United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

NORTH-EASTERN ATLANTIC AND MEDITERRANEAN
Tsunami Information Center
NEAMTIC

A GUIDE TO TSUNAMIS FOR HOTELS

IOC Manuals and Guides N° 69

A GUIDE TO TSUNAMIS FOR HOTELS

Tsunami Evacuation Procedures

A Guide to Tsunamis for Hotels: Tsunami Evacuation Procedures. IOC Manuals and Guides, 69. (IOC/2012/MG/69)

English only.

Electronic copy of this guideline could be downloaded from http://neamtic.ioc-unesco.org

Text by: Ardito Marzoeki Kodijat
Layout and design: Ardito Marzoeki Kodijat
This guidebook is developed in cooperation with Jakarta Tsunami Information Centre
UNESCO/IOC - UNESCO Office Jakarta

For more Information please contact:
North-Eastern Atlantic and Mediterranean Tsunami Information Centre
Intergovernmental Oceanographic Commission of UNESCO
1, rue Miollis - 75732 Paris, France
Tel: +33 1 45683952

Table of CONTENT

Acknowledgement

These guidelines have been prepared in fulfilment of a task of the Tsunami Information Centre (NEAMTIC) Project of the Intergovernmental Coordination Group (ICG) of the Tsunami Warning and Mitigation System in the North-eastern Atlantic, the Mediterranean and Connected Seas (NEAMTWS). NEAMTIC is a two years project funded by the European Union's Directorate General ECHO, it is coordinated by the Intergovernmental Oceanographic Commission of UNESCO and is done in partnership with the Commissariat à l'énergie atomique et aux energies alternatives (France), the Presidenza del Consiglio dei Ministri – Dipartimento della Protezione Civile (Italy), the National Observatory of Athens (Greece), and the Fundação da Faculdade de Ciências da Universidade de Lisboa (Portugal).

Foreword

Following the disastrous 2004 Indian Ocean tsunami, the Intergovernmental Oceanographic Commission of UNESCO (UNESCO-IOC) was given a mandate by its Member States to facilitate the expansion of global coverage of Tsunami Warning and Mitigation Systems (TWS) and to co-ordinate the establishment of a TWS for a region comprising the North-eastern Atlantic, the Mediterranean and Connected Seas. As part of this process, a Tsunami Information Centre (NEAMTIC) is being created to serve the needs of civil protection agencies and the public at large, providing information on warning systems, risks and good practices in respect of tsunamis and other sea-level related hazards. This guideline forms a foundation for these objectives. It provides guidance for hotel managers to assist and guide their guests for evacuation in case of a tsunami event. This is particularly important in the NEAM region considering that the Mediterranean is the first tourist destination in the world. As highlighted in the UNESCO/UNU Symposium "The Great East Japan Tsunami on 11 March 2011 and Tsunami Warning Systems: Policy Perspectives" final statement, tsunami preparedness involves also the awareness component which may be improved by educating the public about the nature and threat of the hazard but also on safe behavior to be adopted in case of an event. Early self-evacuation is of major importance.

Wendy Watson-Wright

Assistant Director General, UNESCO

Executive Secretary of IOC

Executive Summary

This booklet summaries steps that will guide hotels to prepare for tsunami hazards. This guidebook is to be use by hotel management; it is intended to direct them on how to build the hotel's capacity in evacuation planning for tsunami emergency. The guidebook outlines the necessary steps to be undertaken, such as preliminary preparedness assessment using a checklist from the "Tsunami Ready" Toolbox, understanding the warnings (natural warning and official warning), deciding on an evacuation strategy, consideration for a hotel to be an evacuation area and the standard operating procedures for tsunami emergency.

This guidebook is devided into five parts. The first part provides a brief information of what is a tsunami and why it is important for hotels to address this hazard as part of their business. Part 2 decribes the tsunami hazard in the North-Eastern Atlantic and the Mediterranean Seas and efforts that has been taken in response to mitigate the hazard. Part 3 focuses on aspects that hotels need to take into consideration in building tsunami preparedness. This part also elaborates three different situations that influences evacuation strategies. Part 4 elaborates on considerations for a hotel to decides if the hotel could be a tsunami evacuation area, including determining the evacuation place in the hotel premises and on the signage needed for the evacuation place. Finaly, part 5 highlights the evacuation planning and procedures for the hotel that may serve as their standard operating procedures in tsunami emergency.

This guidebook explains the steps in building tsunami preparedness, however, to successfully develop the plans and procedures the hotel has to do all the ground work. It is recommended to work through participatory approach with all hotel stakeholders (staff and management) to simultaneously build in the capacity and ownership. At the same time, the hotel should also coordinates with the local disaster management office and/or other local authorities and stakeholders working on disaster and emergency management (for example red cross) to know more about the tsunami risks in the area as well as other local disaster management issues .

I. Introduction

Hotel is a part of the tourism industry that relies on guests/visitors. However, most hotels are located in tourist areas that are more and more exposed to disasters such as earthquake, volcano, sea level rise, and tsunami. Hotel guests, as tourists, usually are not familiar with the local situation and therefore are considered as one of the vulnerable group. Most of the times tourist are not aware of the nature and threat posed by the hazards in that particular area; thus the guess will not know what to do, and where to go if there is a disaster emergency. During emergency they came to a situation where they need to rely on those who know more about the local situation. In this case the hotel staff and management will be the most reliable source for the guests. Therefore, hotels need to include disaster preparedness as an integrated part of their business operation.

Although tsunami events occur less frequent compared to other disasters, recent tsunami events in the Indian Ocean (2004); Indonesia (2004, 2006, and 2010); Chile (2010); and Japan (2011) have shown that the effects of tsunamis can be catastrophic. The first priority when a tsunami occurs is the evacuation of the people in the tsunami risk areas. The time span between a warning and the impact of the first tsunami wave might be very short (especially for the locally generated tsunamis). This will affect on the when, how, and where the people have to be evacuated.

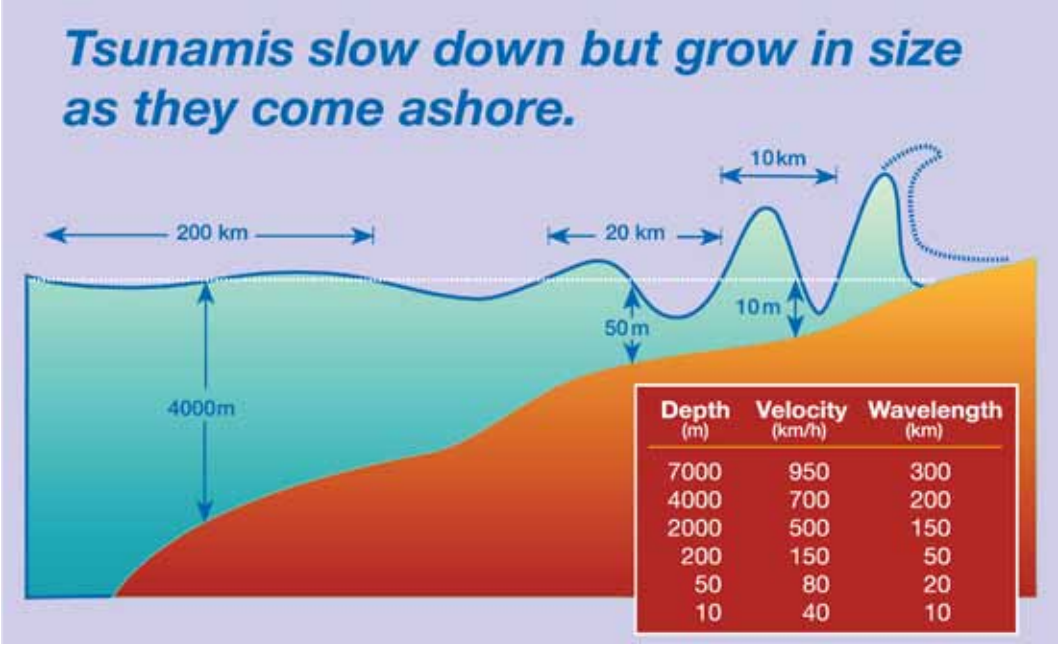
Once a tsunami early warning is received (either natural warning or official warning) hotels are responsible to assist and guide their guests for evacuation. It is very important for the tsunami evacuation plans and procedures to be integrated as one of the hotel's operational systems.

In the North-Eastern Atlantic and Mediterranean coastal areas, tsunami happens less frequently compared to the Pacific. However, there are evidence and records that major tsunamis have happened and have caused fatalities and damaged, for example in Crete (365), in Lisbon (1775), in Messina (1908), and in Aegean Sea (1956). The most recent tsunami happened in 2002 in Stromboli and in 2003 in Algeria, fortunately are not too damaging. This historical record of past tsunamis, scientific trace of events, and written and/or oral reports, indicate a high certainty that another tsunami can happen in the future. It is not a matter of "*if the tsunami will happen*" but more of a question of "*when the next tsunami will happen*". Since most tsunamis resulted from an earthquake activity, it is not possible to predict when the next tsunami will happen. For this reason preparedness is the key for people to be able to respond to and recover from when the tsunami strikes again.

