

Enclosure 5

Industry Proposal for Path Forward on Incipient Detection in Fire PRA
Meeting Summary of the 11/30/2016 Meeting with NRC/Nuclear Energy
Institute

Dated: January 19, 2017



Industry Proposal for Path Forward on Incipient Detection in Fire PRA

NRC Public Meeting
November 30, 2016

Overview of Proposed Technical Enhancements

- Near term: FAQ
 - Re-establishing component-only end state branch
 - Alpha factor
- Longer term
 - Industry-led testing to better characterize incipient phase duration
 - Building upon NUREG 2180 testing results
 - Additional OE, as available

Component-Only End State Branch

- Precedent for component-only damage in NRC-endorsed approaches
 - Example: NUREG/CR-6850 Appendix L
- FEDB
 - There is a set of events (CH, P-CH, (U)) where damage was limited to the component of origin only

NUREG-2180 VEWFDS

Table 7-1. Summary of Fraction of Electrical Cabinet Fires (Bin 15) That Have an Incipient Stage Detectable by a VEWFD System

Category	Incipient stage Detectable by VEWFD System			Total # Events	Fraction (alpha) Mean [lower/upper]
	Yes	No	Undetermined		
Power Cabinets [‡]	16.5	16	22.5	55	0.50 [0.36 / 0.64]
Low Voltage Control Cabinets	6	2	5	13	0.72 [0.46 / 0.92]

[‡] Power cabinets include electrical distribution electrical enclosures such as motor control centers, load centers, distribution panels, and switchgear.

- Based on review of EPRI 1025284 Fire Events Database
- Low Voltage (LV) Control cabinets have an extremely large uncertainty range due to very sparse data

Fraction of fires with Incipient Stage

- FAQ 08-0046 presented a simplified model that assumes that all (100%) of fires in electrical enclosures housing circuits have an incipient stage.
- NUREG-2180 LV cabinet alpha factor based on 8 fire events.
- Industry finalizing in-depth review of previously indeterminate events

Incipient Phase Duration

- Defined as time between degradation start to flame
- Examples showing the presence of an incipient phase
 - Operating Experience
 - Harris has had several successful interventions during the incipient stage that did not lead to flame – three documented in draft NUREG 2180; an additional one occurring this summer
 - Provides additional protection for nearby cabinets with no installed in-cabinet VEWFDs
 - Testing
 - Industry pursuing near-term testing to characterize incipient phase
 - Would be most helpful if tied to previously-conducted NRC testing
 - Will test major vendor products in realistic scenarios