Empirical Study on Emergency Broadcasting: Based on the US, UK and Japan’s Experience

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Abstract

Construction and use of national emergency broadcast system, related to the safety of lives and property. Broadcasting system has the simple construction, easy to set up, transmission distance, wide transmission range, transmission speed, etc., in the notice of emergency incidents, emergency command, emergency evacuation and emergency shelter play a pivotal role. In the recent years, earthquakes, tsunamis and other natural disasters occur frequently, causing great loss of life and property, the establishment of the emergency broadcast system, more and more government attention. We introduce the emergency broadcast system in Japan, the United States, Britain and other countries, analyze the problems our country to carry out emergency broadcast services need to pay attention, and make recommendations.

Keywords: emergency broadcasting, information dissemination, emergency controls, tiered response.

Introduction

In 2004 in Indonesia 9.0 earthquake occurred in Wenchuan, Sichuan Province in 2008 8.0 earthquake in 2010, Chile 8.8 earthquake occurred in Japan in 2011 9.0 earthquake. In recent years, a series of thrilling earthquake caused severe loss of life and property, disaster warning is particularly important. Emergency broadcast is a quick and efficient disaster emergency message transmission channel, may be the first time disaster warnings to the public, in order to prepare in advance to minimize the impact of disasters. Many foreign countries have built a viable emergency broadcasting system, the country is also working to implement the national emergency broadcast system, this paper will summarize the experience of the emergency broadcast overseas development, and put forward their own thinking and recommendations of the national emergency broadcast system construction in China.

9.0 magnitude earthquake occurred in Japan, many people successfully caught a short time before the arrival of the tsunami escape danger, is broadcast to hear the alarm escape. Instructions in case of emergency, the broadcasts are the quickest and most effective means of signal transmission. Similarly, in the area of Qinghai 7.1-magnitude earthquake, the broadcast in the earthquake relief also play a significant role. SARFT after the earthquake disaster, immediately started to wave and shortwave broadcast-based emergency plans fully cover the

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affected areas. At the same time, distributed free of charge to the victims on the radio, effectively solve the people in disaster areas important to listen to broadcast disaster information to understand the problem, and impart information and morale play bridge and link.

China has not established radio and television transmission coverage networks quickly issued an emergency mechanisms and information technology systems, the existing radio and television technology system still cannot meet the requirements of the emergency broadcast. Therefore, in order to meet the needs of the national emergency response system, give full play radio and television covering a wide, high-impact, by many, post quick and easy advantage, absorb and learn from advanced foreign experience, to build a national emergency warning is based on radio and television transmission and network coverage the system is very necessary.

Currently, many countries regarded as an important channel for government television broadcast emergency information dissemination, broadcast television industry units into the emergency alert system member units, the establishment of an emergency broadcast warning system.

![Figure 1. Emergency broadcast.](image)

**The Proposed Methodology**

**Development of overseas emergency broadcasting.** Many countries have carried out an emergency broadcast service, and has achieved some success, to carry out our emergency broadcasting has a certain significance.

Japan is one of the world's most seismically active areas of disaster emergency alert system input very seriously. Disaster emergency broadcast system (EWBS) put into use in 1985, radio and television stations issued an emergency alert message, it will send a control signal to trigger radio has EWBS receiving function, the TV automatically turn on, play a warning message. Japan has experienced many earthquakes every year, only in January 2010 had 1313 times
perceptible earthquake. After several major earthquakes, the Japan meteorological agency beginning in 2007 unveiled to the public earthquake early warning (EEW), seismic monitoring system gives a warning broadcast by the NHK and other broadcasters to the public. In 2011, Japan has experienced 4500 earthquakes, which occurred March 11. 9 magnitude earthquake triggered a tsunami, causing a huge loss of life and property. The earthquake not seen for so many years earthquake early warning is particularly important.

Rapid response is the most notable feature EWBS systems, emergency warning information is generated automatically in the radio and television stations, for a time. Further terminal automatic wake-up also did not tune in to watch the program users get access to emergency information. Local time at 14:46:23 on March 11th, 2011, northeastern Japan Sea, a magnitude 9.0 earthquake, NHK at 14:46 on the release of 48 earthquake alerts and first, an audible alarm is issued, and is accompanied by a text message, then the television screen pop-up window displays a map and details of the earthquake. Rapid alerts provide emergency shelter for people valuable time.

