Handout Reference 1

NFPA 805 Transition
March HNP Pilot Observation Visit

Welcome to Harris Plant

Chris Burton
Director of Site Operations
March 6, 2007

NGG Nuclear Generation Group

Progress Energy

NFPA 805 Transition
March HNP Pilot Observation
Objectives and Background

Jeff Ertman, PE Project Manager
David Miskiewicz, PE Fire PRA Lead
March 6, 2007

NGG Nuclear Generation Group

Progress Energy

NRC HNP Pilot Observation Visit Objectives and Background

Outline:

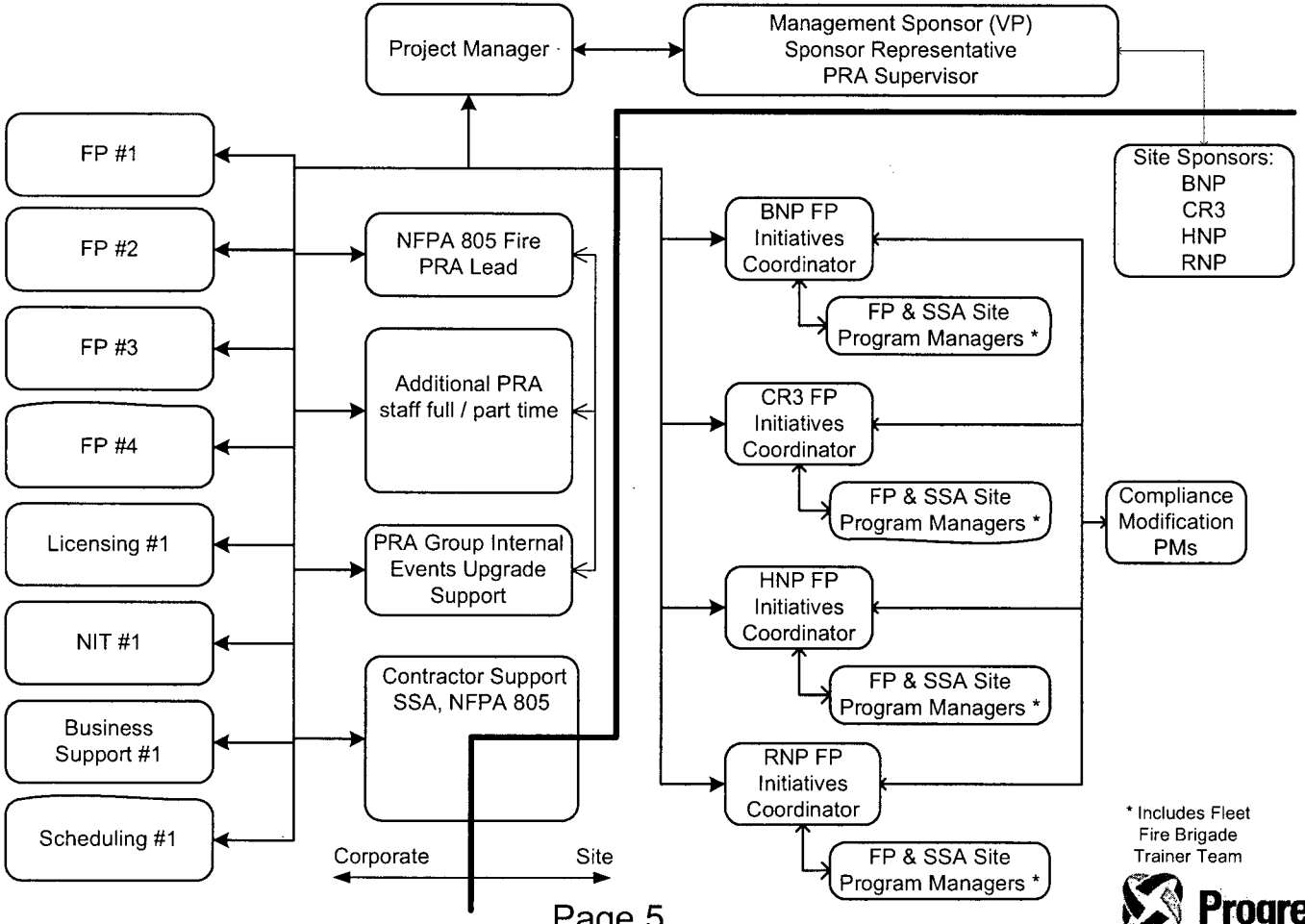
- Transition Project Scope and Goals
- Project Background
- Plant FP Program Based on NFPA 805
  - NFPA 805 Introduction
  - Performance Based Approach
  - NFPA 805 Change Process / License Condition
- Purpose of this Observation Visit

