



EXERCISE INDIAN OCEAN WAVE 18

An Indian Ocean-wide Tsunami Warning and Communications Exercise

4–5 September 2018

Volume 1

Exercise Manual

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This volume has two supplements:

Supplement 1: TSP Bulletins for Scenario 1 Makran Trench

Supplement 2: TSP Bulletins for Scenario 2 Sunda Trench

Prepared by the Exercise IOWave18 Task Team for the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System.

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1. BACKGROUND

The devastating impact of the 26 December 2004 Indonesia earthquake and Indian Ocean Tsunami tragically demonstrated what can happen without an effective tsunami warning system. Tsunamis may not occur often, but when they do they can affect coasts, sometimes across an entire ocean. The 2004 tsunami caused damage and casualties across the entire Indian Ocean basin—even as far away as South Africa. Following this event, UNESCO's Intergovernmental Oceanographic Commission ([IOC](#)) was requested to establish an Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS), to promote the exchange of seismic and sea level data for rapid tsunami detection and analysis, to provide warnings for such events, and to coordinate mitigation efforts among its Member States. An efficient and effective end-to-end warning system was needed, ready to react 24 hours a day to any potential tsunami threat, alert those at-risk coastal communities, and motivate them to take immediate and appropriate steps to save their lives.

Under the guidance of the ICG/IOTWMS, Member States collaborated in the development of the IOTWMS. The IOTWMS is a System of Systems with each National Tsunami Warning Centre (NTWC) of the 28 Member States issuing tsunami warnings to their respective communities based on the tsunami threat information provided by three Tsunami Service Providers (TSPs) of Australia, India and Indonesia. It was initially tested in the Indian Ocean-wide tsunami warning and response exercise IOWave09 held in October 2009 ([IOC/2009/TS/88](#)). It came into operation immediately following the IOWave11 that took place in October 2011 ([IOC/2013/TS/99](#)) exercise, and was exercised again during IOWave14 in September 2014 ([IOC/2015/TS/113Vol.1, Vol.2](#)) and IOWave16 in September 2016 ([IOC/2016/TS/128Vol.1, Vol.2](#)). IOWave16 improved upon the previous exercises with all 24 active Member States participating, 12 of them exercising further down to the community level with about 60,000 people participating in the evacuation drills.

Indian Ocean-wide tsunami exercises are effective tools for evaluating the readiness of the IOTWMS and for identifying changes that can improve its effectiveness. The ICG/IOTWMS notes the value of basin-wide tsunami exercises and drills. The 11th Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System ([ICG/IOTWMS-XI/3](#)) held from 18 to 20 April 2017 in Putrajaya, Malaysia, established a Task Team to organise the next Indian Ocean-wide tsunami exercise (IOWave18) in the second half of 2018 and encouraged maximum participation from all Member States, where possible, to community level.

Exercise IOWave18 will simulate Indian Ocean countries being put in a tsunami warning situation and require NTWCs and the National and/or Local Disaster Management Offices (NDMO/LDMO) in each country to activate their Standard Operating Procedures (SOPs). A primary motive for IOWave18 is to enhance tsunami preparedness at community level. To this end, all Member States are reminded of the newly developed guidelines for the Indian Ocean Tsunami Ready (IOTR) Programme now ready for piloting in coastal communities in the Indian Ocean. IOTR is a community performance-based programme that facilitates tsunami preparedness as an active collaboration of the public (community), community leaders, and national and local emergency management agencies. All Member States, particularly those piloting the Programme, are encouraged to use the IOTR guidelines and indicators to guide their community preparation for Exercise IOWave18.

1.1 EXERCISE DATES AND SCENARIOS

Exercise IOWave18 contains two earthquake scenarios on successive days, 4 and 5 September, with both scenarios run in real-time. The scenario details are provided in Table 1 below.

Scenario 1 – Makran Trench		Scenario 2 – Sunda Trench	
Date	Tuesday 4 September 2018	Date	Wednesday 5 September 2018
Time	0600 UTC	Time	0300 UTC
Magnitude	9.0 Mw	Magnitude	9.3 Mw
Depth	10 km	Depth	10 km
Latitude	24.8 N	Latitude	3.3 N
Longitude	58.2 E	Longitude	96.0 E
Location	Off Coast of Iran	Location	Northern Sumatra, Indonesia

Table 1. Scenario Details

1.2 EXERCISE INVOLVEMENT

The following organizations should be involved in the exercise:

- Tsunami Service Providers (TSPs)
- National Tsunami Warning Centres (NTWCs)
- National Disaster Management Organizations (NDMOs)
- Local Disaster Management Organizations (LDMOs)
- Media Organizations
- Local communities, to the extent decided by each Member State, noting that this exercise has a focus on maximising community involvement.

1.3 MILESTONES FOR MEMBER STATES

Key milestones for Member State participation in Exercise IOWave18 are provided in the checklist below in Table 2. The checklist is intended to serve only as a broad reference and is not all-inclusive.

No	Activity	Timeline
1	IOC Circular Letter N° 2703	December 2017
2	Set up IOWave18 National Coordination Committee involving NTWC, LDMOs, NDMOs, and all other important stakeholders including private industry participants.	January 2018
3	Decide on level of participation and identify communities for evacuation (where applicable).	February 2018
4	Assign agency roles including exercise controller, key participants, and observers.	February 2018
5	Nominate a National Exercise Contact for IOTWMS.	February 2018
6	Issue of Exercise IOWave18 Manual by the Secretariat.	April 2018
7	Secure funding and support for community activities.	Ongoing
8	Develop a National IOWave18 Manual to plan/guide activities including those at community level.	May 2018
9	Address indicators of Indian Ocean Tsunami Ready (where appropriate).	Ongoing
10	Share IOWave18 in-country participation plans with the	June 2018

No	Activity	Timeline
	Secretariat.	
11	IOC-UNESCO Pre-IOWave18 Standard Operating Procedures Workshop and Training on TEMPP.	July 2018
12	Organize and hold pre-exercise national workshop(s) and meeting(s) with key stakeholders including media.	July 2018
13	Ensure Standard Operating Procedures are in place and up-to-date.	August 2018
14	Prepare a media press release.	One week before the exercise
15	Participate in Exercise IOWave18.	4–5 September 2018
16	Hold post-exercise hot and cold debriefs.	After the exercise
17	Complete the IOTWMS online post-exercise evaluation.	September 2018
18	Revise and improve SOPs in accordance with lessons learnt during the exercise.	After the exercise
19	IOC-UNESCO Post-IOWave18 Lessons Learnt Workshop.	November 2018

Table 2. Checklist of activities
to enable Member States' preparation for IOWave18.