US emergency alert system (EAS) by the Federal Emergency Management Agency (FEMA) construction management, occurs when a nation's state of emergency, the president of the United States can make use of EAS immediately release information to the public throughout the United States individual states and regions. US emergency alert system is a national early warning system, January 1, 1997 put into use. In addition the system can alert the local public typhoons, floods and other unexpected weather disasters, but also allows the US president in a speech released nationwide over 10 minutes. So far, in addition to November 9, 2011 United States EAS has been tested beyond, EAS has never been activated used. EAS regulations and standards developed by the federal communications commission (FCC) of the public safety and homeland security bureau, each state has their own EAS program. EAS has become part of FEMA integrated public alert and warning system by FEMA, FCC and the US national weather service (NOAA / NWS) jointly coordinated management.

EAS includes a broadcast network in the event of an emergency throughout the United States, each State and each area has to offer, cable networks and program providers, AM and FM radio and television stations, low-power television (LPTV), cable TV, XM Satellite Radio IBOC, DAB and other digital broadcasters, as well as DIRECTV, dish Network and all other direct broadcast satellite service providers.

Although there is no systematic British emergency broadcast technology system, but to carry out an emergency broadcast service. The British government and the British Broadcasting Corporation (BBC) to carry out relevant cooperation to BBC radio and television network support system as the main emergency broadcast by BBC under the regional and local broadcasters to broadcast emergency information to the national post. Britain adopted by the emergency broadcast radio, broadcast television direct way, in a hierarchical, there was no system design.
Foreign emergency broadcast applications experience. Quick and easy publishing process. Emergencies according to their different types and levels of advance has been making a good appropriate process systems and plans, if an emergency occurs, the system can quickly in the most efficient and easiest publishing process work, which reduces human intervention, response speed very fast.

Regional control design. United States, Japan has regional emergency broadcast system control design, not simply national coverage, according to the emergency information content of different, targeted region and selects the corresponding range of emergency information dissemination.

Full use of radio and television coverage resources. Emergency broadcast system is mainly relying on the existing network of radio and television coverage, and fully mobilize resources available. At the beginning of the construction of the emergency broadcast system, on account of the match with the existing radio and TV transmission network, at run-time use of wireless, cable, satellite, mobile multimedia and other transmission pathways, to maximize coverage of emergency information.

Uniform standards. Standard specification for a nationwide emergency broadcasting system, unity is the foundation. United States and Japan have developed corresponding emergency broadcast standards, the United States also EAS rules and regulations included in the Code of Federal Regulations.

Definition and characteristics of the emergency broadcast system. Emergency broadcast is when major natural disasters occur when unexpected events, public health and social security and other unexpected public crisis has caused or may cause significant casualties, property damage, environmental damage and serious social harm, endanger public safety, the emergency broadcast provides a rapid and efficient message transmission channel, the first time to deliver a message or disaster hazard in a timely manner so that the people know what happened, how should evacuate, hedge the life property damage to a minimum.

Meanwhile, emergency broadcast in the face of public emergencies, the state government issued an emergency message broadcast to the public, providing information services, to assist disaster relief rescue a very important means of emergency is an important part of the national emergency response system.

Constituting the emergency broadcast system. Although the emergency broadcast with a variety of implementations, while its architecture consists of three parts: the control part, transmission part and a receiving part.

Broadcast control is the central part of the emergency broadcast, the burden of control and emergency broadcast task, mainly from the emergency broadcast management system, emergency signal and audio processor.
Emergency radio broadcast control management system has the highest authority on the radio master control system and radio control system combined total for emergency broadcast scheduling. According to the emergency situation, set up an emergency broadcast area, wake-up / power for all terminals or sub-region FM signal coverage occurs via digital addressing coding control signal; in emergency disaster warning the first time to start setting emergency plans to protect emergency system broadcast; and government departments at all levels of emergency management center networking, you can enable the emergency broadcast system by telephone or other online method.

Transmission section. Selection of different emergency broadcast mode, the transmission carrier and in different ways and emergency radio broadcasts using the principle of alternate electric and magnetic fields, the use of electromagnetic wave propagation in the air broadcast signals and control signals; wired emergency broadcast using the principle of frequency division multiplexing, and closed-circuit television signal in HFC opto/coax cable transmission network CPC.