Fleet FP Initiatives Project / NFPA 805 Project Goals

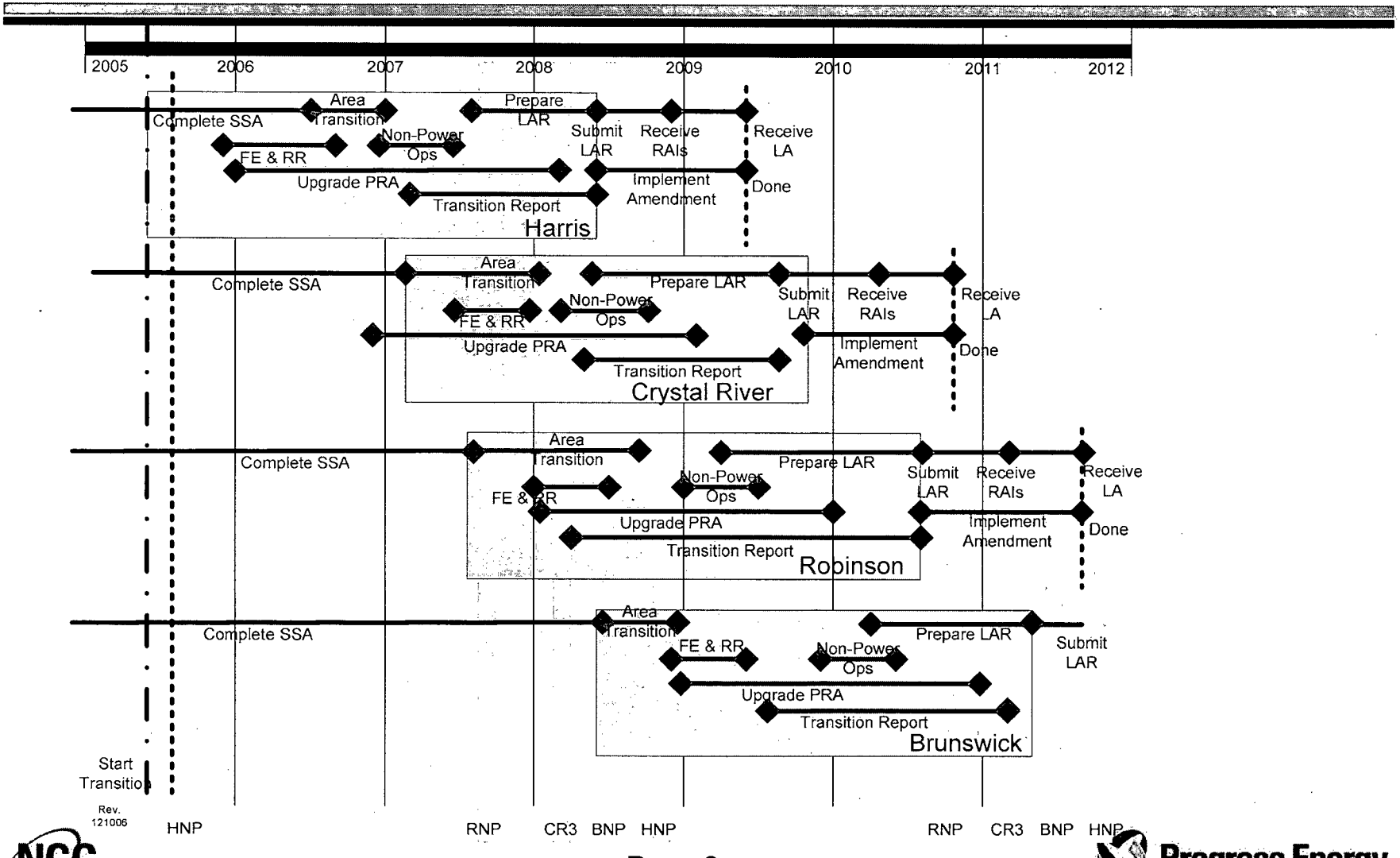
- Address Industry FP Issues with Manual Actions and Multiple Spurious Operations
- Improve safety focus through the performance based, risk informed approach
- Establish a common Fire Protection Program across fleet
- Advance Fire Protection and PSA personnel knowledge and skills

