

Turbine Driven Auxiliary Feedwater Cross-tie

License Amendment Request

Point Beach Nuclear Plant Units 1 & 2

July 28, 2015

Agenda



- Introductions
- Purpose
- Auxiliary Feedwater System Design Basis
- Auxiliary Feedwater Cross-tie
- Beyond Design Basis Events
- Conclusions
- Path Forward
- Questions



Purpose

- The purpose of the pre-submittal meeting is to:
 - Provide an Overview of the Auxiliary Feedwater (AFW) System at Point Beach Nuclear Plant
 - Review the AFW System Design Basis
 - Discuss AFW System Cross-tie Considerations
 - Highlight Beyond Design Basis Events Factors
 - Licensing Basis
 - Current Licensing Basis
 - Proposed Licensing Basis
 - Provide a proposed path forward



Auxiliary Feedwater System Design Basis

- Auxiliary Feedwater (AFW) System (each unit)
 - one full-capacity Motor Driven Auxiliary Feedwater (MDAFW) pump system
 - one full-capacity Turbine Driven Auxiliary Feedwater (TDAFW) pump system
 - ensures adequate heat removal under all circumstances, including loss of offsite power and normal heat sink
- The MDAFW pump discharge piping for each unit can be cross-tied
 - Current licensing basis (CLB)
- For plant fires, including those requiring evacuation of the control room
 - AFW system can provide feedwater to a minimum of one steam generator per unit at sufficient flow and pressure to remove decay heat from the reactor coolant system

Diverse Auxiliary Feedwater Design Basis

Auxiliary Feedwater System Design Basis



- Steam turbine-driven pump is capable of being supplied from either or both steam generators.
- For Station Blackout (SBO) event, only the turbine-driven pumps would be available for decay heat removal.
- System level Failure Modes and Effects Analysis for the AFW System has been performed.

Turbine Driven AFW Pumps Available for Decay Heat Removal During Station Blackout Event (SBO)

