OUR EXPERIENCE

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FM – Radio Data System

Introduction and Testing of FM-RDS for TEW

Tsunami warnings must reach those at risk in time. Warning dissemination technologies are needed that can alert people instantly, have broad coverage and are able to perform under adverse circumstances that are likely to occur after strong earthquakes when conventional communication systems fail.

FM broadcasting has proven to be useful in adverse circumstances if certain precaution measures, such as power back-up systems, are in place. Combined with the Radio Data System (RDS) technology, specific warning messages can be disseminated directly by emergency management authorities as they override regular programming to broadcast them. Furthermore, radio receivers that are switched off or are tuned to a different radio station will automatically spring to life or tune to the frequency that delivers the warning messages. The same principle is used in car radios when they receive a traffic warning.

THE INITIATIVE

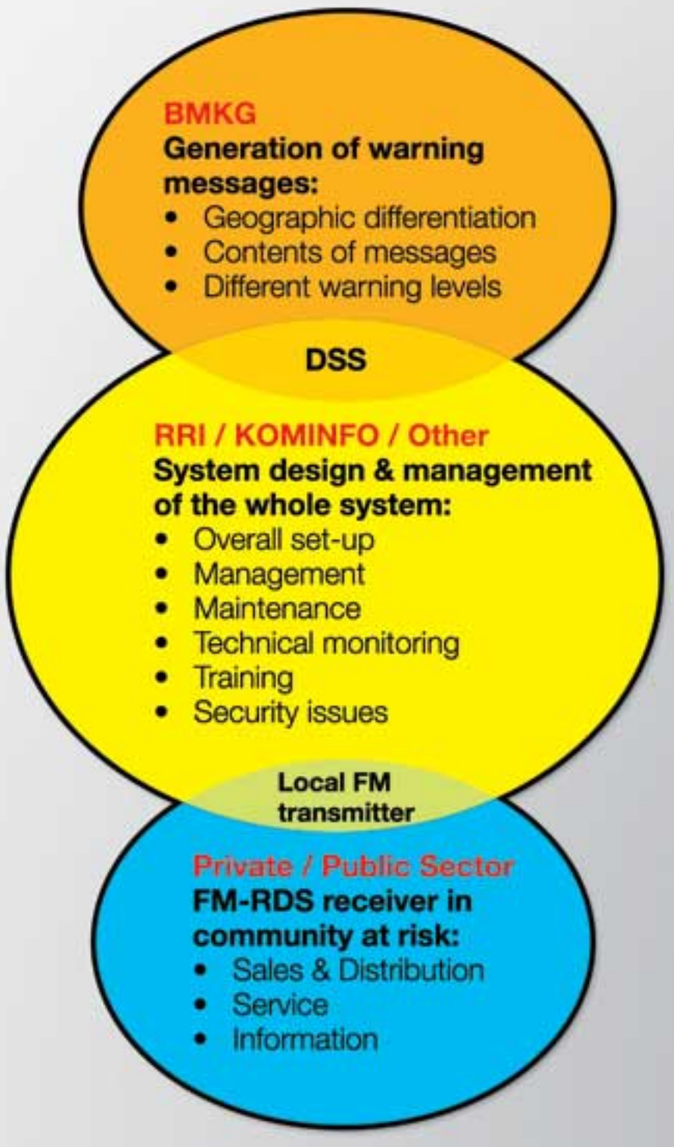
As FM-RDS was considered to be a promising technology for tsunami early warning, a pilot project was initiated to test FM-RDS as a dissemination technology for the "last mile". The pilot project was funded by the Indonesian and German ministries RISTEK and BMBF, and a private German company (2WCOM). GTZ IS became involved as a GITEWS consortia partner to coordinate the introduction and testing in the three GITEWS Pilot Areas.

WHAT HAS BEEN ACHIEVED?

In December 2006, the FM-RDS technology was tested successfully in Bali during a National Drill. The technical set-up was provided by 2WCOM, whereas the testing phase in Bali had been prepared, coordinated and evaluated by GTZ IS.

The preparation phase started with field tests to evaluate signal strength and the selection of an appropriate local FM radio station. The selected radio station, RRI Bali, was then equipped with an RDS-encoder to receive and transmit the RDS signal, as well as with a decoder to monitor the system and for problem solving. A FM-RDS server was installed at BMKG in Jakarta as the warning provider and a fibre optic link was established between BMKG and RRI Bali. In case of a (test) warning, BMKG was supposed to send a set of digital data to RRI Bali. In coordination with the local and national partners, GTZ IS distributed 37 receivers to public institutions and the private sector in Bali. The FM-RDS receivers were clock radios, which upon receipt of an alert signal interrupted the regular programme, produced a loud audio tone and a flashing display indicating a warning message. All recipients of the FM-RDS receiver received brief training and instructions for the testing phase.

The results from the testing proved the technical feasibility of the system, although certain issues, such as 24/7 service of the local radio station, power back-up and limited coverage of the signal in certain areas, needed improvement. The main findings were documented in test reports.



Proposed Set Up of FM RDS System for TEW

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2Wcom Wireless-World-Communication | RRI

The testing in the Pilot Areas of Padang (2007) and Java (2008) basically followed the same logic and procedures. The main difference was that privately operated radio broadcasting stations were included in the testing and were connected directly to the FM-RDS server at BMKG.

LESSON LEARNT

The strength of the system definitely lies in the direct and quick link from the National Tsunami Warning Center (NTWC) at BMKG to the community at risk and its "wake up" function, as well as the possibility to alert regionally or nationally by sending out only one signal.

The feedback from the target groups in all three Pilot Areas to the FM-RDS tests indicated a real demand for, and positive acceptance of, warning devices with the features of the FM-RDS system (individual receivers, wake-up function, price).

Interestingly, the testing also revealed that the biggest challenges for a successful application of the FM-RDS technology were not related to the technical field, but to organizational aspects, such as the overall management of the system, mandates and procedures.

One major issue was linked to the content of the warning message from BMKG, as the target groups of the FM-RDS are local institutions, as well as the public in general. As BMKG is not mandated to issue a call for evacuation – this is responsibility of local governments – it was questioned how local guidance for evacuation could be included in the message. This question led to a principal discussion about the value of warning without guidance and the division of roles and responsibilities between national and local institutions for early warning in the context of local tsunamis and extreme short warning times. While BMKG is now going to include recommendations for response action into their warning messages, it has not yet been determined whether local calls for evacuation will be transmitted by FM-RDS as well.

OUTLOOK AND RECOMMENDATIONS

As the institutional aspects associated with the integration of FM-RDS technology for tsunami early warning purposes have not yet been resolved, warning dissemination via FM-RDS has been suspended in all three pilot areas.

Although a mechanism to insert data directly from the Decision Support System at the NTWC in BMKG into a channel dedicated to FM-RDS is currently under preparation, it will be essential to first solve the organisational issues, such as an overall coherent system design, the roles and responsibilities of the involved institutions, as well as financial and operative questions.

Documentation of FM RDS Test in Pilot Areas

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