

NRC Comments – 09/16/2018

Fire PRA FAQ 18-0014 – Summary of Staff Comments for “Time to detection equals zero for manual NSP calculations”

The following summarizes the staff position for this FAQ and replicates much of the discussion of previous FAQ meetings.

The staff does not believe that time to detection, i.e. detection time, is included in the manual no suppression probability curves. Its position is based on two facts: 1) time to detection is unknown in the fire events database (FEDB), and 2) the duration of the fire, which the curves are based upon, is taken from the FEDB and does not include the time from fire ignition to detection.

Thus the equation used to determine the time used for the manual no suppression curves should retain the Time to detection, i.e. $T(\text{det})$, term, which leads to less time available for suppression before damage.

Since the term $T(\text{det})$ is not to be removed from this equation, then only for those cases where $T(\text{det}) = 0.0$ should the effect of the term be null.

Given the staff's objection to industry's position that the manual nonsuppression curves include the time to detection, the staff still has serious concerns with respect to this FAQ.

The staff is aware that until certain fire damage is done, the PRA initiator (transient, etc.) does not occur and thus the plant does not begin to respond. Thus there are two timelines, the fire timeline and the plant response timeline, that must be factored in to fully understand the plant response to the fire. The staff agrees that if the plant is notified of a fire immediately upon plant damage that there is no delay for detection and $T(\text{det}) = 0.0$.

This FAQ issue should be transferred to the RES/EPRI working group for further review and analysis, as necessary.

The staff believes its earlier position communicated to industry stands. That communication was as follows:

The staff does not agree that the detection time subtraction term can be removed from the equation for time available to determine manual suppression credit. Instead, the staff agrees that the detection time should be adjusted due to scenario specific conditions.

For instance, for areas where detection is not present or personnel occupancy level is low or nonexistent, the removal of detection time from the time available would not be appropriate or consistent with the bulk of the data that makes up the suppression curves and represents earlier success

of suppression. After all, earlier success of suppression relies upon earlier detection.

NRC Research and EPRI are currently in the process of developing a methodology for classifying growth modeling and revising the application of manual non suppression. This methodology will take into account some of the necessary complications for adjusting the detection time in question such as the level of occupancy, detection capability, main control room component alarm conditions, etc. The adjustment of the detection time subtraction term is better suited for a larger working group than a FAQ in order to address the complications and potential misapplications from introducing these conditions bearing upon detection time, and thus, to make the necessary adjustments to the overall methodology that would be required.