Fleet FP Initiatives Project / NFPA 805 Organization

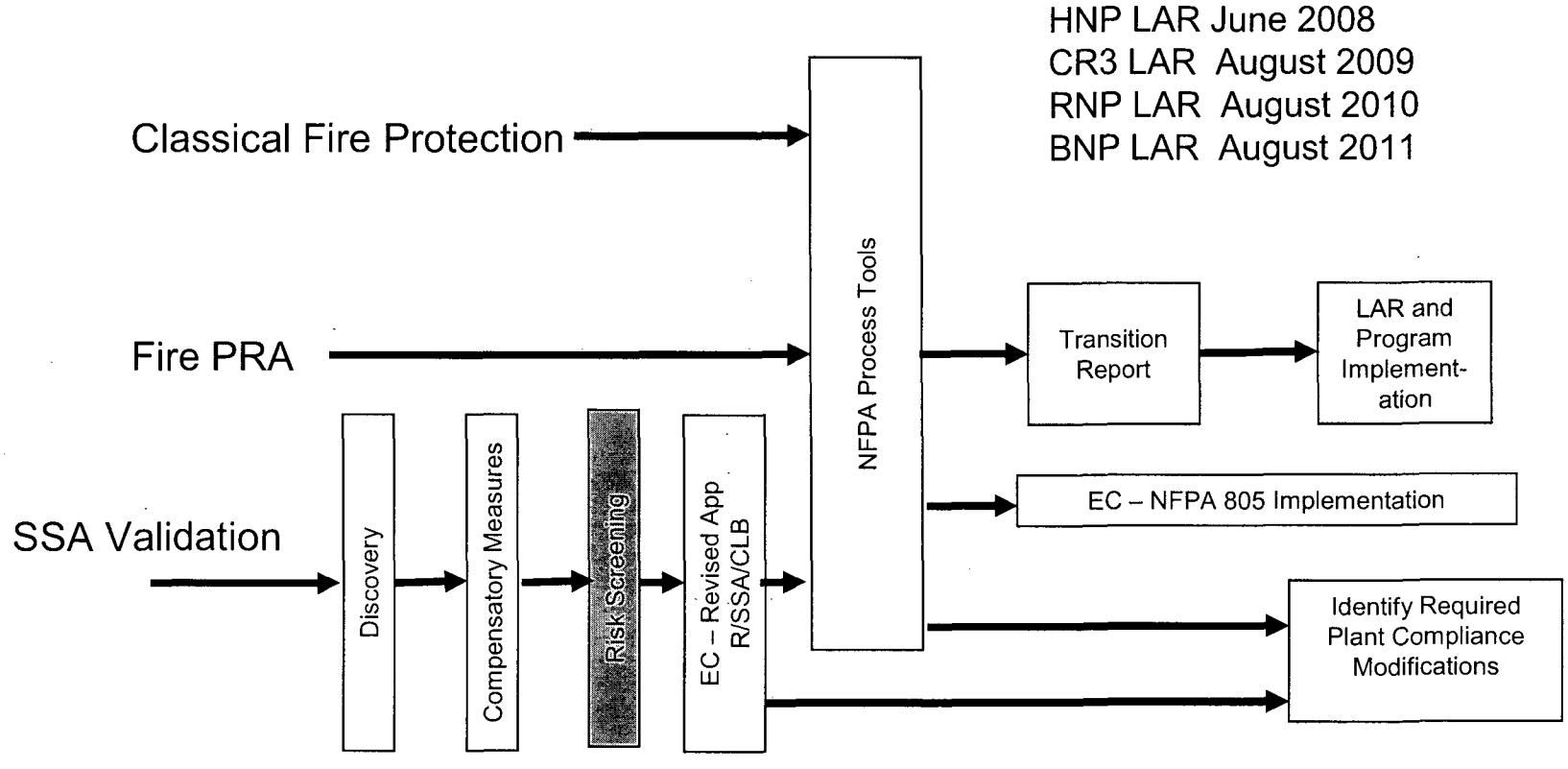
FP Initiatives Core Team Organization



Fleet FP Initiatives Project / NFPA 805 Overview – Conceptual Transition Plan



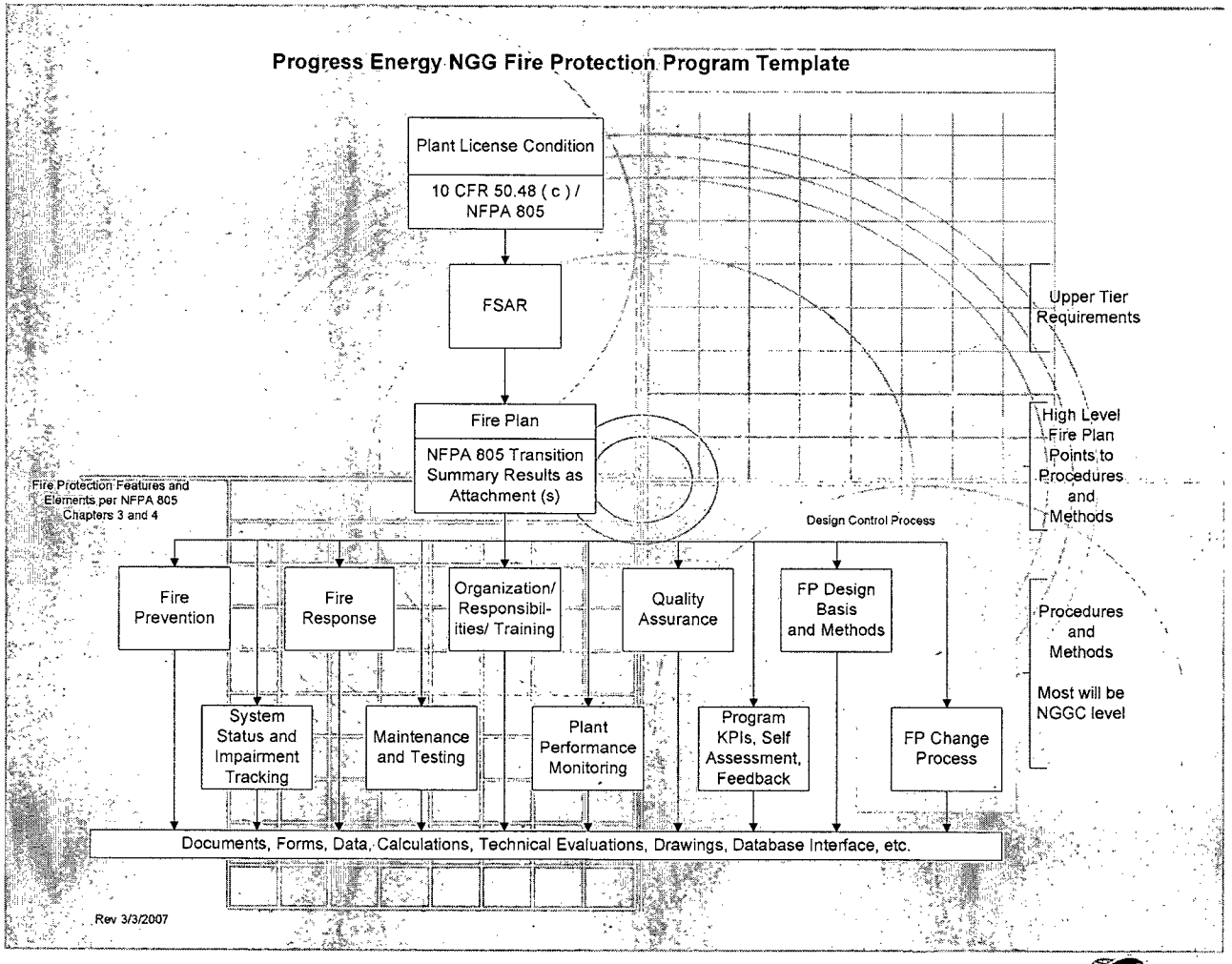
Fleet FP Initiatives Project / NFPA 805 Overview – Work Flow Summary



Fleet FP Initiatives Project / NFPA 805 Major Elements

- *"This standard specifies the minimum fire protection requirements for existing light water nuclear power plants…."*
  - Use of existing deterministic design criteria and NRC approved alternatives when appropriate
  - Provides Performance Based Design Options
  - Includes a Risk Informed Change Process – replaces current FP License Condition change process (50.59 equivalent)
  - Applicable during all mode of operation
  - Meet Chapter 3 Fundamental Program Elements

