

Information for nuclear emergency response: a case study based on ANGRA nuclear power plant emergency simulation exercises

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Abstract

Current nuclear emergency management procedures do not always satisfactorily address issues related to the information availability and to how people in emergency control centres use this information to respond to an nuclear accident. The lack of an adequate and prompt information may lead to a response that can be very different from what authorities recommend and thus create confusion, mistrust, and widespread uncertainty. This is a potentially serious problem for emergency planners.

An adequate and prompt access to relevant information is a critical requirement that emergency teams face while they work towards reducing the undesired consequences of the emergency. There are three basic types of knowledge according to a conceptual framework developed to deal with emergency response: Previous Personal, Previous and, Current Contextual knowledge. Most decisions in emergency control centres require a dynamic combination of all types of knowledge, particularly the current contextual that comes from the emergency settings, including all information about the activities of other emergency teams.

The aim of this paper is to describe the concepts and the structure of a system that aims at storing and disseminating the previous formal and contextual knowledge to help teams make the correct decisions during the evolution of an emergency. The elicitation of critical requirements are provided by a case study based on Cognitive Work Analysis and Naturalistic Decision Making methods, applied to a nuclear emergency response simulation. The framework and a prototype system were tested in a controlled experiment. The paper reports the results of this experiment.

KEYWORDS: *nuclear emergency management; knowledge elicitation; emergency information software; cognitive work analysis.*

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