1.4 INDIAN OCEAN TSUNAMI READY

Exercise IOWave 18 will provide an opportunity for Member States to test the indicators of Indian Ocean Tsunami Ready (IOTR) programme in pilot communities. The eleven (11) indicators of community tsunami preparedness include:

1. Have a community tsunami risk reduction plan,
2. Have designated and mapped tsunami hazard zones,
3. Have a public display of tsunami information,
4. Produce easily understood tsunami evacuation maps as determined appropriate by local authorities in collaboration with communities,
5. Develop and distribute outreach and public education materials,
6. Hold at least three outreach or educational activities annually,
7. Conduct an annual tsunami community exercise,
8. Address tsunami hazards in the community's Emergency Operations Plan (EOP),
9. Commit to support the Emergency Operations Centre (EOC) during a tsunami incident, if an EOC is open and activated,
10. Have redundant and reliable means for a 24-hour warning point (and EOC if activated) to receive official tsunami threats/information,
11. Have redundant and reliable means for a 24-hour warning point and/or EOC to disseminate official tsunami alerts to the public.

The Indian Ocean Tsunami Ready Programme is a community performance-based programme that facilitates tsunami preparedness as an active collaboration of the public (community), community leaders, and national and local emergency management agencies. The main objective of this programme is to improve coastal community preparedness for tsunami emergencies, to minimise the loss of life and property and to ensure a structural and systematic approach in building community

preparedness. This can be achieved by bringing the ownership of preparedness to the community. This programme is on voluntary basis and entails a bottom-up process where the community takes the initiative to build their own capacity. Through this approach, it is expected that the programme will ensure ownership that leads to sustainability in the community. This programme provides a structured and systematic approach to community tsunami preparedness through fulfilling a set of best-practice indicators (as listed above). The guidelines for the Indian Ocean Tsunami Ready Programme are available at www.ioc-tsunami.org/IOTRguidelines.

In order to facilitate the IOTR pilot programme, the ICG/IOTWMS Secretariat and the Indian Ocean Tsunami Information Centre ([IOTIC](http://www.iotc.org)) are running training workshops on Tsunami Evacuation Maps, Plans and Procedures (TEMPP). The first TEMPP workshop was held in Bogor, Indonesia, in November 2017 and the second workshop will be held in Hyderabad, India, in June-July 2018.

1.5 FURTHER INFORMATION

Further information on Exercise IOWave18 is available at the exercise website: www.ioc-tsunami.org/IOWave18.

2. CONCEPT OF EXERCISE IOWave18

2.1 PURPOSE

The purpose of Exercise IOWave18 is to evaluate and improve the effectiveness of the IOTWMS, through its operational TSPs, NTWCs, NDMOs and LDMOs, in responding to a potentially destructive tsunami. The exercise will provide an opportunity for Indian Ocean countries to test their operational lines of communications, to review their tsunami warning and emergency response SOPs, and to promote emergency and community preparedness. Regular exercises are important for maintaining staff readiness for real events. This is especially true for tsunamis, which are infrequent but require rapid response when they occur. The pre-exercise planning and post-exercise evaluation process is as important as the actual exercise, because they bring all stakeholders to closely coordinate their actions. Every Indian Ocean country is encouraged to participate, down to the community level wherever possible.

2.2 OBJECTIVES

The objectives for Exercise IOWave18 are:

1. Validate the dissemination by TSPs of Tsunami Bulletin Notification Messages to NTWCs via Tsunami Warning Focal Points (TWFPs) of Indian Ocean countries and the reception by NTWCs of the TSP messages.
2. Validate the access by NTWCs to the tsunami bulletins and other products on the TSP websites, and the use of that information for the production of national warnings.
3. Validate the reporting by NTWCs to the TSPs of their National Tsunami Warning Status.
4. Validate the SOPs within countries for generating and disseminating tsunami warnings to their relevant emergency response agencies, media and the public.
5. Validate the SOPs within countries for the issuing of public safety messages, ordering evacuations and where possible issuing all-clear messages.
6. Validate the level of community awareness, preparedness and response.
7. Within the above framework, each country should develop its own specific objectives for the exercise.

2.3 EXERCISE SUCCESS CRITERIA

The exercise will be a success when the core objectives above have been exercised, performance evaluated and an exercise report produced. The broad success criteria, depending on the level of involvement of each country, are:

- The communication protocols between the TSPs, NTWCs, TWFPs and information dissemination points within countries are tested and understood.
- Areas of improvement in the tsunami warning and response chain are identified.
- Local communities participate in the exercise to the extent possible and increase their knowledge of tsunami preparedness and response.

2.4 TYPES OF EXERCISE

Exercises stimulate the development, training, testing and evaluation of Disaster Plans and SOPs. Exercise participants may use their own past multi-hazard drills (e.g. flood, typhoon, earthquake, etc.) as a framework to conduct Exercise IOWave18.

At a minimum, Exercise IOWave18 should be conducted to a level of readiness that involves communication and decision making at government level, without disrupting or alarming the general public. Individual countries are particularly encouraged to maximise the extent of their participation, and where possible, to include public notification and community evacuation.

Exercises can be conducted at various scales of magnitude and sophistication. The types of exercises that can be conducted are:

1. Orientation Exercise
2. Drill
3. Tabletop Exercise
4. Functional Exercise
5. Full-scale Exercise

See [Annex II](#) for a more detailed description of each type of exercise.

For Exercise IOWave18, individual Member States should decide what type of exercise they are going to undertake, and whether they will participate in one or both scenarios. Participation in both scenarios, at least at the NTWC and NDMO level, has the advantage of allowing SOP issues identified on the first day to be corrected and exercised again on the second day, and testing different elements of the SOPs because the tsunami arrival times will vary for each scenario.

Member States are encouraged to conduct a functional or full-scale exercise down to community level. If this is not possible, it is recommended that a tabletop exercise should be conducted as a minimum. Functional or full-scale exercises require an increasing level of planning and preparation, particularly when involving community evacuation. Due care should be taken not to inadvertently alarm the public.