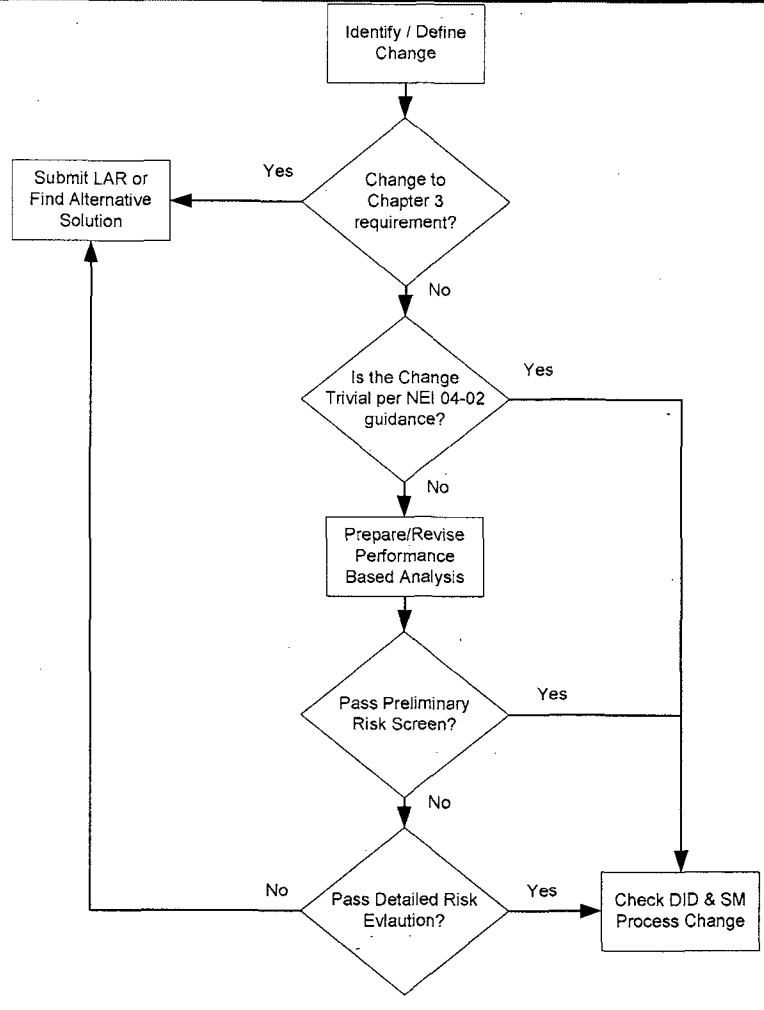
Fleet FP Initiatives Project / NFPA 805 Conceptual Plant Program



Fleet FP Initiatives Project / NFPA 805 Change Process License Condition

- Today's Fire Protection License condition
  - Approved Fire Protection Program must be maintained
  - Changes to the FP Program may be made without prior approval if the 'ability to achieve and maintain safe shutdown' in the event of a fire is maintained
- License condition under NFPA 805 will be revised to use Fire PRA insights
  - Risk Informed Criteria as established per Reg Guide 1.205
  - Changes below the threshold established in RG 1.205 will not require prior NRC approval

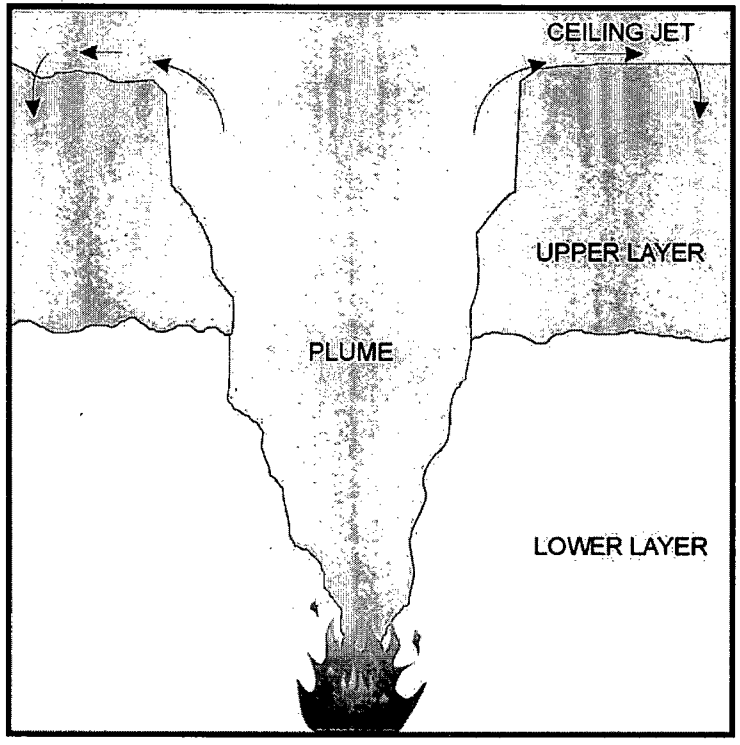
Fleet FP Initiatives Project / NFPA 805
FP Change Process



Fleet FP Initiatives Project / NFPA 805

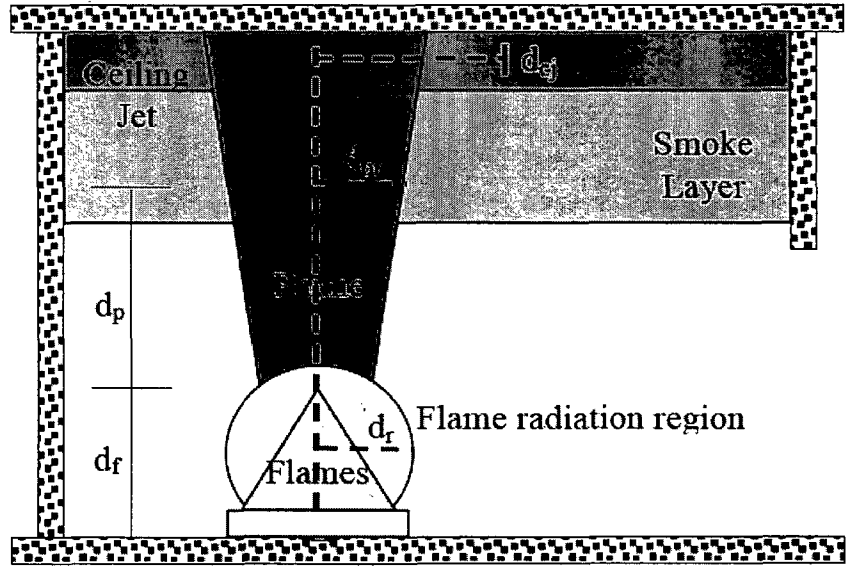
Performance Based – Compartment Fire

"The Physics"



Fleet FP Initiatives Project / NFPA 805

Performance Based – Compartment Fire
The Engineering



Fleet FP Initiatives Project / NFPA 805
Fire PRA - Overview

SSD	PRA
Assure one train available	Determine likelihood of train failure
3 hour wrap good if no suppression, 1 hour wrap good with suppression	Wrap effectiveness is based on actual fire conditions and probability of suppression
Fire assumed to engulf entire area	Fires can be based on actual ignition sources
If the cable is protected it is assumed available, if not protected it is assumed failed	Protected equipment can randomly fail, unprotected equipment may still function
Control room and "feasible" manual actions always assumed successful	All human actions have a failure probability
Equipment/functions not credited not considered, e.g. feed & bleed	Credit plant equipment that can reduce fire risk, e.g. feed & bleed

