



UNITED STATES
NUCLEAR REGULATORY COMMISSION

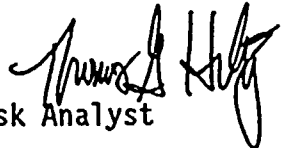
WASHINGTON, D.C. 20555-0001

November 6, 1995

MEMORANDUM TO: Edward J. Butcher, Chief
Probabilistic Safety Assessment Branch
Division of Systems Safety and Analysis

FROM: Thomas G. Hiltz, Senior Reliability and Risk Analyst
Probabilistic Safety Assessment Branch
Division of Systems Safety and Analysis

SUBJECT: TRIP REPORT - AUGUST 29-30, 1995, ON-SITE DISCUSSION OF PALO VERDE NUCLEAR GENERATING STATION RISK RANKING METHODOLOGY AND EXPERT PANEL PROCESS



On August 29-30, 1995, members of the Office of Nuclear Reactor Regulation (NRR), Office of Nuclear Regulatory Research (RES), and NRC contractors from Brookhaven National Laboratories and Science and Engineering Associates, Inc. attended a discussion at Palo Verde Nuclear Generating Station (PVNGS) regarding the PVNGS risk-ranking methodology as it is applied for graded quality assurance (QA). Attachment 1 is a list of attendees. Attachment 2 contains copies of presentation material.

The risk-ranking process appeared to have identified many of the high risk-significant systems. However, it was not clear to the staff why some systems were not considered risk-significant by the PVNGS expert panel. For example, there was little expert panel guidance for considering systems that support operator actions such as Control Room ventilation and annunciators or systems to mitigate Station Blackout (SBO) such as the PVNGS gas turbine generator. The staff questioned the basis for the PVNGS expert panel determination that these systems were not high risk-significant. In addition, the staff noted that aspects of the methodology for quantitatively determining or calculating system risk importance require additional basis. Specifically, PVNGS technique for determining system level risk importance using Risk Achievement Worth produced results that may be difficult to interpret. The staff noted that it may also be desirable to calculate importance measures at the component level because system boundaries may not be optimal for use in a graded QA process. The PVNGS expert panel and PRA experts used $10E-9$ as the truncation level/cutset cutoff and additional discussion may be necessary to determine whether this level is adequate for a graded quality assurance application.

The staff and PVNGS representatives discussed the PVNGS expert panel process. While the staff did not benefit from observing expert panel deliberations, the staff expressed interest in developing a greater understanding of the procedural implementation, structure, and rigor associated with the process for considering information and decision-making. The staff emphasized that the results of the expert panel process need to be reproducible and scrutable.

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The staff identified several issues and suggested that:

- Additional guidance be provided to the expert panel for utilizing risk importance measures.
- The expert panel establish defensible basis for why systems are included/excluded from the final list of high risk systems.
- Additional guidance be provided regarding how the expert panel should supplement PRA scope limitations (i.e, nitrogen back-up was not modelled, but may affect the risk importance of the Instrument Air System).
- Fire, seismic, other external risks should be considered by the expert panel in a more structured manner.
- Containment failure and shutdown risks should be considered by the expert panel in a more structured manner.
- Dynamic risk importance and the effect of planned maintenance should be considered by expert panel.
- The methodology/basis for using the top 20% of the systems for each of the 3 risk measures as an "initial consideration cutoff" is unclear.
- The mathematical process for calculating system importance needs to be justified.

The staff previously discussed several of these issues and suggestions in letters to the Nuclear Energy Institute dated October 14, 1994 and June 15, 1994. Moreover, in the October 14, 1994, letter, the staff enclosed detailed guidance concerning the functions of a expert panel.

The staff noted that current process for ranking graded QA system importance is the same process that was used for determining system importance for the Maintenance Rule. One of Palo Verde's goals is that one risk-ranking process can be used for all applications. Based on these limited discussions, the staff concluded that the PVNGS risk-ranking process was a good beginning but needs to be enhanced to address the issues identified by the staff. The staff will need additional review and interaction with PVNGS before it would be able make any definitive conclusions regarding the robustness, rigor, and adequacy of the risk-ranking process for graded QA.

Attachments:
As stated

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List of Attendees

August 29 and 30, 1995

APS/Palo Verde Nuclear Generating Station

APS/ Palo Verde

Steve Ryan
John C. Brannen
Jim Webb
Bruce M. Johnson
Mark A. Hulet
Carter Rogers
Mike Oren
Roy Lithicum
Sharon Boardman
Angie Krainik
Dave Fan
Lonnie Bullington

U.S. NRC

John Schiffgens
Willard Thomas (Science & Engineering Assoc.)
Mike Cheok
Mark P. Rubin
Tom Hiltz
Bill Reckley
M. Ali Azarm (Brookhaven National Laboratory)
Brad Hardin
Roy Woods