July 17, 2001

MEMORANDUM TO: Mel Fields, RES Coordinator
Division of Licensing and Project Management
Office of Nuclear Reactor Regulation

THROUGH: F. Mark Reinhart, Acting Chief **/RA/**
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SUBJECT: REVIEW OF THE "NRC HUMAN RELIABILITY ANALYSIS RESEARCH PLAN: FISCAL YEARS 2001-2005"

The Probabilistic Safety Assessment Branch (SPSB) has reviewed, as requested, the subject report "NRC Human Reliability Analysis Research Plan: Fiscal Years 2001-2005" which was prepared by the Office of Nuclear Regulatory Research (RES). The review was focused on potential uses by the Office of Nuclear Reactor Regulation (NRR) of the proposed human reliability analysis (HRA) research program.

Our review finds that RES has systematically considered the ongoing and projected NRR activities, as documented in NRC's Risk-Informed Regulation Implementation Plan, in identifying the various tasks of the proposed HRA research program. However, we suggest that RES consider the following comments when developing a more detailed plan or during the performance of the proposed research.

1. Research work on some of the proposed HRA tasks, such as Task 7 (HRA for aging of cable systems), may not be possible or may not be efficiently performed before ongoing or proposed work involving data collection, tests and/or engineering analyses for a variety of cable systems and environments is completed. According to the current RES plan, Task 7 will be initiated in FY2002 and will be completed in FY 2003. These milestones may not be realistic given that for the reliability of cables in a harsh environment, no data and no realistic tests or engineering analyses are currently available. Similar observations can be made for Task 9 (Reactor System Synergisms and HRA).

2. Research work on some of the proposed HRA tasks cannot be effectively performed before integrated deterministic and probabilistic analyses are completed. These analyses are needed to identify specific systems and components as well as designs and failure modes for which risk-significant operator actions are required. For example, Task 7 is proposed to address operator response to potential erroneous indications associated with the exposure of cables in a harsh environment. However, this task cannot be performed before deterministic and probabilistic analyses are completed. Such analyses are needed to determine whether and when risk-significant erroneous

indications are possible. Similar arguments can be made regarding proposed HRA research work related to Task 9 (Reactor Systems Synergisms and HRA) and to Task 10 (HRA for Upgraded and Advanced Control Rooms).

3. Research work on some of the proposed HRA tasks may need to be prioritized based on the need for detailed HRA models in regulatory applications. For example, Task 10 proposes the development of HRA methods for upgraded and advanced control rooms. Based on the AP600 design certification review, the AP600 advanced reactor design is not very sensitive to HRA. Therefore, the proposed HRA research work associated with advanced control rooms should be prioritized according to the specific control room and plant design.

Should you have any questions regarding these comments, please contact me at 415-1072.

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