NFPA 805
Fire PRA - Overview

- Internal Events PRA Self Assessment
- Upgrade Internal Events PRA to support NFPA-805
- Internal Events PRA Peer Review
- Fire PRA Development
- Fire PRA Review (NRC, Peers)
- PRA Support for NFPA-805 change evaluations

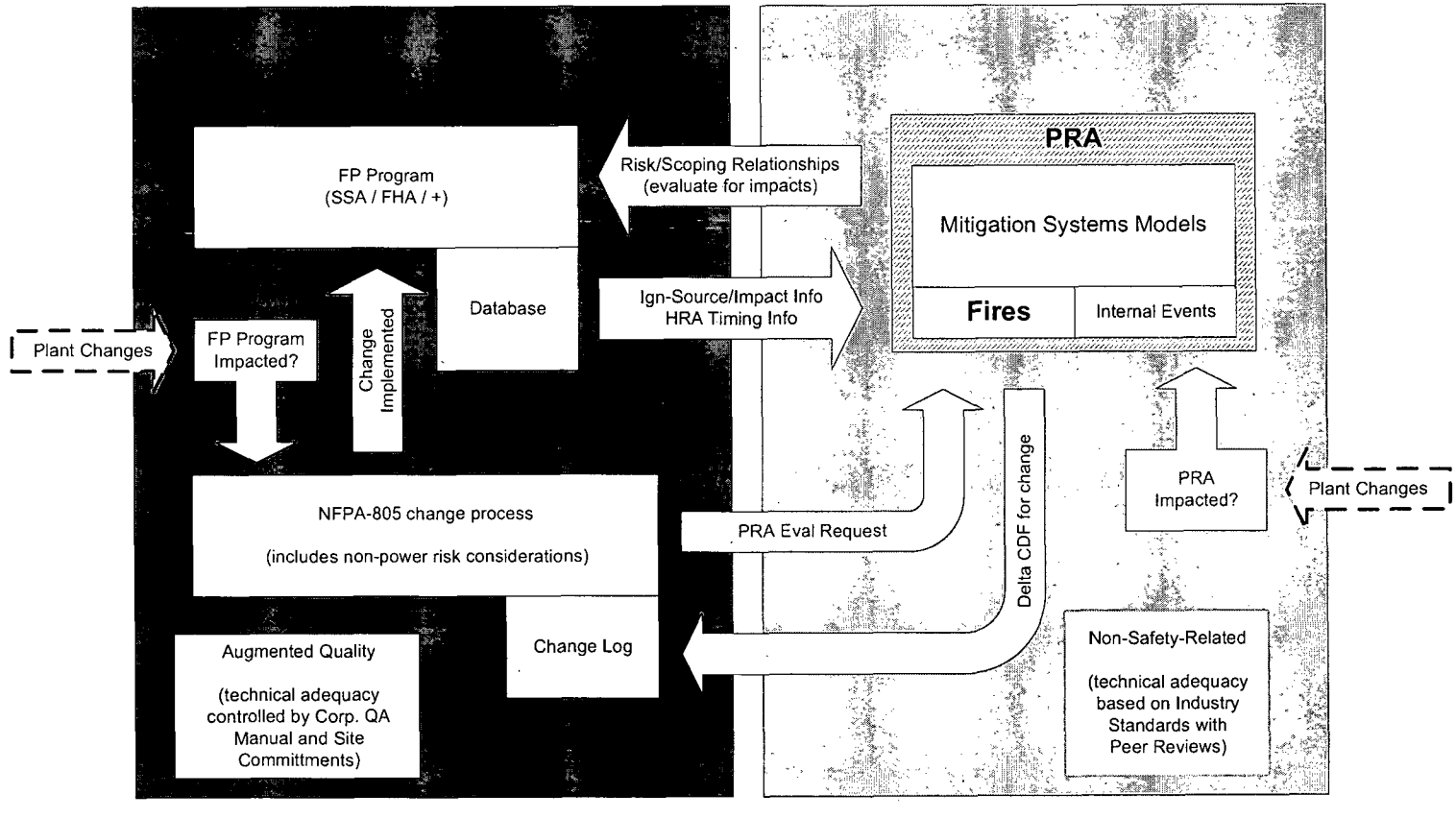
NFPA 805
Fire PRA - Overview

- Fire PRA Tasks (NUREG/CR-6850)
  - Plant Partitioning / Ignition Frequencies
  - Component Selection
  - Circuit Analysis / Cable Routing
  - PRA modeling
  - Scoping / Detailed Fire modeling
  - Human Reliability
  - Screening / Quantification
  - Uncertainty

NFPA 805
Fire PRA - Overview

- Fire PRA uses a progressive screening approach
- Task iteration is expected
  - As we learn more about fire scenarios we can better determine the need for additional data to address the issues.

Fleet FP Initiatives Project / NFPA 805 Program Interface



Fire PRA / Fire Protection
Program Interface

Fleet FP Initiatives Project / NFPA 805 Goal of Pilot Meetings

- Obtain NRC feedback to ensure we are on track for development of:
  - NFPA 805 Fire Protection Program
  - Fire PRA
  - NFPA 805 LAR

Fleet FP Initiatives Project / NFPA 805
HNP Pilot Observation Visit

Additional Q & A

Handout Reference 2

NFPA 805 Transition
March HNP Pilot Observation
Fire PRA Task 8,Scoping Fire Modeling

March 6, 2007

David Miskiewicz, Fire PRA Lead

Ricardo Davis-Zapata, PSA Engineer

NGG Nuclear Generation Group

Progress Energy

NFPA 805
Fire PRA – Task 8

- Purpose - NUREG/CR-6850
  - Screen out those fixed ignition sources that do not pose a threat to the targets within a specific fire compartment, and
  - To assign severity factors to unscreened fixed ignition sources
- Zone of Influence determination (ZOI)
  - Based on Fire modeling
  - Compared SDP, FIVE, 6850
  - Evaluating Oconee Report
- Walkdowns by ignition source to identify targets (next level determination of fire scenarios)
- Source-Target Database
  - Multiple HRR

