

SSHAC Level 1 and 2 Studies: Procedures and Potential Applications

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From the time of its conception in NUREG/CR-6732, the SSHAC process was structured to provide for a wide range of applications. SSHAC Levels 1 through 4 were intended to provide a graded approach to the amount of regulatory assurance—with its attendant cost and resources—that would be necessary for any particular type of application. With the application of SSHAC for nuclear facilities and other high risk-significant facilities, the focus has been on the higher SSHAC Levels and on the development of detailed implementation guidance for SSHAC Level 3 and 4 studies (NUREG-2117). However, as summarized in Juckett et al. (this session), NUREG-2117 is being updated to provide additional guidance on SSHAC Level 1 and 2 studies, as well. The guidance being developed will consider case histories of implementation of lower SSHAC levels, such as the recently completed Level 1 study for facilities at INL (see Payne et al., this session) and discussions with other SSHAC practitioners. The result will be detailed implementation guidance in NUREG-2117 for SSHAC Level 1 and 2 studies, including the essential elements as well as options for enhancing such studies.

Regardless of the SSHAC Level, the goals are the same: to carry out and properly document the activities called “evaluation” and “integration.” These activities are conducted by a Technical Integration Team (TI Team) and are reviewed by a Participatory Peer Review Panel (PPRP). *Evaluation* is the assembly and consideration of available data, models, and methods from the larger technical community that are relevant to the inputs to the hazard analysis. Lower SSHAC Levels include comprehensive review of information in the larger technical community via literature and discussions with representatives of the community. Higher SSHAC Levels include conducting workshops in which Resource and Proponent Experts participate by presenting their information and advocating their models and methods. Documentation of the evaluation process is important. *Integration* is the building of models that capture the center, body, and range of technically defensible interpretations. Lower SSHAC Levels accomplish this activity with a small TI Team and receive feedback from the PPRP. Multiple feedback loops are involved in higher SSHAC Levels, and a feedback workshop is an essential element. In all cases, complete documentation of the process followed and the technical justification of the assessments is an essential attribute of the SSHAC process.

This presentation will discuss the essential elements and procedural steps that define an adequate SSHAC Level 1 and 2 study. In addition, as desired or required for project-specific regulatory assurance, a series of “options” that might be added to a minimal Level 1 or 2 study will be defined. Such options might include conducting a workshop to more explicitly document the consideration of alternative points of view regarding critical technical topics.

To illustrate the usefulness of SSHAC Level 1 and 2 studies, this presentation will review the potential applications of these studies based on recent experience. As discussed in Kammerer et al (this session) and demonstrated in actual application (Payne et al., this session), a SSHAC Level 1 study can provide a key basis for conducting a systematic evaluation of the need to update an existing PSHA. If conducted at the onset of a larger SSHAC Level 3 or 4 study, a SSHAC Level 1 study can provide valuable insights into the significance of various technical issues and allow the larger study to focus on the technical issues of most significance.