

NRC Staff Supplemental Remarks for FAQ 18-0017 – 6/27/18

Overview

This FAQ is not consistent with regards to its purpose. In many cases, the text of this FAQ indicates that a trip can be judged to occur, and implies that this judgement may occur without a full understanding of cables damaged in the fire scenario. In other cases (e.g. NOTE in Purpose of FAQ), the text indicates that this judgment is only relevant when all cables have been traced and that tracing confirms that a trip will not automatically occur from fire damage.

The staff's view is that judgment to apply a trip is only relevant once it has been determined that component and cable damage, upon tracing all cables damaged in the fire scenario, will not produce a trip. This judgment is thus limited to information with regard to a manual trip.

Furthermore, there is no technical basis cited for the conditional probabilities of the trip. And no guidelines or discussion is included in the FAQ on the elicitation of expert opinion behind the categorization of a trip as likely, not likely, or very not likely. Without a link between the categorization of a trip and the conditional probabilities, the methodology seems rather arbitrary.

All in all, this FAQ appears inconsistent and arbitrary, and thus without technical basis.

Operator interviews – Discussion #1

The staff wishes to understand the operator interviews more thoroughly. Therefore please respond to the following questions:

- 1) Provide more details on how operator interviews are conducted to control bias and other known problems in eliciting expert opinion
- 2) Did the final results represent a “consensus opinion” from multiple operator crews?
 - a. What was the basis for the consensus (e.g. training, consistent technical knowledge, consistently messaged PRA results)?
 - b. If the results were “consistent,” then how were the conditional probabilities developed (and what do they represent)?
 - c. If the results were consistent, why not change the procedures to match operator knowledge?
- 3) What information was elicited from the operators to come to your conclusions about the likelihood of them executing a manual trip?

Use of “Likely, unlikely,” etc – Discussion #2

- 1) The FAQ recommends the creation of expert elicitation from “a small panel of operators” for every plant proposing to use this FAQ. Should the results from this FAQ be applied

across the industry rather than developed for each plant? How is consistency of the elicitation process across different plants ensured when different operators for every plant are used to develop these results? After all, very minimal links between the categorization of a trip and the conditional probabilities have been established in this FAQ.

The FAQ identifies some observations from early applications of CTPs. Was there any insight as to the types of compartments or number of scenarios which are affected from the implementation of CTPs?

These recommendations are offered for your consideration.

- 2) We should strive to be consistent in using terms such as “likely” and “unlikely.” NUREG-1880 - ATHEANA User’s Guide, although not a perfect fit, has some expert calibration guidance for HRA. I think that one of the keys to this FAQ is to make sure that there is enough calibration information to make repeatable binning calls.
- 3) The screening criteria for fire events is not dissimilar to the issue the technical community had when trying to model support system initiators (i.e. which have some of the same issues that shutdowns may be operator driven rather than a direct result of failure.) Recommend that you see if the EPRI report on the topic, “Support System Initiating Events” (Product Id: 1016741), has any insights that could be applied.