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Windsor, Connecticut 06095

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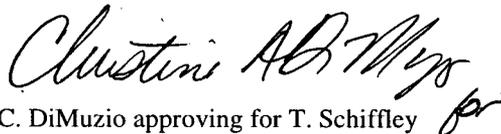
Subject: **PWROG Comments on Draft NUREG report, "Approaches for Using Traditional Probabilistic Risk Assessment Methods for Digital Systems," (PA-RMSC-0334)**

The PWROG appreciates the opportunity to review the October 2007 Draft NUREG report, "Approaches for Using Traditional Probabilistic Risk Assessment Methods for Digital Systems," and we offer the attached comments.

The PWROG believes that identifying a practical and acceptable method for performing PRA modeling of digital systems is important to the future of risk-informed regulation. We acknowledge that a great deal of thought and effort are being expended to identify a credible and robust methodology. We look forward to seeing continuing progress in the evaluation of both traditional and non-traditional methods.

If you have any questions or require additional information, please contact Dave McCoy at (205) 992-5686 or Bob Jaquith at (860) 731-6447.

Sincerely yours,

  
C. DiMuzio approving for T. Schiffley *for*

Frederick P. "Ted" Schiffley II, Chairman  
PWR Owners Group

BSG:las

Attachment

DOYB  
NRR

cc: Licensing Subcommittee  
Risk Management Subcommittee  
Steering Committee  
S. Rosenberg, NRC  
S. Peters, NRC  
J. McKnight, Document Control Desk, NRC  
A. Kuritzky, NRC  
C. Lui, Director, Division of Risk Analysis, NRC  
C. B. Brinkman  
PMO

Attachment to OG-07-497

## Comments

1. The weak link in the overall initiative is the lack of a credible method for quantifying software reliability. Without such a method, there is not much benefit in completing the other tasks associated with this initiative. Section 2.3.5 provides a discussion of the “enormously troublesome” software reliability issue. We believe that it would be prudent to focus on resolving this issue before trying to nail down the best modeling method, be it “traditional” or “non-traditional.” This resolution is addressed to some extent in Section 2.6.5 which recommends that more research be done for software reliability methods as something that “could enhance the state-of-the-art.” We believe that this recommendation should be strengthened and that the issue of software reliability should be raised to a top priority activity.
2. We recommend changing the report title from “Approaches for using Traditional Probabilistic Risk Assessment Methods for Digital Systems” to “Selection and Illustration of Probabilistic Risk Assessment Methods for Digital Systems” to reflect actual scope of the report.
3. We recommend modifying the Abstract and the Background, Section 1.1, of the Introduction to add a convincing case for the need for improved methods for quantifying the reliability of digital systems. Is there reason to believe digital systems are inappropriately high contributors to plant risk? The case for needing improved models for control systems should be different from the case for needing improved models for digital protection systems.
4. With regard to control systems, previous generations of control systems had reliability issues that led to inadvertent plant trips and plant unavailability. The industry put programs in place that encouraged licensees to identify and solve these problems. This action resulted in continuous improvement in control system reliability. As experience continues to be gained with digital systems, these same industry programs will ensure their high reliability.
5. We recommend that the Objective in Section 1.2 be modified to include a lead-in paragraph that states the purpose of the overall initiative, not just the objective to perform the two tasks at hand.
6. The “Criteria for Evaluating Probabilistic Models of Digital Systems” that are developed in Section 2.3, are interesting but they seem to lack a useful purpose in the work presented in this report. The purpose of the report seems to be to compare the usefulness of various PRA methods (ET/FT vs. Markov, etc) for modeling digital systems. However, the criteria are only used to compare four unrelated models with varying degrees of detail for varying types of systems, where the models were developed for different purposes. The Results presented in Section 2.6.4 list 8 “main insights” from comparing the four models to the criteria that were developed. The first 7 insights serve only as caveats for the comparison.
7. Section 2.5.3 lists three “Limitations in State-of-the-Art for Modeling the Reliability of Digital Systems Based on Applications Reviewed.” This list seems reasonable, but it is not well founded on the comparison of the four models.