What is a Tsunami?

Tsunami is a Japanese word closely translating to ‘harbour wave’. Tsunamis are large ocean waves generated by major earthquakes beneath the ocean floor or major landslides into the ocean. Tsunamis that are caused by severe nearby earthquakes are known as **locally generated tsunamis**; this type of tsunami may reach the coast within minutes. Tsunamis that are generated by very large earthquakes far away in other areas of the ocean are known as **distant tsunamis**. Waves caused by these earthquakes travel at hundreds of miles per hour, reaching the coast several hours after the earthquake.

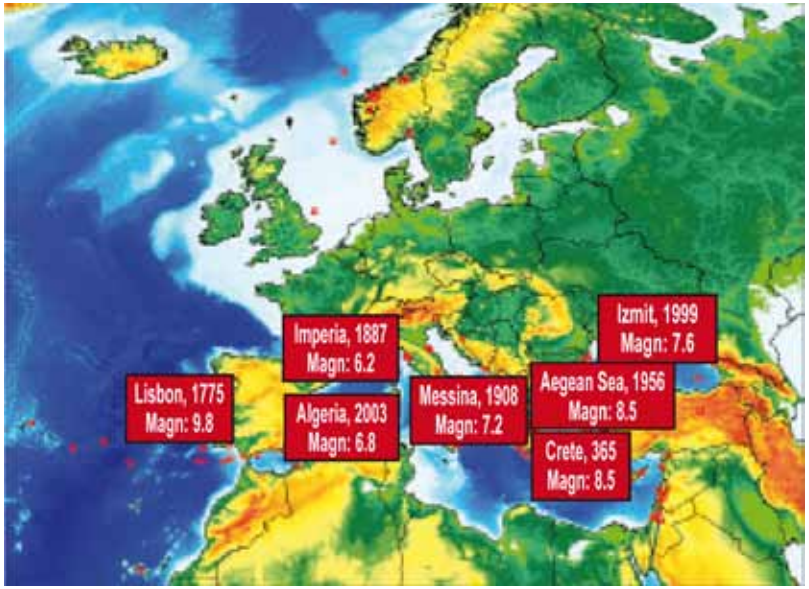
In the deep ocean tsunami travel at jet airliner speeds but the waves are only a few centimeters high and cannot be felt aboard ships. When the waves enter shallow water, they may rise to several meters or, in some cases, tens of meters, striking the coast with devastating force. Tsunami waves can come ashore in many different ways among which are: a wall of water (resembling white wash), a rapidly rising tide, and a series of surf like breakers. The first wave may not be the largest and the series of waves may impact coastlines for several hours.



II. Tsunami Hazard and Mitigation in the North-Eastern Atlantic and the Mediterranean Seas (NEAMS)

Tsunami Facts in NEAM Seas

Although it is less frequent than in the Pacific tsunamis can hit the Mediterranean and North East Atlantic coastal areas, causing extensive loss of lives and properties. Major tsunamis with ten-thousands of casualties and severe damages happened to coastal cities in the past such as in Crete (365), Lisbon in 1775, Messina in 1908 and Aegean Sea in 1956 . Even recently, a tsunami has been generated in the Izmit Bay it has affected the coastline extensively following the 1999 Izmit earthquake. At some locality the inundation distance ranged up to 35 meters. Furthermore, tsunamis have been generated in 2002 in Stromboli and in 2003 in Algeria though fortunately not very damaging. These historical record of past tsunamis, scientific trace of events, and written and/or oral reports, indicates that a high certainty that another tsunami can happen in the future.



Tsunamis in the North-Eastern Atlantic and the Mediterranean (S.Tinti)

The Mediterranean area represents the collision between the European and the African plates, and comprises a number of geodynamic regions affected by a different seismic activity extended from West to East. Furthermore volcanic and geomorphological processes could be at the origin of tsunamis in the area.

This geodynamic condition and the historical records confirmed us that it is not a matter of “if tsunami can happen” in these regions but it is a question of “when it will happen”. This also tells us

Because of the active lithospheric plate convergence, the Mediterranean Sea region is geodynamically characterized by high seismicity and significant volcanism. Furthermore, coastal and submarine landslides are quite frequent, partly in response to the steep terrain that characterizes much of the basin. Tsunamis are among the most remarkable phenomena associated with earthquakes, volcanic eruptions and landslides in the Mediterranean Basin. Until recently, however, it was a widely held belief that tsunamis either did not occur in the Mediterranean Sea or they were so rare that they did not pose a threat to coastal communities. Catastrophic tsunamis are more frequent on Pacific Ocean coasts where both local and transoceanic tsunamis have been documented. On the contrary, large tsunami recurrence in the Mediterranean Sea is of the order of several decades and the memory of tsunamis is short-lived. Tsunami catalogues for the Mediterranean Sea have been compiled by several authors [1].

[1] Strong Tsunamis in the Mediterranean Sea; A Re-evaluation; Gerassimos A. Papadopoulos and Anna Fokaefs, Institute of Geodynamics, National Observatory of Athens, Athens-11810, Greece. ISET Journal of Earthquake Technology, Paper No. 463, Vol. 42, No. 4, December 2005, pp. 159-170

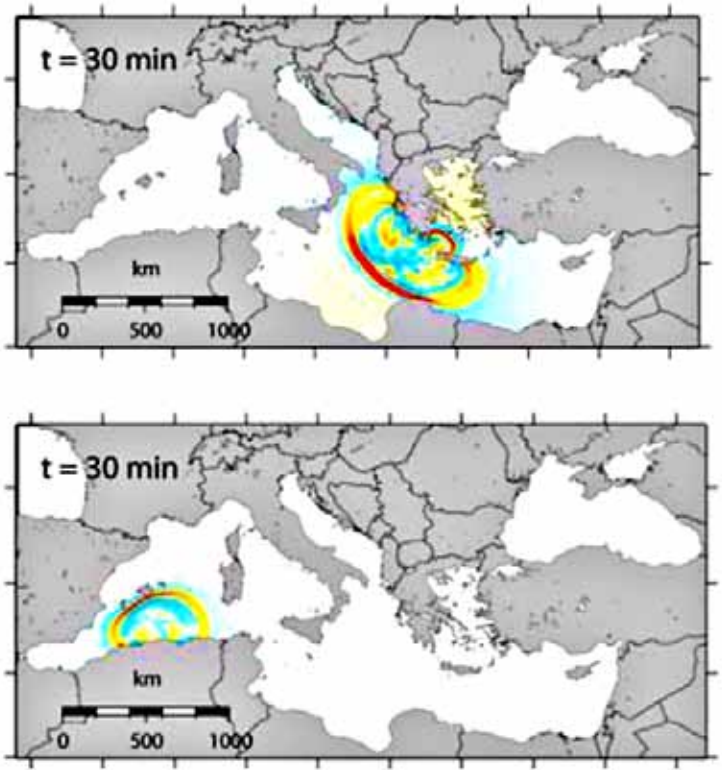
that tsunami risks exists. Therefore, hotels along the coastline facing the Mediterranean Sea and the North-eastern Atlantic need to understand this risks and make sure the preparedness and response capacity are build in their operational system.

Understanding the hazard and identifying the risks

To start to work on disaster management plan, disaster risk reduction, and evacuation planning hotels have to first understand what are the types of hazard that threat the hotel's area and what are the risks caused by these hazards. Tsunami has been identified as one type of hazard that is a threat to the North-eastern Atlantic and the Mediterranean Seas coastal area. Therefore, for hotels that are located in these coasts need to consider tsunami as one of the hazard and assess what are the risks.

Tsunami hazard is complex in nature for it can happen at any time and depending on the location it might only gives a very limited time for the people to evacuate. To assess this hazard one has to understand the geophysical condition of the source, to know how the tsunami is generated by the source, and to know the extent of the inundation that can happen as the tsunami reaches the coast. To have a better understanding the tsunami hazard in the area the hotel needs to:

- Coordinate with local disaster management office and policy makers to understand tsunami hazard in the area and what have been done to mitigate the hazard;
- Know about tsunamis that have come ashore in the hotel area in the past;
- Check hazard maps to know the hotel area's level of threat based on different scenarios: possible time frame of arrival, how the tsunami waves propagate to the area, as well as estimated inundation area and depth in the hotel area.



Example of Tsunamis propagation after 30 minutes from different sources, the scenario above the source is in the western Hellenic arc and bellow is in the north Algeria. (Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, NEAMTWS, Implementation Plan)

Once the hotel knows about the hazards that threaten the hotel's area, the hotel needs to assess what are the potential risk that will affect the hotel if a disaster strikes.

