NRC Meeting
June 4, 2015
CCNPP NFPA 805
License Amendment Application

Exelon Generation

Agenda

- Current Licensing Status: Jim McQuighan
- Fire modeling RAI status (tied to PRA-3): Mark Schairer
  - Fire Modeling RAI status and summary: Mark Schairer.
  - FPRA status: Rob Cavedo.
  - FM RAI 01.l.i.01 (MCB): Mark Schairer.

- Att. L: Request # 7: Wood in North Service Building. Mark Schairer.
- Att. L: New request (#9): FPE - 01.01- Insulation Materials. Mark Schairer.
- Att. L: Request # 8: Self Approval of Non-metallic conduit. Paul Darby.
- SSA – RAI 11: Marinite Board. Paul Darby.

- PRA – 07.01 & 08.01: PRA Modeling of tray & junction boxes. Rob Cavedo.

CCNPP Team Members:

- Exelon/CCNPP Representatives
  - Jeff Stone - Exelon Senior FPRA Manager
  - Jim McQuighan - Exelon Manager, NFPA 805
  - Pat Furio - Exelon Principal Regulatory Engineer (phone line)
  - Rob Cavedo - Exelon Senior Staff FPRA Engineer
  - Pat Pringle - Exelon Senior PRA analyst
  - Paul Darby - Exelon NFPA 805 Electrical Engineer
  - Chris Dobry - Exelon (CCNPP) Fire Protection Engineer
  - Usama Farradj - FPRA consultant (phone line)
  - Tom Daniels - FPRA consultant (phone line)
  - Mark Graham - FPRA consultant (phone line)
  - Mark Schairer - Fire modeling consultant
  - Jeff Quinn - NFPA 805 consultant (phone line)
  - Steve Southard - Fire Protection Engineer (phone line)

Current Licensing Status

- NRC Review LAR: On-going
- NRC (Round #1) RAIs:
  - 60 day 2/9/2015 (done)
  - 90 day 3/11/2015 (done)
  - 120 day 4/13/2015 (done)
- Draft NRC RAI follow-ups (60/90 day): 5/14/2015 (done)
  - Clarification call 5/21/2015 (done)
- NRC public meeting (120 day RAIs, etc): 6/04/2015
- NRC final comments on all RAIs: Target: June/July 2015
- Transmit final results: Att. C, G, S & W + 2 months
- Safety Evaluation: Fall 2015

Current Licensing Status

Attachment S-2:

- S-2: “Modifications will be completed by April 30, 2018. This date assumes SER approval within two years from LAR submittal.”
  - Unit 1: RFO 2016 & RFO 2018.
  - Unit 2: RFO 2017.

Current Licensing Status

Attachment S-3:

- S-3: Implementation of the new NFPA 805 Fire Protection Program to include procedure changes, process updates and training to affected plant personnel. This will occur (within) 12 months following the issuance of an approved SER from the NRC unless that date falls within a scheduled refueling outage. Then, implementation will occur within 60 days after the startup from that scheduled refueling outage.

Fire Modeling RAIs : Status & Summary

The fire model has been reviewed and updated (as necessary) for FM-RAI 01-

- Inclusion of secondary combustible in fire modeling analysis (b, c, d, i.vii, k.vi)
- Modeling of HEAF events (f)
- Incorporation of wall/corner effects (h)
- Main control room fire modeling
  - cabinet heat release rates (HRRs) and propagation to adjacent cabinets (i.viii, i.ix, l.i, l.ii)
  - MCR HRR now uses the 15-bin discretization (i.iv)
  - Abandonment criteria (i.xiii)
- Transient/fixed ignition source area, elevation, location, and fire growth characteristics (i.vi, i.xi, k.iii, l.iii,)
- FDS: device placement and material properties selected (i.xii, i.xiv, k.ii,)
- Cable spreading Room Detector activation time updated (k.i)
- Multi-Compartment Analysis
  - Screening step clarification/revision (j.i, j.iii, j.v,)
  - Ventilation characteristics (j.iv)

Fire PRA Status: PRA-03, PRA-19 a & d.

- Initial Fire Modeling is complete
- Total risk quantification is in progress
- Total Delta Risk, Risk of Recovery Actions will be evaluated IAW RG 1.174 criteria.
- Final Quantification will begin after receipt of final NRC comments on RAI responses
- The final results will accompany the response to RAI PRA 3, 19a and 19d.
- Attachment C, G, S and W updates will be transmitted with the PRA RAI-3 response.