3. SPECIFICS OF CONDUCTING EXERCISE IOWAVE18

3.1 OVERVIEW

The exercise will comprise two scenarios on successive days that will generate simulated tsunami waves travelling across the whole Indian Ocean basin. The first scenario simulates a magnitude 9.0 earthquake in the Makran Trench off the coast of Iran and will commence at 0600 hours UTC on

4th September 2018. The second scenario simulates a magnitude 9.3 earthquake in the Sunda Trench West of Northern Sumatra, Indonesia, and will commence at 0300 hours UTC on 5th September 2018.

Member States are invited to participate in either or both events, which will run in real-time. The scenario start times have been chosen to be more convenient for the "near field" (i.e. local) countries for each scenario. TSPs Australia, India and Indonesia will make exercise bulletins and detailed tsunami threat advice available on their password-protected websites during the events, and will send Notification Messages to NTWCs as the data is updated during the events.

The timelines for issuance of TSP bulletins for both events are given in [Tables 3](#) and [5](#) below. Note that the actual bulletin issue times on the exercise days may be slightly different because the TSPs will be operating in a real-time simulation mode. Participant countries should use the timelines as a guide for planning their involvement in the exercise.

Coverage: All Member States are encouraged to participate. Estimated tsunami arrival times and wave amplitudes to all threatened IOTWMS countries are included in the TSP bulletins and products (refer to Tables 4 and 6, Figures 1–6 for summary information; Supplements 1 and 2 for detailed information).

Messages: The TSPs will issue an initial Exercise Announcement Message to start the exercise on each day. Thereafter, NTWCs will receive Notification Messages from the TSPs according to the timelines shown in [Table 3](#) (Makran Trench) and [Table 5](#) (Sunda Trench), which will direct NTWCs to the TSP password-protected websites to view the detailed exercise bulletins and detailed threat information. Examples of the TSP Notification Messages are given in Supplements 1 and 2.

Threat Details: The following Section [3.2](#) provides the essential scenario details to facilitate the exercise plan. They include the estimated tsunami arrival times of the first significant wave above threat level and the maximum wave amplitudes for each affected country ([Table 4](#)-Makran Trench and [Table 6](#)-Sunda Trench). Also provided are the sample threat map, the maximum wave amplitude map and the tsunami travel time map of the first detectable wave in the Indian Ocean (Figures 1, 2 and 3 for Makran Trench and Figures 4, 5 and 6 for Sunda Trench).

Countries are encouraged to conduct the exercise in real time and use the TSP websites to access the bulletins and other threat information available there. To facilitate the conduct of tabletop exercises and for planning the evacuation exercises, the full set of exercise bulletins are separately provided in Supplement 1 (Scenario 1 – Makran Trench) and Supplement 2 (Scenario 2 – Sunda Trench), which are available for download from the exercise website: www.ioc-tsunami.org/IOWave18.

3.2 EXERCISE SPECIFICS

3.2.1 Scenario 1, Makran Trench

This is the scenario of a magnitude 9.0 earthquake off the coast of Iran (epicentre at 24.8N 58.2E), starting at 0600 UTC on Tuesday 4 September 2018. The simulated tsunami will take approximately 11 hours to travel from its source to the Western coast of Australia.

Table 3: Bulletin Timelines for Scenario 1, Makran Trench

Magnitude 9.0 Earthquake, off coast of Iran, 0600 UTC Tuesday 4 September 2018.

TSP AUSTRALIA			TSP INDIA			TSP INDONESIA		
Time (UTC)	Bulletin Number	Bulletin Type	Time (UTC)	Bulletin Number	Bulletin Type	Time (UTC)	Bulletin Number	Bulletin Type
06:00		Announcement Message	06:00		Announcement Message	06:00		Announcement Message
06:12	1	Earthquake Bulletin	06:05	1	Earthquake Bulletin	06:07	1	Earthquake Bulletin
06:13	2	Threat Assessment Bulletin	06:15	2	Threat Assessment Bulletin	06:12	2	Threat Assessment Bulletin
06:22	3	Confirmed Threat Bulletin	06:30	3	Confirmed Threat Bulletin	06:30	3	Confirmed Threat Bulletin
06:32	4	Confirmed Threat Bulletin	07:00	4	Confirmed Threat Bulletin	07:00	4	Confirmed Threat Bulletin
07:32	5	Confirmed Threat Bulletin	08:00	5	Confirmed Threat Bulletin	08:00	5	Confirmed Threat Bulletin
08:32	6	Confirmed Threat Bulletin	09:00	6	Confirmed Threat Bulletin	09:00	6	Confirmed Threat Bulletin
09:32	7	Confirmed Threat Bulletin	10:00	7	Confirmed Threat Bulletin	10:00	7	Confirmed Threat Bulletin
10:32	8	Confirmed Threat Bulletin	11:00	8	Confirmed Threat Bulletin	11:00	8	Confirmed Threat Bulletin
11:32	9	Confirmed Threat Bulletin	12:00	9	Confirmed Threat Bulletin	12:00	9	Confirmed Threat Bulletin
12:32	10	Confirmed Threat Bulletin	13:00	10	Confirmed Threat Bulletin	13:00	10	Confirmed Threat Bulletin
13:32	11	Confirmed Threat Bulletin	14:00	11	Confirmed Threat Bulletin	14:00	11	Confirmed Threat Bulletin
14:32	12	Confirmed Threat Bulletin	15:00	12	Confirmed Threat Bulletin	15:00	12	Confirmed Threat Bulletin
15:32	13	Confirmed Threat Bulletin	16:00	13	Confirmed Threat Bulletin	17:00	13	Final Bulletin
16:32	14	Confirmed Threat Bulletin	17:00	14	Confirmed Threat Bulletin			
17:32	15	Confirmed Threat Bulletin	18:00	15	Final Bulletin			
18:32	16	Final Bulletin						

Table 4: The Estimated Tsunami Arrival Times and the Maximum Wave Amplitudes for Scenario 1, Makran Trench.

T2 in UTC is the Estimated Tsunami Arrival Times (ETAs) for the first wave above the Threat Level of 0.5 m. The earliest T2 out of the three TSPs is used for each listed country. MAX BEACH in metres is the estimated Maximum Wave Amplitude at the beach. The largest MAX BEACH out of the three TSPs is used for each listed country. No values are given for those countries assessed by all three TSPs as not under threat.