Risk identification and assessment is a process of measuring the potential of loss of life, injury, property damages and economic impact caused by the hazards. Risk assessments involve evaluation of the vulnerability of the people (among other staff, guest, visitors, including guest's children, and people with special needs) and building and facilities (such as integrity of the building structure, water supply, and power supply). Assessment should also consider the hotel's business risks, analyzing the impact if the disaster happens (for example post disaster tourism market and insurance coverage). The main important question to ask in identifying the risk is "what would happen if earthquake and tsunami strikes?" and elaborate the question with: what if it happened at night? what if it happened when the hotel were at the highest occupancy? and what if it happen during cold weather time?

Understanding the tsunami risks in the hotel area will be the basis for the hotel management to better focus on their activities and resources in building response capacity (such as develop tsunami emergency response standard operating procedures), take the necessary actions (for example make sure the building meet the criteria to be designated as vertical evacuation building, re-locate the hotel's power supply and communication system to a safer place), and working on tsunami preparedness (for example conduct regular tsunami exercise involving all staff, related stakeholders and if necessary the hotel guests).

Hotel guests and visitors should be consider as vulnerable group since they usually have limited knowledge of the area. Hotels have the responsibility to ensure the safety and wellbeings of their guests and visitors by informing of the potential disaster and actions to be taken in case of emergency.

Understanding the warning

Natural warning

An earthquake is one of nature's tsunami warning sign, when you feel a strong earthquake that makes you can hardly stand, or a slow shaking but for a longer time, a Tsunami may have been generated (locally generated tsunamis). Tsunami may be preceded by a rapid fall in sea level as the ocean retreats exposing fishes and corals on the sea bottom. In the deep ocean, tsunami wave travels in a speed of jet airplane and slow down as it comes to shallow water but the height of the waves grow in height with a strong and destructing force.

Natural Warning Signs of a Tsunami:

- *An earthquake (strong shaking that make you can hardly stand, or a long slow shaking for more than a minute)*
- *Sea water receding, exposing the fish and corals at the bottom of the sea*
- *A strange loud sound coming from the sea (i.e. loud roar)*

Under these circumstances (locally generated tsunamis), there may not be enough time for an *official warning*. There might be only a very short lead time between the earthquake and the first arriving tsunami wave. For locally generated tsunamis, the hotel should take this natural warning as a sign to evacuate their guests, visitors, and staffs immediately inland and/or to higher ground, and/or to the designated evacuation area.

Official warning

In case of distant tsunami (regional or ocean wide), earthquake might not be the first warning, an earthquake might occur far away across the sea and generated a tsunami wave that propagating toward the coastline in the hotel area. In this case, the hotel will receive the first warning from the responsible authority in the country, the National Tsunami Warning Center (NTWC) and/or the National Disaster Management Office (NDMO), depending on the country tsunami early warning system setting.

The hotel should rely on this warning notification issued by the NTWC to decide when to evacuate their guests, visitors, and staff. Therefore it is important to understand the official warning system and meaning of the warning notification.

In the aftermath of the 2004 Indian Ocean Tsunami in December 2004, the Intergovernmental Oceanographic Commission (IOC) of UNESCO was given the mandate to coordinate and facilitate the global tsunami early warning system. The global coverage is divided into four major regions: the Pacific, Indian Ocean, Caribbean, and North-Eastern Atlantic and the Mediterranean Seas (NEAM). The Tsunami Early Warning System developed for the NEAM region known as North-Eastern Atlantic and the Mediterranean Seas Tsunami Warning System (NEAMTWS). Based on the experience in the Pacific, each region would also maintain a regional Tsunami Information Centre, in this case namely North-Eastern Atlantic and the Mediterranean Seas Tsunami Information Centre (NEAMTIC)

North-Eastern Atlantic and the Mediterranean Seas Tsunami Warning System (NEAMTWS)

The structure of NEAMTWS consist of Tsunami Watch Providers (TWPs), National Tsunami Warning Centers (NTWSs), and Tsunami Warning Focal Points representing each member states. For regular update of NEAMTWS please visit: *www.ioc-tsunami.org/neamtws*

Tsunami Watch Providers (TWPs)

Tsunami Watch Providers are National Tsunami Warning Centers (NTWCs) that are willing and able to provide tsunami alert information to the other Member States at the designated Forecast Points; Tsunami Watch Recipients are the Tsunami Warning Focal Points that will receive the information. TWPs will be responsible in:

- Collecting, recording, processing and analyzing of earthquake data for the rapid initial assessment (locating the earthquake, its depth, its magnitude and its origin time) as a basis for the alert system.
- Computing the arrival time of the tsunami in the forecasting points as listed in the Communication Plan.
- Collecting, recording, processing and analyzing of sea level data for confirming and monitoring the tsunami or for cancelling elements of the alert system.
- Making decisions in accordance with the Communication Plan to elaborate messages.
- Disseminating to the Member States focal points (and national warning centres) of the messages in accordance with the Communication Plan, including tsunami travel time, amplitude and period of the measured tsunami, and cancellation messages .

National Tsunami Warning Centres (NTWCs)

Each member country of the NEAMTWS is responsible for establishing their own National Tsunami warning Centres. The main responsible of NTWC is to provide warnings as soon as possible after a potential tsunami generation; to issue warnings for all destructive tsunamis; to make sure the warning centers operate continuously and the warning messages are sent and received promptly and is understood by the users of the system. Therefore these centers will have the function of:

- Collecting, recording, and processing of earthquake data for the rapid initial warning locating the earthquake, its depth, its magnitude and its origin time)

- Computating the arrival time of the tsunami in the national forecasting points
- Collecting, recording, and processing of sea level data for confirming or cancelling the warning.

Tsunami Warning Focal Point (TWFPs)

The Tsunami Warning Focal Point (TWFP) is a 24/7 contact person, or other official point of contact or address designated by a government. TWFP is available at the national level to rapidly receive and issue tsunami event information (such as warnings). The Tsunami Warning Focal Point is either the emergency authority (civil defense or other designated agency responsible for public safety), or has the responsibility of notifying the emergency authority of the event characteristics (earthquake and/or tsunami), in accordance with the national standard operating procedures. The Tsunami Warning Focal Point receives international tsunami warnings from the NEAMTWS or other regional warning centres.

North-Eastern Atlantic and the Mediterranean Seas Tsunami Information Centre (NEAMTIC)

The North-Eastern Atlantic and the Mediterranean Seas Tsunami Information Centre (NEAMTIC) is a part of the activities coordinated by the Intergovernmental Oceanographic Commission (IOC) of UNESCO and carried out by Member States to developing the NEAMTWS. The objectives of NEAMTIC are:

- Providing information to civil protection authorities and the general public on warning systems for tsunamis and other sea-level related hazards, and on the activities of IOC and European Union (EU) in the field of tsunami preparedness.
- Building capacity through one training workshop on tsunami early warning systems, standard operating procedures, numerical models to determine tsunami travel time, and ISO signage;
- Making citizens, especially youth, aware of the risks of floods from the sea in coastal areas, such as tsunamis, storm surges and strong swells, providing them with knowledge on the phenomena and practices of safe behavior.
- Identifying, sharing and disseminating good practices in plans, methods and procedures to strengthen preparedness for sea level related hazards.
- Fostering linkages between the EU and IOC on intergovernmental and transnational actions to develop NEAMTWS.

For more information on NEAMTIC and get more awareness materials please visit: *www.neamtic.ioc-tsunami.org*

III. HOTEL PREPAREDNESS

What is Preparedness

Preparedness is activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warning as well as the temporary evacuation of people and property from threatened locations (UN/ISDR, 2004).

Disaster preparedness involves forecasting and taking preventive measures prior to an imminent threat. Preparedness comprises the ability to understand the warning (including the ability to receive and interpret the warning), to organize evacuation and/or other measures to be taken to minimize potential loss of life and damage during a disaster and to organize timely and effective rescue, relief and assistance.

Preparedness improves the response to the effects of a disaster; therefore, requires a standard operating procedure and regular testing of the systems and plans.

A disaster-prepared hotel is a hotel that has established its standard operating procedures, systems and plans. They are readily organized for the steps necessary in cases of a tsunami, including: emergency response, evacuation during disaster, and recovery plans after disaster. All of the hotel's stakeholders (management and staff) know how to prepare to, respond to, and recover from disaster.

Building Tsunami Preparedness

In general, hotel business has been characterized as business that has solid and consistent operating procedures and systems. Most hotels have established their emergency response system, especially to fire hazards. Therefore, building the tsunami preparedness should be embedded into the existing system. However, it still will require different adjustment and adaptation considering the complexity of tsunami hazard.

To build tsunami preparedness, the hotel needs to first assess its current capacity and to build based on the need to be more prepared. In Indonesia, to build tsunami preparedness in the hotel industry,

the Indonesian Ministry of Culture and Tourism in cooperation with Bali Hotels Association, supported by the German Centrum für Migration and Entwicklung (CIM) has developed a checklist that enables hotels to assess their state of preparedness[2]. This checklist were implemented in several hotels in Bali under their "**Tsunami Ready"** programme (*www.tsunamiready.com*).