Handout Reference 3

NFPA 805 Transition
March HNP Pilot Observation
Fire PRA Task 11, Detailed Fire Modeling

March 6, 2007

David Miskiewicz, Fire PRA Lead

NGG Nuclear Generation Group

Progress Energy

NFPA 805
Fire PRA – Task 11

- Refine fire analysis
  - Improve HRR determination
  - Determine fire growth vs. time
- Assess suppression capability
  - Automatic Suppression credit
  - Assess fire brigade response time/reliability
- Determine HGL Potential
  - Floor area vs. ceiling height vs. HRR
- Assess ERFBS capability
- Define damage sets

Handout Reference 4

NFPA 805 Transition
March HNP Pilot Observation
Fire PRA Strategy Going Forward

March 7, 2007

David Miskiewicz, Fire PRA Lead

NGG Nuclear Generation Group

Progress Energy

NFPA 805
Fire PRA – Future

- Task 5 – Fire induced PRA models
  - Add/modify internal events logic to model new spurious events and other fire protected related components to account for fire initiators and phenomena
- Task 7 – Quantitative Screening
  - Using FRANC
- Task 3,9,10 – Circuit Routing and Analysis
- Task 12 – HRA
  - Blocked internal event actions
  - New Manual actions
  - Industry participation
- Task 13 – Seismic Interaction
- Task 14 – Quantification
  - Scenarios using FRANC
  - Single top for final (based on XINIT)
- Task 15 – Uncertainty
- Task 16 - Documentation

NFPA 805
Fire PRA – Future

- Internal Events Model
  - Self Assessment
  - Updates
  - Peer Review
- Change Evaluations

NFPA 805 Transition
Chapter 3 - Manual Firefighting Update

Alan Holder, CES/FP

March 8, 2007

NGG Nuclear Generation Group

Progress Energy

PE Manual Firefighting / Fire Brigade Initiatives

- Establish common Fire Brigade Training Programs across PE fleet supporting NFPA-805 Transition
- Conduct of Radiological Reviews (Table G-1) of Pre-Fire Plans and Fire Brigade Training Materials

PE Manual Firefighting / Fire Brigade Initiatives

- NFPA 1403 Lesson Plan Topics Review Schedule
  - Safety & Orientation (complete)
  - Portable Extinguishers (complete)
  - Fire Hose, Appliances, Streams & Foam (complete)
  - Ladders (complete)
  - Ventilation (complete)
  - Fire Behavior
  - PPE
  - Forcible Entry
  - Overhaul
  - Water Supply (B.5.b)
  - Search & Rescue
  - Fire Attack
  - Site Specific

PE Manual Firefighting / Fire Brigade Initiatives

Table G-1 NFPA 805 – Radioactive Release Transition Review Guidance		
NFPA 805 Requirements	**Implementing Guidance**	**Results (Example)**
Radiation release to any unrestricted area due to the direct effects of fire suppression activities (but not involving fuel damage) shall be as low as reasonably achievable and shall not exceed applicable 10 *CFR*, Part 20, Limits.	**Review pre-fire plans.** Ensure for locations that have the potential for contamination that specific steps are included for containment and monitoring of potentially contaminated fire suppression water. Update pre-fire plans as necessary.	Review of Pre-Fire Plans is underway to determine adequacy of guidance for containment and monitoring of potentially contaminated fire suppression water (run-off) for applicable plant areas. Review results to be provided to site FP PM for inclusion in Pre-Fire Plans.
	Review fire brigade training materials. Ensure that training materials deal specifically with the containment and monitoring of potentially contaminated fire suppression water. Update training materials as necessary.	A systematic review of fire brigade training materials is underway within NGG Fire Protection Training PEER Group. A focused approach to fire brigade training has aligned the current fire brigade training schedule as well as the NFPA-805 transition process utilizing a rolling wave method beginning with the HNP and providing lesson learned for incorporation at all PE sites.

PE Manual Firefighting / Fire Brigade Initiatives

Review of Radiological Release, Table G-1

Questions?

Summary of Comments on PIs

- Code of record edition
- Citations of current regulatory basis
- Use of terms safety-related, important to safety in lieu of "important to nuclear safety"
- Terms used in the B-1 Table not defined in NEI 04-02 (FAQ for NEI 04-02)
- Further refinement of compliance statements on a sub-section breakdown
- Appropriate implementing reference
- Previous approval (submittal v. response from NRC in SER)

MT Electrical Raceway Fire Barrier Systems (ERFBS)

Progress Energy

Purpose of the MT ERFBS

- At HNP to protect circuits from fire damage the MT ERFBS was installed to provide a 3 hour barrier for electrical raceway

- HNP has approximately 1250 feet of the 3 hour MT ERFBS and we are the only user in the industry.

MT Resolution Plan

- Resolution is integrated within the HNP transition to the new NFPA 805 risk informed / performance based regulation.
- 3 Main Phases
  - Establish ERFBS Worth
  - Evaluate Applications using NFPA 805 guidance
  - Modify/upgrade remaining applications if necessary

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Establish Barrier Worth

- A fire test was conducted for MT.
- The testing used HNP specific installation designs, materials, and cable fills.
- The testing results were used to develop a calculation that identifies the "rating" of each protected raceway.

MT ERFBS Design

- 4 layer system
  - 1 inch ceramic fiber
  - SS foil vapor barrier
  - Aluminum Tri-hydrate powder
  - 1-1/2 inches ceramic fiber covered in Siltemp

Progress Energy

Establish Barrier Worth -MT ERFBS Testing

- S
  C

Progress Energy

Establish Barrier Worth -MT ERFBS Testing (Cont)

Progress Energy

Establish Barrier Worth -MT ERFBS Testing (Cont)

- Results
  - Item A - 1-1/2 inch free air conduit 21% fill – 134 min
  - Item B – 2-3 inch conduits free air 21 % fill – 180 min
  - Item C – Item A w/ 4 inch tube steel supt - 115 min
  - Item D - Item C w/ upgraded supt - 153 min
  - Item E - 2-1-1/2 free air conduits 21 &28% fill 159 min
  - Item D - Wall mounted 2 inch conduit 28% fill- 180 min
  - Item G – 18 x 18 x 13 j-box – 163 min

MT ERFBS

- Calc Results
- Revised SSA removed credit for MT in 6 fire zones (1-A-ACP, 1-A-34-RHXA,1-A-5-COMA, 1-A-4-COMC, 5-0-BAL, Unit 2 YARD) of approximately 400 ft.
- One zone, 1-A-3-TK, with upgrades to support coverage and adding collars on joints can achieve 3 hr rating (100 ft).
- Remaining fire zone barriers are rated 115 – 169 minutes.

