Prepardness planning by using simulation – use case winter storm

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Due to extreme winter storms and low outdoor temperatures the electricity consumption increases substantially especially in the cold northern regions. This can lead to overload situation in the electric network and consequently the electricity supply in the region is no longer reliable. The storms can also accumulate snow on power lines, causing damage, power outages and communication breakdowns. In the worst cases, when the electricity is cut off for longer time, many houses are at risk of rapid cooling because the heating systems are dependent on electricity. Hence, people are in danger of hypothermia if they cannot move or be evacuated to warm and safe places. Northern areas are sparsely populated with long distances, which complicates rescue actions. There are also foreign visitors who may be even more vulnerable because of language problems and different safety cultures, including e.g. not knowing how to dress properly for extreme weather

This paper presents the ongoing work of a Finnish pilot case of the EU project CRISMA "Modelling crisis management for improved action and preparedness". It shows how computer based simulation can support decision making in preparedness planning of the authorities and involved organizations. The pilot will be evaluated in the project in spring 2015.

The concrete goal for this pilot is to formulate a tool to support preparedness planning which helps authorities to create realistic plans to prioritize the allocation of critical resources which are in shortage. The pilot concentrates in electricity supply that is needed for heating houses in extreme cold conditions. The new software application will identify areas which require urgent actions, e.g. evacuation. It utilizes simulation models for cooling of houses and resource planning. The objective of the tool is to identify the most vulnerable population in the cooling houses in the timeframe of 72 hours starting from the electricity cut-off and at certain outdoor temperature (below zero). The CRISMA decision support tool also includes other applications for example economic impacts model which can be used to evaluate costs of the crisis and mitigation actions. Graphical user interfaces of models are presented by using mockups.

The oral presentation will be given using interactive mock ups and illustrative slides,