The checklist consists of six categories and in each category there are sets of questions to be answer to assess the state of current tsunami preparedness (see Annex):

- **Information Sources and Interpretation**, is to check the hotel's capacity to receive official tsunami warnings from the authority, interpret the warnings, and to disseminate the warning within the hotel.
- **Evacuation Procedures**, is to check the hotel's evacuation procedures from rooms, beach, and public places within the hotel.
- **Evacuation Route and Shelters**, is to check the hotel's evacuation route and signs, including the hotel as vertical evacuation.
- **Community Relations**, is to check external relations with the communities surrounding the hotel.
- **Cooperation**, is to check the cooperation amongst hotels in the surrounding area.
- **Post Tsunami**, is to check all of the preparation that needs to be considered post tsunami disaster.

This checklist is only a suggestion and to be use as a starting point. Each hotel might want to adjust and/or add more to the lists in accordance to the local context, regulation, hotel situation and needs. This checklist could also be use as tools to monitor and evaluate how the hotel is progressing in building their tsunami preparedness.

Once the hotel knows their current state of tsunami preparedness, the hotel can start to build their capacity to increase their tsunami preparedness. These are essential points the hotel needs to build in relation with the tsunami preparedness:

- **Early warning systems**: Hotels should be able to timely receive the warning, especially official warnings, have the ability to understand the warning, and are able to further disseminate the warning to reach all part of the hotel. All hotel guests, visitors, and staff need to be able to hear and receive the warning. To receive the warning, the hotels need to have a close cooperation with the national authorities who are responsible, at national level, for issuing the warning.

[2] *The Tsunami Ready Toolbox, Alexander Kesper, Ministry of Culture and Tourism Republic of Indonesia, Bali Hotels Association, Centrum fur Internationale Migration und Entwicklung, 2008*

- **Evacuation and Shelter:** This should be the primary concern of hotels, especially considering guest and visitors are considered vulnerable since they might not be familiar with the local situation. The hotel has to make sure that all guests, visitors, and staff could be safely evacuated to a designated safe area. Furthermore, taking into consideration that the hotel might be fully occupied, the safe area should be able to accommodate all evacuate. The hotel needs to assess if their building can be considered as vertical evacuation building (meeting all the criteria and standards) or not - in which they have to evacuate all guests, visitors, and staff out of the hotel premises.
- **Emergency Command Function:** In case of emergency hotels should have clear definition of the roles and responsibilities of each stakeholder. Each hotel unit / department should have a clear defined function what they have to do, who will do what and where, and whom they have to report to.
- **Emergency Personnel and Resources:** Hotels need to have procedures to mobilize staffs as emergency personnel with specific roles and ensure that all emergency response is carried out according to plan. Hotels need to ensure that the emergency personnel have the knowledge and skill to perform their duties as emergency personnel. Hotels also need to have all resources needed for emergency and during emergency is available at anytime.
- **Communication and supplies:** Public infrastructure might be paralyzed for several days after the disaster, communication may be cut off. Hotels need to make sure they have emergency communication equipment available, in working condition, and at hand, during and after the disaster, for example satellite phones. Past experience also shows that, in some cases, emergency supplies (water, food, and medical) can take several days before they can get through. Hotels need to ensure that they will have supplies to support them during emergency situation.
- **External Coordination:** THe hotels need to coordinate with local administration and disaster management office (DMO) in developing the hotel's evacuation plan and emergency response. Check the local DMO post tsunami emergency plans and make the hotel's emergency plan based on the DMO's capacity. Form alliance with other hotel and businesses in the area to have better coordination and cooperation and develop common strategy in responding to the disaster.
- **Department Close Down Procedure:** Most hotels might already have this Department Close Down Procedures such as for fire related emergency, weather related emergency, and others. These procedures could be adapted for tsunami emergency. However, it is important to understand that in tsunami emergency, there might by only little time available, especially for the

locally generated tsunami cases. Therefore, it is important to concentrate on the essentials and/or have specific procedures for tsunami emergency.

- **Records Management:** Hotels needs to ensure that all important documents and records are well secured during emergency. Guests hotel records will be very important for post emergency response and reliefs as well as to make sure all people are accounted.
- **Restoring main functions and plan for recovery:** Hotels have to have plans on restoring their main function (water, sanitary, electricity, and communication) for emergency use after the disaster and have a short and midterm plan to recover from the disaster.

Evacuation Strategy

Tsunami threat in each countries are different, therefore, the setting of the tsunami early warning are different from one country to another. There are countries that have a National Tsunami Early Warning Centre with the capacity to detect, analyse, and issue warning when a tsunami is coming to their coastline. Other country, which has lower tsunami threat, might rely on information from the Tsunami Watch Providers (TWPs). These settings will affect the time line of how long they will be able to issue the warning. Therefore hotels need to understand the tsunami early warning setting in their country to decide on their evacuation strategy. There are three basic possible scenarios that can be taken as a consideration to decide whether guests, visitors, and staff need to do an evacuation:

1. Earthquake is felt in the hotel area, but no tsunami warning is issued.
2. Earthquake is felt in the hotel area and a tsunami warning is issued.
3. Tsunami warning is issued, although the earthquake is not felt in the hotel area.

These situations would require different decisions and actions by the hotel, especially if related to tsunami evacuation procedures.

1. Earthquake is felt in the hotel area, but no tsunami warning is issued

Hotels located in an earthquake prone area might feel the earth shakes as it happened. The hotel management needs to decide whether to evacuate the guests from the building or not. Depending on the intensity of the earthquake felt in the hotel area, the hotel management might want to decide to evacuate all guests, visitors and staff once the shaking stops. The hotel has to decide on which earthquake intensity strength they would like to do evacuation

Hotel management also has to understand that an earthquake can be a natural sign of a tsunami. There is also a possibility that the official warning mechanism did not work because of the earthquake. Therefore, even there is no official tsunami warning received, hotel management might still needs to consider doing tsunami evacuation procedures *(See page 6).*

as their standard operating procedures. Should the earthquake reach the level of intensity strength that the hotel has decided to do evacuation, they need to start to evacuate all guests, visitors and staffs once the shaking stops. Earthquake evacuation should be done from inside of the building to the designated assembly area outside the building (an open space). The evacuation procedures involved evacuating guests from their rooms; from restaurants, lobby, function rooms (Ball room, meeting rooms) and corridors; from beach and pool areas; as well as evacuating the staff from the operating department of the hotel (diagram 3.1.). At the same time, after the shaking stops, the hotel management needs to confirm with the authorities whether the earthquake has generated a tsunami. If the authorities confirmed that **the earthquake did not generates a tsunami** and no tsunami warning is issued, then they should proceed with

In locally generated tsunami, time is very crucial. Hotel management has to consider that the first wave may arrive with minutes. There is only short time period between the time of the earthquake and the time of the arrival of the first tsunami wave.

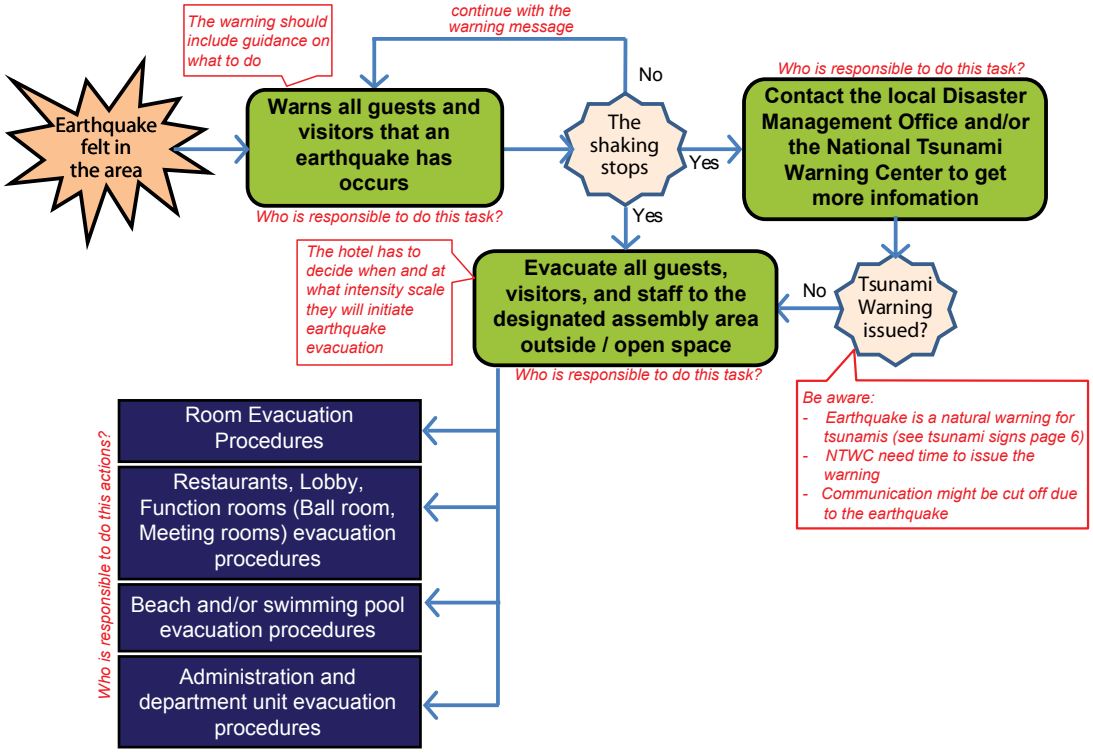


Diagram 3.1. Decision Making on Tsunami Evacuation When Earthquake is felt in the Area, no tsunami warning is issued

earthquake evacuation and emergency response. Hotel management needs to understand that it might take several minutes for the authorities to analyze and decide whether a tsunami warning would be issued or not. Hotel management also has to understand that there is a possibility that the official warning mechanism did not work because of the earthquake. Therefore, even if there is no official tsunami warning received, hotels management might still need to consider doing tsunami evacuation procedures.