No	Country Name	T2 (UTC)	MAX BEACH (m)
1	Australia	17:37	1.64
2	Bangladesh	21:44	0.58
3	Comoros	12:09	1.20
4	Djibouti	10:57	1.47
5	France	16:21	2.86
6	India	07:46	3.25
7	Indonesia	13:35	1.52
8	Iran	06:00	14.84
9	Kenya	12:04	1.7
10	Madagascar	11:54	1.05
11	Malaysia	-	-
12	Maldives	09:19	2.70
13	Mauritius	11:42	1.52
14	Mozambique	12:31	1.0
15	Myanmar	-	-
16	Oman	06:09	17.70
17	Pakistan	06:00	11.71
18	Seychelles	10:31	2.40
19	Singapore	-	-
20	Somalia	09:09	2.58
21	South Africa	-	-
22	Sri Lanka	10:40	1.13
23	Tanzania	12:08	1.31
24	Thailand	-	-
25	Timor-Leste	-	-
26	UAE	06:28	9.47
27	UK	11:00	1.88
28	Yemen	08:17	2.48

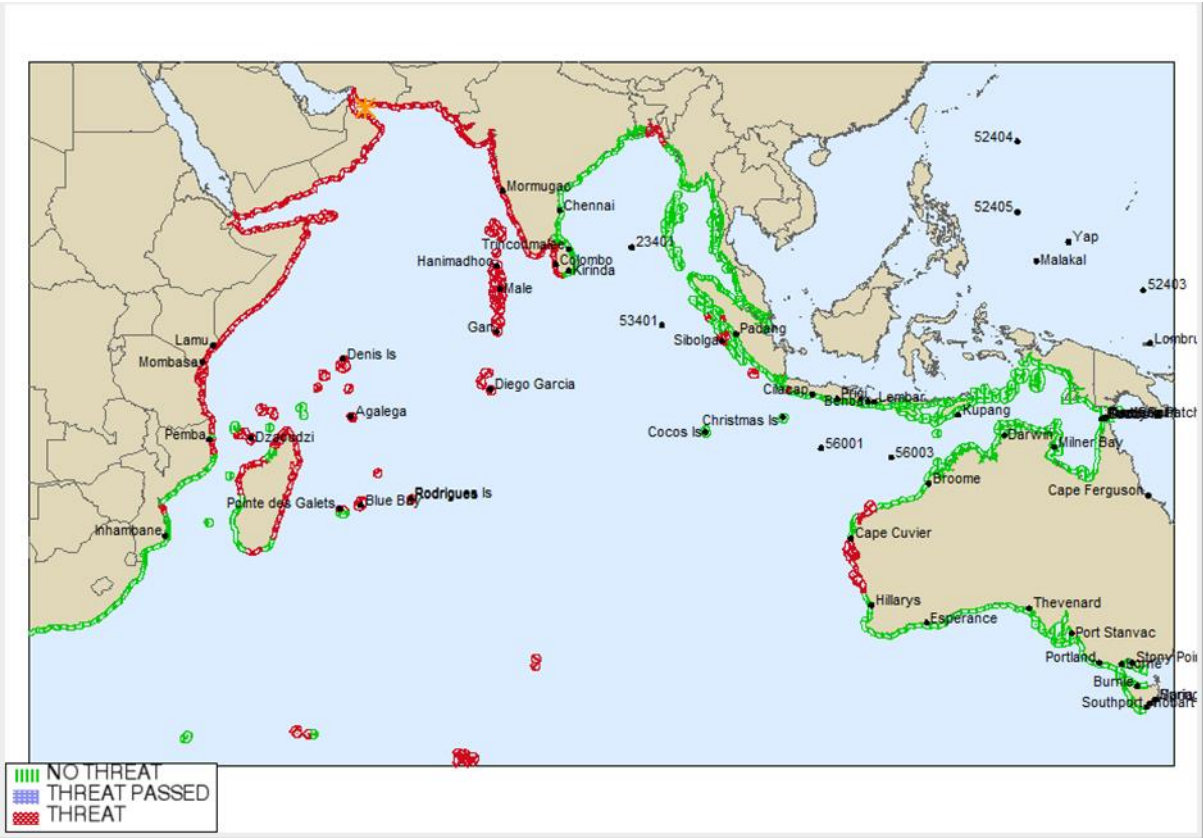


Figure 1. Threat Map produced by TSP Australia for Scenario 1, Makran Trench.

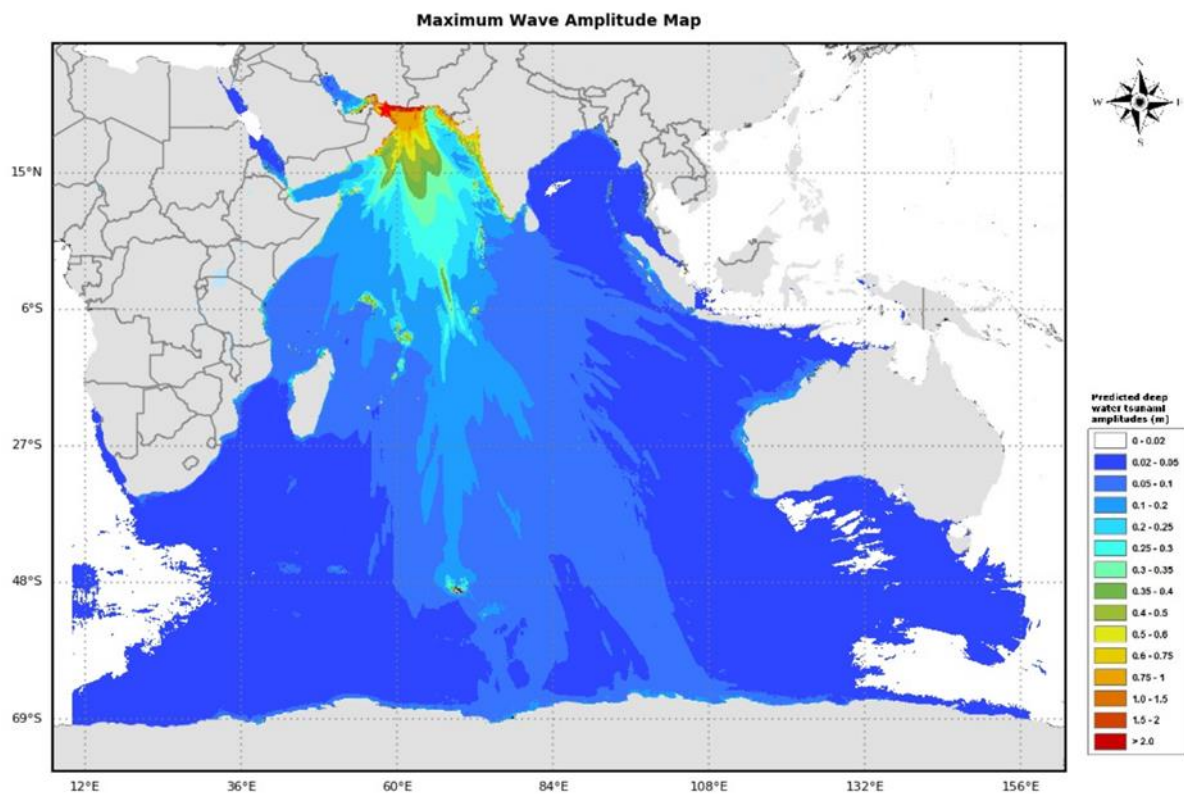


Figure 2. The Maximum Wave Amplitude Map produced by TSP India for Scenario 1, Makran Trench.

