SPEAKER / PRESENTATION INFORMATION

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Biography	Brad Rearden obtained his B.S., M.S. and Ph.D. in Nuclear Engineering from Texas A&M University. He is a senior R&D staff member and leader of the Nuclear Criticality Safety Methods Team in the Radiation Transport and Criticality Group at Oak Ridge National Laboratory. He is the lead developer of the TSUNAMI sensitivity and uncertainty analysis tools of SCALE.		
Title	***SCALE TSUNAMI Sensitivity and Uncertainty Analysis Capabilities and Data***		
Abstract	SCALE 6.0 TSUNAMI provides a comprehensive suite of tools for sensitivity and uncertainty analysis, especially as applied to criticality code validation. The sensitivity of k_{eff} to all multigroup cross-section data can be easily generated on explicit three-dimensional (3D) models using KENO V.a or KENO-VI. Uncertainties in k_{eff} due to uncertainties in the cross-section data are quantified with the comprehensive SCALE 6 cross-section-covariance data library. Correlation coefficients are generated based on the shared uncertainty between application systems and benchmark experiments to quantify the similarity of the systems on a system-wide or nuclide-reaction specific level. These correlation coefficients can be used in trending analysis to quantify the bias and bias uncertainty for the application based on available benchmark experiments. Gaps in validation coverage can be identified, and an additional margin of safety can be quantified to account for potential biases due to validation gaps. Data from various types of experiments can be assimilated to quantify a bias and bias uncertainty using data adjustment techniques. With the data adjustment techniques, it is possible to quantify sources bias on an energy-dependent, nuclide-reaction specific level. Also, bias uncertainties due to gaps in available benchmark experiments can be quantified on a detailed level. Bias information for particular materials obtained from replacement-type experiments can be obtained from reactivity-difference sensitivities and incorporated in the data-adjustment process, providing a unique means to project measured biases from the use of a material in an experimental matrix to its use in an application system, which could be substantially different from the experiments.		