EDO Principal Correspondence Control

FROM: Dana A. Powers, ACRS

DUE: 06/28/00

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DOC DT: 05/23/00
FINAL REPLY:

TO:

Chairman Meserve

FOR SIGNATURE OF : ** GRN **

Travers, EDO

CRC NO: 00-0344

DESC:

SECY-00-0053, "NRC Program on Human Performance in Nuclear Power Plant Safety"

ROUTING:

Travers
Paperiello
Miraglia
Norry
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Burns
Collins, NRR
Millman, OEDO
ACRS File

DATE: 05/30/00

ASSIGNED TO: RES

CONTACT: Thadani

SPECIAL INSTRUCTIONS OR REMARKS:

Prepare response to ACRS for EDO signature. Add Commissioners and SECY as cc's.

USE SUBJECT LINE IN RESPONSE.

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E-RIDS: SECY-01

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CORRESPONDENCE CONTROL TICKET

Date Printed: May 26, 2000 16:30

PAPER NUMBER:	LTR-00-0344	**LOGGING DATE:**	
ACTION OFFICE:	EDO		
AUTHOR:	DANA POWERS		
AFFILIATION:	ACRS		
ADDRESSEE:	CHRM RICHARD MESERVE		
SUBJECT:	SECY-00-0053, "NRC PROGRAM ON HUMAN PERFORMANCE IN NUCLEAR POWER PLANT SAFETY"		
ACTION:	~~Direct Reply~~ Appropriate Action		
DISTRIBUTION:	CHAIRMAN, RF		
LETTER DATE:	05/23/2000		
ACKNOWLEDGED	No		
SPECIAL HANDLING:	SECY TO ACK		
NOTES:			
FILE LOCATION:	ADAMS		
DATE DUE:	~~06/12/2000~~	**DATE SIGNED:**	

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D.C. 20555-0001

May 23, 2000

The Honorable Richard A. Meserve
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Meserve:

SUBJECT: SECY-00-0053, "NRC PROGRAM ON HUMAN PERFORMANCE IN NUCLEAR POWER PLANT SAFETY"

During the 472nd meeting of the Advisory Committee on Reactor Safeguards, May 11-13, 2000, we completed our review of SECY-00-0053, "NRC Program on Human Performance in Nuclear Power Plant Safety." Our Subcommittee on Human Factors reviewed this matter on March 15, 2000 . During our review, we had the benefit of discussions with representatives of the NRC staff.

Observations and Recommendations

1. The staff has started to develop a framework for coordinating the agency's activities in this important area. The relevant activities of other agencies have been reviewed and operating experience has been analyzed.

2. The analysis of operating experience to identify latent conditions resulting from organizational and programmatic deficiencies and to assess their risk significance is an important element of the Program and should be expanded.

3. Activities under the Program should focus on supporting the two major agency initiatives to risk inform the regulations and to revise the reactor oversight process.

4. The coordination between the, A Technique for Human Event Analysis (ATHEANA) project and the analysis of operating experience project should be improved. ATHEANA's data needs should be considered in the analysis of operating experience. The analysis could, in turn, suggest areas of possible improvements in human reliability analysis models such as ATHEANA.

5. The work proposed in the Program to characterize the extent to which human performance is captured in the revised reactor oversight process (RROP) should be pursued. The validity of the assumption that the impact of cross-cutting issues on plant safety will be reflected in the performance indicators and the baseline inspection findings should be tested.

Discussion

The current Program provides a good step toward the coordination of the staff's activities in this very important area. We expect that the Program will evolve as the results of the current efforts are obtained and new activities are identified.

The staff reviewed the activities of other agencies in this area and performed an analysis of operating experience. Preliminary results from this analysis indicate that human performance has been an important contributor to the large majority of significant events. Latent conditions such as failure to fix known problems, inadequate attention to organizational learning, and inadequate maintenance practices figured prominently in these events. Latent conditions, in fact, outweighed active human performance errors by four to one. What remains to be done is to evaluate the significance of these observations in a probabilistic risk assessment context. The challenge here is not so much the evaluation of the risk significance of individual human errors but, rather, the significance of latent conditions that may lead to poor human performance and the potential for common-cause failures.

We agree with Commissioner Merrifield's observation in his speech at the Regulatory Information Conference that "...we and our licensees must continue to wage an aggressive campaign against the buildup of latent conditions and we simply must not forget to worry." The results of the staff's analysis of operating experience indicated that a major part of latent conditions stems from organizational deficiencies. Such organizational issues constitute an important element of what the International Nuclear Safety Advisory Group has called the "safety culture" of the plant (INSAG-4, 1991).

The agency's two major regulatory initiatives are to risk inform the regulations and to revise the reactor oversight process. We believe that an important consideration in determining which projects should be included in the Program is the degree to which these projects support the agency's initiatives. For example, it is not clear to us what needs of the RROP or ATHEANA will be satisfied by the results of the project on control room design or the Halden simulation experiments.

Risk informing the regulations requires models for human reliability analysis (HRA). There are two broad areas of human performance activities that are included in HRA: activities before an initiating event and activities after an initiating event.

The HRA for routine pre-initiator activities relies largely on the methods described in the Human Reliability Handbook. As we stated in our letter on ATHEANA dated December 15, 1999, an important omission in the analysis of pre-initiator activities is the failure to investigate how human errors during normal operations would initiate a plant event. We believe insights derived from the analysis of operating experience, as well as recent models of human error, can be used to perform this investigation.

The major HRA project for post-initiator activities is ATHEANA. There needs to be more coordination between the ATHEANA project and the analysis of operating experience project. The ATHEANA data needs should be inputs to the data analysis project and the findings from the analysis could suggest improvements to the ATHEANA model. For example, the kinds of

latent conditions identified by the analysis of operating experience should be significant inputs to the identification of the error-forcing context that is an important element of ATHEANA.

The revised reactor oversight process defines three cross-cutting issues: human performance, safety-conscious work environment, and problem identification and resolution. An assumption in the oversight process is that the impact of cross-cutting issues on plant safety will be reflected in the plant performance indicators and the baseline inspection findings. This is an untested assumption. The proposed activity to characterize the extent to which human performance is captured in the revised reactor oversight process will test this assumption and should be pursued.

We look forward to hearing from the staff on the results obtained from this Program.

Sincerely,

Dana A. Powers
Chairman

References

1. SECY-00-0053, Memorandum dated February 29, 2000, from William D. Travers, Executive Director for Operations, NRC, to The Commissioners, Subject: NRC Program on Human Performance in Nuclear Power Plant Safety.
2. Remarks of Jeffrey S. Merrifield, Commissioner, at the Regulatory Information Conference, Washington, D.C., March 29, 2000.
3. International Atomic Energy Agency, Vienna, International Nuclear Safety Advisory Group, "Safety Culture," Report 75-INSAG-4, 1991.
4. Swain, A.D., and H.E. Guttmann, *Handbook of Human Reliability Analysis with Emphasis on Nuclear Power Plant Applications,* NUREG/CR-1278, Rev. 1, Sandia National Laboratories, Albuquerque, NM, August 1983.
5. Letter dated December 15, 1999, from Dana A. Powers, Chairman, ACRS, to William D. Travers, Executive Director for Operations, NRC, Subject: NUREG-1624, Revision 1, "Technical Basis and Implementation Guidelines for A Technique for Human Event Analysis (ATHEANA)."
6. Letter dated February 19, 1999, from Dana A. Powers, Chairman, ACRS, to William D. Travers, Executive Director for Operations, NRC, Subject: SECY-98-244, "NRC Human Performance Plan."