Receiving portion. Broadcast emergency broadcast receiving terminal, depending on the location and installation of systems associated methods, emergency radio broadcast receiving terminal has various types.

**Key Technology.** According to the characteristics of the emergency broadcast system, the construction of the emergency broadcast system key is choosing the right way to release the information, and a control signal transmission means, to ensure that the emergency broadcast system out, but also to develop the corresponding terminal to ensure timely response to the broadcast terminal, let hear people in disaster areas, and thus play a role in the emergency broadcast.

When disasters occur, often accompanied by power outages, or communications, traffic disruption as disaster information release and early warning systems should be simple structure, wide coverage, easy to receive information distribution system. All potential when the system is building the first fully exploit the existing resources of the broadcast, to be a complement to mobile, network disaster will spread the information.

Radio is the audio signal by modulating, amplifying and transmitting the like, converted into an electromagnetic wave radio transmission by airway, which without geographical restrictions, without environmental impact, without cumbersome wiring and other advantages. Will be loved by the majority of users, more simple construction, listen to flexible, easy to expand, and high cost, it is the construction of urban, rural, tourist attractions emergency security command broadcast mainstream programs.

**Control signal transmission.** Emergency radio control system is mainly to complete the task of publishing and managing emergency control signal, such as to meet the emergency situation, immediately launched the emergency broadcasting control command. Control command is a digital code embedded in the broadcast signal, transmitted to the emergency
broadcast receiving terminal specified frequency through the various radio and television transmission systems, emergency broadcast receiving terminal automatically boot broadcast emergency announcements.

The key components of the control system for the digital addressing coding machine, various control methods will eventually go to the emergency control of the entire broadcasting system by addressing coding machine, which broadcast the actual realization of sub-regional disaster. The realization of audio information via emergency radio station broadcast control software management and addressing control. The receiving device can be addressed through the broadcast control software, automatic control, point-broadcast to be any partition group, arbitrary setting function.

Disaster response center or various functional departments of emergency radio control system should be established by the government and by telephone or other remote control to open the emergency broadcast plan online mode, so that unattended, may be the first time warning.

Public emergency broadcast terminals installed in the main station building, outdoor and other public places, you can get the signal from the FM / AM or cable television network, with a specially designed tweeter for stand-alone installation in public. Public emergency broadcast terminals should also be considered in the installation continuity of supply factors, we must ensure that the emergency broadcast, the device can wake up and timely when the power supply to the power supply difficulties or disaster recovery installation point, should be coupled with solar panels and batteries.

**Particularity of emergency broadcast.** Reform and opening up, promote the rapid development of radio and television broadcasting, our country has adopted the central, provincial, municipal and county levels do radio and television policy, which played a crucial role in the history of time. In recent years, the advent of digital, network, systems integration development, ownership, management of resources, along with radio and television have been some changes around the formation of a certain difference.

**Covering digitization degree of particularity.** United States, Japan's emergency broadcast system, basically built on the basis of digital television, for example, Japanese is the use of superimposed caption signal is superimposed on the normal screen caption emergency information. Our country because digital broadcasting started late, the current digital level is not high, especially in the vast rural areas, urban areas, most are still watching analog television, so when the construction of the emergency broadcast system, we must take this into account, the use of existing resources to provide services, and to adopt new means compatible with future developments. Our emergency broadcasting started late, relatively scarce construction and operational experience related systems. But we want to realize their own strengths we can use a higher starting point for technology, drawing national experience, comprehensive utilization of
some communication, computer, Internet and other technologies and resources to achieve more powerful emergency broadcasting.

**Conclusion**

Events and people's lives and property caused by severe pain and threat, so we have to think deeply emergency treatment to deal with unexpected accidents, in order to reduce the destruction of lives and property in the event of an incident. Broadcast with the construction is simple, easy to set up, transmission distance, wide transmission range, transmission speed, etc., in the past many incidents emergency notice, emergency command, emergency evacuation, emergency settle played a pivotal role in any other means and the methods cannot be replaced. Especially when tolls caused traffic disruption, power supply, communication paralysis, the more obvious advantages.

**References**


