Millstone Unit 2
LAR to Revise TS 3.8.1.1

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Revise TS 3.8.1.1

AGENDA

- **Background**
- **Issue**
- **Proposed Resolution**
- **Deterministic Assessment**
- **BTP 8-8 Considerations**
- **Risk Assessment**
- **Conclusion**

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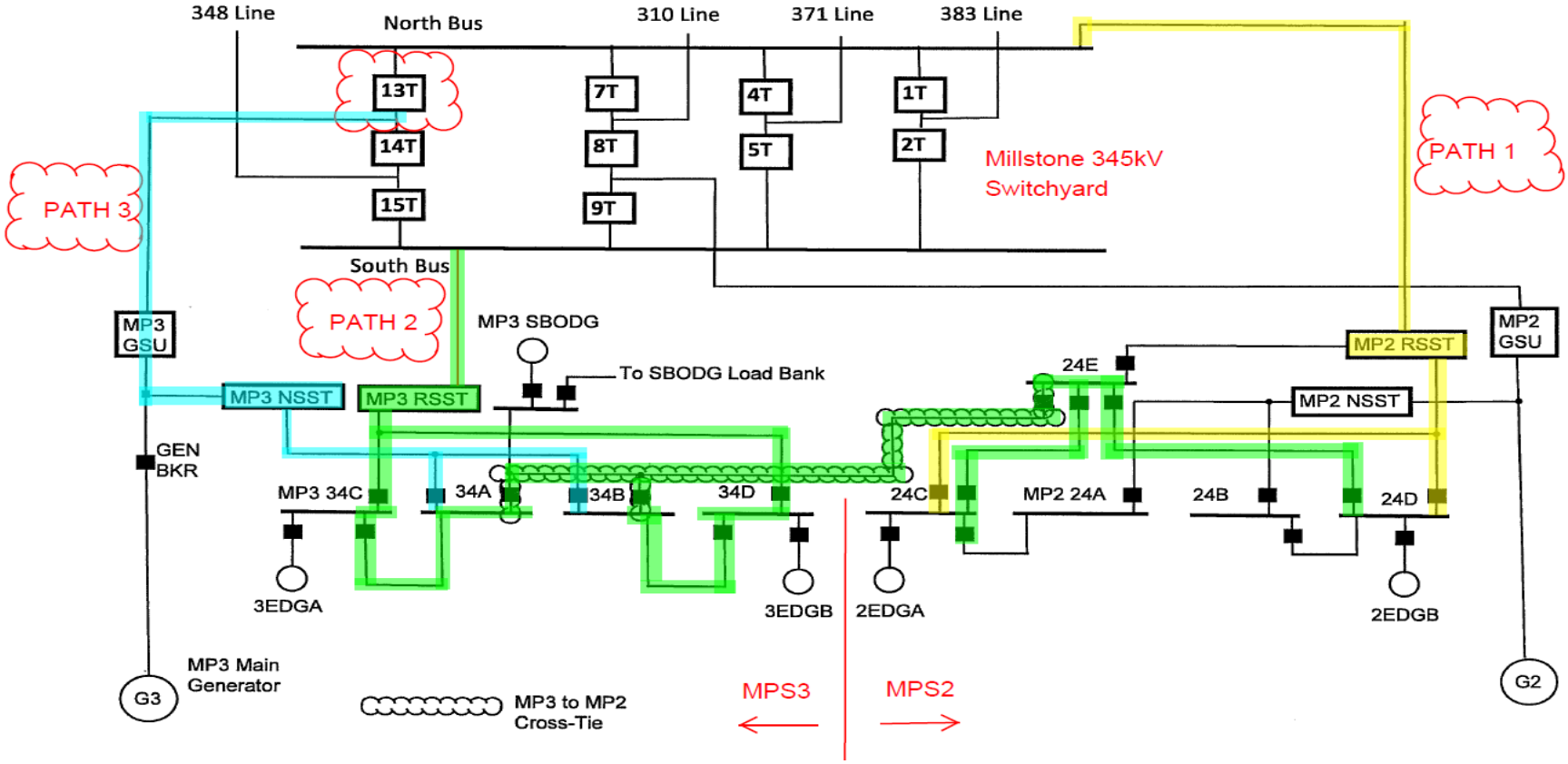
Figure 1