2. Earthquake is felt in the hotel area and tsunami warning is issued

In the case that an earthquake is felt in the hotel area and confirmation is received from the authorities that the earthquake has generated a tsunami (locally generated tsunamis), the hotel management will need to immediately start to initiate their tsunami evacuation procedures (diagram 3.2.). While the earthquake evacuation is in process the hotel also needs to warn all guests, visitors, and staffs that a tsunami warning has been issued and tsunami evacuation procedures has been initiated.

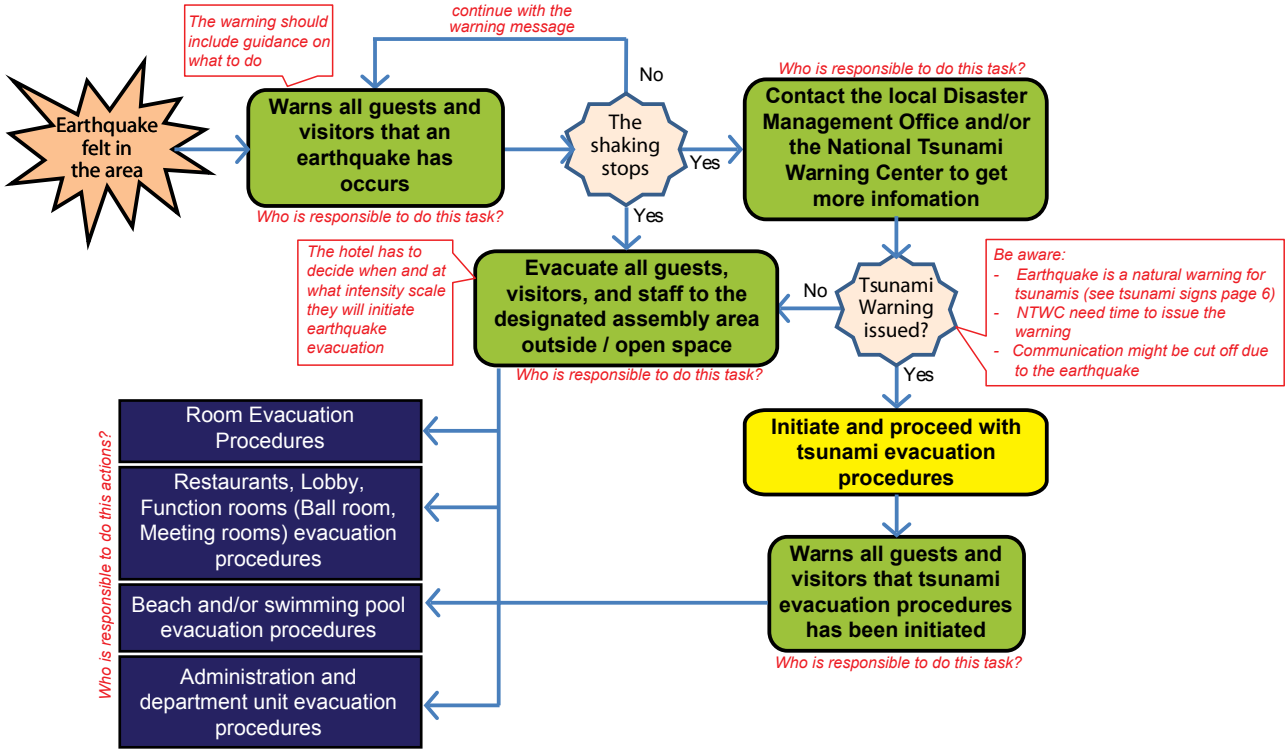


Diagram 3.2. Decision Making on Tsunami Evacuation When Earthquake is felt in the Area and a Tsunami Warning is ssued

3. Tsunami warning has been issued although no earthquake is felt in the hotel area

Tsunami threat in some countries is due to a regional or ocean wide tsunamis, a tsunami that is generated by an earthquake that happened across the ocean. The earthquake is not felt anywhere near the hotel area, therefore, nobody in the hotel is aware that a tsunami is heading toward the coastline. In this type of situation the only reliable information is the official warning issued by the National Tsunami Warning Centre (NTWC) of the country.

Once the warning is received, the hotel needs to understand the information/message specifically the level of the warning, the estimated time of arrival, and any advice issued by the National Tsunami Warning Centre. Depending on the distance, a threat of a regional or ocean wide tsunami, might take a few hours to arrive in the coastline. The threat might decreases or escalates as it travels through the ocean. Therefore, it is important to continue to monitor the warning that is issued by the NTWC. Should the warning be issued as a low threat (depending on the analysis and evaluation of the NTWC) there might not be a need to do a full evacuation. Evacuating people from the beach (for hotels located by the beach) might be sufficient. Other action that might be taken is to start all preparation for tsunami evacuation so when the threat escalates and tsunami evacuation procedure needs to be initiated all preparation has been done (diagram 3.3.)

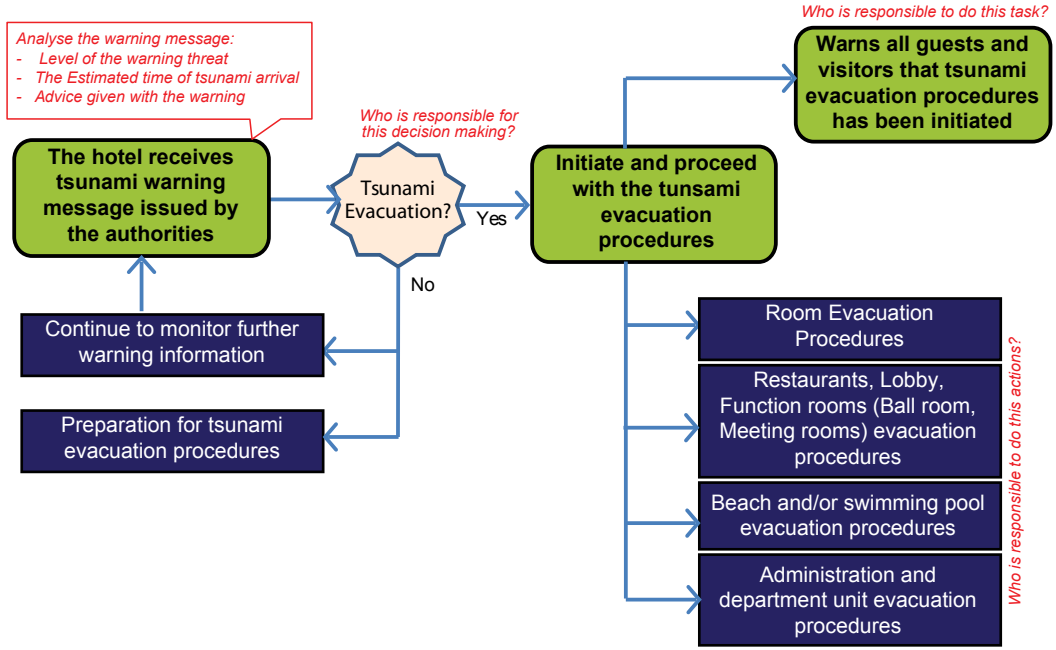


Diagram 3.3. Decision Making on Tsunami Evacuation after a Tsunami Warning is issued

IV. HOTEL AS EVACUATION AREA

General Considerations on Hotel as Evacuation Area

Hotels have to decide on the location where they will evacuate the guests, visitors, and staff during tsunami emergency situation. The area of the hotel can be considered as an evacuation area, whether horizontally to a higher ground within the hotel premises or vertically inside the hotel's building. Multi-storey hotels located at the beach make an ideal evacuation structure. Thus the guests and other people in the area can easily and quickly reach these hotels. Hotel rooms, ballrooms, meeting rooms, restaurants, and parking garage that are located above the estimated tsunami inundation depth can be an ideal place for people to take refuge of during the tsunami. However, before deciding to designate the hotel as an evacuation area, there are criteria and measures to be consider. (Diagram 4.1.)

