Section from Report or Slides from April 26th Presentation	Comment	Plan for resolution
Section 7.2 and Slides 88 and 89	Please provide additional clarity on the difference between the reliability under "Detector System Availability, Reliability" vs. the reliability of the incipient system to detect during the incipient phase, which is handled under "System Effective Detecting Incipient Stage." The reliability of the system to detect any fire seems to overlap with the reliability of the system to detect a fire during its incipient phase.	Applicable sections will be reviewed and clarified if needed. Section 2.6 of report defines system performance measures such as reliability, availability and effectiveness. In Part II effectiveness estimates were maintained separate from reliability and availability estimates for several reasons: (1) the underlying data used to estimate these parameters are different, (2) reliability and availability are system specific, while effectiveness is system and application/scenario specific, (3) plant specific data could be used to inform the reliability/availability parameter estimates, while effectiveness would require additional testing to inform, and (4) maintaining a distinction between these estimates enhanced transparency of how they are estimated and what they represent. Thus, it was a conscious modeling decision made by the team to keep effectiveness, reliability, and availability separate even though they could have been combined into one term, because doing so would complicate the use of plant specific data.
Section 7.2 and Slides 88 and 89	The unreliability of the detector system seems to be revised values for the overall detection systems, as provided in Appendix S of NUREG/CR-6850. Clarify if these revised values should supersede the values provided in NUREG/CR-6850 for typical detection systems.	The unreliability presented in the report are for the "detectors" or "detector units." These estimates do not take into account the unreliability / unavailability of the fire alarm system. CLARFICATION NEED: Appendix S of NUREG/CR-6850 (EPRI 1011989) is related to "Fire Propagation to Adjacent Cabinets" and does not discuss detector system reliability. The intent of this comment is unclear. Please provide clarification.

Section from Report or Slides from April 26th Presentation	Comment	Plan for resolution
In-cabinet and Area-wide Excel spreadsheet	It is not clear what the time to damage in the spreadsheets is meant to represent, please clarify how the time to damage should be determined. Additionally, in the situation that a target is 0" above a cabinet, if the incipient phase is not to be included in the time to damage cell then the target would be assumed damaged at t=0. In this case, which is the case for many cabinets that benefited from incipient detection, no credit could be given to the incipient system's ability to successfully suppress the fire prior to damaging the target. Even though the cabinet has an incipient phase greater than 30 minutes, the system effectively detected in its incipient phase, MCR response was successful, field operator response was successful. If the time to damage is not meant to include the incipient phase, please ensure that this is the expected result of this situation.	Applicable sections of the report will be reviewed and clarified if needed. The time to damage is determined as presented in NUREG/CR-6850 (EPRI 1011989). *No incipient stage duration is included in the time to damage estimate due to its uncertainty in duration and that it is not expected to generate thermal conditions that threaten the integrity of other targets in the room.* (Ref. NUREG/CR-6850, EPRI 1011989) The report uses all incipient stage timing information that could be identified from operating experience to develop the "α" (fraction of fires that do not have an incipient stage) and "ξ" (human unreliability) terms in the event trees presented in Section 6. The event tree uses the main control room non-suppression curve (which is more favorable than the electrical suppression curve) for the fraction of fires that do have an incipient stage. The 30 minutes is used as a screen criteria to estimate the fraction of fires that have an incipient stage. The 30 minutes is based on worst case operator response (15 minutes) and generalized detector performance (detectors respond approximately at the mid-point of an incipient stage duration, based on testing). Thus, this estimate has no direct correlation to incipient stage duration. As such, adding an incipient stage duration time to the time to damage would be inconsistent with the approach presented in this report. If a target is damaged at t=0, an alternative solution to installing smoke detection may be warranted to ensure defense-in-depth and safety margins are maintained.

NRC-RES Response to Industry Comments on Final Draft (Pre-Publications) NUREG-2180

Section from Report or Slides from April 26ᵗʰ Presentation	Comment	Plan for resolution
Slides 85 and 87	Slide 87 of the April 26th presentation states that the column "Fraction of Fires that have an Incipient Stage" is based upon the "Fraction of potentially challenging or greater fires that have an incipient stage of greater than or equal to 30 minutes." That being the case, following the success branch gets us to enhanced suppression, which is dependent upon the time to damage. Since 30 minutes is the assumed incipient phase, because we're in the success branch of the fire event tree (FET), provide guidance on whether or not 30 minutes for the incipient phase can be added to the time to damage.	Applicable sections of the report will be reviewed and clarified, if needed.

The 30 minutes is based on worst case operator response (15 minutes) and generalized detector performance (detectors respond approximately at the mid-point of an incipient stage duration, based on testing). Thus, this estimate has no direct correlation to incipient stage duration. As such, adding an incipient stage duration time to the time to damage would be inconsistent with the approach presented in this report. The timing information (i.e., "time available") is used to inform the human reliability analysis estimates.

The 30 minute screening criteria cannot be added to the time to damage for the approach used in the report. |