By Sharad Sadhu

Indonesia Public Broadcaster Implements DRM Emergency Warning Function - RRI sets up EWF in Digital Radio Transmissions in FM Band[1]

By Sharad Sadhu, Technology Consultant

Summary

The Indonesian public broadcaster, Radio Republic Indonesia (RRI) has taken the final step towards implementing the DRM Emergency Warning Functionality (EWF) in its five DRM FM transmissions. To that effect, RRI convened a two-day EWF workshop event in Jakarta in mid-October 2020 in which all the stakeholders participated and made presentations. This follows the recent commissioning of RRI's five digital radio transmitters in the FM band, using the Digital Radio Mondiale (DRM)[2] FM digital radio standard. After this, an in-depth evaluation of the technical parameters and coverage of the DRM FM transmissions was carried out by the Indonesian Ministry of Information and Communication (Kominfo), arriving at some very favourable conclusions on the performance.

RRI commits itself to providing Emergency warning services to public

In a significant step forward, RRI has committed itself to providing comprehensive emergency warning services to the public in Indonesia, using the DRM infrastructure.

DRM transmitters can be used for disseminating disaster warning to the radio listeners, in the event of an impending natural disaster. DRM in all bands supports "EWF" (Emergency Warning Functionality), which can automatically re-tune the receiver to the emergency program or even help to switch on receivers from standby in case of pending disasters. The emergency program then combines audio announcements with multi-lingual Journaline information to reach hearing impaired users and travelers with detailed on-demand information.

To discuss in detail the EWF and the end-to-end EWF deployment the recent Jakarta virtual webinar brought together RRI representatives, the national emergency disaster management agency (BMKG), regional disaster management bodies (BPBD), local disaster management councils, broadcasters, the Indonesian regulator Kominfo, the online connectivity provider Telkom (all of them physically present) and experts of Fraunhofer IIS representing the DRM Consortium, who joined online.
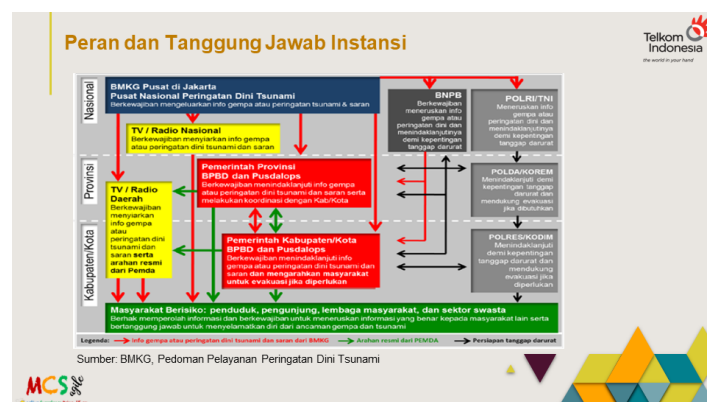

1: Disaster warning flow from BMKG

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[1] Info sources: RRI, Kominfo, Telkom Indonesia, DRM and Fraunhofer IIS

[2] www.drm.org

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Saving people's lives is by far the most important and critical mandate for the broadcasters, including the public broadcaster. This is very well recognised by RRI and this step brings the public broadcaster very close to the fulfilment of its obligation.

This well organised workshop addressed all aspects of the end-to-end EWF workflow, generation of disaster warning signals by the national / regional agencies, format for warning signals, signal distribution by online connectivity, EWF technology for DRM digital radio, signal-flow, warning signal distribution through DRM digital radio transmissions, reception of the EWF signals by DRM digital radio receivers and audible alarms and textual warnings / info provided by the Journaline system in the DRM radio, including on large public signage and display systems.

