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**Discussion of Comments from a Peer Review of  
A Technique for Human Event Analysis (ATHEANA)<sup>1</sup>**

**John A. Forester, Sandia National Laboratories**  
**Ann Ramey-Smith, US Nuclear Regulatory Commission**  
**Dennis C. Bley, Buttonwood Consulting, Inc.**  
**Alan M. Kolaczkowski and Susan E. Cooper, Science Applications International Corp.**  
**John Wreathall, John Wreathall & Co.**

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**O.S.E.I.**

In May of 1998, a technical basis and implementation guidelines document for A Technique for Human Event Analysis (ATHEANA) was issued as a draft report for public comment (NUREG-1624). In conjunction with the release of the draft NUREG, a peer review of the method, its documentation, and the results of an initial test of the method was held over a two-day period in Seattle, Washington, in June of 1998. Four internationally-known and respected experts in human reliability analysis (HRA) were selected to serve as the peer reviewers and were paid for their services. In addition, approximately 20 other individuals with an interest in HRA and ATHEANA also attended the peer review meeting and were invited to provide comments. The peer review team was asked to comment on any aspect of the method or the report in which improvements could be made and to discuss its strengths and weaknesses. They were asked to focus on two major aspects:

- (1) The soundness of the philosophy underlying ATHEANA. Are the basic premises on solid ground and is the conceptual basis adequate?
- (2) Is the ATHEANA implementation process adequate given the description of the intended users in the documentation? Assuming the technical basis is adequate, is the guidance for conducting the search and quantification processes and for integrating the results into the PRA adequate, e.g., clear, effective, usable?

The four peer reviewers asked questions and provided oral comments during the peer review meeting. They also provided written comments approximately two weeks after the completion of the meeting.

Detailed comments from the peer reviewers addressed the strengths and weaknesses of many aspects of the methodology including:

- use of terminology and organization of the document,
- use and effectiveness of the underlying psychological models and error taxonomy,
- use of retrospective analysis and the associated database of human-system events,
- treatment of performance shaping factors (PSFs),
- usefulness and adequacy of the search process for identifying potentially important unsafe human actions and their error-forcing contexts (EFCs),
- and the usefulness and adequacy of the ATHEANA quantification process.

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All of the reviewers thought the ATHEANA method had made significant contributions to the field of PRA/HRA, in particular by addressing the most important open questions and issues in HRA, by attempting to develop an integrated approach, and by developing a framework capable of identifying types of unsafe actions that generally have not been considered using existing methods. The reviewers had many concerns about specific aspects of the methodology and made many recommendations for ways to improve and extend the method, and to make its application more cost effective and useful to PRA in general. Details of the reviewers' comments and the ATHEANA team's responses to specific criticisms will be discussed.

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