




Harris/NRC Pre-submittal Meeting: Risk-Informed Completion Times

August 22, 2019

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Duke Energy Attendees

Art Zaremba (Manager, Nuclear Fleet Licensing)

Bob Rishel (Director, Probabilistic Risk Assessment)

Heather Szews (Manager, Probabilistic Risk Assessment)

Jordan Vaughan (Lead Nuclear Engineer, Nuclear Fleet Licensing)

Rob Isbell (Lead Nuclear Engineer, Probabilistic Risk Assessment)

Kevin Abell (Nuclear Shift Manager, Operations)

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Agenda

- Introduction (Desired Meeting Outcomes)
- PRA Models and Real-Time Risk Model Overview
- License Amendment Request Overview
- Recent OE (TSTF-505 LARs and other risk-informed submittals)
- Implementation
- Timeline for LAR Submittal/Closing Remarks

Overview of PRA Portion of HNP TSTF-505 LAR

- Consistent with TSTF-505 Rev. 2 Template
  - No Loss of Function
- PRA models updated/upgraded and peer-reviewed
- F&O Closure independently validated
- Total CDF/LERF meet RG 1.174, Rev. 2 criteria
- Seismic Penalty

Internal Events PRA

- HNP IE PRA model was subject to self-assessment and full-scope peer review in 2002 IAW guidance in NEI-00-02, Industry PRA Peer Review Process.
- 2006, a self-assessment was conducted to identify supporting requirements that did not meet Category II of the ASME Standard RA-Sb-2005 and RG 1.200, Rev. 1.
- 2007, a focused scope industry peer review against two elements was conducted as a follow up to the self-assessment against ASME Standard RA-Sb-2005 and RG 1.200, Rev. 1.
- 2017, a focused scope industry peer review was conducted against one supporting requirement for a model change that was determined to be an upgrade. The review team concluded that the change met the technical requirements at Capability Category II with no F&Os

Internal Flood PRA

- 2014 - Flooding self-assessment
- 2014 - Full scope peer review against RG1.200, Rev. 2
- 2017 - Jan/Feb Closed F&Os reviewed as pilot for F&O closure – observed by NRC
  - Assessment team confirmed resolution of internal flood findings met at CC-II.
  - Post-May 3 Letter from NRC to NEI, F&O Closure Report revised to address deltas from Staff Letter clarifications

Fire PRA

- 2008 - HNP Fire PRA was subject to a review conducted by the NRC during the NFPA 805 Pilot process and an additional focused scope industry peer review.
- Performed prior to the publication of RG 1.200 Rev 2. Self-assessment was conducted to assess the differences between ANSI/ANS and the current version of the PRA standard.
- Assessment confirmed there were no technical differences between the two versions of the standard.

Fire PRA (continued)

- In June 2019, Focused Scope Peer Review:
  - Implementation of the obstructed plume methodology
  - Upgrade of the fire induced structural steel analysis.
  - No new findings were issued from this peer review.
- Closed findings were reviewed and closed in October 2017 for the Fire PRA model using the process documented in Appendix X to NEI 05-04, NEI 07-12 and NEI 12-13, “Close-out of Facts and Observations” (F&Os) as accepted by NRC (ML17079A427).

F&O Closure Review

- Formal process by independent review team
  - Assessed disposition of Findings for Internal Events, Internal Flooding, and Fire PRAs
  - Addressed in detail in the LAR assessment Technical Adequacy section

Other Hazards

Seismic

- No Current HNP Seismic PRA
- NRC Staff Assessment of Harris Seismic (ML14090A441):
  - Re-evaluated hazard bounded by SSE in frequency range of 1 to 10 Hz
  - Therefore, seismic risk evaluation not merited
  - Seismic penalty will be applied to all RICTs based on current seismic hazard for CDF (screened for LERF<1.0E-7)

High Winds

- Bounding analysis concludes that the High Winds hazard can be screened from calculations in the RICT Program.