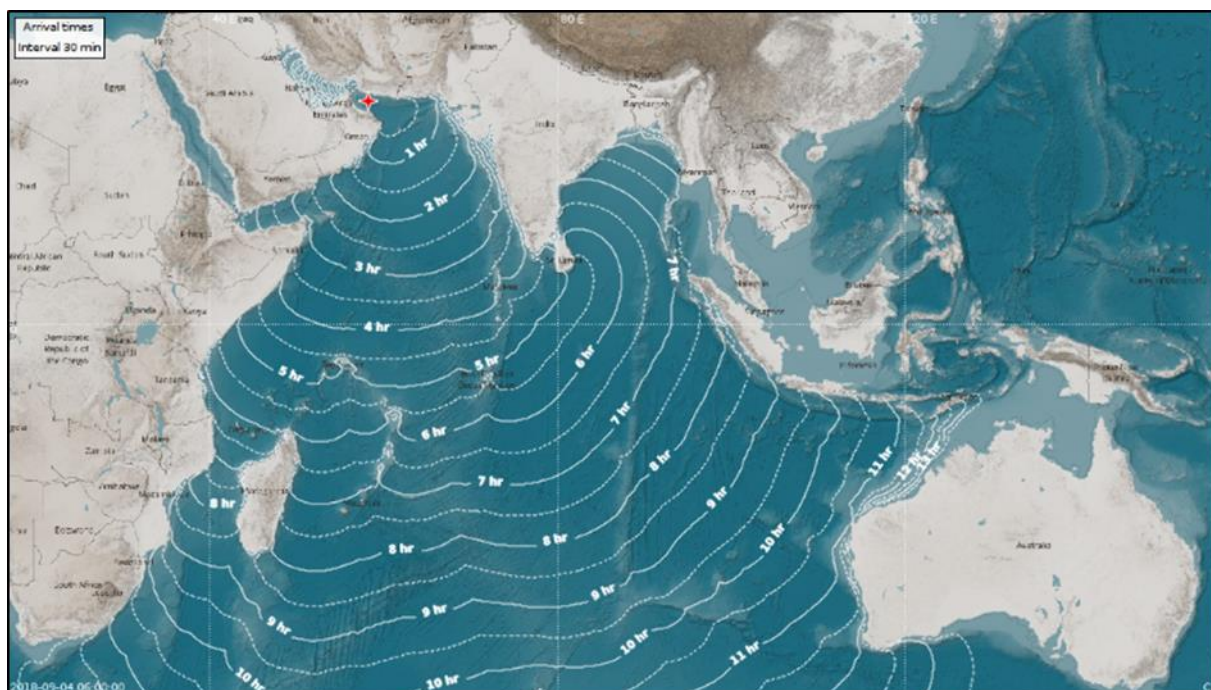


Figure 3. The first detectable wave Tsunami Travel Time contours produced by TSP Indonesia for Scenario 1, Makran Trench.

3.2.2 Scenario 2, Sunda Trench

This is the scenario of a magnitude 9.3 earthquake in the Sunda Trench off the West of Northern Sumatra (epicentre 3.3N 96.0E), starting at 0300 UTC on Wednesday 5 September 2018. The simulated tsunami will take approximately 8 hours to travel from its source to the coasts of Iran and Pakistan, and 11 hours to travel to the Southern coast of South Africa.

Table 5: Bulletin Timelines for Scenario 2, Sunda Trench

Magnitude 9.3 Earthquake, off West coast of Northern Sumatra, 0300UTC Wednesday 5 September 2018.

TSP AUSTRALIA			TSP INDIA			TSP INDONESIA		
Time (UTC)	Bulletin Number	Bulletin Type	Time (UTC)	Bulletin Number	Bulletin Type	Time (UTC)	Bulletin Number	Bulletin Type
03:00		Announcement Message	03:00		Announcement Message	03:00		Announcement Message
03:09	1	Earthquake Bulletin	03:05	1	Earthquake Bulletin	03:07	1	Earthquake Bulletin
03:10	2	Threat Assessment Bulletin	03:15	2	Threat Assessment Bulletin	03:12	2	Threat Assessment Bulletin
03:22	3	Threat Assessment Bulletin	03:30	3	Threat Assessment Bulletin	03:30	3	Confirmed Threat Bulletin
03:32	4	Confirmed Threat Bulletin	04:00	4	Confirmed Threat Bulletin	04:00	4	Confirmed Threat Bulletin
04:32	5	Confirmed Threat Bulletin	05:00	5	Confirmed Threat Bulletin	05:00	5	Confirmed Threat Bulletin
05:32	6	Confirmed Threat Bulletin	06:00	6	Confirmed Threat Bulletin	06:00	6	Confirmed Threat Bulletin
06:32	7	Confirmed Threat Bulletin	07:00	7	Confirmed Threat Bulletin	07:00	7	Confirmed Threat Bulletin
07:32	8	Confirmed Threat Bulletin	08:00	8	Confirmed Threat Bulletin	08:00	8	Confirmed Threat Bulletin
08:32	9	Confirmed Threat Bulletin	09:00	9	Confirmed Threat Bulletin	09:00	9	Confirmed Threat Bulletin
09:32	10	Confirmed Threat Bulletin	10:00	10	Confirmed Threat Bulletin	10:00	10	Confirmed Threat Bulletin
10:32	11	Confirmed Threat Bulletin	11:00	11	Confirmed Threat Bulletin	11:00	11	Confirmed Threat Bulletin
11:32	12	Confirmed Threat Bulletin	12:00	12	Confirmed Threat Bulletin	13:00	12	Confirmed Threat Bulletin
12:32	13	Confirmed Threat Bulletin	13:00	13	Confirmed Threat Bulletin	15:00	13	Final Bulletin

TSP AUSTRALIA			TSP INDIA			TSP INDONESIA		
Time (UTC)	Bulletin Number	Bulletin Type	Time (UTC)	Bulletin Number	Bulletin Type	Time (UTC)	Bulletin Number	Bulletin Type
13:32	14	Confirmed Threat Bulletin	14:00	14	Confirmed Threat Bulletin			
14:32	15	Confirmed Threat Bulletin	15:00	15	Final Bulletin			
15:32	16	Final Bulletin						

Table 6: The Estimated Tsunami Arrival Times and the Maximum Wave Amplitudes for Scenario 2, Sunda Trench.

