The Open Initiative for Next Generation of Probabilistic Safety Assessment

As we enter a time in which safety and reliability have come to the attention of the public, especially in the face of climate change and a nuclear renaissance, efforts are being made in the direction of the “next generation” of Probabilistic Safety Assessment with regards to software and methods. These new initiatives hope to present a more informative view of the actual systems, components, and interactions which PSA models represent in order to help decision makers go forward into the future.

We hope to provide an open and transparent public forum to disseminate information, independently review new ideas, and spread the word. We want to emphasize an openness which will lead to methods and software with higher quality, lead to better understanding of PSA models, encourage peer review, and allow the transportability of models and methods.

We hope to bring to the international PSA community the benefits of an open initiative, and to bring together the different groups who engage in large scale PSA, in a non-competitive and commonly shared organization for the good of PSA; in this way, researchers, practitioners, corporations, and regulators can work together in open cooperation.

Over the last 5 years, some non classical calculation techniques and modeling methods in nuclear PSA have been extensively studied. The concern of these investigations has been to end the use of (1) numerical approximations for which we do not know the error factors, (2) modeling methods which leave out perhaps critical elements of the actual plant, and (3) lack of good man-machine and organizational modeling techniques. From all these investigations, some alarming issues related to large, safety critical PSA models have been raised, which we feel need to be addressed before new calculation engines or next generation user interfaces are put into place:

- Better visualization of PSA results;
- Difficulty of different software working with the same PSA model;
- Lack of data and software backward and forward compatibility;
- No universal format for industry data.

- Quality assurance of calculations;
- Un-founded reliance on numerical approximations and truncation;

- Portability of the models between different software;
- Clarity of the models;
- Completeness of the models;
- Modeling of human actions;

As well as new calculation engines and user interfaces, it is clear that a standard computer representation for large, safety critical PSA models, a representation which is independent of all PSA software, should be the step forward in addressing the above issues.

As our first activity, we have created a working group to begin the creation of a standard representation for PSA models. Over the next few months, we will set up working groups in the other aforementioned areas.

We believe that each of you who are visiting this site have something to contribute. We encourage all of you to submit articles, presentations, summaries of work-in-progress, free software, new ideas, links to other web sites … in short, anything which will add to our emerging view of what PSA can be.

We will publish everything submitted on the web site un-refereed and un-edited.

Let us enter into an open forum together, and work together to know the limits of our methods, to push those limits, and to expand our understanding.