Other Hazards

- No other external hazards required to be included in the RICT calculations.

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RICT Program Real-Time Risk Model

- Real-Time Risk Model as currently used for existing Maintenance Rule a(4) Configuration Risk Management Program
  - Uses PHOENIX Risk Analysis Software
  - Incorporates RICT/RMAT calculation features

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License Amendment Request

- Based on TSTF-505, Revision 2 and NEI 06-09
- 18 different Technical Specifications (TS) impacted by proposed change
  - Portions of Reactor Trip System instrumentation and ESFAS instrumentation included
- Modes 1 and 2 only
- New TS Section 6.0 Program
- Variances from TSTF-505, Revision 2
  - Harris TS are old PWR Standard TS; not Improved NUREG-1431 TS
  - Subtle differences in Condition/Required Action wording
  - TSTF-505 Conditions/LCOs exist that are not in the HNP TS
  - RICTs proposed for some plant-specific LCOs/Actions not in TSTF-505
  - Plant-specific changes to address supported system Actions
  - Re-typed/clean TS pages not included

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Harris Changes to Address Supported System Actions

- HNP TS have different usage rules than NUREG-1431 ITS with regard to treatment of support system inoperability and the applicability of supported systems LCO actions
- NUREG-1431 directs that only the support system Required Actions are applicable when a supported system LCO is not met solely due to a support system LCO being not met
  - Provisions do not exist for HNP TS
  - For HNP, when a system is inoperable due to inoperability of the support system, any applicable action of the supported system is concurrently in effect with the support system action
- Creates conflict for proposed RICT Program because in some cases the supported system is not in the scope of the program and a more limiting action requirement may be in effect when the support system is inoperable

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Harris Changes to Address Supported System Actions

- Plant-specific changes are proposed for the following LCOs that are NOT in the scope of the RICT Program to address the situation when a RICT is in effect on a support system:
  - LCO 3.3.3.6 (Accident Monitoring Instrumentation)
  - LCO 3.4.3 (Pressurizer)
  - LCO 3.6.5 (Containment Vacuum Relief System)
  - LCO 3.7.6 (Control Room Emergency Filtration System)
  - LCO 3.7.7 (Reactor Auxiliary Building Emergency Exhaust System)
- LCO Actions are annotated as follows:
  - “Not applicable if [SYSTEM] is inoperable solely due to inoperability of a required support system with a RICT in effect.”

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Recent OE (TSTF-505 and other risk-informed LARs)

- Key issues from Byron/Braidwood and Limerick TSTF-505 audit:
  - Potential loss of function Conditions – none for HNP
  - Defense-in-depth principles associated with instrumentation TS
    - Applicability to HNP TS 3.3.1 (Reactor Trip System Instrumentation) and TS 3.3.2 (ESFAS Instrumentation)
- Harris 50.69 LAR and Essential Services Chilled Water System AOT extension LAR OE

Implementation

- Operations owns implementation
- Cross-functional team supporting implementation
- RICT implemented in Modes 1 and 2 only
- Real-Time Risk and PRA Models updated to support the RICT Program
- Procedure changes and training
- Industry OE (Benchmark, Risk-Informed TS Task Force, TSTF)

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Procedures and Training

- New procedures developed and existing procedures revised to address the following:
  - The new RICT Program (responsibilities, definitions, plant conditions for which the program applies etc.)
  - Calculation of risk management action times (RMAs) and RICTs
  - Development and implementation of RMAs
  - Use of the CRMP software tool (i.e., PHOENIX or the real-time risk model) with the RICT Program
- Three levels of training for the RICT Program is proposed:
  - Level 1 – User Training
  - Level 2 – Management Training
  - Level 3 – Site Awareness Training

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Closing Remarks

- Next Steps:
  - Submit LAR in September 2019
  - Revise/develop implementing procedures in parallel and subsequent to NRC staff review of LAR
  - Conduct training in 2020
  - Ready to implement RICT Program within 120 days of receipt of SE

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