EFCOG Best Practice #237

Facility: DOE Complex

Best Practice Title: Adoption of NFPA 70 (National Electrical Code) 2020 in place of NFPA 70 2017

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Brief Description of Best Practice: NFPA 70 2020 is recommended for approval across the DOE Complex as an upgrade to NFPA 70 2017 in 10 CFR 851 Worker Safety and Health Plans (WSHP).

Why the best practice was used: 10 CFR 851 lists safety and health consensus standards with which the contractor must comply when applicable with site hazards (851.23). Only the versions of consensus standards that were in effect on January 17, 2018 were promulgated pursuant to rulemaking therefore only those specifically cited versions are required by the Rule. Contractors may include successor versions of the consensus standards that provide equal or greater worker protection if included in their DOE-approved worker safety and health program.

What are the benefits of the best practice: The use of NFPA 70 2020 is at least as protective as the 2017 edition, except for one issue noted below, and even more protective in some areas, such that the new edition should be considered for DOE Complex wide acceptance. NFPA 70 2020 is recommended for approval across the DOE Complex as an upgrade to NFPA 70 2017.

What problems/issues were associated with the best practice: As demonstrated in Attachment 1, there has been only one change to the *NFPA 70, National Electrical Code* in the 2020 Edition that could present adverse impact to worker health or safety (rated "3", as described in the attachment). All other provisions of the 2020 edition are at least as protective as provided in the edition specified in 10 CFR 851, *NFPA 70*-2017.

Based on this evaluation, it is recommended that *NFPA 70, National Electrical Code*, 2020 Edition be adopted for use in the DOE, with exception of Subsection 700.12(I)(2)(3). This Subsection addresses requirements for individual emergency lighting units, which are required to illuminate means of egress in case of loss of general area illumination due to a normal power loss.

The following is the revised text, per *NFPA 70, National Electrical Code*, 2020 Edition (only the relevant portion is quoted):

> *700.12 General Requirements*
> *(I) Unit Equipment*
> *(2) Installation of Unit Equipment*
> *(3) The branch circuit feeding the unit equipment shall be one of the following:*
> *a. The same branch circuit as that serving the normal lighting in the area and connected ahead of any local switches*

b. Where the normal lighting circuit is served by one or more branch circuits, a separate branch circuit, provided with a lock-on feature, that originates from the same panelboard as the normal lighting circuits. The branch circuit disconnecting means for this branch circuit shall be provided with a lock-on feature

The change in this subsection could result in an unsafe condition. Opening of a branch circuit breaker in an area where general lighting is served by a single branch circuit will result in a loss of general lighting, with emergency lighting unit equipment not activated if not fed from the same branch circuit. This is not consistent with *NFPA 101, Life Safety Code,* 2017, Section 7.9.2.3(2) which states:

7.9.2.3 The emergency lighting system shall be arranged to provide the required illumination automatically in the event of any interruption of normal lighting due to any of the following:
(1) Failure of a public utility or other outside electrical power supply
(2) Opening of a circuit breaker or fuse
(3) Manual act(s), including accidental opening of a switch controlling normal lighting facilities

It is recommended the text in subsection 700.12(I)(2)(3) of *NFPA 70-2020* be replaced with the wording from *NFPA 70-2017*, Subsection 700.12(F)(2)(3), which reads:

(3) The branch circuit feeding the unit equipment shall be the same branch circuit as that serving the normal lighting in the area and connected ahead of any local switches. Exception: In a separate and uninterrupted area supplied by a minimum of three normal lighting circuits that are not part of a multiwire branch circuit, a separate branch circuit for unit equipment shall be permitted if it originates from the same panelboard as that of the normal lighting circuits and is provided with a lock-on feature."

How the success of the Best Practice was measured: N/A

Description of process experience using the Best Practice: At the time this analysis was performed, process experience did not exist.