Existing Engineering Equivalency Evaluations (EEEE)

- Existing Engineering Equivalency Evaluations (86-10 Evaluations) will be screened for adequacy.
- FPIP-0125 Developed for screening task.
- Used only for current 86-10's pre-transition!

EEEE Screening

- Purpose to ensure adequate quality of the EEEE's being transitioned and provide NRC with a consolidated table for review.
- EEEE's are not considered to have prior NRC approval.
- NEI 04-02 allows transition as described in 4.3.1 however no guidance is provided for screening.
- NEI 02-03 guidance is utilized

EEEE Screening

- Out put is a table of acceptable EEEE's which will be included in the LAR.

- Any EEEE which does not meet the screening criteria will be further evaluated.

Handout Reference 9

FAQ 8 - NRC PROPOSAL

PURPOSE

A high-level purpose of NFPA 805, as implemented under the endorsement of 10 CFR 50.48(c), is to clarify how licensees may use the flexibility afforded by 10 CFR 50.48(c)(2)(vii) and 10 CFR 50.48(c)(4) to develop a process to maintain the flexibility available to licensees under Generic Letter (GL) 86-10 evaluations.

DESCRIPTION

10 CFR 50.48(c) requires licensees to submit 10 CFR 50.90 license amendments for any changes to Chapter 3 features of NFPA 805, unless they have been previously approved by the NRC. Under the standard license condition of GL 86-10, licensees are allowed to make certain types of changes without prior NRC approval as long as the changes do not adversely affect the plant's ability to safely shutdown in the event of a fire.

To apply this proposal licensees must send the proposed process/methods outlined in this proposal to the NRC for approval. Then, they may use the approved processes/methods without prior approval for specific applications, as long as the application is within the bounds of staff approval of the proposed methods/processes.

The licensees' proposal must request an amendment under 10 CFR 50.90, using the flexibility available under 10 CFR 50.48(c)(vii) and 10 CFR 50.48(c)(iv) to allow 10 CFR 50.48(c) licensees to establish a process that enables them to make change to Chapter 3 of NFPA 805, as long as those changes only affect the referenced standards and listings, such as Underwriters Laboratory, Inc. or Factory Mutual listings. Under the proposal the licensee will commit to a process to evaluate deviations from secondary codes and listings required by NFPA 805 Chapter 3. The NFPA 805 change evaluation process will be used to ensure that nuclear safety performance goals, objectives and criteria and satisfied along with defense-in-depth and safety margins, as described in 10 CFR 50.48(c)(2)(vii).

Therefore, application of this process/method requires two steps. First, the process/methods and bounds of the process must be submitted to the NRC for approval. Second, following approval by the NRC, all plant specific changes made under this license amendment will undergo the same evaluation process as part of 10 CFR 50.48(c)(2)(vii). This second step, application of the process/method, will not require NRC approval.

This proposal would not apply to NFPA 805 Chapter 3 changes that do not relate to NFPA codes or listings. Changes to other portions of Chapter 3 of NFPA 805 would continue to require individual 50.90 amendments addressing the specific deviation.

PROPOSAL

"License may perform change evaluations for, deviations from the NFPA codes mentioned in NFPA 805, and listings for rated components, without a 10 CFR 50.90 submittal, as long as the specific requirement for the feature is not included in NFPA 805 Chapter 3 itself, and the NFPA 805 change process is used."

JUSTIFICATION

Since this proposal will be approved by the NRC as part of the 50.90 submittal, it will meet the legal requirement of 10 CFR 50.48(c)(2)(vii). The basis for the change evaluation to be included in the 50.90 submittal will be that each individual change will be evaluated against the NFPA 805 change process (nuclear safety requirements, defense-in-depth and safety margins evaluation), and providing this flexibility does not adversely impact the features required by Chapter 3 of NFPA 805 to protect fire safe shutdown at the plant. By only allowing changes to the secondary codes and listings, the changes are bounded. All features required by Chapter 3 will continue to be required. Secondary features may be changed based on an evaluation, using the required methods in a similar manner as is currently allowed under the Generic Letter 86-10 license condition, without prior NRC approval.

CONCLUSION

This proposal will permit, within the bounds of secondary codes and listings, and following NRC approval of a 50.90 amendment, licensees to evaluate fire protection features without prior NRC approval. Other issues not addressed by NFPA codes or listings would have to be submitted for NRC approval on a case by case basis.

EXAMPLE
Section 3.6.1 requires a hose system to be installed per NFPA 14. Using this process/method, a hose system must be available and have access to "all power block buildings," and must also be a Class III standpipe, but may deviate from other specific requirements of NFPA 14. These deviations must not contradict other text in Chapter 3 of NFPA 805, and the NFPA 805 change process is used.

SECTION APPLICATION - FAQs that would benefit from this method are listed.

