From:	Ernie Kee
To:	Mehta, Shivani
Subject:	[External_Sender] Input for the Public Meeting: "Fire Probabilistic Risk Assessment (PRA) Realism Topics Meeting" today (12/03/19)
Date:	Tuesday, December 03, 2019 10:01:54 AM

Dr Mehta,

I am writing in advance of the subject meeting for which you are listed as a contact. The purpose for writing you is to provide some input and background about the use of probabilistic risk assessment in utility and regulatory decision-making after looking through the NEI slides for the meeting. By way of background, I have retired from the South Texas Project after working there almost 30 years in several positions including the probabilistic risk assessment group. In the following two main points, or dissents, are presented that are based on my understanding regarding the path NEI is advocating. The NRC may also be contemplating the path that is indicated in the NEI slides.

1) In my opinion we all (but particularly NRC regulation) should avoid understanding fire risk using numbers derived from a probabilistic risk assessment (that are small). That is, although protection as quantified by a PRA may be a small number, it should not be taken as a reason to relax or even increase protection standards. My viewpoint is this: It is good that risk from fire, determined by any means, is very small, it indicates that to the best of our knowledge, protection is working well. Assuming quantification from PRA can be used as an indication of safety based on my understanding of protective system design is not the right way to think about the problem. To be blunt, in my opinion the line of thinking reveals a lack of understanding about the how to evaluate the efficacy of protective system design. Protective systems are engineered to terminate initiating events before they progress to catastrophe and therefore the best protection produces no (catastrophic) data to demonstrate its efficacy. Good protective system design produces no data; it is therefore unknown what impact change may have to the efficacy of the design in the absence of an engineering analysis.

2) Numerical values from a probabilistic risk assessment should not be taken to be an indication of safety; numerical probability can not be accurately assigned to a reasonably complex physical process, especially in the absence of data. Even if comprehensive data sets are available for a foundation, probabilities assigned to the expected performance of a (new) protective system that is one having a different design than the one from which data are derived, has even less foundation. In a commercial nuclear power plant setting where no fire has gone to catastrophe, core damage or maybe something like INES Level 4, is evidence that whatever protective system designs are in place are working well; thus producing no data.

The above concerns should not be interpreted as advocating nothing be done to assess and manage risk. Instead, given that risk quantification using probabilistic risk assessment in a complex protective system design setting is unreliable at best, we should instead rely on the nuclear power plants' ongoing engineering analysis of the protections already in place and make sure design, maintenance, and operational deficiencies are managed properly. The most effective risk management is contained in the Utility Corrective Action Programs. These programs use root cause analysis to engineer protection against any future fire event(s) that have occurred, design reviews, and quality assurance reviews to ensure existing protection is properly maintained and designed.

In summary, assigning ever more exact probabilities to the efficacy of protective systems is not the best use of either regulator or utility resources. Resources are best spent on engineering analysis of root cause, ongoing reviews of the potential for design deficiencies, and design of economical alternatives for compliance with regulations.

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