T2 in UTC is the Estimated Tsunami Arrival Times (ETAs) for the first wave above the Threat Level of 0.5 m. The earliest T2 out of the three TSPs is used for each listed country. MAX BEACH in metres is the estimated Maximum Wave Amplitude at the beach. The largest MAX BEACH out of the three TSPs is used for each listed country. No values are given for those countries assessed by all three TSPs as not under threat.

No	Country Name	T2 (UTC)	Max Beach (m)
1	Australia	04:38	10.77
2	Bangladesh	06:38	3.74
3	Comoros	11:14	2.53
4	Djibouti	12:40	1.72
5	France	09:20	9.96
6	India	03:00	12.88
7	Indonesia	03:00	50.27
8	Iran	10:42	1.7
9	Kenya	11:08	3.17
10	Madagascar	10:24	10.43
11	Malaysia	05:56	4.99
12	Maldives	06:04	12.08
13	Mauritius	08:38	13.58
14	Mozambique	11:42	4.22
15	Myanmar	04:34	5.18
16	Oman	09:52	3.92
17	Pakistan	10:32	2.66
18	Seychelles	09:06	5.73
19	Singapore	-	-
20	Somalia	10:00	5.76
21	South Africa	13:32	6.82
22	Sri Lanka	04:44	10.06
23	Tanzania	11:28	3.65
24	Thailand	04:10	9.04
25	Timor Leste	08:26	0.87
26	UAE	11:36	1.3
27	UK	06:28	12.10
28	Yemen	09:42	5.07

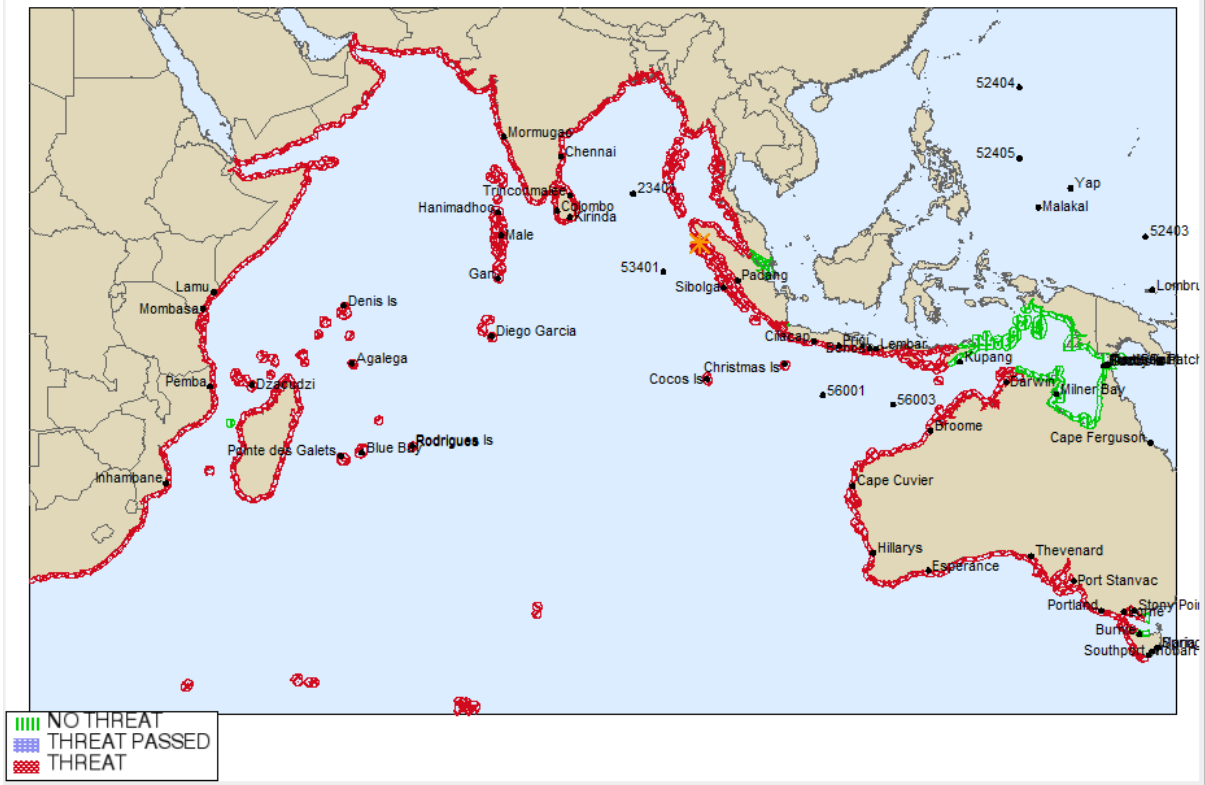


Figure 4. Threat Map
produced by TSP Australia for Scenario 2, Sunda Trench.

