

Palo Verde Nuclear Generating Station Generic Letter 2004-02

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Introductions

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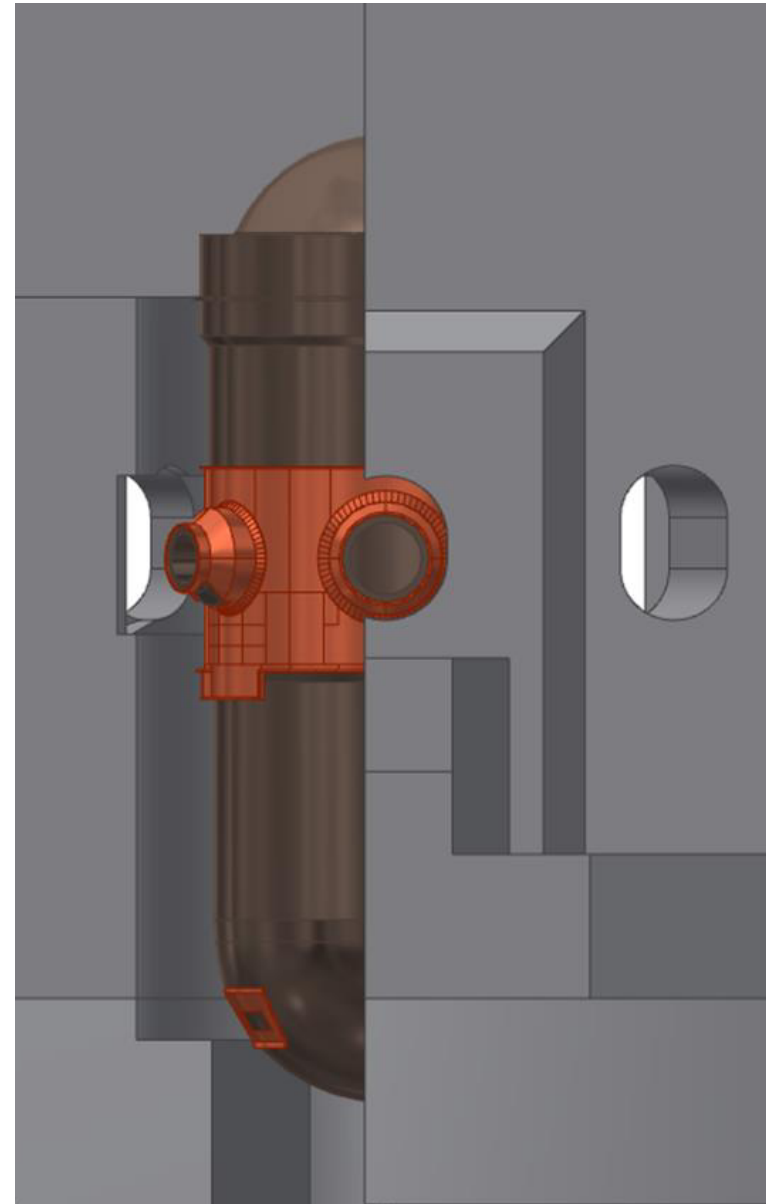
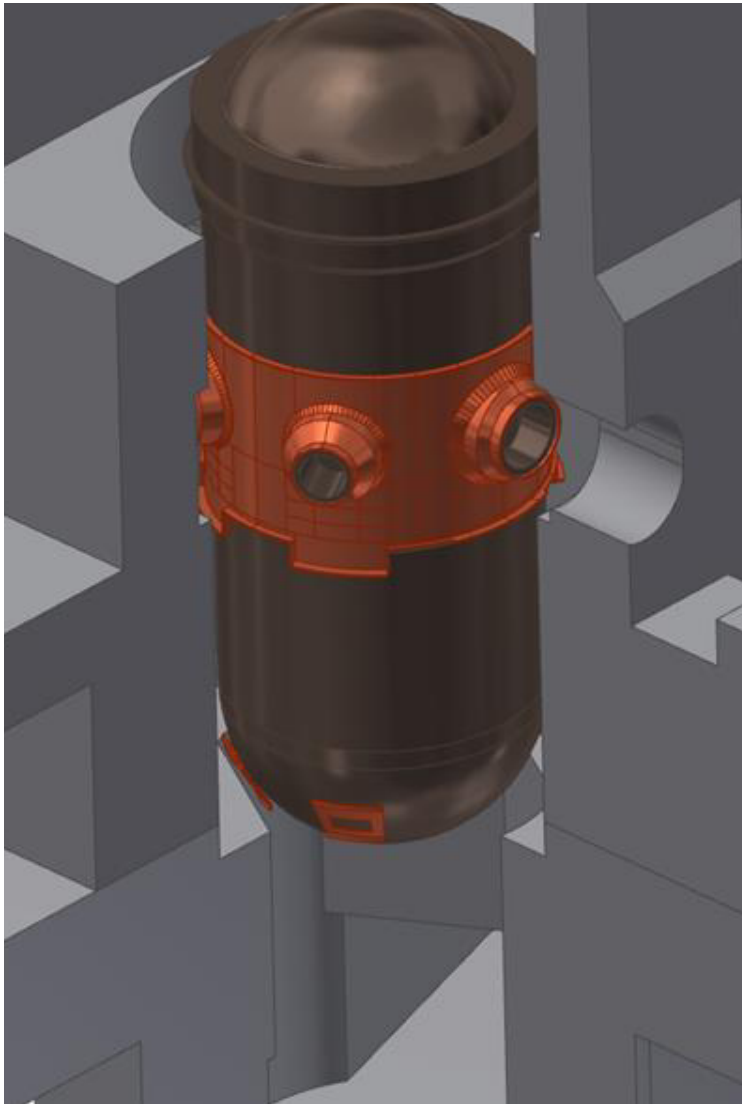