Millstone Station AC Power System



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Background

- MPS2 credits the MPS2 NSST and the MPS3 ‘A’ RSST or the MPS3 ‘A’ NSST to meet alternate offsite power source requirements for GDC-17.
- When MPS3 ‘A’ RSST is removed from service for maintenance, MPS2 must credit the MPS3 ‘A’ NSST as the alternate offsite power source for GDC-17.
- MPS3 ‘A’ NSST is not considered to be an operable offsite circuit for MPS2 if 13T is closed (per the MPS2 TS Bases).
  - Breaker 13T and its disconnect switches are required to be open to meet GDC-17 sub-requirement for circuit independence, since a postulated single failure of breaker 13T would result in loss of both offsite power sources for MPS2.
  - If 13T is closed while the MPS3 ‘A’ RSST is inoperable, MPS2 would be required to enter TS 3.8.1.1 Action a.2, which allows 72 hours to restore operability.
  - However, it should be noted that maintaining 13T closed <u>does not impact</u> the availability of the MPS3 ‘A’ NSST circuit.

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Issue

- To comply with the requirements of GDC-17 for MPS2, switchyard breaker 13T is normally opened when the MPS3 ‘A’ RSST is out of service.

- However, operating with breaker 13T open while the MPS3 ‘A’ RSST is out of service increases the susceptibility of MPS3 to a LOOP event.
  - MPS3 shutdown risk is Orange under this configuration, due to possible events such as a potential fault in the 348 line.

- Millstone Station is planning to replace the MPS3 ‘A’ RSST and Millstone 345kv switchyard South Bus ‘B’ components during the fall 2020 outage as part of life cycle management and equipment reliability improvement initiatives.

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Proposed Resolution

- DENC proposes a LAR to add a new Required Action to MPS2 TS 3.8.1.1 “A.C. Sources – Operating” condition a.) for “one offsite circuit” being inoperable with an Allowable Outage Time (AOT) of 14 days.
  - This new Action (a.3) would allow MPS2 to operate for 14 days during future MPS3 preventative maintenance activities, with the MPS3 RSST ‘A’ out of service and breaker 13T closed.
  - Action a.3 would only be entered if the MPS2 emergency diesel generators (EDGs) are operable and a supplemental power source is available.
  - MPS2 will credit Millstone Station Beyond Design Basis (BDB) power sources as supplemental power sources.
  - Current action a.2 would also be modified to note the action a.3 exceptions from existing 72 hour AOT.

- Additionally, this LAR will include a one-time AOT extension up to 35 days for the fall 2020 outage to support the necessary equipment replacement.

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Inoperable Equipment		Required ACTION	
a.	One offsite circuit	a.1	Perform Surveillance Requirement 4.8.1.1.1 for remaining offsite circuit within 1 hour prior to or after entering this condition, and at least once per 8 hours thereafter.
		AND	
		a.2	Restore the inoperable offsite circuit to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

(within 14 days if ACTION Statement a.3 is met)

AND

a.3 Restore the MPS3 'A' RSST offsite circuit to OPERABLE status within 14 days* if the following requirements are met within 30 days prior to entering this condition:

- The MPS2 emergency diesel generators are verified to be OPERABLE.
- A supplemental power source is verified to be available.

* To facilitate replacement of the MPS3 `A' RSST and associated components during the fall 2020 refueling outage, the use of a temporary, one-time 35-day allowed outage time is permitted provided the requirements of Required ACTION a.3 are met.

