Operation Support and Training by Expert and Information Systems for technical SAR Measures and Buildings' State Evaluation

C. Schweier (1), M. Markus (1)

(1) Institute for Technology and Management in Construction, University of Karlsruhe (TH), Germany (schweier@tmb.uni-karlsruhe.de / markus@tmb.uni-karlsruhe.de)

Earthquake disasters are in the most regions of the world relatively rare events. So the deployed response field units have often no or not sufficient experience with such situations. For this reason one of the aims of our project "Novel Rescue and Restoration Technologies" is to research and develop technologies that support field personnel during disaster response after earthquakes.

Expert and information systems offer the possibility to support the decisions of the field personnel in complex and unfamiliar situations. They can be used for training purposes and to support the operations in a real case. Two different expert an information systems were developed: one to support the onsite search and rescue (SAR) personnel at building collapses and another one for the support of the inspectors at the evaluation of buildings' states after earthquakes.

In both cases after input of information related to a certain situation, the expert system poses context sensitive subsequent questions and gives assistance for the site inspection. The *expert and information system for rescue operations* then generates advice concerning suitable SAR procedures and equipment for the given situation. Additionally basic information, check lists as well as calculation components are offered as support. The system was tested and further developed in co-operation with specialists of the German governmental disaster relief organisation (THW). The *expert and information system for the buildings' state evaluation* is still in a stage of development. It should assist the inspectors to decide reliably and in a short time whether the buildings after an earthquake are safe to be further used or not. Interactive checklists depending on the building type as well as further auxiliary material like e.g. construction plans

will support the inspectors to classify the buildings.

Both expert and information systems are part of the also developed Disaster Management Tool (DMT). The DMT is a software system supporting decision makers, surveillance and intervention teams during disaster response. It is developed at the Karlsruhe University within the Collaborative Research Center (CRC) 461 "Strong Earthquakes" based on the results of its engineering research projects. The central database of the DMT stores stock data and up-to-date data collected during the disaster response. The expert and information systems as part of the DMT have access to this data and are themselves able to transmit data collected in the field to the central database. This facilitates the work of the field units as well as of the decision makers in the emergency operation centres.

The presentation will include the development stage of both expert and information systems, their integration in the Disaster Management Tool and their use to coping with an earthquake disaster.