Presentations were made on behalf of RRI, Telkom, BMKG, BPBD and the DRM Consortium, identifying the core sectors of the EWF command chain, its command flow process, and the final dissemination by DRM digital radio transmitters. The functions carried out by all the stakeholders were explained. These were supported by several live demonstrations of the processes.
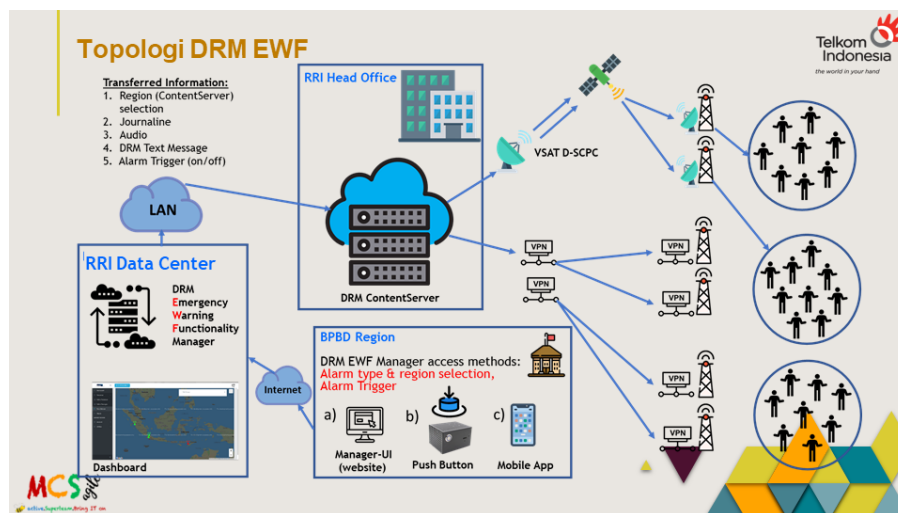

2. Signal flow presented by Telkom

RRI presented its preparedness as the key partner in the EWF chain and the logistics it has put into place. Telkom described its role in conveying the critical warning signals from the source to RRI and to RRI's transmitters, BMKG explained its role detection of the potential disaster, generation of the warning signals, its SOP and the role of its regional units.
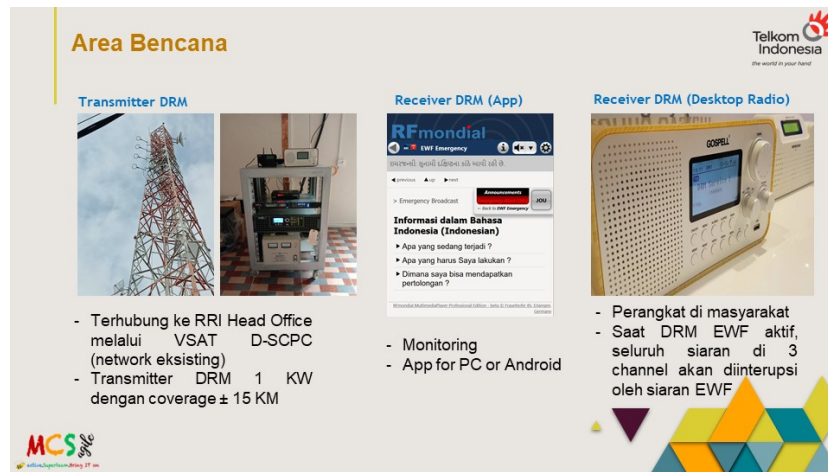
3. All systems go presented by RRI

Fraunhofer made several online presentations and live demos over the two days, covering the EWF facility in the DRM standard, generation and transmission of warning sounds and text messages, multilingual messages for hearing impaired and for foreigners, receiver functioning in case of emergencies and waking up of DRM receivers from standby sleep mode.

The demos attracted keen attention and explicitly exhibited the functioning of the systems and their set up. It was established that the DRM EWF is an extremely versatile and dependable warning system; it can be configured to reliably and accurately generate appropriate warning signals to be delivered to the specific affected areas.
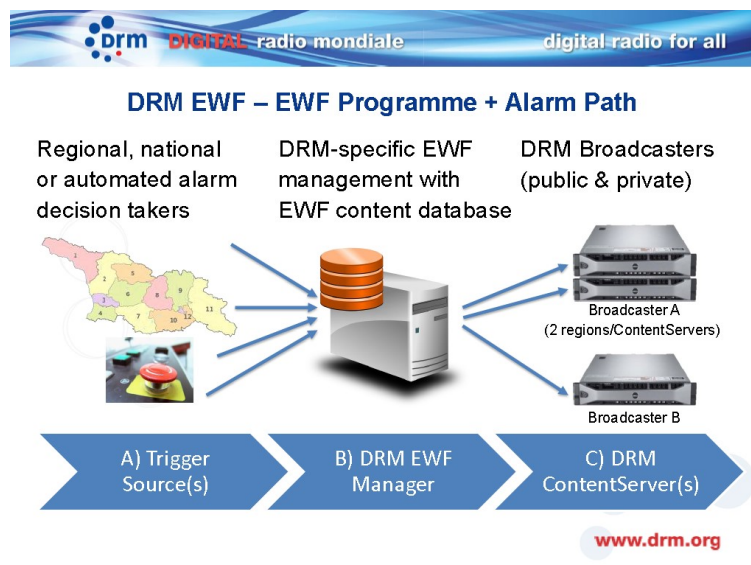

4. EWF overall signal flow chart

It is evident that, with this watershed event having successfully concluded, the senior management of RRI is fully committed to carrying out its mandated duty in saving people's lives in the face of natural disasters.