1. Hotel location

Location of the hotel will be the first consideration for tsunami evacuation. However, before considering this the hotel needs to make sure that the hotel is not located in a tsunami risk area. This can be confirmed by the local authority/agency that is responsible in developing tsunami risk map of the area. The tsunami risk map will indicate if the hotel is indeed located in a tsunami inundated area and what is the estimated tsunami inundation depth of the area. Hotel that is considering to use their premises as an evacuation area needs to make sure that the area is outside the estimated inundation area and/or higher than the estimated inundation depth. Multi-storey buildings in the hotel premises such as the hotel building, parking garage building are potential to be the evacuation place.

In some cases, although the hotel is located in a tsunami risk area, the hotel ground area and lobby is higher than the estimated tsunami inundation depth because it is elevated in such a way. Hotel ground that is above the estimated tsunami inundation depth can be considered as the area for horizontal evacuation (evacuation area that can be reach horizontally, including running to higher ground), people and guests should be easily evacuated to this place.

Should the hotel is not located in a tsunami risk area, the hotel might still want to consider to become a tsunami evacuation area to safe the life of the people evacuating from a tsunami.

2. Hotel design and structures

Multistory hotel buildings that are built on concrete frame and/or steel structures, and meet the seismic standard and building codes, are potential location to be a vertical tsunami evacuation building. As a vertical evacuation building, the hotel structure must not only withstand the preceding earthquake with minimal damage and remain functional but also has to withstand the tsunami wave and debris it carried. Therefore it is important to first assess the hotel structure to be sure that it can serves as an evacuation building. Commonly the third floor and above of an evacuation building can be consider as a save place to refuge, however, it depend on the the estimated tsunami inundation depth of the area.

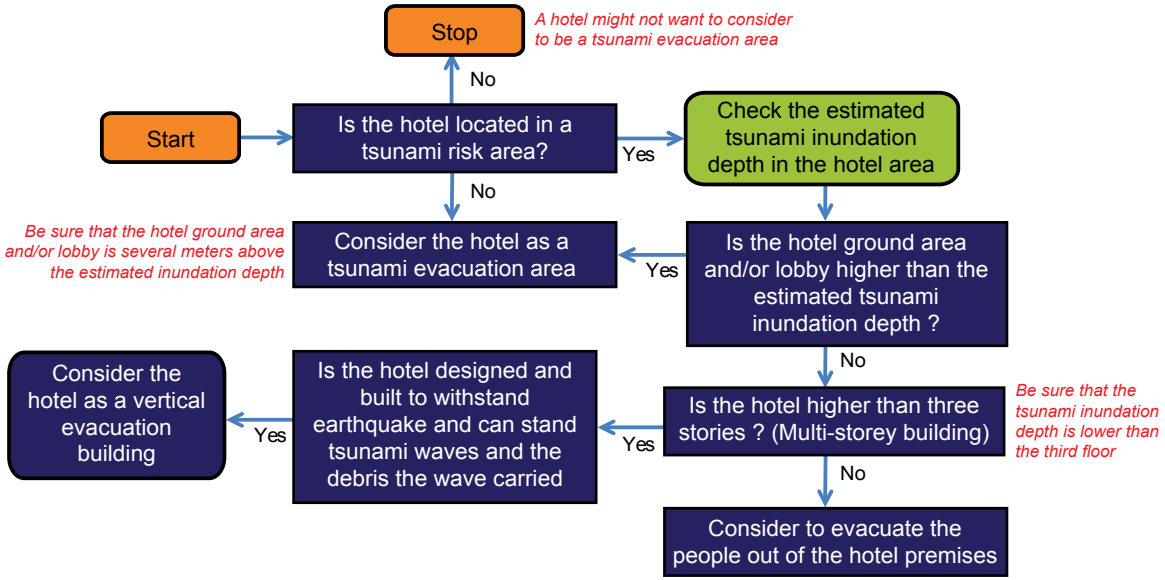


Diagram 4.1. Decision Making Process on Type of Tsunami Evacuation

Determining Evacuation Areas in Hotel Premises

1. On hotel a ground

Open spaces in the hotel premises, which are located on a higher ground above the estimated tsunami inundation depth, are potential to be tsunami evacuation areas. The advantages of using

these open spaces as a tsunami evacuation area are as follows:

1. Open spaces can be easily accessed by hotel guests or visitors. Furthermore if an earthquake happens in the area, many people (especially hotel guests) might be reluctant to reenter the hotel building again.
2. Open space at a higher ground level can accommodate a large number of people.
3. Open space can be use as park, sport area, and/or jogging area.
4. Open space in the hotel premises can be a safe evacuation process (no traffic and transportation are involved).

The main consideration for hotel ground/open space as an evacuation area is that the location does not directly face the beach/open sea where the tsunami wave will approach. In addition of a higher ground location the evacuation area also should be well covered and be saved from incoming wave as well as retracting waves.

Some modifications might be needed to designate an open space as an evacuation area:

1. Ensure that the open space is on a higher ground, above the inundation area and can withstand potential damage and/or erosion from the tsunami wave and the debris it carried.
2. Ensure there are clear access during day time and night time.
3. Ensure the safety and security of the people in this area during and after the tsunami strikes.
4. Ensure all the necessary equipments needed for emergency are available on the evacuation area.

2. On parking garage

Some hotels do not have open spaces on their premises, however there are parking garage/ building adjacent to their hotel. Parking garages are usually open space with vertical column as the structure. This allows for the water to flow over the building with minimal resistance. The parking garage should be designed and be built in accordance to the seismic standard and building codes and could withstand the tsunami wave and the debris it carried. The main disadvantage of a parking garage is when it is full of cars during the tsunami: it reduces the space, limits people circulation area and the cars can be a part of the destructing debris to the building structure.

3. Inside Hotel building

Evacuating vertically in the hotel has many advantages:

1. Evacuating to the upper floor in the hotel often is faster than evacuating to a higher ground outside of the hotel.

2. Evacuating within the hotel do not need vehicles therefore it is not affected by the traffic
3. Evacuation management will be easier
4. Evacuation routes and places are easy to mark

However, before deciding to use the hotel building as tsunami vertical evacuation building, the hotel has to make sure that:

1. The hotel has to withstand earthquake with minimal damages and can stand tsunami wave and debris carried by the water.
2. The evacuation location in the building should be as far as possible from the beach and are secured from the incoming tsunami waves.
3. The building must be strong, accessible in a short time and have enough capacity to accommodate all evacuees.
4. The evacuation location/floor should be higher than the estimated tsunami inundation depth.
5. The evacuation building should have the necessary equipment and infrastructure for emergency situation, wide enough emergency stairs, emergency electricity, and other requirements.

4. Evacuation out of the hotel premises

Saving lives of the hotel guests, visitors, and staff should be the main concern of the hotel. If the hotel is not qualified as a tsunami vertical evacuation building and there are no higher grounds in the premises of the hotel, the hotel should consider evacuating all of the people out of the hotel premises to higher ground or to a designated evacuation area.

Evacuating out of the premises would require a more thoughtful steps and procedures such as considering the traffic, security, and the safety of the people:

- The evacuation area should be out of reach of the tsunami waves either for horizontal or vertical evacuation. The evacuation area should consider the maximal expected wave height, the inundation area and inundation depth.
- The evacuation routes are free from the wave's path and are leading away from the incoming waves. If the evacuation area is out of the hotel premises, the evacuation routes should consider the traffic, road conditions and other obstacles that will affect the travel time needed to reach the evacuation area.
- The evacuation area should be able to accommodate the expected number of people that are supposed to use the evacuation area. The hotel needs to ensure that the hotel's number of guests can be accomodate in the evacuation area. If it is a public evacuation area the hotel

need to take into account the number of people from other hotels, the community and people from the streets

- The evacuation area should be reachable and can accommodate people with special needs (disabled, pregnant woman or parent with babies, and the elderly).
- The hotel needs to consider the time between the warning is issued and the time of the arrival of the first wave, The hotel needs to make sure that people can reach the evacuation area could be reach in time.
- The tsunami evacuation area could be an assembly place during the tsunami and/or could be an emergency shelter for a longer period of time.

5. Vertical evacuation structures

Hotels that are not qualified as a vertical evacuation building and are located in flat areas that are far away from higher grounds might want to consider to build a stand alone, simple and strong vertical evacuation structure. A vertical evacuation structure could be made of steel structure or concrete columns that are strong enough to withstand the tsunami wave. The hotels need to make sure that the evacuation structure can accommodate all the people in the hotel when the tsunami strikes.

Tsunami Evacuation Tower in Kushimoto Town, Wakayama Prefecture (http://www.icharm.pwri.go.jp/publication/newsletter/newsletter6_oct07_e.html)

Evacuation map, route, and signs within the hotel premises

If the hotel decides to use its premises as a tsunami evacuation area, the hotel will be responsible to ensure that guests, visitors, and staffs know where to go to in case of emergency. If the hotel decides to evacuate the people out of the hotel premises, to the guests, visitors, and staff should also know the information on the closest designated evacuation area.

