

### Problem Statement for MCB definition and utilization of App L of NUREG/CR-6850:

- The MCB is currently defined in 6850 and the FAQ as typically excluding the back side of the panel.<sup>1</sup> Justification is being provided for an extension of this definition.
- If the MCB definition is expanded, does that cause problems with the application of App L damage model?
- 6850 is not very clear on the frequency that should be applied with App L, Figure L-1. One mistake that can be made is to divide the MCB frequency up by the number of scenarios (or panels) and applying only that portion of frequency for each MCB scenario (or panel).

### Fire events categorization and implications for definition:

Information gleaned from discussions with 6850 authors and review:

- Written events cannot distinguish between front and rear of MCB.
- When interfacing with licensees to get clarification on MCB events, categorized events in the MCB (front or back) as MCB fire events. Often, unable to determine where in the MCB, i.e. front or back, the fire occurred.
- Note that, in the fire events database, fire events 163 and 980 refer to the back (or back of the) MCB panel as the fire source. Each of these MCB fire events was potentially challenging (only 5 potentially challenging events and 2 undetermined events constitute the MCB frequency).

Concluded that the binning of the events supports including the back side of the MCB panel in bin 4.

### Application of App L:

Purpose of App L was to allow a model such that the entire length of the MCB would not be damaged, i.e., specific target sets would be identified.

- Generally if front side of MCB is open or has partial partitions longitudinally, the back side is also configured in that manner; therefore need for the model on the back side
- App L is based on fire approach and credit for suppression. Suppression is generic to MCR and can apply anywhere in MCR. The severity factors are based on the configuration of the load and thus do not exclude the back side of the MCB.

Concluded that App L damage model could be applied to the back side of the MCB, as for the front side.

### Application of frequency with App L

Potential mistake in calculating the frequency when applying App L.

- With Figure L-1, the entire MCB frequency should be applied since fires from anywhere in the cabinet can contribute to damage of the target pairs selected for damage.

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<sup>1</sup> Note the difference between “back panels/cabinets” and “back side of the MCB panels.” The former refer to non-adjacent electrical cabinets in the “rear” of the MCR, if there is such an area. These are completely separate from the MCB panels. The latter refer specifically to the MCB panels “back (rear) side,” which may be part of a “whole” panel or a somewhat separate section where there may be a walkway between the “front” and “back” sides. The guidance here addresses only this latter concept, i.e., MCB panel “back side,” whether or not part of the “whole” or somewhat separate.

- The frequency can be divided up according to MCB sections if the integral in App L is recalculated.

#### Any further definition of MCB needed?

- If the back side of the MCB is included in the definition, then the overall back and front side should be bolted together as a single piece. This would allow a MCB to be joined by a continuous overhead, or by an overhead with holes along it longitudinally such as holes for ventilation. When looking up while in the walkway between the front and back sides of the MCB, should not only see MCR ceiling; should see MCB ceiling as described above. The presence of a MCB cabinet ceiling would connote a single cabinet.
- Cables must be connecting the front and back sides of the MCB, although not necessarily along the entire length.
- The front and back side of the MCB cannot be divided by panels.

If the front side of the MCB meets the criteria in FAQ 18, and the back side meets the above criteria (e.g. electrically connected, physically one cabinet, and not divided between front and back), then the back side is classified as an integral part of the MCB

#### Credit for full partitions dividing the MCB longitudinally

- Partitions between panels/cabinets allow the analyst to avoid postulating pairs, triplets, etc., of damage sets across those partitions when applying App L, Fig L-1, as unmodified.
- Should cabinet frequency be apportioned according to partitions, then App L, Fig L-1, will need to be recalculated. Under this condition, a partition can be applied as providing more time for fire damage to occur on the other side of the partition.
- A decision will need to be made on a case specific basis by the staff on whether partial partitions merit this credit. Credited partitions must have no significant openings or gaps between sections.

#### Frequency apportionment between separate MCB panels/cabinets

- Each MCB panel/cabinet scenario should have the entire MCB frequency assigned to it, as the assumption made by the 6850 authors is that the single 60' by 10' MCB represents the entire frequency of all MCB panels/cabinets in the MCR.

#### Point regarding treatment of propagation

- Propagation from the front to back of the panel should be considered for a MCB with a "separated" front and back side. For a MCB separated by a walkway, such propagation only need be considered at locations in the MCB where cables cross from front to back.
- To evaluate propagation between the front and back sides of a MCB, targets from both the front and back sides of the MCB will define the target set. Targets including both the front and back panels need only be postulated when the CCDP exceeds that of targets confined to either the front or back of the MCB. The pair of targets with the greatest separation in the target set should define the parameter  $d$  used for Fig L-1. Targets sets limited to either the front or back side should also be considered for damage for a MCB comprised of a front and back side. For

a MCB consisting of only a front or back side, the pair of targets with the greatest separation should be used.