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This commitment was firmly put in place by Mr Freddy Ndolu, Supervisory Board Member of RRI, by Mr Rahadian Gingging, Director Technology of RRI and by the senior executives of all agencies.

Committing 5 DRM FM stations

RRI had already decided to implement the EWF service in its five DRM FM transmitting stations which are currently operational in Pelubharan Ratu in Sukabumi province[3], West Java, Pantai Labuan in Banten Regency, West Java, Cilacap, Java Tengah province, Labuan Bajo, Nusa Tengarah Timor province in Eastern Indonesia and in Painan, West Sumatra.

The location of these initial DRM FM transmitters has been selected so that these transmitters could be efficiently deployed for EWF warnings (including tsunami warnings) in the Western and Southern coastal areas. More such transmitters are planned in the near term to cover many such critical areas.
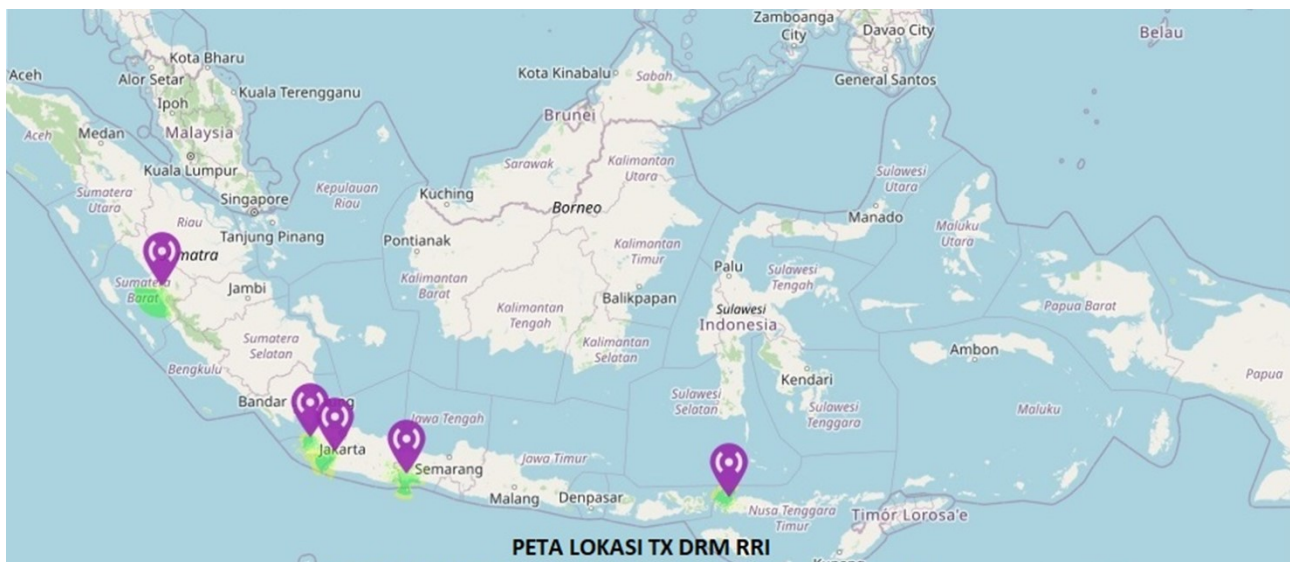
5. DRM FM transmitters operating in coastal areas

RRI's digital FM transmissions are based on the worldwide and open DRM digital radio standard, as applicable to the FM band, enabling digital radio experience, from better and more diverse audio services using the latest audio codec standard xHE-AAC, to on-demand Journaline advanced text information available free-to-air on the radio set, and EWF – Emergency Warning Functionality.

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[3] The first-ever DRM FM transmitter to be commissioned in the Asian region.