FM RAI 01.I.i.01: MCB Fire Modeling

- The main control room (MCR) fire modeling analysis has been revised to model all main control board (MCB) vertical sections using the heat release rate (HRR) from NUREG/CR-6850, Table G-1, case 5, which is for "vertical cabinets with unqualified cable, fire in more than one cable bundle open doors".
  - This is the most conservative HRR value available in NURE/CR-6850 Table G-1 and has a 98th percentile HRR of 1002kW.

- The risk results did increase, however it appears (preliminarily) that the total plant risk is still acceptable (& will meet the risk objectives for transition).

- Since the NUREG/CR-6850 bounding HRR (i.e., worst case) is being used, this is an acceptable approach and no further justification is needed.

- At this time, there is no plan to use the alternate approach. However, CCNPP cannot say with 100% certainty that this will be the final answer until the final results are complete.

- CCNPP proposes to answer this follow up RAI with our responses to any 120 day follow-up RAIs or the integrated analysis (i.e., PRA RAI 03).

Att. L: Request #7 - Wood in NSB/(Power Block)

- NFPA 805 Section 3.3.1.2(1) requires that "Wood used within the power block shall be listed pressure-impregnated or coated with a listed fire-retardant application."
- Three (3) fenced-in storage areas within the basement of the North Service Building (part of power block) contains non-compliant wood.
- Limits on quantities of wood are administratively established by the fire protection engineer.
- Fire risk is mitigated by:
  - Minimal fixed ignition sources.
  - Installed NFPA 13-compliant sprinkler system designed for the hazards in the area.
  - Fire barriers to adjacent fire areas.
  - Loss of all credited cables in the areas of concern has been analyzed – plant can achieve and maintain a safe and stable condition (i.e., hot standby) with a NSCA success path free of fire damage and no recovery actions.

New Att. L: (Request #9): Insulation Materials

- NFPA 805 Section 3.3.4 requires that "Thermal insulation materials, radiation shielding materials, ventilation duct materials, and soundproofing materials shall be noncombustible or limited combustible."
- Many radiation shielding materials are not tested for combustibility but rather are tested for flame spread and/or ignitability.
- For instances that CCNPP neither complies with this rule, nor has prior NRC approval either:
  1) a performance-based evaluation approval request (Attachment L) in accordance with 10 CFR 50.48(c)(2)(vii) will be developed that will request approval based on the following criteria:
     - Fire-retardant types that have passed NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films* (NFPA 805 Section 3.3.1.2(2) requirement for plastic sheeting).
     - Have a flame spread rating commensurate with Class A interior wall/ceiling finish materials in accordance with NFPA 101, *Life Safety Code* (NFPA 805 Section 3.3.3 requirement for interior finishes).
  2) Any materials that do not meet the above criteria will be evaluated for acceptability (i.e., as adequate for the hazard) as part of the Attachment L request.

Att. L: Request #8: Non-metallic Raceways /Conduit

- Original Construction Requirement for underground and concrete-embedded applications (corrosive conditions – metal subject to failure).
- Not relied upon for grounding.
- Not credited to be fire resistant in the NFPA-805 analysis.
- Do not contribute to fire loading.
- Concrete and ground materials prevent:
  - Internal fires from impacting credited external circuits
  - External fires from impacting credited internal circuits.

- We intend on revising Att. L Request #8 to remove the request for permission to evaluate & self-approve the use of Non-metallic raceways (conduit) in applications that are neither embedded in concrete or buried underground as a licensee identified change.

SSA - RAI 11: Marinite Boards in Containment

- Deterministically, the marinite boards will not be credited as a 20 foot separation barrier (non-intervening combustible).
- Probabilistically, the marinite boards are credited as a “fire break” to prevent fire spread between the east & west areas of containment.
- New VFDRs will be evaluated IAW NFPA-805 4.2.4 as part of the PRA integrated response (PRA RAI 03).
- Construction:
  - Twenty-five feet (min.) of each cable tray is covered top & bottom w/ ½ in. Marinite XL.
  - Banded to the trays - 3/8 in. stainless steel banding 12 gauge (min.).
- Inspected prior to start-up in accordance with procedures.

PRA – 07.01 & 08.01: FPRA FAQ 13-005 & FAQ 13-006

FPRA FAQ 13-005: PRA modeling of cable hot work fires/self-ignited cable.

FPRA FAQ 13-006: PRA modeling of junction box fires.

- We intend to revise the analysis using the guidance provided in FPRA FAQs 13-005 & 13-006.
- Results will be included in PRA-3 integrated response.