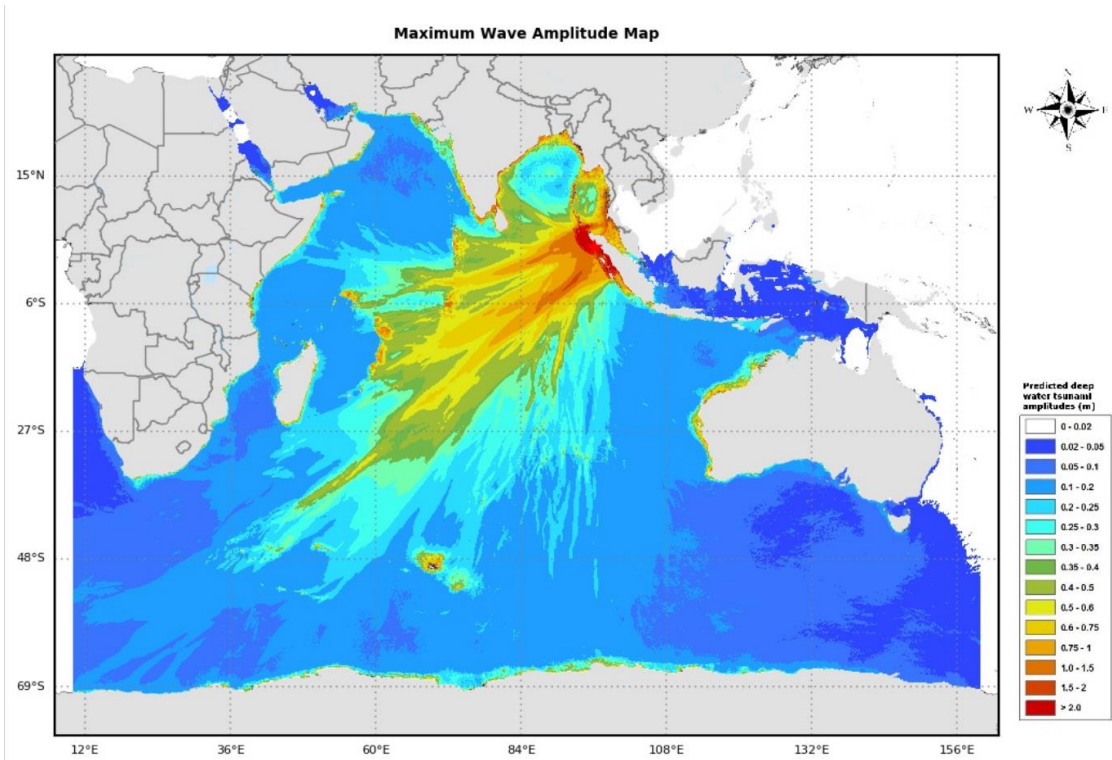


Figure 5. The Maximum Wave Amplitude Map
produced by TSP India for Scenario 2, Sunda Trench.

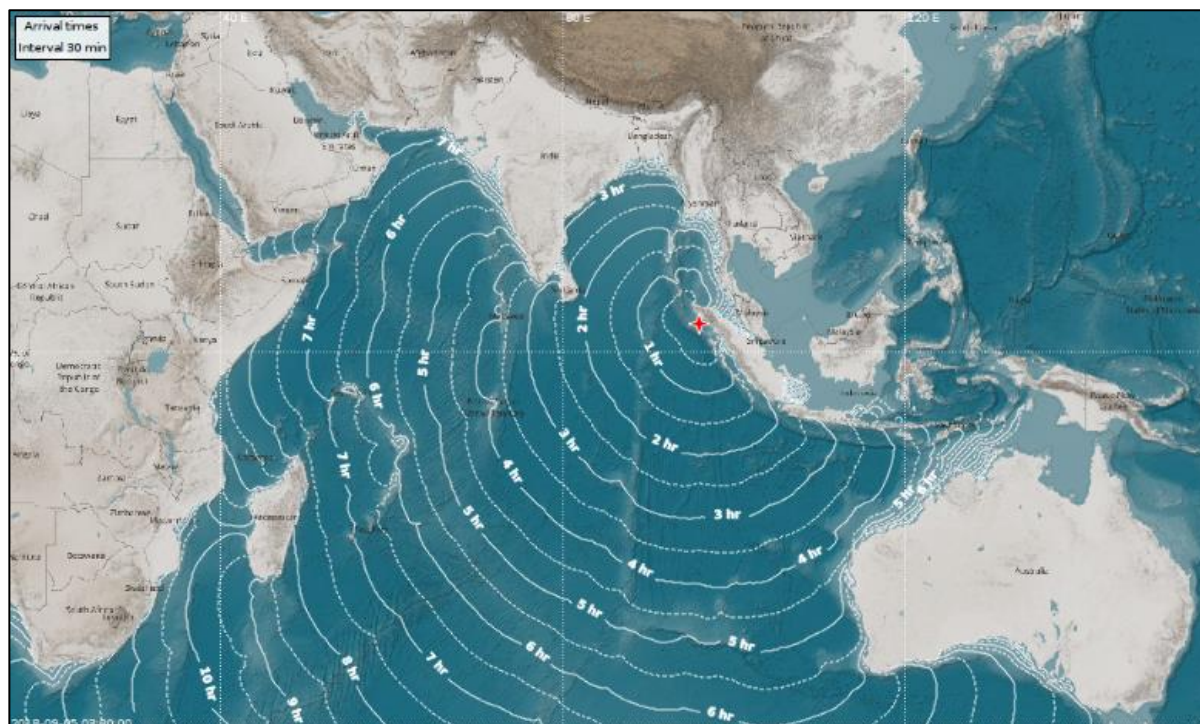


Figure 6. The first detectable wave Tsunami Travel Time contours produced by TSP India for Scenario 2, Sunda Trench.

3.3 LOGGING AND STATUS REPORTING PROCEDURE

During the exercise NTWCs are requested to log the times of reception of TSP Bulletin Notification Messages and of accessing TSP websites, and of reporting their National Warning Status via the TSP websites. The logging can be done either directly via the online evaluation form or via log forms – see [Annex III](#) Post-Exercise Evaluation for details.

Detailed logging and reporting procedure:

1. Following the reception of each TSP Bulletin Notification Message, NTWCs should:
 - Log the time of reception of the TSP Notification Message, and how it was received (GTS, email, fax, SMS).
 - Use a web browser to access the password-protected website for the TSP given in the Notification Message, and log the success or otherwise of this access.
2. Following the times at which the first simulated National Warning would be issued by the NTWC or NDMO in each country, and then every time the simulated National Warning status would change, the issuing agency should:
 - Report the National Tsunami Warning Status for their country via the web-based “NTWC Warning Status” form available on each TSP website.
 - Log the time of the status report and which TSP's website was used for the report. NOTE: **Only one status report is required on each occasion**, using the form on **any** of the TSP websites.

3.4 WEBSITE PASSWORDS

The user names and passwords for accessing each of the TSP password-protected websites are unique to each NTWCs and are not included here. Please be reminded that the login credentials

used by NTWCs for operational events and communications tests can be used to access IOWave18 bulletins. If any NTWC is unsure of their login credentials, please contact the IOTWMS Secretariat at iotwms@unesco.org. Please note that the websites are not intended to be viewed by the general public.

