

## **CONCEPT NOTE**

### **“IOWave - 18” - REGIONAL & NATIONAL TSUNAMI SIMULATION EXERCISE**

5<sup>th</sup> September 2018

Organized by Disaster Management Center (DMC)

Ministry of Irrigation & Water Resources and Disaster Management, GoSL

#### **Background**

According to a recent study researcher has warned, that Sri Lanka and most of the Indian Ocean Rim countries are highly vulnerable to large or even larger tsunamis generated by 9.2 Sumatra earthquake occurred on 26<sup>th</sup> December, 2004. 26<sup>th</sup> December, 2004 Sumatra earthquake resulted in a trans-oceanic tsunami, with wave heights up to 100 feet in some places, which impacted much of the Indian Ocean Rim countries. The resulting tsunami killed over 250,000 people in fourteen countries, including Sri Lanka, Indonesia, Thailand, India, and inundated thousands of coastal communities.

The recent study<sup>1</sup> conducted by University of Miami, USA and University of Peradeniya, Sri Lanka on frequency of past giant earthquakes in the Indian Ocean region indicated that Sri Lanka and most of the Indian Ocean Rim countries were affected by giant tsunamis at highly variable intervals, from a few hundred to more than one thousand years. During the 7,000-year records of Indian Ocean tsunamis preserved in the sediment, the research team found evidence that estimated the time period between consecutive tsunamis from 181 (up to 517) years and 1045 years. The longest period was nearly twice the time period prior to the 2004 earthquake. Professor Falk Amelung of UM, stated that the study results indicates there may be a 1000-year time period without a tsunami, which is nearly twice as long as the silence period prior to 2004 earthquake. This means that the subduction zone is capable of generating earthquakes almost twice as big as in 2004.

#### **Introduction**

Regional and national tsunami warning systems in every country must maintain a high level of readiness so that all the actions relevant to the public's safety can be provided effectively and efficiently during fast-onset and rapidly-evolving natural disasters involving marine inundation of coastal areas. Because of the relative infrequency of tsunamis, but knowing that tsunamis can have widespread impact across oceans and seas, the Intergovernmental Oceanographic Commission (IOC) of United Nations Educational, Scientific and Cultural Organization (UNESCO) and its Member States (MS) have been advocating through their Intergovernmental Coordination Groups (ICGs) and Indian Ocean Tsunami Warning and Mitigation Systems (IOTWMS) for the regular conduct of tsunami simulation exercises.

To maintain a high state of operational readiness, National Tsunami Warning Centers (NTWCs) and Disaster Management Center (DMC) must regularly practice their emergency

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<sup>1</sup> Holocene Indian Ocean tsunami history in Sri Lanka. 2014. Kelly L. Jackson, Gregor P. Eberli, Falk Amelung, Melany A. McFadden, Andrew L. Moore, Eugene C. Rankey and H.A.H. Jayasena. Department of Marine Geosciences, Rosenstiel School of Marine and Atmospheric Science, University of Miami, USA

response procedures in order to ensure that vital communication links work seamlessly, and that agencies and response personnel know the roles that they will need to play during a real event.

Though tsunami occurrences are rare in Sri Lanka, the Indian Ocean Tsunami of 2004 has shown the severity of the hazard and that the population near the coast and coastal low-lying areas are highly vulnerable to the risk of tsunami. Therefore anyone living or working in the coastal belt must have a clear understanding of tsunami and able to respond positively to such a devastating natural phenomenon.

### **About the Regional Tsunami Simulation Exercises (RTSE)**

The Indian Ocean Rim countries called for establishment of an Indian Ocean Tsunami Warning and Mitigation System (IOTWMS) in the aftermath of 2004 tsunami. The Indian Ocean Tsunami Warning Mitigation System (IOTWMS) is the result of significant international collaboration and contributions from Indian Ocean Rim countries, in response to the devastating tsunami occurred on 26<sup>th</sup> December, 2004. An Intergovernmental Coordination Group was established in 2005 with the support of UNESCO's Intergovernmental Oceanographic Commission to provide a governance mechanism for a new System, which became operational in 2011.

Thus, Indian Ocean Rim countries are now need to sustain the tsunami warning system, dissemination mechanisms, continuous community awareness programs and enhance the response capability that have been developed across the Indian Ocean Rim countries over last ten years. Indian Ocean Rim countries must remain alert and prepared against the ever present tsunami threat.