Background

- 12/18/2013 - APS submitted Revision 2 to Supplemental Response to NRC Generic Letter 2004-02
- 4/15/2015 – PVAR 4644513 documents that APS failed to identify and evaluate Microtherm on the Reactor Vessel
- 6/10/2015 – Initial Public Meeting with NRC
 - Beaver Valley Operating Experience with Microtherm
 - Communication with the Industry
 - Industry Testing of Microporous Insulation
 - Extent of Condition

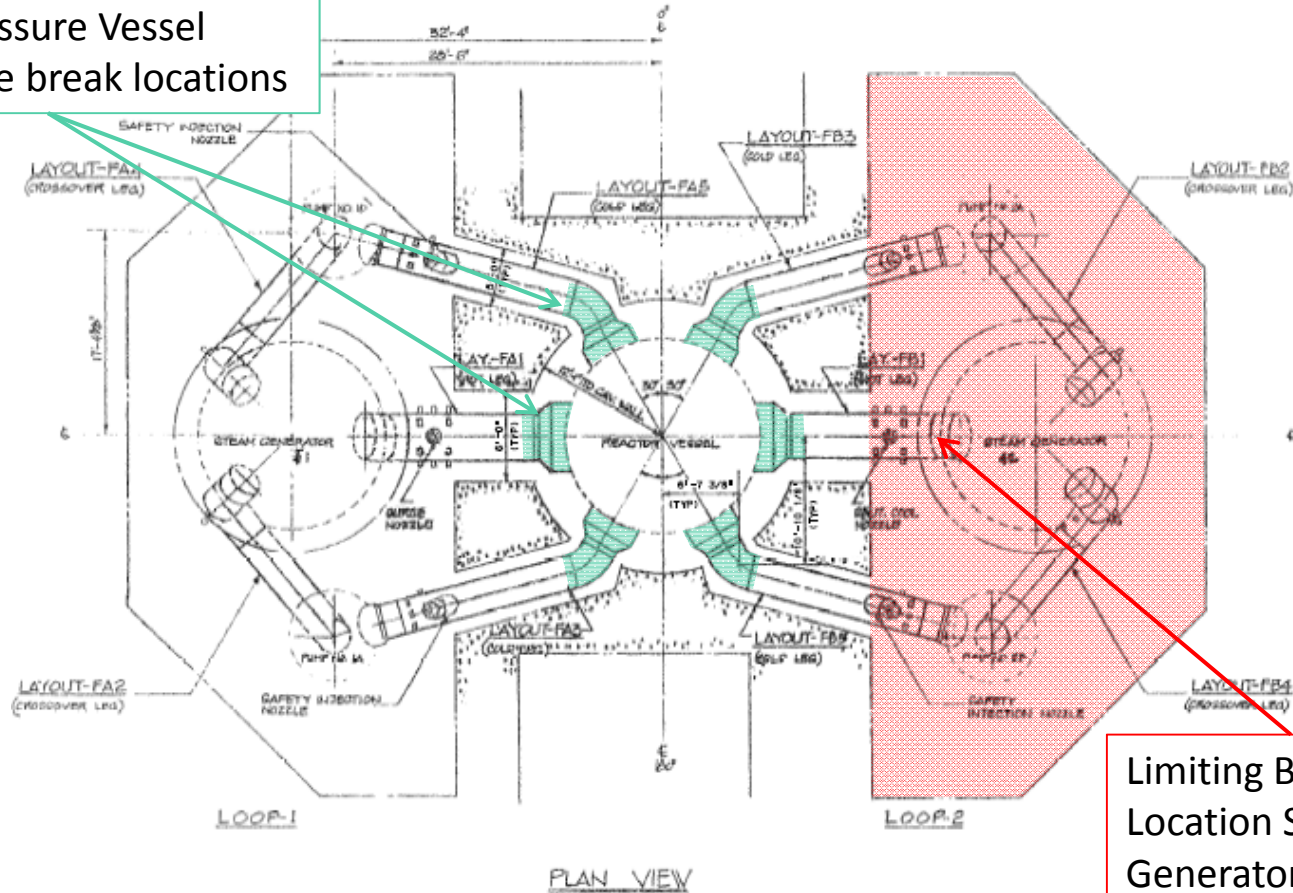


Microtherm Locations



Break Locations

Reactor Pressure Vessel
(RPV) Nozzle break locations

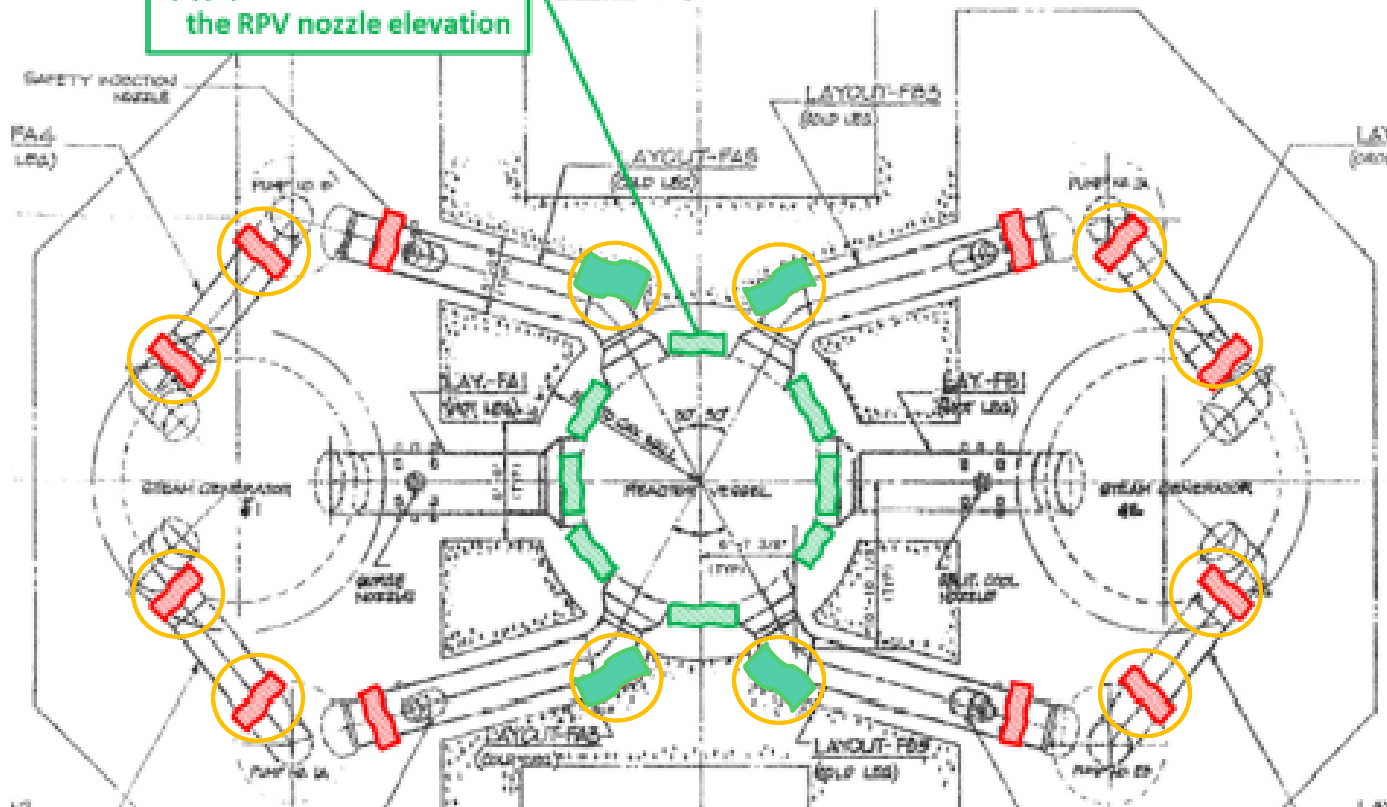


Limiting Break
Location Steam
Generator Hot Leg
Nozzle

Extent of Condition

LOCATION	Unit 1	Unit 2	Unit 3
Cold Leg 1A, 1B, 2A, 2B RTD	X	X	X
Below RPV Nozzle	X	X	X
RPV Cavity	X	X	X
RPV ICIs	X	X	X
Crossover 1A, 1B, 2A, 2B RCP Nozzle			X
Crossover 1A, 1B, 2A, 2B SG Nozzle			X
Cold Leg 1A, 1B, 2A, 2B RPV Elbow			X

These Temp-Mat sections (typ.) are located beneath the RPV nozzle elevation



