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On Some Issues Related to the Models of Human and Organizational Factors and their Use in the Decision Making Process

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Synopsis

The paper presents some results from a research on the best approaches to be adopted in order to evaluate the impact of various models used for Human and Organizational Factors (HOF) in nuclear field (nuclear power plants (NPP) and the infrastructure specific for their lifetime cycle - design, operation and extension of operation and decommissioning of a NPP). The work considers that modelling of HOF in integrated models for the whole NPP and its infrastructure was identified as an important issue by all the major accidents in the NPP (for instance, TMI, Chernobyl and Fukushima). However there are fundamental difficulties to develop models for such systems (combined technical-social and economical systems). Previous models used for similar cases in the evaluation of the lessons learnt from major accidents and in the modelling of the security of energy supply aspects were used by the author. In this paper results are presented with the use of three type of models

- Operational research (using matrix approach) for describing the systems, their elements, the challenges and results of the challenges
- Expert type approach based on best practice and expertise included in documents and researches of holistic type
- Risk based evaluations based on methodologies from the Integrated Risk Informed Decision Making.

The three type of approaches mentioned above were applied to three case studies for NPP and their infrastructures (NPPI):

- Case A –NPPI in validation of research/design and testing of a prototype
- Case B –NPPI of “middle age” from the postulated lifetime perspective experiencing a major accident
- Case C –NPPI at the end of the initially postulated lifetime experiencing a catastrophic accident

The results illustrate the strengths and weaknesses of each approach and the areas of their complementarity, which are going to be used in further more detailed studies

Country or International Agency

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