### **Implementation of Regional and National Tsunami Simulation Exercise (RTNSE)**

This Regional and National Tsunami Simulation Exercise is scheduled on 5<sup>th</sup> of September 2018 with the participation of seven Indian Ocean Rim Countries. In Sri Lanka, the activation and coordination of this simulation exercise from National to local level is entrusted to Disaster Management Center (DMC).

### **Overarching Objective**

The overarching objective of this regional and national scale exercise is to measure the physical as well as the human resource capacity and response times of the various stakeholders involved to address such a rare but potentially destructive tsunami event.

### **Specific Objective**

1. To validate and evaluate the procedures for countries to receive the Tsunami Messages issued by the Regional Tsunami Service Providers (TSPs) through their National Tsunami Warning Center (NTWC);
2. To test the dissemination of the Tsunami warning messages to the relevant agencies that are responsible for emergency response;

3. To identify best practices and critical areas to be addressed in future activities, and room for improvements in the entire process including the procedures already tested between TSPs and NTWCs and also the diverse landscape of national capacities to handle the tsunami risk;
4. To evaluate the effectiveness of communication flows between the stakeholders involved, country readiness and the efficiency of emergency operation and response procedures in place;
5. To identify the required support to enhance the ability of each level to respond to and mitigate the negative impacts of tsunamis;
6. To understand the gaps in National Emergency Operation Plan (NEOP) developed for Sri Lanka.
7. To practice and find the gaps in Synergized SOP of (NTWC) and (DMC)

### **Purpose of participating in Regional Tsunami Simulation Exercise**

Purpose of participating in regional tsunami simulation exercise is to understand the gaps in prevailing mechanism at national to local level and to facilitate the speedy dissemination of alerts across the vulnerable coastal districts of Sri Lanka.

### **Tsunami Simulation Exercise: A scenario for participating countries & stakeholders**

The proposed regional tsunami simulation exercise is based only on major tsunami which could originate in Sumatra-Andaman seduction zone of the Indian Ocean. Participating countries have selected either a distant or a regional source event which will cause the greatest impact to their country.

The exercise will be conducted in real time and the Indian Ocean Tsunami Service Providers – Indonesia, India and Australia will issue alert and warning messages to Department of Meteorology as the National Tsunami Warning Center (NTWC) alerting them to the simulated threat. They will then analyze the information received to assess the threat to their nation and take actions as they deem appropriate.

### **Key stakeholders proposed for Tsunami Simulation Exercise:**

This exercise involves national level simulated tsunami warning issued by the service provider, dissemination, disaster management and main emergency response organisations. Several Regional, National and Sub national level stakeholders are already chosen, including 14 coastal districts of Sri Lanka and selected local communities for the evacuation exercise.

This exercise will include evacuation of population in pre-selected GN Division of each coastal district under this exercise. All stakeholders will be made aware through media and all other communication channels.

#	Name of the key stakeholder	Functional Role expected
1	Disaster Management Center	Overall Coordination, Facilitation and Dissemination
2	Department of Meteorology	Receiving of Tsunami warning sent by Tsunami service provider
3	14 Coastal District Secretariats	Re-Dissemination of Tsunami Warnings
4	14 Selected DSD's	Sub national level coordination
5	14 Selected GND's	Re-Dissemination of last mile Tsunami Warnings
6	Police	Evacuation of population, maintaining of Law & Order
7	Tri-Forces	Emergency Response
8	Media	Communication/Dissemination
9	Ministry of Disaster Management	Observers
10	Geological & Mines Bureau	Observers
11	Airport & Aviation of Sri Lanka	Observers
12	NARA	Observers
13	ADPC	Observers
14	Sri Lanka Red Cross Society	Observers
15	WFP	Observers
16	Japanese International Cooperation	Observers
17	Prof Dilanthi(Hudersfield)	Observers
18	Prof Reched(Hudersfield)	observers

### Key Activities scheduled

The following key activities are proposed by the Disaster Management Center (DMC) for successful completion of regional and national tsunami simulation exercise.

#### Orientation Phase I

##### 1. Initial meeting scheduled on 01<sup>st</sup> of August 2018:

All the DMC staff will be sensitized on proposed national Tsunami exercise and allocate duties for each divisions and the individuals of DMC.

##### 2. Orientation session scheduled on 10<sup>th</sup> August 2018:

The orientation seminar is an overview or introduction. Its purpose is to familiarize participants with roles, plans, procedures, or equipment. For the purpose of IOWave 18, an orientation seminar could be used as an opportunity to introduce the national stakeholders to the TSPs, in general, in a country in which the agencies has never previously been directly involved in the simulation exercises. A different example of an orientation exercise would be to involve the national stakeholders required to assess the feasibility of using a national emergency operation center that is already performing an emergency response function for other risks in order to respond to a tsunami event.