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Deterministic Assessment

- During the extended AOT, MPS2 power supply defense-in-depth will be maintained.
  - Two offsite sources through two separate paths to the 345kV transmission network will be available.
  - There will be a loss of separation / independence at one location, 345kV switchyard breaker 13T, during the AOT.
  - In addition, the two MPS2 EDGs will be operable, as will the Millstone's Station Blackout (SBO) diesel generator, which is credited for a SBO at one unit (MPS2 or MPS3).
- The Millstone station BDB program includes backup power sources, including EDGs, maintained at an onsite BDB storage facility.
  - The 480 / 120 vac diesel generators are credited to connect to MPS2 electrical busses in the BDB event to maintain battery chargers & RCS inventory and bring the unit to a safe and stable state.

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Deterministic Assessment

- As part of the BDB program, a 4160 vac combustion turbine is available to the station from a SAFER location to provide additional power to bring the unit to cold shutdown.

- The existing BDB program, procedures, personnel, training, and overall strategies would be utilized to support defense-in-depth during the extended AOT.

- In addition, should a fault occur at the 13T breaker, the fault can be isolated with disconnect switches, and offsite power restored within 8 hours as is described in MPS2 FSAR section 8.1.2.2.d.

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NUREG 800 BTP 8-8 Considerations

- As discussed in BTP 8-8, the following requirements would be imposed prior to entry or during the extended AOT:
  - The availability of BDB equipment will be verified prior to entry and periodically thereafter.
  - Entry will be limited to once per 24-month period (or refueling interval).
  - Entry will not occur if severe weather is anticipated.
  - The system load dispatcher will be contacted daily.
  - Component testing or maintenance of safety systems and important non safety equipment in the offsite power systems that can increase the likelihood of a plant transient (unit trip) or LOOP will be avoided.
  - No discretionary switchyard work will be performed.
  - Important SSCs will be protected.
- The 310 line will be de-energized when South Bus is removed from service to meet the BTP 8-8 requirement to minimize reactor trip potential for MPS2.

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Risk Assessment – 13T Closed & South Bus Energized

- Two independent failures are required to generate MPS2 LOOP:
  - Switchyard component passive fault (spurious operation failure rate = 4.83E-07/hr per NRC generic reliability estimate for circuit breakers), and
  - Failure that causes MPS2 reactor trip (1.46/yr Dominion plant-specific PRA estimate)

- This scenario results in an estimated increase of 1.81E-06 in MPS2 LOOP probability.

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Risk Assessment – 13T Closed & South Bus De-energized

- Line 310 will be removed from service to minimize MPS2 trip risk.

- One failure is required to generate MPS2 LOOP:
  - Switchyard component passive fault (spurious operation failure rate = 4.83E-07/hr per NRC generic reliability estimate for circuit breakers)

- This scenario results in an estimated increase of 4.53E-04 in MPS2 LOOP probability.

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Risk Assessment – 13T Open

- A fault in the 348 line results in a MPS3 LOOP with 13T open and MPS3 ‘A’ RSST out of service.

- The likelihood of a 348 line fault is not negligible (11 faults over 10 year period per Dominion OE review).

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Conclusions

- New TS Actions for MPS2 Offsite Sources with extended AOTs are needed to support essential equipment reliability improvements to address life cycle management and to reduce shutdown risk for MPS3.

- Power source defense-in-depth will be strengthened by crediting existing BDB strategies and equipment.

- The greater improvement in MPS3 shutdown risk (by mitigating a more likely line fault that causes a LOOP on MPS3) outweighs the minimal increase in MPS2 LOOP frequency (due to a highly unlikely passive component fault)

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Schedule

- NRC Pre-Submittal Meeting on 03/07/2019
- Site Facility Safety Review Committee Review targeted for mid June 2019
- LAR Submittal to the NRC expected by end of June 2019
- DENC will request approval by early August 2020

Questions?