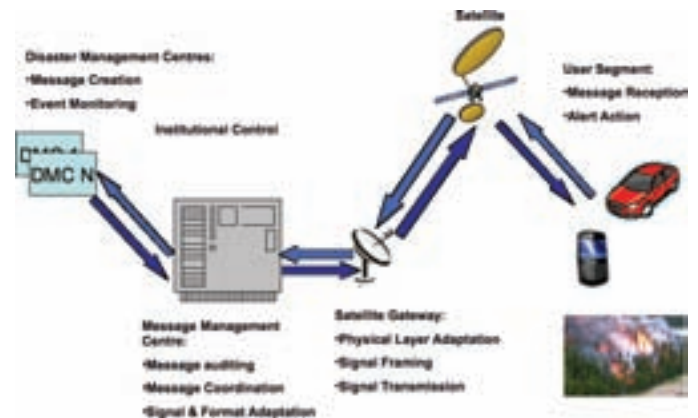


Satellite solutions

A recent feasibility study has shown that satellite systems offering a resilient approach to alerting the public are within reach, writes Shaun O'Neill, BAPCO European Officer.



"The maximum benefits from the system are expected to be found in cases where a large area is affected and there is significant infrastructure damage."

Major emergencies over recent years have highlighted the critical role in communicating with the public before, during and in the immediate aftermath of such events. Existing mechanisms have often not been adequate to meet the needs of emergency services and disaster coordination agencies in their desire to deliver vital information to the public.

Many of the issues associated with communicating with the public during major emergencies concern: who has responsibility to communicate? What should be communicated? What is the desired response of the public? These are challenging questions.

But what mechanisms are available to authorities once these questions have been addressed? And critically, how resilient are they to the actual impact of major emergencies? Such mechanisms include TV and radio, public telephone and mobile phone networks, as well as personnel on the ground. Previous disasters have demonstrated that existing mechanisms can be severely degraded.

Existing mechanisms often share common lines of failure with extensive reliance on terrestrial infrastructure or sensitivity to network overloading. To address this, a study initiated by the European Space Agency (ESA) and undertaken by a UK-based team of Avanti Communications, Helios and BAPCO has examined the feasibility of a satellite based system for alerting the public, complementing and enhancing existing mechanisms.

The study has investigated the possibility of providing simple alerts to the public via a satellite broadcasting system. We affirmed that for maximum benefit from the concept, the system should be compatible with small, widely adopted user terminals, avoid proprietary technologies and allow for a harmonised approach at regional level. This led the objective to pursue a system based around the use of mobile phones and Personal Navigation Devices (PNDs).

Our design has therefore sought to harness satellite platforms which have inherent compatibility with small form factor mobile terminals and the potential for future integration into mobile phones and PNDs. We have proposed two systems, based on either the European GNSS Navigation Overlay Service (EGNOS) or S-band DVB-SH. Much user equipment is already compatible with EGNOS and possible in the near future with S-Band, but for a full capability system, evolutions still need to be made in

partnership with PND and mobile phone manufactures. Our design also relies on the inherent location-knowledge of increasing numbers of these devices in order to provide geo-specific alerts so that key messages can be communicated to targeted communities rather than a scattergun approach that could include non affected areas.

In both our proposals the system collects alerts generated by authorised actors (eg emergency services), acting simply as a delivery mechanism. For this purpose we have also proposed a Messaging Management Centre that coordinates alert requests and permissions under institutional control. The establishment of this centre results in various governance, and command and control related issues which need to be carefully considered. In particular, the authority to communicate to affected sections of a community or indeed any associated accountability.

Achieving future resilience

The study aspect of the project is now complete and the results are being communicated to the wide range of stakeholders. To support this, the project has produced a detailed breakdown of costs and benefits for the system and a roadmap for its potential development. The maximum benefits from the system are expected to be found in cases where a large area is affected and there is significant infrastructure damage. Based on the frequency of disasters we have estimated that annual benefits could be between €16m and €178m per year in Europe – but highly variable depending on surrounding conditions. These annual benefits take into account the number of deaths or amount of damage that can be avoided through use of the satellite based alarm system. These benefits compare positively with the estimated total capital and operation cost associated with system design/implementation/operation.

The success of the concept will ultimately depend on the desire of emergency and disaster authorities for the increased resilience achievable, the development of workable operational procedures for public alerting of this type, and the co-operation of mobile phone and PND manufacturers in developing compatible equipment. It is along these lines that future activities will be focused.

A highly resilient system to alert the public appears to be within reach, if supported by both those in the emergency and disaster response communities, and manufactures.