Data Collection for Human Reliability Analysis
RES/DRA

Consistent with the Commission's policy statements on the use of probabilistic risk assessment (PRA) and for achieving an appropriate PRA quality for NRC risk-informed regulatory decision-making, the NRC has ongoing activities to improve the quality of human reliability analysis (HRA). The adequacy of data available for HRA is a concern on the credibility and consistency of human error probability estimates. To address this need, NRC's Office of Research (RES) is developing methods and tools for efficient and effective collection and use of data to support HRA. Two high level objectives are: (1) improving understanding of the operators' behavior in responding to plant malfunctions; and (2) inform the estimates of human error probabilities. The two objectives support qualitative and quantitative analyses of HRA, respectively.

With emphasis on supporting qualitative HRA, the staff developed a prototype event timeline tool to assist NRC inspectors in event inspections. A feedback to the reactor oversight process was performed to gain feedback from the NRC inspectors. The staff is coordinating with the Office of Nuclear Reactor Regulation and Region II office to visit the H.B. Robinson nuclear power plant to collect the human performance information on its March 28, 2010 fire event. The timeline tool will be tested for the data collection.

In regard to HRA data, RES signed an agreement with a U.S. utility in March 2011 to collaborate on the collection of human performance information on the utility's training programs for HRA. The information sources include the licensed operator simulator training, job performance measures, and emergency drills. A data collection method is under development. Key activities relating to the method development include the following:

- The method was field tested in July 2011 at the utility's site on simulator training data. The results indicated that the method was ready for a pilot data collection with some minor improvements.

- The staff is actively working with the HRP staff on piloting the data method to the six U.S. crews that are performing simulator exercises in the HRP in summer 2011 to ensure that the method can be used for collecting simulator data in an experimental setting rather than in a training setting.

- The staff is applying the method to past events (e.g., the events documented in the augmented inspection event reports) to ensure that the method is applicable for collecting information from the reported events.

- The staff is coordinating its efforts in performing accident sequence precursor analysis (ASP) and SDP analysis to ensure that the method is suitable for HRA in these two regulatory applications. The method will bridge the data and applications.

- The staff is working with a database software vendor to implement the data method in the software; U.S. utilities widely use this vendor's database software in their training programs. The implementation of the data method in the software will streamline the data collection and analysis process to reduce human efforts, increase the utility's acceptance, and possibly reduce the barrier for expanding the data collection to other utilities.

- The staff is coordinating with those at the agency who are in charge of developing a new HRA method to address SRM-M061020 to ensure good data support for the method.

Selected Major Milestones and Schedules				
Major Milestones	**Original Target Date**	**Revised Date**	**Completion Date**	**NRC Responsibility**
Established a memorandum of understanding with a NRC licensee to collect the licensee's licensed operators simulator training data	February 2011		March 2011	RES/DRA
Developed and implemented a data collection tool for simulator training data collection	August 2011	February 2012		RES/DRA
Analyzed licensed operator simulator training data obtained under a MOU with a US licensee	August 2011	September 2012		RES/DRA
Complete NRC inspectors review on the event timeline	January 2011		May 2011	RES/DRA
Develop a method that can aggregate data of various data sources to inform HEP estimates	June 2012			RES/DRA
Letter report on the use of operating experience to inform HEP estimates	January 2012	January 2013		RES/DRA
A draft NUREG report for NRR review and comment on empirical data for HEP estimates	December 2012	September 2014		RES/DRA
Team visit the H.B. Robinson plant to collect the human performance information in the fire event dated on March 28, 2010.	November 2012			RES/DRA