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Alternative Method for Calculating Embrittlement for Steel Reactor Vessels

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Alternative Method for Calculating Embrittlement for Steel Reactor Vessels; Request for Comment on Petition for Rulemaking

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General Comment

The ASTM E900-15 embrittlement trend curve (ETC) was developed from an extensive database of Charpy transition temperature shift measurements gathered from operating BWR and PWR surveillance capsules. It was developed via the ASTM consensus process and reflects the best understanding of embrittlement available at the time and a very large set of measured data. There is a substantial technical basis document supporting the ETC available from ASTM. The range of material and irradiation conditions comprising the database used to develop the ETC appear to include the NuScale operating conditions. Therefore, the E900-15 prediction ETC should be better able to predict the NuScale embrittlement than the prediction method currently in 10CFR50.61 and RG1.99R2.

The NuScale requested change to RG1.99R2 adds the ASTM E900-15 ETC as an alternative for new plants, but for 10CFR50.61 the requested change is not limited to new plants. The

E900-15 ETC was developed based on data primarily from the currently operating fleet and is applicable to this fleet. The change made to RG1.99R2 should not be limited to new plants, but should be allowed as an alternative for the current U.S. operating fleet also.

The uncertainty term in the current 10CFR50.61 and RG1.99R2 is not directly applicable to the E900-15 ETC. There is an uncertainty term in E900-15 which was developed from the large dataset used to develop the ETC which is based on this ETC specifically and is more appropriate for use in a margin term.

Sincerely,

J. Brian Hall

ASTM E10.02 sub-committee chair