

NFPA 805 Transition

Harris Nuclear Plant (HNP) Fire PRA Demonstrations

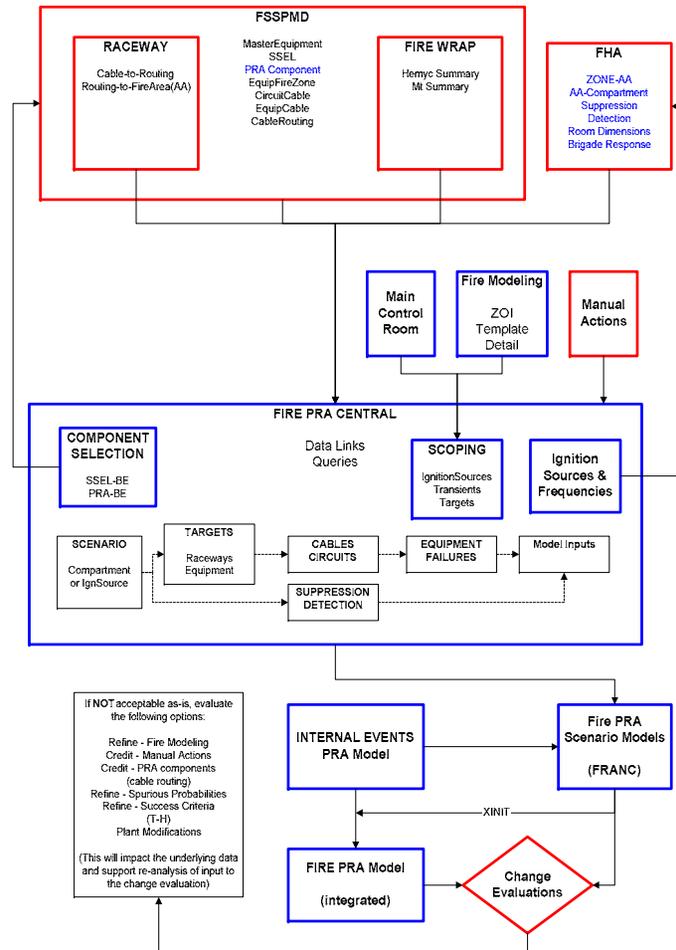
HNP Pilot Meeting
May 30 – June 1, 2007
Raleigh, NC

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Data Infrastructure

Fire PRA Data Flow



FRANC

- **Compartment Scenarios**

- ▶ All unprotected targets assumed impacted
- ▶ Compartment Ignition Frequency w/o severity factor
- ▶ Draft fault tree
- ▶ No credit for manual suppression
- ▶ No recovery credit
- ▶ FRANC beta software

Timelines and Damage Sets

Timelines

operations timeline			rt	or	gr
fire systems timeline	al		auto	man	
plant response		sp			glst
fire growth	f	race		bar	hgl
					multi
damage sets	D0	D1	D2	D3	D4
	source	add local unprotected raceways	add protected raceways	add balance of raceways in compartment	add multi-compartment

- f** fire begins (source impacts - failures/sp)
- al** fire alarm
- race** raceway targets ignite
- sp** spurious actuation occurs (and other failures)
- auto** automatic suppression actuates
- rt** operator trips reactor
- man** fire brigade begins suppression actions
- or** operator responses
- bar** fire barrier failure
- glst** goal parameter(s) out of acceptable range (lost)
- hgl** damaging hot gas layer established
- gr** goal recovery
- multi** hgl spreads to adjacent area
- un** unrecoverable condition is reached (fuel cladding damage)

the order of the events on each timeline are generally fixed
 however, the timing can move based on other factors
 such that the relative order of the events between timelines can vary.

Hot Gas Layers / Damage Sets

- Determine critical HRR for HGL generation
- Evaluating sources using progressive complexity
 - ▶ 1. Using the source-target database determine the scenario HRR from the 98th ZOI:
source + target trays + adjacent cabinets
 - ▶ 2. Build simplified fire growth models based on guidance in NUREG/CR-6850 (Template)
 - ▶ 3. Expand fire modeling detail as warranted