

# Recommendations for Inputs Related to Pressure-Temperature (P-T) Limits Submittals

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# Background



- Currently, there are several NRC-approved methodologies documented in Topical Reports that are used to develop licensee P-T limits
- Each of these methodologies use different assumptions, so they can each produce unique P-T limits
- The inputs selected for use in each of the methodologies also affect the resulting P-T limits
  - All inputs are not necessarily detailed in licensee submittals
- As a result, it is can be challenging for the staff to independently review and assess P-T limit submittals if all of the methods and inputs important to the determination of the P-T limits are not included in submittals
- Based on this, the staff has some recommendations for inputs for licensee submittals that would facilitate the staff's review, reduce the need for requests for additional information (RAIs), and make the submittal review process more efficient

# Recommended Summary of Inputs (1/2)

- The staff recommends a summary of inputs similar to the following in future P-T limits submittals to facilitate review:

GEOMETRY DATA			
Description	Value	Units	Source*
Inside radius of RPV (to inside surface of clad)			
Cladding thickness			
RPV base metal wall thickness			
REFERENCE TEMPERATURE DATA (for all materials with EOL fluence > $1 \times 10^{17}$ n/cm <sup>2</sup> )			
Description	Value	Units	Source*
Material description		N/A	
Material type (i.e., SA-533 Gr. B Cl. 1)		N/A	
Product form (plate, weld, forging)		N/A	
Thickness (if different than above)			
Heat No.		N/A	
Initial reference temperature, $IRT_{NDT}$ (including description of method used to determine $IRT_{NDT}$ )			
Copper content, Cu			
Nickel content, Ni			
Chemistry factor, CF (including description of method used to determine CF)			
Fluence (at clad/base metal interface, specify EFPY)			
Calculated irradiation shift, $DRT_{NDT}$			
Margin (including description of method used to determine Margin)			
Calculated $RT_{NDT}$			

\* Note: Source should refer to a docketed submittal or be a reference included with the submittal.

# Recommended Summary of Inputs (2/2)

TRANSIENT DEFINITIONS (specify for each all transients evaluated)			
Time	Temperature (units)	Inside Surface Heat Transfer Coefficient (units)	Outside Surface Heat Transfer Coefficient (units)
Specify all time-history points here			
OTHER DATA			
Description	Value	Units	Source*
Flange RT <sub>NDT</sub>			
Preservice Hydrostatic Test Pressure			
MATERIAL PROPERTY DATA (for both base metal and clad)			
Description	Value	Units	Source*
Thermal conductivity			
Specific heat			
Density			
Young's modulus			
Yield strength			
Poisson's ratio			
Mean coefficient of thermal expansion			
Stress-free temperature			
LIMITING NOZZLE DATA			
Description	Value	Units	Source*
Nozzle description		N/A	
Material type (i.e., SA-533 Gr. B Cl. 1)		N/A	
Description of how the stress analysis was performed for the nozzle		N/A	
Pressure stress coefficients used to calculate stress intensity factor			
Thermal stress coefficients used to calculate stress intensity factor			
Initial reference temperature, IRT <sub>NDT</sub> (including description of method used to determine IRT <sub>NDT</sub> )			

\* Note: Source should refer to a docketed submittal or be a reference included with the submittal.