Braidwood Station and Byron Station Requests for Relief for Alternate Examination Frequency Under ASME Code Case N-729-1 for Reactor Vessel Head Penetration Welds in accordance with 10 CFR 50.55a (a)(3)(i)

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July 27, 2015

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Purpose

- Provide a brief history of B/B Relief Request related to the RPV Head Nozzles
- Provide technical basis for Re-examination interval requested of every other cycle for Braidwood and Byron Station
  - MRP-395
  - New sensitivity analyses performed at 95th percentile
- Understand technical questions that may exist on Relief Request

B/B RPV Head Nozzle History

- During Byron Station Unit 2 Refueling Outage in Spring 2007 (B2R13) a PWSCC flaw was identified in penetration 68 and it associated J-groove weld
- ASME Code Case N-729-1 was incorporated into 10 CFR 50.55a as an augmented ISI program in September 2008 and allowed volumetric or surface examination every second refueling outage, even with detected flaws
- However, in a final rule action published in the Federal Register (FR) at 73 FR 52730, dated September 10,2008, 10 CFR 50.55a(g)(6)(ii)(D)*(5)* added a condition modifying ASME Code Case 729-1, Note (8) indicating that if flaws attributed to PWSCC had been identified, the re-inspection interval must be each refueling outage
- Thus, volumetric and/or surface examinations are conducted every outage

B/B RPV Head Nozzle History

- In 2010, NRC authorized inspection frequency of every other outage for Byron Station Unit 2 under RR I3R-16, SE also included the statement that if future indications were found, would change inspection frequency to every outage
  - Volumetric and/or surface examinations of all penetrations with the exception of penetration 68
- Exelon submitted I3R-20 for Byron Station Units 1 and 2 and I3R-09 for Braidwood Station Units 1 and 2 for use of Westinghouse weld overlay method on reactor vessel head penetration housing and J-groove welds, April 2011
  - Included that future indications found would change inspection frequency to every outage
- NRC approved I3R-09 and I3R-20 Revision 1 as a repair method, March 2012
  - All repaired nozzle penetrations examined with UT and Surface Examinations (PT) every outage
- Exelon submitted a Revision to the Relief Request for I3R-09 and I3R-20 which requests relief to eliminate surface examinations after successful examinations, September 2014
- Exelon recently provided a revision to the previously submitted Relief Request for I3R-09 and I3R-20, changing the frequency of surface examinations to every other cycle after successful examinations have been obtained

Proposed Relief Request

- Requests UT examination inspection frequency interval of every other outage for all reactor vessel closure head penetrations (inclusive of repaired penetrations) for Braidwood Station Unit 1 and Byron Stations Unit 1 and Unit 2
- Request supported by:
  - Effectiveness of current inspection requirements, including recent indications found in cold heads (i.e., reactor vessels operating at reactor cold-leg temperature (Tcold) including Braidwood Station and Byron Station)
  - Deterministic crack growth rate analysis
  - Probabilistic Monte Carlo simulation analysis
  - Margin to leakage for flaws detected in cold heads

Proposed Relief Request

- Personnel exposure reduced approximately 500-1000 mRem each outage an inspection is not required to be performed
- Implement approved Relief Request to support Byron Station Fall Outage 2015 (B1R20)
- Continued implementation of UT Inspection Frequency Relief Post-Peening application
  - Peening application planned for Byron Station Unit 2 Spring 2016 outage (B2R19)
  - Inspection Frequency Relief for all nozzles

Technical Basis for Re-examination Interval of Every Second Refueling Outage for PWR Reactor Vessel Heads Operating at Tcold with Previously Detected PWSCC

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