Dear Reviewer,

You have been selected to review the Polymer Pipe Task Group (PPTG) report to the NE
Your input is critical to make this report and the gap analysis relevant to improving and
Your time and expertise is greatly appreciated by the PPTG and NESCC. Please return th
results to the NESCC committee. If you have any questions, please contact Dr. Aaron Fo

The review form consists of two tabs within this Excel file. The *General Comments* tab i
or the report as a whole document. Grammatical and editorial comments placed in this
or recommendations within the report will be discussed by the PPTG and brought up to

The *Gap Analysis* tab is where the NESCC would like to gather specific feedback on the
for any specific comments on the identified gap. Please use the pull-down menu in the *P*

Priority Listing

Routine: a *routine* enabling technology or safety issue that requires *no special* SDO sup
Normal: an *imprtant* enabling technology or safety issue that requires *enhanced* SDO s
Expedited: a *key* enabling technology or safety issue that requires *focused* SDO and *Sta*

Thank you again for your time and effort in reviewing the PPTG report.
Aaron Forster
Convener; Polymer Pipe Task Group
National Institute of Standards and Technology
Gaithersburg, MD 20899

SCC due to your expertise in either polyethylene piping or nuclear plant water design ar
development of standards for polyethylene piping for nuclear power plant applications.
is file back to Dr. Aaron Forster at NIST by XXXX date. He will compile the results and rep
orster by phone (301-975-8701) or email (aaron.forster@nist.gov).

s a place where the reviewer (you) may add specific comments pertaining to sections of
section will be addressed specifically by the PPTG. Editorial comments pertaining to the
the NESCC at the next meeting

gaps identified in Chapter 6 of the PPTG report. Please use the*Comments* column
Priorities column to prioritize the gap. The gap priority definitions are given below:

port. The gap may be addressed during the next periodic review.
upport. This gap would require a coordinated approach to resolve.
keholde r support. This gap requires expedited SDO and Regulatory action.

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the PPTG report
conclusions

Reviewer Name:

Contact Information: Phone:

Email:

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Comment

Report Section	Page	Standard	Recommendations
5.1 Standards for Pipe Resins	**13**	ASTM D3350	A new or amended standard that addresses resin properties that are critical to nuclear industry.
			Change induction time measurement to OIT measurement for thermal stability of resin
5.2 Standards for Design Basis and Strength	**15**	ASTM D2837 & TR-3	A distinct accounting for the design factor (DF).
			Substantiation of the linearity of HDB curve at 140 ^{o}F, not just at 23 ^{o}F.
			Testing applications for a 60 year life at elevated temperature$^{\$}$
			A method to account for creep behavior during excusions above 140 ^{o}F
5.3 Standards for Valves and Fittings	**17**	ASTM F2880	Expansion of standards to different types of fittings with the inclusion of validated temperature and pressure derating tables
5.4 Standards for Joining *Butt Fusion*	*19*	ASTM F2620 & PPI TR-33	A minimum code of practice for operators
			A technical document specific to fusion machines and pipe manufacturers that defines essential variables for fusing pipe.
			Data acquisition forms for record keeping
			A methodology for evaluating the combined effects of alignment tolerances, fusion machine, and ambient conditions on the integrity of the joint
Report Section		Standard	Recommendations

5.4 Standards for Joining, cont.		ASTM F2880 & PPI TR-33	A technical document that identifies destructive and non-destructive testing that reflect short and long term viability of fusion joint
Electrofusion	*24*	ASTM F1055 & PPI TN-34	A minimum code of practice for operators
			A technical document specific to electrofusion instruments and pipe manufacturers that defines essential variables for fusing pipe.
			Data acquisition forms for record keeping
			A methodology for evaluating the combined effects of fitting tolerances, control box tolerances and ambient conditions on the integrity of the joint,
			A technical document that identifies destructive and non-destructive testing that reflect short and long term viability of fusion joint
5.5.1 Standards for PE Compounds	**26**	ASTM D1693	Difficult to control essential variables for this test; such as stress at point of crack initiation, specimen thickness and notch depth.
			Failure in this geometry does not predict the accurate time to failure of pipe
		ASTM D1473	Impact of processing samples (pipe vs. compression molded) on failure times not adequately documented
			Methods to section thick pipe do not account for potential gradients in microstructure or residual stress
			No equations to calculate stress intensity factor changes with notch growth

Report Section		Standard	Recommendations
5.5.1 Standards for PE Compounds	**26**	ASTM D1473	No method to address ductile failure at end of PENT test

			These methods do not nescessarily support long time models for prediction
		Overall	There is no quantitative link between long time performance and actual service life prediction
			Does not provide specific instructions for testing fusion specimens
5.5.2 Standards for PE Pipe	**29**	ASTM D3035	Does not specify F1473, but specifies D1598 for pipe testing
		ASTM F714	Does not specify F1473, but specifies D1598 for pipe testing
		ASTM D1598	Test fluid and flow through pipe not specified
5.5.3 Standards for PE Fusions	**32**		No specific standards developed for testing long-term behavior of PE fusions
5.5.4 Standards to Evaluate Surface Flaws	**33**		No standards to address characterization of surface flaws and the impact on long-term behavior
5.5.5 Standards for Non-Destructive Examination	**33**		Test methods and equipment are available to conduct a volumetric inspection of a pipe and fusion. There is no specific criteria that links critical flaw geometry or cold fusion zones to the risk of failure. Therefore, there are no standards available to
5.5.6 Standards to Develop HDB/HDS at Long-Times	**33**	D2837, ISO 9080	Substantiation of the linearity of HDB curve at 140 ^{o}F, not just at 23 ^{o}F.
		Overall	There is no quantitative link between long time performance and actual service life prediction

Report Section		Standard	Recommendations
5.6 Standards for Chemical Resistance	**36**	ASTM F2263	Test conditions for oxidative resistance of PE pipe to chlorinated water should specified relevant to use conditions in service water.
		PPI TR-19	Test protocol needed for testing chemicals against polyethylene, that accounts for PE molecular weight.
			Identification of experimental controls such as chemical exposure levels, times and a more thorough identification of degradation via OIT or Spectroscopy.
		Overall	Develop a derating standard based on the type and level of chemical exposure of a pipe material in a nuclear plant.
Other Standard Gaps			
Pipe Hangers and Supports		ANSI/MSS SP-58-2009	Hangers and supports have a critical role with regard to piping and standards should be addressed as piping transitions from buried into the plant
Seismic Design		ASME B31E-2008	Standards should be specified for seismic design
Fire Resistance			The resistance to fire and specific measures required to reduce fire risk should be determined for pipe materials that transition from below ground into the plant.
UV resistance			Standards to evaluate and rank the resistance to UV are not addressed for pipe transitions that may occur above ground and exposed to sunlight.

[$] Nuclear power plants are currently certified for operation for 40 years with an opportunity to extend operation

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20 years.

Priority
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