3.3.1.2(1) - Listing for pressure-impregnated or coated with listed fire-retardant wood. - FAQ 06-0019

3.3.1.2(2) - Fire resistance of plastic sheeting - per NFPA 701

3.3.1.2(5) - Controls on combustible and flammable liquids - per NFPA 30 or other applicable NFPA standards

3.3.1.2(6) - Control on use and storage of flammable gases - per NFPA standards - FAQ 06-0020

3.3.1.3.1 - Hot work procedure - per NFPA 51B, NFPA 241

3.3.2 - Structural integrity - per NFPA 220

3.3.3 - Interior finishes - per NFPA 101

3.3.5.1 - Listing of cable for plenum use - FAQ 06-0022 (Partial)

3.3.6 - Roofs - per NFPA 256

3.3.7.1 - Storage of flammable gas - per NFPA 50A

3.3.8 - Bulk storage of flammable or combustible liquids - per NFPA 30 - FAQ 06-0023

3.4.1(a) - On-site fire brigade capability - per NFPA 600, 1500, and 1582 - FAQ 06-0007

3.4.3(a)(1) - Fire brigade training - per NFPA 600 or 1500

3.4.4 - Fire fighting equipment - per applicable NFPA standards - FAQ 06-0026

3.5.1(b) - Flow rate calculation - per NFPA 13 or 15

3.5.2 - Fire water tanks - per NFPA 22

3.5.3 - Fire pumps - per NFPA 20

3.5.10 - Fire main - per NFPA 24

3.5.15 - Fire hydrants - per NFPA 24

3.6.1 - Standpipes - per NFPA 14

3.7 - Fire Extinguishers - per NFPA 10

3.8.1 - Fire alarm - per NFPA 72

3.8.2 - Fire detection - per NFPA 72

3.9.1 - Water fire suppression - per appropriate NFPA standards including 13, 15, 750, and 16

3.10.1 - Gaseous fire suppression - per NFPA 12, 12A and 2001

3.6.3 - Listing of hose nozzles as electrically safe

3.11.1 - Building separation - per NFPA 80A

3.11.2 - Fire barriers - per NFPA 251

3.11.3 - Listing of fire rated door assemblies, fire dampers.

3.11.3 - Fire barrier penetrations per - NFPA 80, 90A, 101

3.11.4 - Listing of fire rated devices for through penetration fire stops.s

Harris NFPA 805 Pilot Observation Meetings / Reviews
2007 Schedule

The following is the current schedule for the Harris NFPA 805 pilot meetings. Process for implementation is provided after the table. Grey background has been completed. Revisions are in red and underlined.

Pilot Plant	Meeting Location	Date	Topic	Type of Review
Harris	Follow-up Phone Call	Jan 23, 9-11:30 pm (send products Jan 9)	*Fire PRA Products* Task 7.1 Plant Partitioning Task 7.6 Ignition Frequencies Task 7.2 Component Selection ##	Detail Review of Products / Calculations
Harris	Follow-up Phone Call	Feb 5 12:30-2:00 pm (send products Jan 17)	*Classical Fire Protection* Task 2.1.1 Chapter 3 Non Fire Area Transition Results Tasks 3.0 Radiological Release Implementation ##	Detail Review of Products / Calculations
Harris	Harris	March 6, 1-4 pm, March 7, 8 am-3 pm (send products Feb 20)	*Fire PRA Products* Task 7.8 Scoping Task 7.11 Detailed Fire Modeling * ##	Detail Review of Products / Calculations
Harris	Harris	March 8 8am-3pm (send products Feb 22)	*Classical Fire Protection* Task 2.1.3 Manual Firefighting * Task 2.2 Equivalency Evaluations * Task 2.3.2 MT Wrap Barrier Calculation	Detail Review of Products / Calculations
Harris	Phone Call	April Timeframe Follow-up call as needed	*Fire PRA Products* Previously reviewed products Task 7.1/7.2/7.6 and related FAQs ##	Detail Review of Products / Results
Harris	Harris, NRC or Phone Call	April 18, 1-5 pm April 19, 8am-3pm (send products April 4)	*SSA / Electrical* Task 7.3/7.10 Circuit Analysis for PRA Task 5.3 Non-power operations review Task 4.2 Fire Area Transition selected results ##	Detail Review of Products / Calculations

Harris NFPA 805 Pilot Observation Meetings / Reviews
2007 Schedule

Pilot Plant	Meeting Location	Date	Topic	Type of Review
Harris	Harris	May 29, 1-5 pm May 30, 8-5pm May 31, 8-3pm Send products May 15th Potential expanded meeting at FAQ NEI meeting.	*Fire PRA Products* Task 7.5, Fire Induced PRA Model Task 7.12 Post Fire HRA *SSA Products* Task 4.4 Update T-H Analysis Task 4.5 Recovery Action Update ##	Detail Review of Products / Results
Harris/	Phone Call	June Time Frame as needed.	Follow-up to previous reviews ##	Detail Review of Products / Results
Harris/ Oconee	TBD Raleigh or Charlotte	Later in July (send products June 26) Duke to provide input on dates	*Fire PRA Products* Task 7.14 Fire Risk Quantification Selected Scenarios *FP Program* Task 8.0 Change Evaluations Selected Items / Scenarios ##	Meeting Presentations Include Detail Review of Products / Results when available
Harris	Harris	September Note NEI Forum	TBD	Detail Review of Products / Results
Harris / Oconee	Raleigh /Charlotte / RII ?	Nov 12-14	Combined meeting general status, methodologies, LAR content, etc	Meeting Presentations
Harris	Harris	Feb 4-8, 2008	PRA Audit	NRC Audit

Meetings that flag this note will likely contain some sensitive or proprietary information.
* Documents will not be transmitted ahead of the meeting for this topic; they will be provided during the site pilot visit.

Harris NFPA 805 Pilot Observation Meetings / Reviews
2007 Schedule

Proposed implementation process:

1. 'Detail Review' type observation meeting under "Type of Review" is conceptually intended to be a small team from the NRC to focus on a narrow scope. There would be minimal meeting preparation other than preparation and review of the products themselves. Some meetings listed will be a follow-up phone call instead of face to face meetings.
2. The products will be transmitted to the NRC approximately a week prior to the meeting/phone call. It is recommended that a phone call be used to describe the product presented.
3. NRC comments/questions on the products will be listed on the Parking Lot; the Parking Lot will be posted to the NEI Web Board for the other transition plants.
4. Topic defines the skill area and products to review. The products may be adjusted depending on progress, but the skill area will not change.
5. Results will be discussed at next face to face NEI NFPA 805 Task Force meeting. The meeting duration may need to be increased to accommodate this. Task force members may ask NRC clarification questions on new parking lot items during the public/NRC part of the meeting.
6. Duke/PE will send a representative to the meetings for the other Pilot.
7. The meeting length will typically be 4-6 hours, but may be longer, as agreed upon by NRC/pilot plant. Additional time will be added as needed to accommodate plant walkdowns when the pilot meeting is at the site for observation.