

PDR 7-16-82
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M E M O R A N D U M

TO: Mr. D. Ward, Chairman
ACRS Subcommittee on Human Factors

FROM: Anthony Debons, Ph.D.
Consultant *Anthony Debons*

DATE: May 13, 1982

SUBJECT: SECY 82-111, Requirements for Emergency Response Capability Meeting of May 5, 1982 - Washington, DC

1. Dr. C. Hopkins, Technical Director, Human Factors Society, did not support SECY 82-111 because it diminished the role of Human Factors in establishing the requirements for Emergency Response Capability. I concur in Dr. Hopkins' position. Dr. Hopkins recommended that a task analysis be undertaken preliminary to the implementation of design modifications included for SPDS. My study of this aspect of Dr. Hopkins' proposal following the May 5, 1982 Conference has indicated that a kind of task analysis was conducted as part of the design of the control room, although not documented. At the conference I stated that a system analysis (of which a task analysis would be part) would be desirable.

By system analysis I mean the following:

- 1.1. A specific statement of the goals and objectives of the total system and components of the system.
- 1.2. A detailed mapping of the data flow through the system.
- 1.3. Organizational (management) structure to support the operation of the system.
- 1.4. A detailed task analysis for each component of the system and the interrelationship (dependencies) that influence the overall functional integrity of the system.

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2. There is evidence in the study of the present system configuration to support the fact that considerable thought and care has been applied, by the interested agencies, to insure that the safety goals and objectives be attained. As a matter of fact, it is inconceivable that the formal statements that are included as part of the emergency operating procedures could be developed without such thought and assessment. Furthermore, as the present system evolves operationally it is expected that changes will be initiated to increase the safety margins now provided by the system. In my view, it is not realistic to expect the interested agencies to engage in design activity "de nouveau", considering what has been achieved to date. On the other hand, it is important to recognize, in my judgment, the need for a thorough system analysis as part of the evolving design of the system. Such an analysis can provide answers to the following questions that are considered pertinent.
 - 2.1 What is the frequency of use of the present instrumentation? Displays that are not frequently used could possibly be integrated with other displays, if necessary.
 - 2.2 How are the displays currently used operationally? What is the justification for the use of the displays and what function do they specifically serve to the overall objectives of the system?
3. I recommend consideration be given to the establishment of a central analysis activity for NRC operations by the federal government. This activity would collect and assemble operational data on all the functioning aspects of current and future projected systems. My site visits have indicated that considerable data can be obtained from simulation and training exercises that would be invaluable as sources for the conduct of experiments on control displays and other aspects of the system. The central analysis activity would collect and assess such data, thereby providing a major source of feedback to both operating and management personnel.
4. I remain uncertain as to the nature of the research program now undertaken or projected in support of the numerous technical issues that have surfaced as the result of my several site visits and conferences. I recommend that a report be compiled of existing research program undertaken by both the public and private sector that directly or indirectly impact on NRC's present interests in nuclear plant safety. These data would be invaluable in determining whether or not the critical problems on system operations are being addressed.