

Human Reliability Assessments: Using the Past (Shuttle) to Predict the Future (ORION)

Abstract:

NASA uses two HRA assessment methodologies. The first is a simplified method which is based on how much time is available to complete the action, with consideration included for environmental and personal factors that could influence the human's reliability. This method is expected to provide a conservative value or placeholder as a preliminary estimate. This preliminary estimate is used to determine which placeholder needs a more detailed assessment. The second methodology is used to develop a more detailed human reliability assessment on the performance of critical human actions. This assessment needs to consider more than the time available, this would include factors such as: the importance of the action, the context, environmental factors, potential human stresses, previous experience, training, physical design interfaces, available procedures/checklists and internal human stresses. The more detailed assessment is still expected to be more realistic than that based primarily on time available.

When performing an HRA on a system or process that has an operational history, we have information specific to the task based on this history and experience. In the case of a PRA model that is based on a new design and has no operational history, providing a "reasonable" assessment of potential crew actions becomes more problematic.

In order to determine what is expected of future operational parameters, the experience from individuals who had relevant experience and were familiar with the system and process previously implemented by NASA was used to provide the "best" available data. Personnel from Flight Operations, Flight Directors, Launch Test Directors, Control Room Console Operators and Astronauts were all interviewed to provide a comprehensive picture of previous NASA operations. Verification of the assumptions and expectations expressed in the assessments will be needed when the procedures, flight rules and operational requirements are developed and then finalized.