

ITSU – XX**NATIONAL REPORT SUBMITTED BY MALAYSIA****BASIC INFORMATION****1. National Contact**

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4. Emergency Management

In Malaysia the Deputy Prime Minister who is the chairmen of the National Disaster Management and Relief Committee which function as the national coordination mechanism for the management of disaster activities. This committee consists of representatives from various government and private agencies that are involved in disaster reduction and emergency management. Members of the

committee including the National Security Division, Armed Forces, Police, Fire and Rescue, the Civil Defense and many other organizations.

The *MKN 20* document clearly defined the functions and responsibilities of the relevant agencies that are involved in disaster emergency situations. The primary emergency management agency in Malaysia is the National Security Division under the Prime Minister Department that assigned the responsibility to coordinate all other relevant agencies in the event of any disaster occurring in Malaysia.

For tsunami disaster, the Malaysian Meteorological Department is responsible for issuing earthquake and tsunami warning information and the National Security Division is responsible for coordinating all other relevant agencies for tsunami evacuation.

5. Local and Distant Tsunami Procedures

Malaysian government has decided to set up a national tsunami early warning system, after the 26 December 2004 tsunami, to provide early warning on tsunami that may affect Malaysia. This system is expected to be completed by end of 2005. The tsunami warning centre is located at the Malaysian Meteorological Department Headquarters and is responsible for issuing earthquake and tsunami warning information.

Malaysian Meteorological Department (MMD) is operating on a 7day X 24hour watch over the occurrence of earthquake and tsunami in the Indonesian and the Philippines subduction zones. The potential tsunamigenic earthquakes occur in these seismic active zones generate tsunami and may take only 1 to 3 hours to reach the coastal areas of Malaysia.

The MMD operates the national seismic network and made available to the Minister, the national and state disaster management agency, mass media and other relevant agencies within 15 minutes of occurrence, the position and magnitude of moderate and strong earthquakes that are detected between the area of 90°E to 130°E and 5°S to 15°N. For earthquakes occur outside our seismic network, MMD's seismic system imports seismic waveform data from the GSN stations through the IRIS and USGS LISS server and the determination of position and magnitude of earthquakes can be made available within 15 to 20 minutes time.

MMD receives tsunami watch information message from PTWC and Japan Meteorological Agency (JMA) within 15 to 20 minutes after the occurrence of strong earthquakes. The messages are transmitted to MMD by GTS operated by World Meteorological Organization, fax and e-mail.

MMD considers all the earthquake and tsunami related information from PTWC, JMA, USGS and EMSC before making the decision for the issuance of tsunami warning. MMD is in the process of developing its own threshold magnitude for

declaring a potential local tsunami emergency if earthquakes occur within its territorial water. MMD threshold criteria will largely based on the PTWC and JMA operational procedures. For distant tsunami warning , MMD will depend on the tsunami watch messages issued by PTWC and JMA.

In the event of tsunami warning, the duty officer in MMD contact by phone, sending SMS short message and fax the tsunami warning message to the National Security Division that is responsible for coordinating all other relevant agencies for tsunami evacuation. SMS short message and fax also send to other agencies. The warning message also delivered by hotline to Radio and Television Malaysia (RTM) for broadcasting.

SUMMARY

After the 26 December 2004 catastrophic tsunami disaster, Malaysian government has decided to set up a national tsunami early warning system to provide early warning on tsunami generated in the Indian Ocean, South China Sea or the Pacific Ocean that will affect Malaysia. This system is expected to be completed by end of 2005. The tsunami warning centre is located at the Malaysian Meteorological Department and is responsible for issuing earthquake and tsunami warning information. The National Security Division is responsible for coordinating all other relevant agencies for tsunami evacuation.

Enhancement of National Seismic Network

The national seismological network will form an integral part of the national earthquake and tsunami early warning system as it provides the first level of alert on the possible occurrence of tsunami. Currently MMD operates 12 seismic stations in the country with additional 2 new seismic stations is planned for the existing network. The number of seismic stations with broadband sensors will increase from the existing 3 to 7. Sharing of near real time seismic data with other centres such as IRIS, USGS and Geoscience Australia has been implemented. The data sharing is crucial and helps to improve with better accuracy the determination of the location and magnitude of earthquakes.

Tide Gauges Network

Malaysian Meteorological Department plans to install a total of 6 water level and tide monitoring stations at the selected outpost islands. Satellite communication is used for transmit real time tide gauges data to the MMD for analysis.

Deep Ocean Buoys Network

A total of three deep ocean buoys will be deployed at strategic locations in the Northwest Straits of Malacca, South China Sea and Sulu Sea for early detection of tsunamis.

Tsunami Modeling in The Malaysian Seas

Several universities, MACRES and the Department of Irrigation and Drainage Malaysia in collaboration with foreign tsunami experts is in the process to develop the numerical tsunami model generating inundation maps for the coastal areas of Malaysia.

