EXPERIMENTAL STUDY ON THE EFFECT OF A PROCEDURE UNDER UNEXPECTED SITUATIONS

Makoto Takahashi [1]
Daisuke Karikawa [1]
Genta Sawasato [1]
Yoshitaka Hoshii [1]
[1)] *Tohoku University, Japan*

Abstract

Preparing procedures for a wide range of situations is considered important and has been confirmed to be effective for realizing reliable operations and a higher level of safety in complex socio-technical systems. However, once a situation drifts outside the scope of prepared situations, the effectiveness of using a pre-defined procedure may degrade, and operators have to make decisions without relying on procedures. In such cases, stronger operators are dependent on procedures, and the more unreliable operators' decision may come from the possible lack of a deeper understanding of the objective systems. The present study experimentally confirms that a strong dependence on the procedure may deteriorate the performance under unexpected situations outside the range of procedures. A Smart Grid Simulation environment, in which dynamic decision making is required to deal with the given situations to avoid blackout, is adopted as the experimental testbed.

The scenarios for the expected situation presented herein are constructed on the basis of the events that have not been presented to the subjects in advance. The subjects are divided into two groups. The subjects in Group A are not given a written procedure that enables an effective operation for the predefined situations, whereas subjects in Group B are instructed to strictly follow the procedure. The results imply that the task performance evaluated on the basis of the number of causing a blackout degrades for the subjects following the procedure when facing unexpected situations.

Keywords: Procedure, unexpected situations, task performance, cognitive experiments

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