

Potential Fire Research For Discussion - March 28, 2017

Priority	Title	Description/Plan of Action
	In-Cabinet Fire Growth Modeling	<p>Current fire PRA methods assume a t-squared fire growth profile for analysis. Fire event experience suggests that not all fires exhibit this behavior. Industry has proposed using additional fire attributes from the fire events database to help better define the types of fire growth profiles that occur in NPPs. This effort could also provide some segregation among the various electrical cabinet types. For fire frequency, most electrical cabinet equipment is lumped into one bin. Through this approach, different treatments could be used for the population of cabinets where the fire phenomenon may be different. It is unclear if the fire events database and existing test data are sufficient to develop revised in cabinet fire growth rates. Additional full scale testing will be necessary to characterize the fire growth and generation of hazardous conditions. To gain significant improvements in fire PRA realism, it may be necessary to explore new methods for coupling fire frequencies, HRR distributions, fire growth profiles, and fire suppression effectiveness.</p>
	Transient Fire HRR and Methodology	<p>Heat release rates and damage induced by transient fires do not match operating experience as modeled in fire PRAs. Transient fires have been the object of several Fire PRA FAQs and additional research by EPRI. EPRI has established a working group to review the whole problem and develop more realistic treatment. As part of this effort, new peak HRR distributions and fire growth times would be developed along with improved understanding of the probability of spread from an ignition source to the transient combustible. Industry has proposed a methodology for developing a transient fire propagation parameter using the Fire Events Database, and this methodology is under review by an NRC/Industry vetting panel. Full exploratory and confirmatory testing will be necessary to support this effort.</p>
	Smoke Detector Activation Dataset Development	<p>Validation pool for simple smoke modeling technique (temperature rise) is limited to one experimental data set. Validation results show wide scatter in the prediction of all the models, indicating that the correlation linking smoke detector activation and temperature is weak. More advanced models are available, but validation data does not exist.</p> <p>The objective of this research is to develop a set of high quality data to be used later to validate numerous smoke detection models or sub-models, and provide basis for fire model input parameters specific to detector activation models.</p> <p>RES Action: Conduct testing at NIST to develop a high quality dataset to support validation</p>