A Hachment 3

Mitigating Systems Performance Index

Reporting Demands and Failures in MSPI

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Failures

- Unavailability is only monitored when critical, but failures, demands, and run hours have to be counted in all modes
- Failures are by component, not system or train/segment
- Only report failures of monitored components
- You only have a failure if there is loss of the monitored function within the component boundary. See page F-18, Table 2 "Component Boundary Definition"

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What is a Failure ?

- Loss of a monitored function during the mission time
- Loss of a monitored function is assumed to have occurred if the established success criteria have not been met
- PSA success criteria documented in basis document Appendix G section 1.3
  - Success criteria may be design basis or other criteria as determined in the PSA
- If evaluation shows you can change success criteria, you can use it going forward but not for a failure that has already occurred

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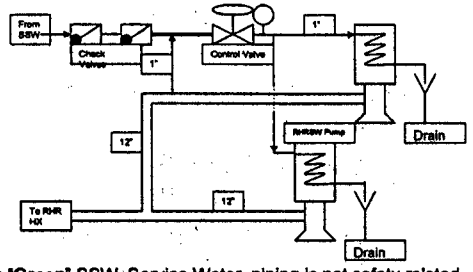

The "Green" SSW, Service Water, piping is not safety related
SSW serves as a non-safety related keep fill for RHRSW
The "Red" piping was clogged with sand
Zero psi was indicated downstream of the control valve on the pressure indicator (PI). Pumps were not running
The RHRSW train was declared inop due to loss of motor cooling
Motor cooling is required to fulfill PRA success criteria
Motors can only operate for 20 minutes without motor cooling

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Is This a Failure?

- The piping is not within the monitored component boundary
- page F-23, starting on line 5 which discusses the failure or discovered condition of non-monitored SSCs:

  "An example could be a manual suction isolation valve left closed which would have caused a pump to fail. This would not be counted as a failure of the pump. Any mis-positioning of the valve that caused the train to be unavailable would be counted as unavailability from the time of discovery. The significance of the mis-positioned valve prior to discovery would be addressed through the inspection process."

- You count unavailability from the time of discovery, however, there is no failure of a monitored component
- However, if a pump had started and failed due to the clogged service water line, it would have been a failure of a monitored component

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EDG Event

- Cooling fan belts replaced during overhaul
- Bolts replaced with insufficient torque
- PMT completed sat
- During an additional surveillance, bolts failed
- EDG did not fail but was shut down
- Mission time is 24 hours
- Evaluation determined EDG would fail at ten hours

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Is This a Failure

- Would not have met PRA success criteria
- PMT completed sat; diesel declared operable
- Failure was due to maintenance that was performed
- Failure occurred during surveillance after PMT
- Even though the failure was due to the maintenance that was performed, it was not found during PMT
- Counts as a failure

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Is This a Failure?

- Pump was reassembled without torquing bolts
- PMT completed sat and pump declared operable
- Subsequent review of work package shows Ind Verification of torque not signed
- Field verification showed that bolts were not torqued adequately; would not meet mission time
- Count as a failure, even though there was no demand

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Things You Need to Know About Reporting MSPI Failures

- *"Failures of monitored components on demand or failures to run, either actual or test are included in unreliability. Failures on demand or failures to run while not critical are included unless an evaluation determines the failure would not have affected the ability of the component to perform its risk-significant at power function."*

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Things You Need to Know About Reporting MSPI Failures

- *"In no case can a postulated action to recover a failure be used as a justification to exclude a failure from the count."*
- Assume that a relay fails that inhibits the autostart of a pump, but Ops can manually start it from the control room
- If the failed relay is within the component boundary (see Table 2), it is a failure

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Things You Need to Know About Reporting MSPI Failures

- You must report all failures of monitored components in MSPI, even though in Maintenance Rule you can exclude those that were not Maintenance Preventable
- If a monitored component is an installed spare pump and it fails, it needs to be reported; regardless of configuration. Example would be spare pump where you discover all of the oil in a motor was drained due to a break

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When is a MR Failure not an MSPI Failure ?

- RHR Pump developed a large seal leak
- MR definition of FF was TS limit on leakage, which was exceeded
- PRA success criterion was still met, so this MR FF was not reported as an MSPI failure

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When is a MR Failure not an MSPI Failure ?

- During an outage, on CCW pump start, a relief valve lifted and failed to reseat
- Caused a decrease in level in expansion tank which provides suction to pump
- AOP required Ops to shut off pump (equipment protection)
- Resulted in loss of shutdown cooling
- No MSPI unavailability (subcritical)
- No failure of any monitored component
- Relief valve is not a monitored component
- Handled under SDP

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When is a MR Failure not an MSPI Failure ?

- Failure of a MR component that is not an MSPI monitored component (i.e. check valve, relief valve, etc.)
- Failure of a MR function that is not an MSPI monitored function (PAM CIV indication)

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Discovered Conditions

- Discovered conditions, even when no actual or test demand existed, count as a demand and a failure
- If analysis provides more margin, it can be used <u>in the future</u> (Change PSA criteria from design basis)
- If no PSA model change is required, the analysis can be used prior to the next quarter. Example would be flow required to meet success criteria (F-22 line 21)
- If analysis requires a change to the PSA model , MSPI cannot be changed until after the PSA and basis document have been changed. Change is effective the following quarter

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Failures of Non-Monitored Components

- Do not count as a failure of a monitored component but do count as unavailability from time of discovery
- Mispositioning of a pump's manual isolation valve would only count in UAI from time of discovery

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Failures of Non-Monitored Components

- However, if pump started and failed because of the mispositioned valve, it counts as a demand, a failure, and unavailability
- Failures of non-monitored support SSCs (ex. air handler, instrument air), do not count as a failure of a monitored component in MSPI

Demands

- *Start demand*: Any demand for the component to successfully start
- *Load/Run demand*: Applicable to EDG only. Any demand for the EDG output breaker to close

Start demands is the total of all demands. Load/Run demands are only those where the breaker is expected to close

Reporting of Demands and Run Hours

- Actual ESF demands and run hours plus
- Estimated or actual test demands and run hours plus
- Estimated or actual operational or alignment demands and run hours

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Reporting of Demands and Run Hours

- Actual ESF demands must come from an actual ESF signal (10CFR50.72/50.73)
- Estimates can be based on:
  - Scheduled test and operational demands
  - Actuals from at least a cycle
- Count demands/run hours in all modes

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Reporting of Demands and Run Hours

- If the basis for estimated demands and/or run hours changes by more than 25% (12 quarters), the estimate must be changed in CDE
- After entering estimates into CDE, no data reporting is required unless estimates change by 25%. If reporting actuals, data has to be reported every month
- Reporting actuals is always an option

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Questions

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