since the electrical power chain typically accounts for about 20% of a building's initial cost, this proposal enables the electrical engineer to design a power chain that has the practical effect of reducing those costs by an additional 20%. It also provides energy savings through reduced material usage and heat losses over the building's entire lifecycle. For billion dollar projects, this could be a potential

cost savings of $900,000 to $1,750,000.

Estimated Immediate Cost Impact Justification (methodology and variables):

This proposal will reduce immediate cost and life cycle cost of a building by permitting designers to specify electrical closets, wires, conduit, transformers, cooling networks and related power chain elements between **load** side of the electric service and the receptacle and lighting branch circuit networks according to historical, observed and projected electrical demand profile of nearly every occupancy class typically found on an educational settlement.