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Part II: Assessment of Impact on Plants Using BTP 5-3 to Estimate $RT_{NDT(u)}$

Simon Sheng
Senior Materials Engineer
NRR/DE/EVIB
simon.sheng@nrc.gov

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Impact on 19 PWRs

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1. Pressurized Thermal Shock (PTS)

a) For plants whose limiting PTS material happens to be a plate (or forging) using BTP 5-3

- Applied adjustment factor (RT_{NDT} based) to perform updated PTS evaluation.
- Results:

  Adjustment may cause one of these plants to exceed the PTS screen criteria during the license renewal (LR) period.

  Other plants are predicted to be below the PTS screen criteria during the LR period.

Note: The NRC PTS and pressure temperature (P-T) limit evaluations are based on recent docketed information (LRAs, P-T limits or PTLR, and power uprates)

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1. Pressurized Thermal Shock (PTS)

b) For plants whose limiting PTS material is not a plate (or forging) using BTP 5-3

- Apply adjustment factor to calculate RT_{PTS} for the limiting plate (or forging) using BTP 5-3.
- Compare this BTP 5-3 affected RT_{PTS} to the docketed RT_{PTS} (most of them are welds).
- Results:

  None of these plants are affected because the BTP 5-3 affected plate (or forging) will not become the new PTS limiting material.

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2. P-T Limits

a) For plants whose limiting ART (initial RT_{NDT} + ΔRT_{NDT} + Margin) material happens to be a plate (or forging) using BTP 5-3

- Results:

All these plants are potentially affected because the ART of the limiting material will be increased by the adjustment factor.

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2. P-T Limits

b) For plants whose limiting ART material is not a plate (or forging) using BTP 5-3

- Apply adjustment factor to calculate ART for the limiting plate (or forging) using BTP 5-3.
- Compare this BTP 5-3 affected ART to the docketed ART (most of them are welds).
- Results:

  None of these plants are affected because the BTP 5-3 affected plate (or forging) will not become the new ART limiting material.

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2. P-T Limits

c) Further examination

- Check closure flange requirements (the notch in the P-T limits)

- Results:

The PWRs having notches are potentially affected because the RT_{NDT} of BTP 5-3 affected closure flange forging will be increased by the adjustment factor.

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P-T Limits

PTS does not apply to BWRs

a) Defined by beltline and upper vessel
   - Plants having plate or forging as limiting ART material
     - All of these plants are potentially affected.
   - Plants having welds as limiting ART material
     - Beltline portion of the P-T limits for some of these plants are potentially affected because the GE method affected plate (or forging) may become the new ART limiting material.

Note: Further evaluation is needed to determine the effect on the portion of the P-T curve defined by the closure flange region.

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b) Defined by beltline only

- Beltline Forging is limiting ART material

  - P-T limits potentially affected due to adjustment factor.

c) Defined by upper vessel only

- Nozzle forging is limiting material

  - Curved portion of P-T limits is potentially affected Further evaluation is needed to determine the effect on the portion of the curve defined by closure flange region.

Conclusions

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- One PWR PTS evaluation potentially affected
- Some PWRs and BWRs P-T limits potentially affected
- No immediate safety concern

PTS

- For the only affected plant, PTS screening criteria will not be exceeded 10 years from now

P-T limits

- actual heat up and cool down transients are far more conservative than licensed P-T limits
- P-T limits are based on future projected neutron fluence
- built-in conservatism in the P-T limit methodology
- For BWRs, actual heat up and cool down follow saturation curve, far below licensed P-T limits

Next Steps

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  - Assess what we heard from industry today
  - Modify NRC Action Plan considering industry input
- Communicate findings to affected plants, if issues are identified
- Revise BTP 5-3 in Standard Review Plan
- Request revision of industry topical reports on P-T limits
- Issue a generic communication