Public Awareness and Education

The National Security Division has taken the leadership role of public awareness and education on tsunami disasters. In collaboration with the local universities and other government agencies, numerous workshops, seminars, training and drills has been carried out to raise the awareness of the public relating to earthquake and tsunami. MMD is in the process of developing a basic website providing information on earthquakes and tsunami information.

NARRATIVE

Establishment of Malaysian National Tsunami Early Warning System

On 26 December 2004, a large earthquake of magnitude 9.3 occurred west of Aceh in Sumatra, Indonesia. The epicenter was located at latitude 3.1°N and longitude 95.5°E, about 680 kilometres northwest of Kuala Lumpur and 590 kilometres west of Penang. This earthquake has generated a massive and disastrous Indian Ocean-wide tsunami that struck the coasts of a number of countries in the region with high waves. This unprecedented tsunami had killed hundreds of thousands of people in several countries bordering the Indian Ocean. A total of 74 persons have been killed and many properties were destroyed along the northwest coastal areas in Peninsular Malaysia particularly the coastal areas of Penang, Kedah, Perlis and to a lesser extent Perak and Selangor

The tragedy happened because no country bordering the Indian Ocean had any experience and capability in the issuance of tsunami warning. The Government of Malaysia is very concerned with the lack of capability in carrying out tsunami watch and the issuance of early warning for tsunami in the nation. The Government has assessed the incident and identified the following limitations :-

- No agency was mandated to maintain tsunami watch
- Malaysian Meteorological Department (MMD) maintains a network of seismological stations and only issues information related to earthquake and tremors
- Unnecessary public panic on tsunami and tremors as a result of non-availability of timely and accurate information.

In this regard, Malaysian government has decided to set up a national tsunami early warning system to provide early warning on tsunami that may affect Malaysia. In the absence of an effective tsunami warning system, the Government will not be in a position to provide any effective early warning to the public in the event of another tsunami generated in the Indian Ocean, South China Sea or the Pacific Ocean that will affect Malaysia.

The Government has decided that the National Tsunami Early Warning System to be set up shall have the following key features :-

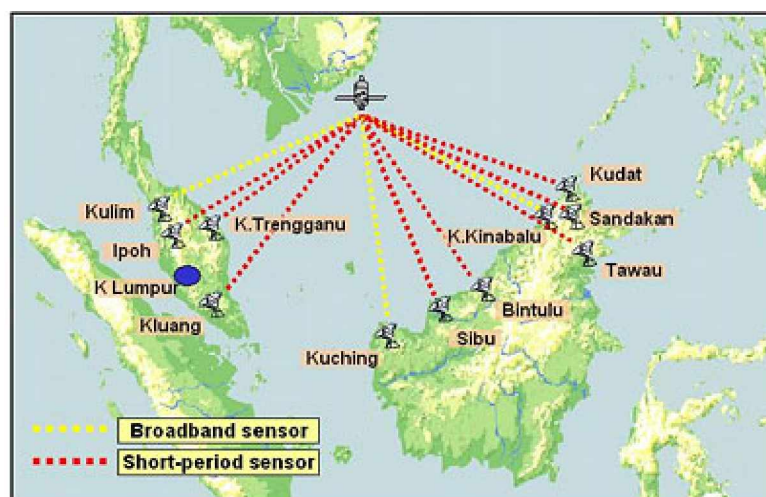
- Maintaining real-time continuous monitoring of earthquake occurrences and tsunami on a 24-hour basis throughout the year
- Issuance of information, advisory, notice, early warning and warning on the occurrence of earthquake and tsunami that threaten the security and safety of Malaysia

- The system shall be an integral part of the proposed Indian Ocean Tsunami Warning System to be coordinated by the Intergovernmental Oceanographic Commission.

This system is expected to be completed by end of 2005. The tsunami warning centre is located at the Malaysian Meteorological Department Headquarters and is responsible for issuing earthquake and tsunami warning information.

Enhancement of MMD Seismic/Earthquake Monitoring System

The Malaysian Meteorological Department (MMD) operates a total of 12 seismological stations throughout the country namely: five stations located in Peninsular Malaysia at Kulim, Kuala Lumpur (FRIM), Ipoh, Kluang and Kuala Terengganu; four stations located in Sabah at Kota Kinabalu, Kudat, Tawau and Telupid (Sandakan) and three stations located in Sarawak at Kuching, Sibu and Bintulu.



Location of existing seismic stations

MMD's current real-time digital seismic network is able to detect earthquakes and acquire digital seismic waves in real-time from the remote seismological stations distributed at nation-wide.

The network consists of one field station (K. Lumpur) using digital leased line for real time data transmission and the remaining 11 field stations with VSAT telemetry and 128kbps digital leased-line communication from the service provider's satellite gateway to the central processing centre in Kuala Lumpur for processing, analysis and dissemination.

