Improving communication during disasters

May 13 2013

During a major disaster, where a lot is happening and chaos rules, it is important that the emergency services have a shared awareness of the situation. Credit: Morguefile

A small armband which can be attached to the injured. An information board containing a complete visual record of events. This is technology helping to improve communications during major national disasters.

Debates about emergency responses to acts of terrorism, natural disasters and major accidents are no strangers to the media. Every accident is followed by a discussion about who was responsible, who was to blame, and what might have been done better.

"After the events on Utøya on 22 July 2011, there was a great willingness to improve on all counts", says SINTEF researcher Jan Håvard Skjetne.

"But there was perhaps too much focus on the police and terrorism angle", he says. "It's too easy for us to focus exclusively on events such as the recent Boston bombings, but we must be aware of all situations in which accidents take place – such as avalanches, explosions and transport disasters.

In these situations, we should be concentrating on the sharing of information between the police, fire and health services" says Skjetne.

Skjetne is Project Manager for "BRIDGE" – a major EU project which is addressing emergency response collaboration during disasters, and is looking into how technology can help to improve response strategies.

Information is being lost

"First close your eyes, turn your back, pull a plastic bag over your head and hide behind a curtain. Then try to hold a conversation with someone standing some distance behind you and speaking an unfamiliar dialect. Now you can begin to understand how difficult it is to communicate by radio", says police inspector Bjørn Danielsen. Danielsen is employed at the Norwegian Police Academy and has used this illustration during debates addressing effective communication.

At present it is a fact that information during accidents can only be shared by people actually talking to each other.

Skjetne is one of many who believe that information doesn't have to be transmitted only by telephone and radio. "Things can go haywire and a lot of information can be lost", he says. "In order to plan the transport of casualties out of a disaster area, the preparation of reception centres, and the saving of lives, it will be essential to provide information about how many people are injured – and how seriously", says Skjetne. "Can some of the injured wait for help? Are some of them dying? How many are

uninjured? "It is in such situations that we can envisage the use of technical systems which establish closer links between the police, health and fire service crews", he says.

Shared information

During a major disaster, where a lot is happening and chaos rules, it is important that the emergency services have a shared awareness of the situation. This is why Norwegian researchers have now established a system which provides a visual overview of events taking place at the scene of the disaster. Information can be shared between the various units deployed by the emergency services, using tablets, PCs and large information boards.

"This is a geolocation-based system which assembles all available data and displays them on a map", says Skjetne. In this way, all information can be made available both to, and shared between, personnel out in the field, and to those staffing the emergency centres where response coordinators can control operations from their desks.

How many injured?

Together with the other partners in the EU project, the researchers have also participated in looking at the problem from the other end. We have now established an initial concept designed to ensure that hospitals work better together.

The German Fraunhofer research centre has produced a small armband which can be attached to the injured following an accident. The armband is part of an electronic system which sorts and prioritises the injured – a so-called triage system similar to that used by Norwegian accident and emergency personnel today. With the help of a colour coding system on

the armbands, emergency response personnel can label groups of patients depending on the seriousness of their injuries. For example, urgent cases are indicated by those wearing red armbands.

"The system we are talking about is very simple, but can be extended to include pulse measurements, ECG, etc.", says Skjetne. "The key here is that all injured persons are given a unique identification tag, and in this way it is possible to follow an injured person from the scene of the accident to the hospital", he says. He refers to a statement made by the health services: "If there are more than five injured persons following an accident, we lose track of where these are located and what is happening to them".

Olav Eielsen heads the regional emergency medical expertise centre RAKOS established by the Helse Vest health trust in Stavanger. He is a supporter of the new triage system which will soon be tested as part of a major Norwegian exercise to be held outside Stavanger in September.

Closed systems must be opened

Jan Håvard Skjetne is in no doubt that it will be a long-term task to implement a shared emergency response apparatus in Norway. Major financial and organisational differences across Norway make this work highly problematic – complicated by the fact that all the relevant response services are coordinated by different agencies; the fire services by the Directorate for Civil Protection and Emergency Planning (DSB), the police by the Ministry of Justice and Public Security, and the health service sector by the various municipal and county council authorities.

In order for these services to be able to share information, help is needed to open up the in-house systems they currently employ. At present, the fire department employs the LOKUS system which notifies it of the location of all its emergency vehicles. The health services can trace the

movements of all its ambulances within its own system, but none of these systems share any information.

Learning from major exercises

Each year, major exercises are organised which give the emergency services the opportunity to train for accident situations such as train collisions, in which the injured may lie scattered across the scene of the accident, or avalanches in steep mountain terrain during which tracker dogs and rescue teams are searching for casualties.

SINTEF has interviewed 40 emergency service managers to tap into their views on risk, opportunities, and the weaknesses of exercises. All those interviewed raised the issues of exercises, and intense and repeated training. Even the best instructions have no value if there are no opportunities to train in "real-life" situations.

At a recent SINTEF seminar addressing this issue, Ann Christin Olsen-Haines from the DSB caused a stir when she challenged what we really get from these exercises.

"If it is true that when our colleagues ask the following day "how did the exercise go?", and those involved reply "OK, everyone had a good day", then this cannot be good enough", she says. "An exercise must have a pre-defined objective – we must be clear about what we intend to get out of it in advance. In this way we can might have the opportunity to learn something", says Olsen-Haines.

Provided by SINTEF