Red: Temp-Mat Impacting Existing Break Location (SG HL Nozzle)

Green: Temp-Mat Impacting New RPV Break Location

Unit 3 Only

Analysis to date

- Debris Generation
 - Primary success path is removal of Temp-Mat in the D-rings for current limiting break
 - Microtherm ZOI (zone of influence) based on robustness of encapsulation
 - Encapsulated Microtherm ZOI and restrained separation of pipe at RPV nozzle break limits Microtherm quantity to the local region of the break location
- Debris Transport
 - RPV nozzle break – Temp-Mat generated to the Reactor Cavity will not transport to strainers based on very low flow velocity and upward vertical flow path of 18 to 23 feet
 - Cold Leg RPV Elbow Temp-Mat is still being analyzed for impact (Unit 3 Only)
 - Generated Microtherm assumed to transport to the strainers

Analysis to date (cont)

- Industry Testing / NPSH
 - Salem U2 Test 6 Head Loss conditions (with Min-K) bound Palo Verde with Microtherm for post-LOCA flow scenarios
 - Comparative analysis indicates Palo Verde NPSH and structural limits should be bounded by existing SG HL Break location

Actions to finalize

- Confirm Removal of Temp-Mat from D-ring
- Confirm Removal of Temp-Mat from Unit 3 RPV Cold Leg Elbows
- Confirm impact of identified Temp-Mat and Microtherm for RPV on chemical effects
- Finalize LPSI pump failure to trip after Recirculation Actuation Signal (RAS) Scenario
- Complete final review of assessment report

Summary

- A resolution path exists for D-ring and RPV nozzle break cases
 - Confirmation of chemical effects and LPSI flow scenario items in process
 - Open Strainer Area is expected to be comparable with original analysis
- Confirm removal of Temp-Mat in D-Ring
 - Removal of RTD Temp-Mat (all 3 units)
 - Removal of Crossover Piping Temp-Mat in Unit 3
- Confirm removal of Cold Leg RPV Elbows in Unit 3
- Supplement APS Response to GL 2004-02



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