The most visible way to let the guests, visitors, and staffs know about the evacuation area and routes are by providing hotel evacuation map that is readily available in each room and to posting signs in the hotel premises. Evacuation routes, safe locations, assembly points should be clearly marked on the hotel premises so those who evacuate will have no difficulties in finding where to go to the safe place.

There are different tsunami signs available however since 2008, UNESCO/IOC encouraged its member states to develop and use IOC-compliant tsunami signage and symbols in order to promote consistency in understanding and actions. Three are three basic signs within the ISO 20712 standard which provides specifications and guidance on safety sign for tsunami hazards:

Tsunami Hazard Zone Sign

This tsunami sign informs the hotel guests that they are in a tsunami hazard area as has been identified by the local authorities. It is important to have this sign be visible and posted in the hotel premises as well as in the surrounding areas of the hotel especially in the area where many people usually gather such as open space, parks and on the beach.

Example of ISO 20712 Tsunami Hazard Sign Placement

Evacuation Place in High Ground Sign

This sign should be placed on the site that has been designated as a safe high ground for evacuation. High ground evacuation place can be a natural open space that is located beyond the reach of the estimated tsunami wave height, or an artificially/engineered high grounds (which can function as open space, sport area, or park) that are build as a tsunami evacuation place.

Vertical Evacuation Building Sign

This sign should be placed in the hotel building if the building has been designated as a vertical evacuation building (meeting all the criteria to be a vertical evacuation building). This sign informs the hotel guests that in case of tsunami evacuation emergency they should go to this building. Inside the building there has to be signs which indicate the floor they should to go to as the safe place. This sign has to be visible from far away as well as from an eye level as the people get closer to the building.

These tsunami signage should be placed at the evacuation place, indicating to the evacuatee that they have reached the designated save place. It is equally important is to also place the evacuation routes signs. There are also different evacuation route signs. The ISO 20712 approved evacuation routes should use the same basic signs as the above complementing with directions where the evacuatee have to go.

Example of ISO 20712 Tsunami Evacuation Map

V. EVACUATION PLANNING AND PROCEDURES

Evacuation Planning

A tsunami evacuation plan is a plan that will be the reference when a tsunami warning has been issued and an evacuation need to be done. Tsunami evacuation plan involves deciding and preparing the tsunami evacuation area (chapter IV), the decision making procedures to do the evacuation, and the evacuation procedures. The purpose of hotel tsunami evacuation is to save the lives of hotel guests, visitors, and staff. Therefore, the planning should be able to guide the management to decide when to evacuate, to guide all people to the designated evacuation area through the evacuation routes and to conduct everything based on the agreed procedures and processes.

Decision to Evacuate

The decision to evacuate is the first step of the evacuation process. During emergency situations (either experiencing the earthquake or receiving tsunami early warning – chapter III), the hotel management needs to analyze, makes assessment of the situation and decide whether to evacuate the people or not. These decision criteria should be noted as part of the standard operating procedures. Several factors the hotel needs to consider in deciding to evacuate are:

1. **The earthquake**; the hotel needs to decide to evacuate the people immediately after the event, (especially for locally generated tsunami) for example the decision might be based on the intensity of the earthquake felt during the event or how long they feel the shaking.
2. **Timeline**; the hotel needs to consider the time needed to safely and effectively evacuate the people, for example to consider the location of the evacuation area, is it near or far, whether the evacuation involves heavy traffic or not.
3. **Location of the evacuation area**; is the evacuation area located in the hotel premises or outside of the hotel premises, will it be a vertical evacuation or using a high grounds?
4. **Evacuation routes**; special consideration might be needed for evacuation that is outside the hotel premises;
5. **Number of people to be evacuated**; the number of guests and visitors at the time of emergency;
6. **Hotel capacity and resources**; the personnel and recourses available at the time of the event.

Roles and Responsibilities

Tsunami evacuation is a complex process. Hotel tsunami evacuation also has its own complexity especially related to people it involves, for example the type of people (hotel guests might consist of people from different cultures with different languates) and the number of people to be evacuated. Hotel management has to clearly define the roles and responsibilities of their staff during emergency situation. The evacuation plan has to clearly designate specific tasks to the staff especially who will do what, when, and where. This tasks will be a part of the hotel's standard operating procedures. Due to the nature of emergency, a less time consuming procedures might need to be established. However, these procedures and processes should continue to be a part of the roles and responsibilities of the specific functions of the hotel units / departments.

The hotel needs to make sure that no guests remain behind, including those who might need special assistance to evacuate. To ease the process of checking if all guests have been safely evacuated, the hotel might want to consider setting up a task team (for example guest evacuation team) that will be responsible in evacuating the guests from their rooms.

*The task of the "**guest evacuation team**" is not only to evacuate all guests from their rooms, but also to mind the visitor to the hotel as well as public who might seek shelter in the hotel. Therefore the hotel should make sure of systematic and easy procedures and should make use of the existing resources available. Special attention needs to be placed on the evacuation of guest rooms since this task requires a lot of time and human resources. Members of the guest evacuation team can be drawn from employees from relevant departments and shifts like housekeeping, bell service, room service, stewarding, duty manger, and night manager etc. Please note that the composition of the guest evacuation team during night shifts and on public holidays might be different from regular shifts and days. Every member of the team should have a realistic designated number of rooms and/or floors to check. Ensure the safety of the team and be aware of the very limited time. Members of the evacuation team should at least be proficient in basic English (The Tsunami Ready Toolbox) .*

Tsunami Evacuation Procedures [1]

Room Evacuation Procedures:

1. Knock on the door of the guest room and shout: 'Tsunami Evacuation!'
2. If there are no response, enter the room. Make sure the guest evacuation team has the master key to enter the rooms.
3. Search the bedroom and bathroom areas and check the walk in cupboard.

[1] *The Tsunami Ready Toolbox, Alexander Kesper, Ministry of Culture and Tourism Republic of Indonesia, Bali Hotels Association, Centrum fur Internationale Migration und Entwicklung, 2008*

4. If the room is empty, mark that the room has been checked and is empty (see "all clear tags"). Proceed to the next room.
5. If the room is occupied, tell the guest to proceed to the evacuation area immediately. Point out the direction to the evacuation route.
6. Tell the guests to leave their luggage and bring only their valuables and identification cards.
7. As the guests leave the room, make sure they lock the door and mark the room as has been checked and move to the next room.
8. If there is a guest in the room who does not want to leave **DO NOT** mark the room as empty. However, do proceed to the next room.
9. When the whole floor has been checked, double-check the rooms without the mark and make sure the room is empty.
10. When all their designated rooms are check and clear, the evacuation team members should assist other team members or should proceed directly to the evacuation area.

*"**All Clear Tags**" can be placed on the doorknobs after a guest room is checked and cleared, or use a chalk mark on the door. This can avoid double checking and might help when searching for missing guests. All clear tags should be stored in fire hose cupboards, in room service trolleys as well as at the housekeeping department or wherever else the emergency keys are stored for collection. 'All Clear Tags' can also be used by other departments to mark those rooms and facilities are successfully shut down. Evacuation personnel should be informed about where 'All Clear Tags" are stored and make use of them wherever it makes sense (The Tsunami Ready Tookbox).*

Note: Some guests might also require physical assistance to evacuate

1. *Bring disabled guest or guests requiring additional assistance to evacuate to the emergency staircase.*
2. *Ask other guests to assist the person. If nobody could assist, leave these guests in the staircase area until all rooms on the whole floor are checked.*
3. *Return to assist the disabled guests to reach the evacuation area.*

Lobby, Restaurants, Bars, Ball Rooms, Meeting Rooms and Banquet Rooms Evacuation Procedures:

1. Cease all servings, stop any music, and turn on lights.
2. Inform the guests in the room of the tsunami alarm and tell them to proceed to the evacuation point. Point out the direction to the evacuation route or nearest emergency exit.
3. Direct all guests out of the room. Evacuate the guests sitting at tables closest to the exit first and then working down through the room.

4. If necessary inform all tables individually and tell the guests they must proceed immediately to the evacuation point.
5. If any guest needs assistance to evacuate, instruct other able persons to assist, if nobody could help, assist the guest once all the other people have been evacuated from the room.
6. If any guest refuse to leave the room, they must be escorted out by two waiters/employees.
7. Make sure to check public toilets, storage, or other enclosed rooms in the area.
8. Once all the guests have been evacuated, close the room and mark the room as has been checked and empty.

Beach and/or Swimming pool Evacuation Procedures

If the hotel is located on the beach and/or have swimming pool on the ground floor, the hotel is responsible to alert all the people on the beach and swimming pool of the tsunami warning and to continue with the beach and swimming pool evacuation procedures. Evacuating people on the beach and/or swimming pool could be the responsibility of the lifeguards or beach security.

