

Nine Mile Point Unit 2 AST LOCA Approach to Elemental Iodine Removal

NRC Public Meeting on RAI 6
April 9, 2020



Exelon Generation®

Summary of Current Licensing Basis Elemental Iodine Removal

- Current Licensing Basis (CLB) analysis of record, H21C-106 Revision 2, models elemental iodine removal in bypass leakage pathways as follows:
 - Main Steam Lines (MSLs):
 - Modeled as two pathways in RADTRAD; one for MSIV stuck open and one representing the other three lines
 - No compartments; holdup was accounted for with delayed release timing
 - Elemental iodine is conservatively capped at a constant 50% (*only piping between the MSIVs credited*)
 - Other bypass leakage pathways
 - Grouped together into drywell (DW) bypass, wetwell (WW) bypass, and delayed DW bypass leakage pathways in RADTRAD with the delayed pathway accounting for transit time similar to MSLs
 - Elemental iodine in all bypass leakage pathways capped at a constant 50%

Summary of Current Licensing Basis Elemental Iodine Removal

H21C-106, Appendix C, Page C1:

Elemental iodine will most likely be adsorbed on the aerosols and will deposit with the aerosols; but for conservatism, the elemental iodine removal will be “capped” at 50%. Note that elemental iodine as a gas would deposit on all surfaces (vertical surfaces as well as a factor of π greater for horizontal surfaces) as compared to only the projected horizontal surface for gravitational settling.

NMP2 SER (ML081230439) Section 3.2.1.2.5.2, Page 18:

For elemental iodine, the licensee assumed that a DF of 2 applies for natural deposition in the bypass piping. This is consistent with the licensee’s assumption of elemental iodine plate-out on aerosol particulate, as was used in their drywell spray calculation. The NRC staff notes that the conservatively calculated aerosol activity removal by settling in the piping exceeds a DF of 2, and finds that the DF of 2 for elemental iodine is acceptable. The licensee took no credit for organic iodine removal.

Summary of Changes to H21C-106 Revision 3 to Be Consistent with CLB Elemental Iodine Removal

- Changes will be made as follows to make the models from H21C-106 Rev. 3 consistent with the CLB for elemental iodine removal:
 - Time-dependent elemental removal associated with each MSL volume will be replaced with a constant 50% removal in a single pathway for each MSL (DF=2 for each pathway)
 - Time-dependent elemental removal modeled in the DW and WW bypass leakage pathways will be replaced with a constant 50%
 - Discussion in Sections 2.3.1.4 and 7.10 of H21C-106 Rev. 3 and associated tables and results will be modified or removed to be consistent with the discussion in H21C-106 Rev. 2 with regards to elemental iodine removal in the leakage pathways
- It is expected that the impact of the change will be a slight decrease in doses from those presented in the LAR; elemental iodine removal in leakage pathways is not a significant factor in the offsite and Control Room doses.

LAR Impacts with Implementing CLB Elemental Iodine Removal

- Enclosure A (H21C-106 calculation revision) updated
- Attachment 1, Technical Evaluation
 - Table 1 on Page 3 of 22
 - Discussion on Page 10
- Changes planned to be submitted
 - Only updated Enclosure A
 - RAI response discussion