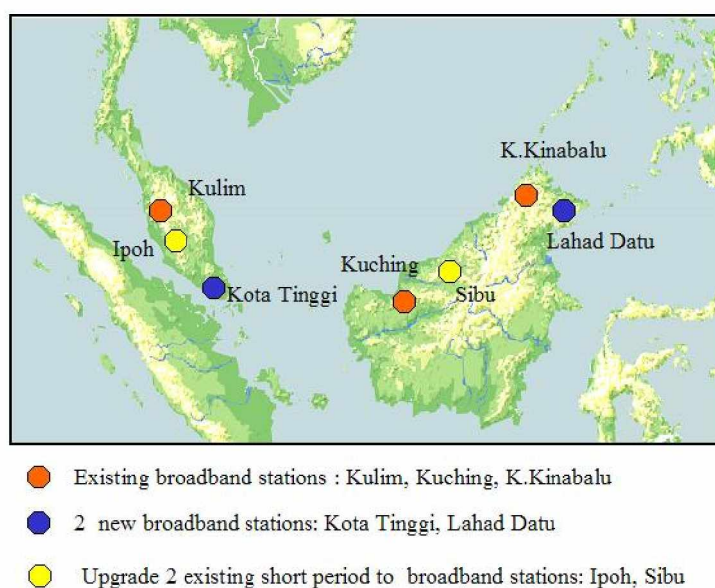
Real-time Seismic Data Sharing

Malaysia is already linked with IRIS, USGS and Geoscience Australia through Internet and is contributing near real-time waveform data from its 3 broadband stations; Kulim, Kuching and K.Kinabalu for regional and international exchange.

Likewise, Malaysia also importing real time waveform data from the GSN seismic stations through the IRIS and USGS LISS's Server. The data sharing is crucial and helps to improve with better accuracy the determination of the location and magnitude of earthquakes.

Upgrading Seismic Network

Malaysia will strengthen its existing earthquake monitoring system. Two new seismic stations will be added to the network. The existing 2 seismic stations that equipped with short period sensors will be upgraded to broadband sensors. The upgrading of the seismic network is expected to be completed by end of year 2005. The picture below shows the location of the broadband stations.



Location of broadband seismic stations by end of year 2005

Tide Gauges Network

Malaysian Meteorological Department, Royal Malaysian Navy and Malaysian Survey & Mapping Department operate the tide gauges along the coastal waters of Malaysia. Most of the tidal gauges are not equipped for real time data transmission.

A total of 6 water level and tide monitoring stations is planned to be installed in 6 selected outpost islands under the National Tsunami Early Warning System Project. These monitoring stations serve as the first line monitoring system as they will detect the rise of water level. Each of the 6 new stations will have a water level meter coupled with a tide gauge to measure the rise and fall of water. Satellite communication is used for real time data transmission of the tide gauges data to the central processing centre in Kuala Lumpur for analysis. The expected date of installation is by end of year 2005.

Deep Ocean Buoys Network

Buoys equipped with bottom pressure sensor positioned in the deep-ocean have been proven to detect the early passage of a tsunami before it reaches shallow waters and causes destruction along the coasts. These signals are very useful since it is the first set of instrumentation that confirms the generation of a tsunami and its probable size. The position of the buoy should be based on a study that would maximize the lead time of states to issue a warning to communities at risk.

In the event that a tsunami is generated, the equipments on the buoy will detect the tsunami wave and relay this information via satellite communication to the server in the National Tsunami Early Warning Center.

A total of three operational data buoys with seabed-mounted tsunami detection modules will be deployed at strategic locations in the Northwest Straits of Malacca, South China Sea and Sulu Sea for early detection of tsunamis. The expected date of completion is by end of year 2005.

Dissemination of earthquake and tsunami advisory/warning

A Dissemination Component is designed to disseminate advisory/warning and other information to all relevant personnel and agencies after the occurrence of an earthquake/tsunami. The modes of dissemination include the following :-

- a. Dispatching short messages (SMS) to mobile phones to selected users.
- b. Sending electronic/telefaxes to relevant disaster management agencies
- c. Transmitting relevant information to mass media and mass media broadcasting systems consisting of radio, television and print media
- d. Alerting the targeted public through public announcement systems using sirens and alarms including facilities available at mosques
- e. Alerting the public through phones and SMS based on area discrimination
- f. Automated updating of the MMD earthquake and tsunami web-pages.

Tsunami Modeling in The Malaysian Seas

Malaysia has not experienced any known tsunami before December 26 2004. No work and study has been carried out related to numerical tsunami modeling of the seismic

generated tsunami waves that affect Malaysia. Technical assistance is required to assist in developing numerical models taking into consideration of the shallow water in the Straits of Malacca and the South China Sea. Currently several universities, MACRES, Department of Irrigation and Drainage Malaysia are in collaboration with foreign tsunami experts to develop the numerical tsunami model to generate inundation maps for the coastal areas of Malaysia.

Public Awareness and Education

The National Security Division has taken leadership of public awareness and education on tsunami disasters. In collaboration with the local universities and other government agencies, numerous workshops , seminars, training and drills has been carried out to raise the awareness of the public relating to earthquake and tsunami. MMD is in the process of developing a basic website providing information on earthquakes and tsunami information.