

Use of Human Reliability Insights to Improve Decision-Making

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This paper describes the use of insights obtained during the development and application of human reliability analysis (HRA) as part of a probabilistic risk assessment (PRA) to support decision-making, including improvements to operations, training, and safety culture. Insights have been gained from the development and application of HRA as part of a PRA for nuclear power plants in the USA, Europe and Asia over the last two decades. These models consist of Level 1 and Level 2 PRA models of internal and external events, during full power and shutdown modes of plant operation. These insights include the use of human factors information to improve the qualitative portion of the HRA. The subsequent quantification in the HRA effectively prioritises the contributors to the unreliability of operator actions, and the process facilitates the identification of the factors that are important to the success of the operator actions. Additionally, the tools and techniques also allow for the evaluation of key assumptions and sources of uncertainty. The end results have been used to effectively support decision-making for day-to-day plant operations as well as licencing issues. HRA results have been used to provide feedback and improvements to plant procedures, operator training and other areas contributing the plant safety culture. Examples of the types of insights are presented in this paper.