PWR Owners Group-NRC Meeting

Risk-Informed Technical Specification Initiative 1
Technical Specification Required Action Endstates

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Jim Andrachek
Westinghouse Electric Company

PWR Owners Group-NRC Meeting

Agenda

- WCAP-16294 Mode 4 Endstate Changes Approved in the NRC's SE
- May 27, 2010 Teleconference with the Staff
- Benefits of Remaining in Mode 3 versus Mode 5
- Differences Between Mode 3 versus Mode 5
- Proposed Justification for Remaining in Mode 3
- TSTF Traveler
- Open Discussion

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Mode 4 Endstate Changes Approved in the NRC's SE

- TS 3.3.2, "ESFAS Instrumentation," Conditions B, C, and K
- TS 3.3.7, "CREFS Actuation Instrumentation," Condition C
- TS 3.3.8, "FBACS Actuation Instrumentation," Condition D
- TS 3.4.13, "RCS Operational Leakage," Condition B
- TS 3.4.14, "RCS PIV Leakage," Condition B
- TS 3.4.15, "RCS Leakage Detection Instrumentation," Condition E
- TS 3.5.3, "ECCS- Shutdown," Conditions A, B, and C
- TS 3.5.4, "RWST," Condition C

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Mode 4 Endstate Changes Approved in the NRC's SE (cont.)

- TS 3.6.6A, "Containment Spray and Cooling Systems (Atmospheric and Dual)," Conditions B, and E
- TS 3.6.6B, "Containment Spray and Cooling Systems (Atmospheric and Dual)," Condition F
- TS 3.6.6C, "Containment Spray System (Ice Condenser)," Condition B
- TS 3.6.6D, "Quench Spray System (Subatmospheric)," Condition B
- TS 3.6.6E, "Recirculation Spray System (Subatmospheric)," Condition F

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Mode 4 Endstate Changes Approved in the NRC's SE (cont.)

- TS 3.6.7, "Spray Additive System (Atmospheric, Subatmospheric, Ice Condenser and Dual)," Condition B
- TS 3.6.11, "Iodine Cleanup System (Atmospheric and Subatmospheric)," Condition B
- TS 3.6.12, "Vacuum Relief Valves (Atmospheric and Ice Condenser)," Condition B
- TS 3.6.13, "Shield Building Air Cleanup System (Dual and Ice Condenser)," Condition B
- TS 3.6.14, "Air Return System (Ice Condenser)," Condition B

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Mode 4 Endstate Changes Approved in the NRC's SE (cont.)

- TS 3.6.18, "Containment Recirculation Drains (Ice Condenser)," Condition C
- TS 3.7.7, "Component Cooling Water System," Condition B
- TS 3.7.8, "Service Water System," Condition B
- TS 3.7.9, "Ultimate Heat Sink," Condition C
- TS 3.7.10, "Control Room Emergency Filtration System," Condition C
- TS 3.7.11, "Control Room Emergency Air Temperature Control System," Condition B

Mode 4 Endstate Changes Approved in the NRC's SE (cont.)

- TS 3.7.12, "ECCS Pump Room Exhaust Air Cleanup System," Condition C
- TS 3.7.13, "Fuel Building Air Cleanup System," Condition C
- TS 3.7.14, "Penetration Room Exhaust Air Cleanup System," Condition C
- TS 3.8.1, "AC Sources- Operating," Condition G
- TS 3.8.4, "DC Sources- Operating," Condition D
- TS 3.8.7, "Inverters- Operating," Condition B
- TS 3.8.9, "Distribution Systems- Operating," Condition D

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May 27, 2010 Teleconference with the Staff

- The Staff proposed that the Industry consider justifying Mode 3 versus Mode 4 as the preferred endstate
- Based on deterministic Staff concerns associated with remaining in Mode 4 for an indefinite period of time
- The basis for the Staff's proposal was
  - The Accumulators are in Mode 3, when RCS pressure > 1000 psig
  - The automatic starting capability of the systems is available in Mode 3
  - Very few safety analyses are performed in Mode 4
  - The plant risk is low in Modes 3 and 4

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May 27, 2010 Teleconference with the Staff (cont.)

- The Staff requested that the Industry propose the approach to be used to justify Mode 3 as the preferred endstate in a public meeting
- The change would be available to all three PWROG NSSS plants

Benefits of Remaining in Mode 3 versus Mode 5

- Automatic Safety Injection and Steamline Isolation signals are available in Mode 3 to mitigate the associated transients
- Automatic actuation of safety systems is much more reliable than operator action
- More operator actions are required to mitigate initiating events in Mode 5
- The Accumulators and ECCS pumps are available in Mode 3 to mitigate transients
- FSAR design basis safety analyses that are performed at full power or part power, and are based on conservative conditions, bound Mode 3 operation

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Benefits of Remaining in Mode 3 versus Mode 5 (cont.)

- The FSAR design basis safety analyses do not address Mode 5 operation
- Mode 5 involves switching to RHR cooling, which is a manual operation, therefore loss of inventory events can occur due to either operator errors or system faults
- The AFW turbine-driven pump is available in Mode 3, which provides a diverse method of removing decay heat if power is lost
- The AFW turbine-driven pump is not available in Mode 5 due to low steam pressure
- More equipment is required to be available in Mode 3 than in Mode 5 (e.g., number of ECCS trains, DGs, etc.) which provides more options for mitigating transients

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Differences Between Mode 3 versus Mode 5

- RCS temperature and pressure are at normal operating values in Mode 3
- Steam generator temperature and pressure are at normal operating values in Mode 3
- Some initiating events in Mode 3 do not need to be considered in Mode 5 due to a much reduced probability of occurrence (due to reduced temperatures and pressures), or due to the system not being in use, such as large, medium, small RCS LOCAs, RCP seal LOCAs, steamline breaks, feedline breaks
- In general, transients would progress at a slower rate in Mode 5 than in Mode 3 allowing for increased operator action time

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Proposed Justification for Remaining in Mode 3

- Qualitative Deterministic Evaluation
  - All equipment would be available, except for the inoperable equipment that required the shutdown to mitigate any event that occurred in Mode 3
  - FSAR design basis safety analyses that are performed at full power or part power, and are based on conservative conditions, typically bound Mode 3 operation
  - Automatic actuation of safety systems is available to mitigate any event in Mode 3
  - Discuss all of the benefits (differences) between Mode 3 and Mode 5
- Qualitative PRA Evaluation of Initiating Events in Mode 3 versus Mode 5

TSTF Traveler

- A TSTF Traveler will be prepared to reflect the changes in endstates from Mode 5 to Mode 3

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Open Discussion