The aim would be to identify the upgrades/adaptation eventually needed to tackle this particular type of risk. The main motivation for an orientation exercise is the need to provide stakeholders with an overview of authorities, strategies, plans, policies, procedures, protocols, and resources needed (i.e. to be set up) or already available at country level for responding to a tsunami. This kind of exercise would provide an opportunity to raise awareness among the national emergency operations center and response officials regarding the RTSE.

### **3. Table Top Exercise (TTE) scheduled on 13<sup>th</sup> -31<sup>st</sup> August 2018**

A table-top exercise may also be referred to as a “discussion exercise”. Participants are presented with a situation or problem that they are required to discuss and for which they formulate the appropriate response or solution. Normally, the exercise requires no simulation other than a scenario and/or prewritten exercise injects.

An exercise moderator introduces a simulated scenario to participants and, as the exercise advances (in time), exercise problems and activities (injects) are further introduced. This type of exercise is used to practice problem-solving and coordination of services with or without time pressures. There is no deployment or actual use of equipment or resources.

A table-top exercise simulates an emergency situation in an informal, stress-free environment. The participants, usually people at a decision-making level, gather around a table to discuss general problems and procedures in the context of an emergency scenario.

### **4. Press Release/National level Media Briefing to be scheduled prior to the full simulation exercise**

Press release should be prepared and circulated among major national communication channels including print, broadcast and telecast media. It should clearly include the objective, purpose, date and time of the exercise. In addition, Media briefing should also arranged to inform the exercise as otherwise it will create an unnecessary chaos among coastal population during the exercise.

## **Sub National level Orientation Phase II**

**5. Arrange and Conduct Table Top Exercise (TTE) at your respective districts in-between 13<sup>th</sup> - 31<sup>th</sup> August 2018, based on guidance provided during the above meeting:**

**6. Identify the most vulnerable 76 GNDs for Tsunami in 14 districts with the assistance of District Secretary, Divisional Secretary and respective Grama Niladhari of selected GND:**

## **Operational Phase III**

**7. Conduct Regional and National level Tsunami simulation exercise on 5<sup>th</sup> September 2018:**

A full-scale Tsunami simulation exercise may also be referred to as a “practical” or “field” exercise. It includes the movement or deployment of people and resources to provide a physical response “on the ground” to a simulated situation. These exercises are typically used to test all aspects of a country's warning and emergency management systems and processes, and to the extent that is practical, using actual centers and communications methods.

### **6.1 Conduct a Drill exercise at the most vulnerable GNDs for Tsunami in 14 districts on 5<sup>th</sup> September 2018 in line with Tsunami simulation exercise**

In a drill exercise, staff physically handle specific equipment or perform a specific procedure or single operation. A drill usually focuses on a single organization, facility or agency such as a national emergency operation center, hotel, school or village. The exercise usually has a time frame element and is used to test procedures. Performance is evaluated in isolation. A drill is a subset of a full-scale exercise.

## **Evaluation Phase IV**

### **8. Conduct evaluation on post tsunami simulation exercise:**

The goal of evaluation is to validate strengths and identify opportunities for improvement within the participating organizations. This is to be accomplished by collating supporting data, analyzing the data to compare effectiveness against requirements, and determining what changes need to be made by participating organizations, as well as the DMC as a coordinating agency to support effective tsunami warning and decision making.

Evaluation of this exercise should focus on the adequacy of plans, policies, procedures, assessment capabilities, communication, resources and inter-agency/inter-jurisdictional relationships that support effective tsunami warning and decision-making at all levels of government. Participants that choose to include additional objectives, for example by exercising public warning and/or response plans, can expand the evaluation form accordingly.

### **9. Final Evaluation Report** can include the following,

1. Exercise description
2. Post-Exercise Evaluation Summary and Findings
3. Identification of Best Practices or Strengths
4. Identification of Areas for Improvement
5. Recommendations on Plans of Action for Improvement

## **Expected outputs**

- Stakeholders are well aware and understand their role in scheduled regional and national tsunami simulation exercise
- Table Top Exercises are conducted in all 14 Coastal districts
- Most Vulnerable GND's are identified and selected for tsunami simulation exercise at each coastal district
- Regional and National level Tsunami simulation exercise conducted

- Evaluation Report on Regional and National level Tsunami simulation exercise is published