

NRC Comments – 6/27/18

Fire PRA FAQ 18-0015 – More Realistic Contained Fire Duration Limits

The NRC staff provided original comments on this FAQ on 4/19/18.

- 1) The staff acknowledges that long duration fires may play a larger role in risk than warranted due to the current way the fire PRA methodology is employed. The lack of burnout in fire scenarios allows fires limited to the source of origin to cause damage beyond what is expected.

Agree

- 2) Yet the staff notes that justifications for the selected floor on nonsuppression failure probability and the choice of duration limit have not been provided.

The data used to develop the non-suppression curves is the basis for reducing the limits. There is no evidence that a floor should exist. The data already allows for fire durations more than twice what has been seen in the industry. This clarification has been added to the FAQ.

- 3) The staff feels that long duration fires can exist, although with low probability. Thus, fires should not be truncated at long durations. High HRRs beyond the 98th percentile are already excluded from analyses; however, high likelihood HRRs should not also be excluded

We agree that the long duration fires can exist. But, we do not agree that contained fires that do not ignite secondary combustibles will be long duration events once plant personnel arrive. This is a clearly stated limitation of this approach. The NSP curves include both fire that ignite and do not ignite secondary combustibles. These curves are conservatively being applied to only those cases where fires are contained.

With respect to industry's response to 2) and 3), industry is proposing that the duration of fire be constrained due to the arrival of plant personnel. Crediting plant personnel for suppression is contradictory to the condition which is being addressed, the growth of fire when manual suppression fails.

The staff continues to feel that the characteristics of the fire itself must be examined to determine when burnout occurs, and the consequences of burnout applied to the duration.

The staff does not agree that the amount of credit for non-suppression is unlimited, i.e. no floor is necessary. Should the staff and industry agree eventually upon limits on fire

duration from burnout, then it will be unnecessary to discuss decreasing the existing floor on the probability for non-suppression.

- 4) The FAQ should be divided into two portions: 1 – floor on nonsuppression probability, and 2 – limit on duration. The second part should be handed off to the RES research program since under its Fire Progression Project fires suppression by plant personnel will be separated from those suppressed by the fire brigade, enabling long duration fires to be handled much more realistically.

We believe that agreed conservatism mentioned in item #1 can be addressed through this FAQ..

- 5) The staff understands the problem presented by MCR fires per the example in the FAQ. Are there other situations in which long duration fires produce HGL even though no secondary combustibles are ignited?

Although the most risk significant cases are associated with control room abandonment, the concept is applicable to all NSP curves. The arrival times will be much delayed in non-control room cases. This is reflected by the much longer allowed fire burn durations.