FAQ Number 14-0008 **FAQ Revision** 0

FAQ Title Main Control Board Treatment

Plant: Various Date: ~~5/16~~/5/2014

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Purpose of FAQ: To clarify the definition of the Main Control Board, and to extend the definition to cover rear side of the main control board.

Relevant NRC document(s): NUREG/CR-6850

Details:

NRC document needing interpretation (include document number and title, section, paragraph, and line numbers as applicable): NUREG/CR-6850, Appendix L

Circumstances requiring interpretation or new guidance: Currently, the main control board (MCB) definition can be interpreted to exclude the rear side of the MCB panel. However, a review of the background supporting NUREG/CR-6850 development suggests that this interpretation may not be appropriate, and that the MCB should also include the rear side of the MCB panel. The purpose of this FAQ is to clarify this definition, and to give guidance on application of the frequencies in Appendix L, Figure L-1.

Detail contentious points if licensee and NRC have not reached consensus on the facts and circumstances: None

Potentially relevant existing FAQ numbers: NFPA 805 FAQ 06-0018

Response Section:

Proposed resolution of FAQ and the basis for the proposal:

MCB Definition

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Currently, the main control board (MCB) definition can be interpreted to exclude the rear side of the MCB panel. However, a review of the background supporting NUREG/CR-6850 development suggests that this interpretation may not be appropriate, and that the MCB should also include the rear side of the MCB panel.

For clarity purposes, it is important to first distinguish between individual electrical cabinets behind the MCB that are detached from the MCB (e.g., relay racks) but still located in the main control room and what is ~~referred~~ referenced in this FAQ as the rear side of the MCB. The former are completely separate from the MCB panels and are not within the scope of this FAQ.

This FAQ specifically refers to the rear side of the MCB which may be part of a "whole" panel or a somewhat separate section where there may be a walkway between the "front" and "rear" sides.

It should be noted that NFPA 805 FAQ 06-0018 (NUREG/CR-6850 Supplement 1 Chapter 5) describes the criteria for the classification of the front side of the MCB.

Conditions for inclusion of the rear side of the MCB panel

For the rear side of the MCB to be treated as part of the MCB, both the rear and front sides should connected together as a single enclosure. This essentially creates a MCB with a continuous overhead, or by an overhead with penetrations or vents along it longitudinally. That is, the presence of a MCB cabinet ceiling would connote a single cabinet. Also, cables must connect the front and back sides of the MCB, although these cable crossings do not need to extend the full length of the overall MCB.~~.~~ If the MCB meets this description, then the rear side of the MCB is classified as an integral part of the MCB~~. It should be noted that NFPA 805 FAQ 06-0018 (NUREG/CR-6850 Supplement 1 Chapter 5) describes the criteria for the classification of the front side of the MCB.~~ The following clarifications are also applicable to the definition of the MCB:

~~1. Cables may be connecting the front and back sides of the MCB~~.

1. There may be partitions installed longitudinally between MCB panels (i.e., sections). These partitions may be credited as described later in this FAQ.
2. ~~Finally, t~~The front and rear side of the MCB cannot be separated by partitions or cabinet walls.

~~For MCB that do not meet this definition, the front side of the MCB will need to be defined based on the guidance in NFPA 805 FAQ 06-0018.~~ Any other cabinet or panel in the main control room other than the front side of the MCB or the rear

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side as discussed here may need to be classified as an "electrical cabinet" (i.e., Bin 15) for determining fire ignition frequencies.

Treatment in Chapter 6 of NUREG/CR-6850 (Fire Ignition Frequencies)

A review of fire events categorization supporting the development of NUREG/CR-6850 suggests that the available data at the time did not distinguish between front and rear sides of MCB. Based on this evidence (i.e., the fire events data used for the development of NUREG/CR-6850), it is appropriate to include the rear side of the MCB panel in Bin 4.

Application of Appendix L, Figure L-1

The methodology described in Appendix L of NUREG/CR-6850 includes credit for applicable severity factor and non-suppression probability. Since the front and rear sides of the MCB are generally configured in similar manners, the Appendix L damage model is applicable to the front and rear sides of the MCB.

Partitions between panels/cabinets impact the progression of a fire and the characterization of damage sets across those partitions. Consequently, there are three alternatives for treating partitions:

1. Recalculate the values in Figure L-1 in NUREG/CR-6850 based on the physical dimensions of the credited partitioned section(s). Under this alternative, it is assumed that the partitions prevent fire propagation between panels provided partitions are solid, continuous, and noncombustible~~do not have significant holes or gaps~~. In addition, the MCB generic frequency needs to be apportioned according to the partitions (i.e., dividing the generic frequency by the number of panels separated by the partitions). It should be noted that recalculating the values in Figure L-1 in NUREG/CR-6850 requires numerical methods for solving the model described in Appendix L of NUREG/CR-6850.

2. For the case where the values in Figure L-1 in NUREG/CR-6850 are not re-calculated, the MCB generic frequency should not be apportioned between different panel sections. The full generic frequency should be assigned to all of the panels separate by the partitions. This is appropriate because the values in Figure L-1 represent the probability of a fire starting and growing anywhere in the length of a "typical" MCB regardless of the partitions. In this configuration, the partitions can be credited for preventing fire propagation provided that they are solid, continuous, and noncombustible~~re are no openings or gaps between the panels~~. The practical implication of this approach results in conservatively applying the full generic frequency to each panel (i.e., not apportioning the generic frequency by panel sections) but limiting the fire propagation to each partitioned section.

3. The analysis can conservatively treat the panel as if the partitions did not exist to avoid the need to address the adequacy of the partition and recalculating the values in 'Figure L-1' in NUREG/CR-6850.

Fire propagation within credited partitions from the front to rear of the MCB panel should be considered when developing target sets. For scenarios where the fire can propagate from the front to the rear side of the MCB (or vice versa), the target set should include the damage associated with cable or components in both sides of the MCB.

If appropriate, provide proposed rewording of guidance for inclusion in the next Revision: