

## **PSA PEER REVIEW FORUM 6 ABSTRACT**

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A high quality Probabilistic Safety Assessment (PSA) program must be built around a well structured, well documented, and detailed plant specific PSA study. The study can be maintained in a “living” state by periodically updating it to reflect plant changes, new data, improved analysis methods, or improved understanding of the plant. One essential element missing is a process to ensure quality.

The US nuclear industry established the requirement for design review to ensure quality. This requirement has branched into various forms from 10 CFR 50, Appendix B to second check on work performed. A second person review is needed but not sufficient to ensure high quality PSA studies.

Most of the current US nuclear power plant PSA studies were conducted in response to NRC Generic Letter 88-20 (Individual Plant Examination for Severe Accident Vulnerabilities). At the time the Individual Plant Examinations (IPEs) were performed, there was no specific requirement for conducting the studies. In fact, the goal of the Individual Plant Examination program was somewhat vague – identification of plant vulnerabilities. A full scope PSA was not a requirement of the Generic Letter 88-20. The IPE program allowed for a high level or screening approach to satisfied the requirements of the Generic Letter as opposed to the level of detail traditionally used in a PSA.

To support the utility industry in their efforts to respond to Generic Letter 88-20, several contractors offered their services. Each contractor offered a different methodology and approach to conducting the PSA study. As a result, there is now a large non-uniformity among utility PSAs detailed methods. In addition, a quality PSA is realistic and plant specific as well as broad in scope addressing many complex issues. The complex nature of the PSA study results in quality control and verification which is many times more difficult than that encountered in traditional nuclear plant calculations.

The BWR Owners’ Group recognized these factors and attempted to resolve specific PSA element issues through evaluations and comparisons of some of the higher risk significance elements. This process of comparison was deemed to resource consuming to be practical. Consequently, the PSA Peer Review program was established to ensure a high quality review of each participating BWR. Using this process, the plant PSA would be subjected to a review by a diverse team of experts who are experienced in the PSA process, end uses of the PSA as well as familiar with the reactor and containment designs. The product of this program has been an overall improvement in the quality of the PSA studies as they are updated and recommendations of the Peer Review Team are incorporated. A significant by-product of the PSA Peer Review program has been a trend toward standardization of various elements of the PSA as well as a recognition that a variety of PSA methods can be used to perform a plant specific PSA study.

Over time the use BWR Owners’ Group PSA Peer Review process has expanded. Currently all four major owners groups in the US use a reactor type specific version of the process. By the end of 2003, almost all commercial operating power reactors in the US will have used a version of the PSA Peer Review process. In fact, an adaptation of the PSA Peer Review process has been used on the PSA of a heavy water moderated reactor (CANDU).

The current ASME PRA Standard uses a process similar to the PSA Peer Review Process to ensure quality. The combination of the ASME Standard and the PSA Peer Review Process can be applied to provide a quality assurance process to a plant specific PSA.