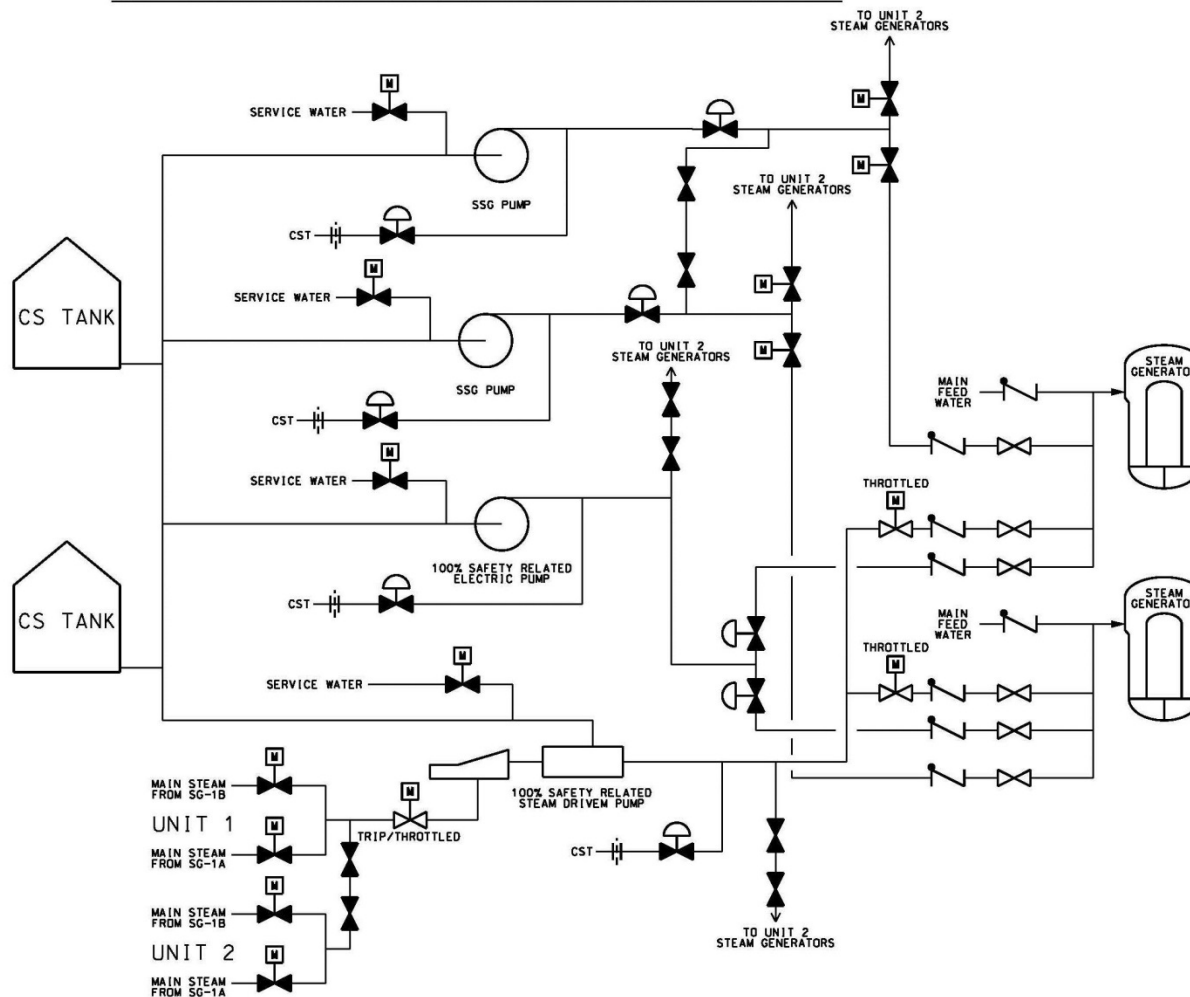


Auxiliary Feedwater Cross-tie

- MDAFW pump discharge piping for each unit can be cross-tied (in CLB)
- TDAFW suction is cross-tied to a common suction from the condensate storage tanks
- TDAFW pump steam supply, exhaust, and water discharges are cross-tied
- A single TDAFW pump can deliver flow to one SG on each unit at the flow rates necessary for decay heat removal
- TDAFW cross-tie has been implemented as part of Fukushima FLEX strategies for use in beyond design basis events

AFW Pumps Can Feed Steam Generators on Opposite Unit

AFW SYSTEM - MAJOR FLOW PATHS PER UNIT WITH SHARED STANDBY STEAM GENERATOR (SSG) PUMP SYSTEM





Beyond Design Basis Events

- TDAFW Pump Steam Supply and Discharge Cross-tie installed to meet NRC Order EA-12-049 for implementation of strategies for mitigating Beyond Design Basis Events
- Improves system redundancy and the capability to handle multiple failures
- Manual action required to align the TDAFW pump discharge and steam supply cross connects. Included in FLEX Support Guidelines (FSGs)

Turbine Driven AFW Pump Cross-tie Added for Implementation Strategies to Mitigate Fukushima Beyond Design Basis Events



Licensing Basis

- Current Licensing Basis
 - The Motor Driven AFW pump system includes a cross connect pipe between the units. Technical Specification 3.7.5 credits the availability of the MDAFW pump cross-tie capability
- Proposed License Amendment Request
 - The TDAFW pump unit cross-tie is credited for the Fire PRA.
 - Table S-2, Committed Modifications in NFPA 805 Application (MOD-2), Cross tie TDAFW pump steam supplies and pump discharge(s) to allow opposite unit support
 - Risk is reduced by having the cross-tie capability available to maintain Decay Heat Removal
 - Cross-tie requires prior NRC approval

Motor Driven AFW Cross-tie in CLB. Turbine Driven AFW Cross-tie to be added to CLB via License Amendment Request



Conclusions

- The Point Beach Nuclear Plant CLB contains a provision for cross-connecting a MDAFW pump to supply feedwater to both units
- The proposed licensing action would allow for cross-connecting a TDAFW pump to supply feedwater to both units like the MDAFW pump
- A single TDAFW pump is capable of supplying adequate AFW flow to remove the decay heat on two units via a single steam generator on each unit
- The TDAFW pump unit cross-tie is credited in the NFPA 805 LAR
- NRC approval is required for use of the TDAFW pump cross-tie prior to use



Path Forward

- A license amendment request (LAR) will be submitted requesting NRC approval to manually cross-tie the TDAFW steam supply and discharge during abnormal events
- An updated failure modes and effects analysis (FMEA) will be conducted to ensure that the condition associated with the affected unit will not propagate to the unaffected unit when the units are cross-tied
- Required Actions and Completion Times for LCO 3.7.5 will be included in the LAR submittal as applicable

Failure Modes & Effects Analysis will be updated and Technical Specifications revised as applicable to reflect TDAFW cross-tie



Questions