



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

May 13, 2004

Dr. William D. Travers
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington DC 20555-0001

SUBJECT: GOOD PRACTICES FOR IMPLEMENTING HUMAN RELIABILITY ANALYSIS

Dear Dr. Travers:

During the 512th meeting of the Advisory Committee on Reactor Safeguards, May 5-8, 2004, we reviewed Draft Letter Report (JCN W6994), "Good Practices for Implementing Human Reliability Analysis (HRA)," dated April 6, 2004. Our Subcommittees on Reliability and Probabilistic Risk Assessment (PRA) and on Human Factors also reviewed this matter in detail on April 22, 2004. During these reviews, we had the benefit of discussions with representatives of the NRC staff and their contractors. We also had the benefit of the documents referenced.

CONCLUSIONS AND RECOMMENDATIONS

1. Draft Letter Report, "Good Practices for Implementing Human Reliability Analysis (HRA)," should be issued for public comment.
2. Draft Letter Report, "Good Practices for Implementing Human Reliability Analysis (HRA)," should be peer-reviewed by domestic and international experts.

DISCUSSION

Central to the Commission's policy on a phased approach to PRA quality is the availability of guidance documents. HRA is an important element of PRA. While there is general consensus that the Human Reliability Handbook (NUREG/CR-1278) provides reasonable models for evaluating human performance during routine activities such as maintenance, there is no agreement among HRA experts on how to model human performance during accident conditions. Since the guidance provided by available documents such as the American Society of Mechanical Engineers Standard and the Nuclear Energy Institute PRA Peer Review Process Guidance (NEI-00-02) is at a high level, there is a need to develop more detailed guidance. The draft letter report is intended to fulfill this need.

The report provides a set of good practices that HRA analysts should follow regardless of the particular model that they use. This is an important first step toward achieving consensus within the HRA community regarding the quantification of human reliability. The report is based on staff and contractor experience and is ready for public comment.

Developing a set of good practices for assessing human reliability during accidents is particularly challenging. Several models based on different assumptions have been proposed by domestic and international experts. We believe that the report will benefit from a formal peer review by these experts. Their participation in the development of the report will provide the

additional, and very important, benefit of contributing to its acceptance by the international community. Therefore, the staff should organize such a review.

We were disappointed that organizational issues did not receive the attention they deserve. Experts analyzing operating events have concluded that these issues frequently are significant performance shaping factors. While we acknowledge that the state-of-the-practice on these issues is not mature, omitting them in the report ignores an important determinant of human performance.

We look forward to reviewing the report after the public comment period and the peer review.

Sincerely,

/RA/

Mario V. Bonaca
Chairman

References:

1. "Good Practices for Implementing Human Reliability Analysis (HRA)," Draft Letter Report (JCN W6994), April 6, 2004.
2. J. Forester, D. Bley, S. Cooper, E. Lois, N. Siu, A. Kolaczowski, and J. Wreathall, "Expert Elicitation Approach for Performing ATHEANA Quantification," *Reliability Engineering and System Safety* 83 (2004) 207-220.
3. "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," ASME RA-S-2002, American Society of Mechanical Engineers, April 5, 2002.
4. "Probabilistic Risk Assessment Peer Review Process Guidance," NEI 00-02, Revision A3, Nuclear Energy Institute, March 2000.
5. A.D. Swain and H.E. Guttmann, "Handbook of Human Reliability Analysis with Emphasis on Nuclear Power Plant Applications - Final Report," NUREG/CR-1278, SAND 80-0200, Sandia National Laboratories, August 1983.