In the case that the earthquake is felt in the hotel area, make sure the beach personnel are familiar with the natural tsunami warning signs (see page 6) and to report any suspicious signs indicating a possible tsunami to the relevant decision makers

As some of the guest might be swimming or do water sports (surfing or sailing), it is important for the lifeguards and/or beach security to be able to inform them using megaphones or other signals that can get their attention.

1. Get attention of the guest on the beach by shouting “Tsunami Evacuation!”
2. Make sure that the people on the water that a tsunami warning has been issued for the to get out of the water and start evacuating
3. Check all restrooms/toilets, changing rooms and showers in order to make sure that people are aware of the warning.
4. Guide the people around to the evacuation area.
5. Make sure that the beach and/or swimming pool is empty and nobody returns (for example to get their belongings or to watch the tsunami come)

Administration and Hotel Operation / Department Evacuation Procedures

Hotel management is also responsible to make sure that all staff is safely evacuated and all operations are securely close down in emergency. Most hotels probably have already established this department close down procedure for example in the case of fire emergency, weather emergency. These procedures can be adapted for tsunami emergency.

Guidelines for Guest on Tsunami Evacuation

To ensure all guests and visitors are familiar with the hotel policy on safety for tsunami evacuation procedures, in addition to providing an evacuation maps and evacuation routes and signs, the hotel should also provide information on practical steps for tsunami evacuation to their guests. Having these steps will ease the *guest evacuation team* in ensuring that all guests understand, willing, and be cooperative during the evacuation process. Example of steps to guide hotel guests in tsunami emergency are:

1. When you feel a strong earthquake and you can hardly stand, or you feel a slow shaking that continues for a longer time, a Tsunami may have been generated.
2. Stay calm and do not panic.
3. After the shaking stops, move calmly to the designated assemble area (always check evacuation area of the hotel), then wait for further instruction by the hotel officials / security.
4. If the sea level receded, exposing fishes and corals, then you should move quickly to higher ground (check if the hotel is a designated vertical evacuation building). Do not go to the beach to confirm or to watch the tsunami.
5. If you are swimming on the shore you might not feel the earthquake, always be mindful of what is happening on the beach. If you see people curiously gathered on the beach, move away from the sea and go to the assemble area.
6. Hotel officials/security will evacuate all guests to higher ground and/or safe area that have been officially designated as tsunami evacuation area. All instructions will be given using a microphone system and/or a megaphone. Listen, follow all of the instruction and move in an orderly manner to the evacuation area.
7. During a tsunami stay calm and do not panic. Do not leave the tsunami evacuation area until it is officialy announced by the authorities that it is safe to leave the evacuation area. Tsunami will come in several waves and there are time gaps between the waves.
8. During a tsunami emergency, the hotel staff, local disaster management office, police and other emergency organization will try to save lives please follow all their instruction and give your full cooperation

The guests need to be reminded that in case of tsunami evacuation they have to follow the procedures each step for the safety of themselves and other people, and all tsunami evacuation instruction has to be taken seriously even in the cases of non-destructive event.

Annex

This checklist gives an overview about the steps which are necessary in order to get a hotel tsunami ready. Supporting information is provided in the 'Tsunami Ready' fact sheets (www.tsunamiready.com). This list is only a suggestion. Please feel free to copy the list and alter it according to the needs. Should you have any comments or ideas for improvement please let them know so they can share your ideas with others (info@tsunamiready.com). Logo on the left is the certification branding use by the Tsunami Ready.

A. Information Source and Interpretation		
Task / Items	**Status**	**Follow up**
a. Hotel is connected to reliable early warning source		
b. Tsunami early warnings can be received despite power black outs		
c. There are at least two early warning sources available (e.g. SMS, TV, VHF)		
d. Early warning information can be received on a 24/7 basis		
e. Early warning information is monitored on a 24/7 basis		
f. Responsible staff knows how to interpret warnings in order to initiate evacuation		
g. Clear SOP's for interpretation of warning messages and decision making are in place and communicated		
h. Staff is familiar with natural early warning signs and general tsunami facts like likely arrival times etc.		
i. Communication devices like loudspeakers and/or sirens are available and operational to alert staff and guests, also on the beach (consider power outages)		
j. Staff knows how to communicate alarm to guests		
k. Staff and guests are educated on how to interpret tsunami alarm Guests are familiar with evacuation procedures		
l. Tsunami information material for guests is available in every room		

B. Evacuation Procedures		
Task / Items	**Status**	**Follow up**
a. Responsibilities and SOP's are clearly defined and communicated to all staff		
b. Guest and staff evacuation procedures are implemented and tested		
c. Department close down procedures are implemented and tested		
d. Beach Evacuation procedures are implemented and tested		
e. Official public evacuation routes are known and communicated		
f. Hotel management and staff are familiar with public emergency procedures and preparations		
g. Test alarms and evacuations are carried out on an irregular basis		

C. Evacuation Route and Shelter		
Task / Items	**Status**	**Follow up**
a. Decision on horizontal versus vertical evacuation has been made		
b. Internal evacuation routes are clearly marked		
c. Suitability of evacuation spot has been evaluated by expert		
d. Evacuation spot is easily accessible		
e. Evacuation spot is large enough for all guests and staff (at least 1 m^2/person)		
f. Shelter is equipped for emergency (water, food [for at least 3 days] communication devices, check lists, important contacts etc.)		
g. Shelter and equipment are checked at least every 2 weeks		

D. Community Relations		
Task / Items	**Status**	**Follow up**
a. Cooperation opportunities with the immediate general public have been explored		
b. Problem of how to deal with access demands of the general public to hotel has been addressed and a solution found		

E. Cooperation		
Task / Items	**Status**	**Follow up**
a. Hotel management consulted with neighbouring hotels, the local administration and relevant institutions on emergency cooperation and procedures		

F. Post Tsunami (the following questions need to be addressed)		
Task / Items	**Status**	**Follow up**
a. How can guests and staff be evacuated if transport infrastructure is destroyed		
b. Does it make sense to prepare post disaster plans with other hotels to share resources like equipment, emergency supplies, doctors etc.?		
c. Where can official disaster related information and instructions be obtained from?		
d. Which organizations can help and how can they be contacted? (e.g. US/Australian consulate/army, private organisations like Hills & associates etc.)		
e. Who are the official Indonesian search & rescue organisations and how can they be contacted?		
f. Who else needs to be informed (company headquarters etc.)?		
g. Where could the hotel evacuate to once the water receded if the building is not safe anymore and how can guests and staff be supplied with basic necessities?		
h. Does it make sense to collaborate with other hotels nearby		

References

The Tsunami Ready Toolbox, Alexander Kesper, Ministry of Culture and Tourism Republic of Indonesia, Bali Hotels Association, Centrum fur Internationale Migration und Entwicklung, 2008

Strong Tsunamis in the Mediterranean Sea; A Re-evaluation; Gerassimos A. Papadopoulos and Anna Fokaefs, Institute of Geodynamics, National Observatory of Athens, Athens-11810, Greece. ISET Journal of Earthquake Technology, Paper No. 463, Vol. 42, No. 4, December 2005, pp. 159-170

Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, NEAMTWS, Implementation Plan (Third Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, NEAMTWS), IOC Technical Series No. 73. UNESCO 2007. (Electronic copy, English only)

Tsunami risk assessment and mitigation for the Indian Ocean: Knowing your tsunami risk – and what to do about it, IOC Manual and Guides no. 52, Paris: UNESCO, 2009 (English)

Tsunami Preparedness Information Guide for Disaster Planners, IOC Manual and Guides no. 49, Paris: UNESCO, 2009 (English)

Newsletter / ICHARM -- The International Centre for Water Hazard and Risk Management, Issue No.6, http://www.icharm.pwri.go.jp/publication/newsletter/newsletter6_oct07_e.html

Tsunami Evacuation Plan for Kelurahan Kuta, Bali, A Documentation of the Process and Result of Tsunami Evacuation Planning, District Government of Badung, Bali Hotel Association, Indonesian Red Cross – Bali Chapter, GTZ IS – GITEWS, 2010

Handbook of Tsunami Evacuation Planning, S. Scheer et.al, JRC Scientific and Technical Reports, 2011

Disaster Risk Reduction, A Toolkit for Tourism Destination, Practical Examples from Coastal Settlements in ASIA, United Nations Environment Programme, 2008

Vertical Evacuation From Tsunamis: A guide for Community Official, FENA P646A / June 2009

Queensland Evacuation Guidelines for Disaster Management Group, Queensland Government, 2010

ISO standard on beach safety flags and water safety signs for an accident-free summer, Ref.: 1147, News and media News 2008

NORTH-EASTERN ATLANTIC AND THE MEDITERRANEAN
TSUNAMI INFOMATION CENTRE

Intergovernmental Oceanographic Commission of UNESCO
1, rue Miollis - 75732 Paris, France
Tel: +33 1 45683952