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6. RRI engineers in action; setting up DRM FM transmitters

Digital Radio Services

Currently, all the DRM FM digital radio stations are broadcasting audio services RRI Pro 1 and RRI Pro 3, plus a Journaline text service with news and current affairs information in textual form (in writing) in Bhasa Indonesia, The Journaline text information services allows to provide listeners with programme related and programme independent information for on-demand look-up at the radio set as a free-to-air services, national, Jakarta and international news, and other items of interest to our audiences, all without the need for Internet connection.

7. DRM FM transmission waveforms at all 5 locations

KOMINFO Measurements

KOMINFO conducted extensive measurements on the DRM FM transmissions of RRI at Pelabuhan Ratu, West Java and later at RRI Jakarta. Kominfo concluded that the test results in the field are consistent with ITU-R Recommendation BS.1114 and BS.1660. These conclusions, now publicly available, include that DRM digital radio in the FM radio band can be implemented side by side (co-existence) with analog FM radio using 200 kHz frequency spacing from existing FM radio; full DRM implementation can be emitted with a frequency space of 100 kHz between adjacent DRM FM radio transmissions; DRM technology on FM frequency bands can improve the effectiveness and efficiency of frequency spectrum usage, and DRM FM is a solution to provide for additional needs of broadcast radio channels in regions where FM channels are currently unavailable.
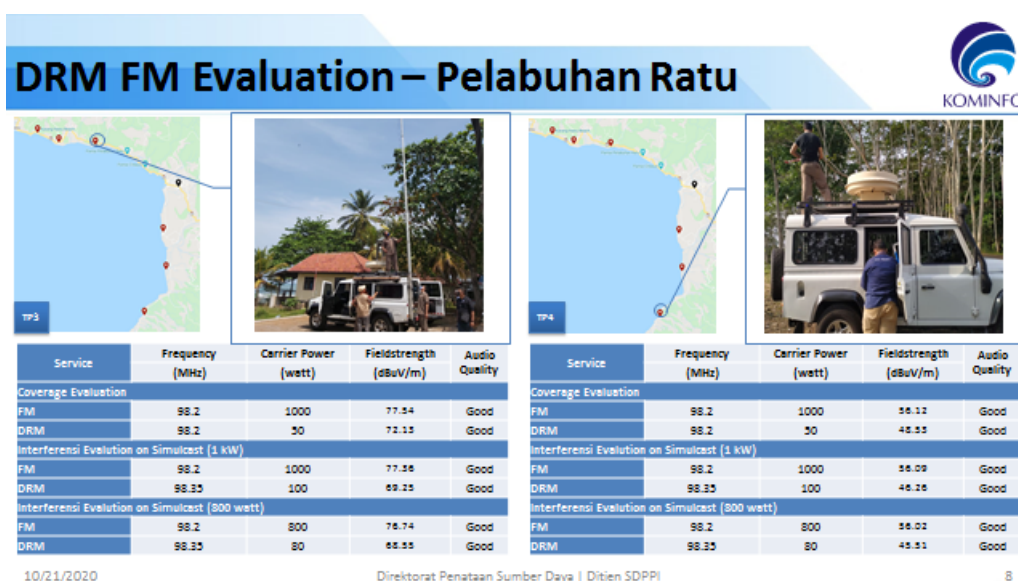
8. Evaluation results on DRM FM transmissions by Kominfo
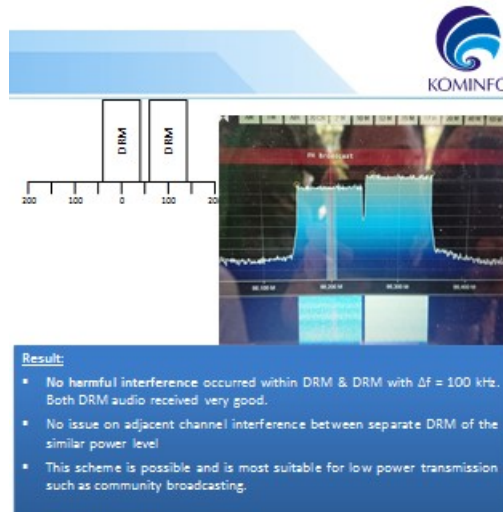
9. Two DRM FM slots side by side

Conclusion

With this the stage is set for the first-ever large-scale implementation of the EWF service in the Asian region. This will surely set an example for other countries in this region to use DRM EWF technology in order to save people's lives.

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