3.5 ACTIONS IN CASE OF A REAL EVENT

All documentation and correspondence relating to this exercise is to be clearly identified as **Exercise IOWave18** and **For Exercise Purposes Only**. In the case of a real event occurring during the exercise, TSPs and NTWCs will issue their normal message products for the event. Such messages will be given full priority and all TSPs should stop the exercise immediately and send an Announcement Message to that effect.

3.6 RESOURCING

Although participating countries will have advance notice of the exercise and may elect to stand up a special dedicated shift to allow normal core business to continue uninterrupted, it is suggested that realistic resource levels be deployed in order to reflect some of the issues that are likely to be faced in a real event.

3.7 MEDIA INVOLVEMENT

The media have an important role in raising tsunami awareness to the public. Member States are therefore encouraged to involve the media in the exercise. Each country is responsible for the coordination of national in-country media communications for the exercise. Media may be invited to participate or be simulated by exercise control staff.

The degree of media involvement in the exercise will vary from country to country, such as a paragraph in a newspaper, television coverage of an evacuation drill or information transmitted to the public via media networks. In all cases, it is important to ensure that the media and public know about the exercise beforehand so that they do not mistake it for a real tsunami warning.

Participating agencies should seek guidance from their National Contact for Exercise IOWave18 regarding responses to individual approaches by in-country media concerning the exercise.

3.8 PRESS RELEASE

The UNESCO External Relations and Information department (ERI) will issue an international Media Advisory to alert the press of Exercise IOWave18 about one week before the exercise.

ICG/IOTWMS Member States should consider issuing one or two exercise press releases to their respective country's media in conjunction with the UNESCO release. Member States' press releases will give adequate alert to their country's population and give their local media time to conduct interviews and documentaries with participating exercise organisations in advance of the exercise. [Annex I](#) contains a sample press release that can be customised by Member States.

A second Member State press release, one week before the exercise, could provide a more detailed description of exercise activities to take place in-country.

4. POST-EXERCISE EVALUATION

4.1 EVALUATION AND DEBRIEFING

Following the exercise, participating countries are requested to complete the online Exercise Evaluation Survey. This feedback will assist in the evaluation of Exercise IOWave18 and in the development of subsequent exercises.

The goal of exercise evaluation is to validate SOPs and to identify opportunities for improvement within the participating organisations. This is to be accomplished by collating supporting data, analysing the data to compare effectiveness against requirements, and determining what changes need to be made by participating organisations as well as the IOTWMS as a collective to support effective tsunami warning and decision making.

Evaluation of this exercise will 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 and the community response.

The evaluation aims to inform and facilitate individual participant country evaluations as well as the integrated IOWave18 Report. The Post-Exercise Evaluation questionnaire addressing the respective focus areas and objectives is included in [Annex III](#) for information and guidance. Please note that all participant countries are requested to complete the questionnaire **online** by **30 September 2018**. The link to the questionnaire will be provided to the IOWave18 National Exercise Contacts before the exercise.

Member States are encouraged to appoint Exercise Evaluators within each of their in-country agencies participating in the exercise, who would collect information during the exercise for the purposes of the Post-Exercise Evaluation. Member States are also encouraged to conduct formal exercise debriefs inclusive of all participants in their respective agencies, to facilitate a collective and official national evaluation. For details of how to conduct a national evaluation refer to [Annex II](#).

4.2 EXERCISE OBSERVERS

It is recommended that independent and objective Exercise Observers be appointed at all exercise points to support the collection of such data. Observers are to be guided by the exercise objectives and the information required in the Post-Exercise Evaluation questionnaire. International observers can be made available to Member States upon request and on the understanding that the Member States will fund the observers' travel costs and per diems. Benefits of international observers include providing an independent assessment of the in-country response, recommending improvements to SOPs and communication linkages consistent with international best practice, and evaluating the success of the exercise in an Indian Ocean-wide context.

The terms of reference for exercise observers are:

1. Provide a chronology of the events and actions that you observed.
2. Where appropriate, provide a statement of your observations in relation to each of the core exercise objectives 1–6 (as provided in section [2.2](#) above).
3. Comment on the testing and understanding of communication protocols between the TSPs, NTWCs, TWFPs and information dissemination points within countries.
4. Identify strengths in the tsunami warning and response chain.
5. Identify areas of potential improvement in the tsunami warning and response chain.
6. Comment on the extent that local communities participated in the exercise.
7. Provide examples of how community knowledge of tsunami preparedness and response has been increased as a result of the exercise.

The guidelines for exercise observers are:

- Remain within the designated observation area.
- Do not interfere with exercise play.

- Follow the instructions of the organizer of the observer program in any of your interaction with the exercise participants.
- Direct any questions to the organizer of the observer program or other designated individual.

Exercise observers are requested to submit their reports to the ICG/IOTWMS Secretariat at iotwms@unesco.org by 30 September 2018.

4.3 EXERCISE REPORT

In completing the online Post-Exercise Evaluation questionnaire, participating organizations are encouraged to note areas for improvement and actions that they plan to take. All official Post-Exercise Evaluation questionnaire responses are designated as “For Official Use Only” and will be restricted for use by the IOWave18 Task Team for the purpose of compilation of the Exercise Report. The Exercise Report will be submitted to the ICG/IOTWMS and Member States will have the opportunity to provide comments. The report will be published in the IOC Technical Series and will be in the public domain (i.e. available on the IOC website). Member States may also choose to share their national evaluation reports with the public.

ANNEX I

SAMPLE PRESS RELEASE

TEMPLATE FOR NEWS RELEASE - USE AGENCY LETTERHEAD

Contact: *(insert name)* **FOR IMMEDIATE RELEASE** *(insert phone number)* *(insert date)*
(insert email address)

INDIAN OCEAN-WIDE TSUNAMI EXERCISE SET FOR SEPTEMBER 2018

(Insert country name) will join over xx other countries around the Indian Ocean Rim as a participant in mock tsunami scenarios on 4th and 5th September 2018. *(insert country name)* will exercise the Makran Trench scenario on 4th September and/or Sunda Trench scenario on 5th September *(select appropriate scenario(s))*.

The purpose of this Indian Ocean-wide exercise is to increase tsunami preparedness, evaluate response capabilities in each country and improve coordination throughout the region. The aim is to exercise all levels of the tsunami warning and response chain, with a primary focus on the local coastal community level.

“The 2004 Indian Ocean tsunami and subsequent events in the Indian and Pacific Oceans have brought to the attention of the world the urgent need to be more prepared for such events,” said *(insert name of appropriate official)*. “This important exercise will test the current procedures of the Indian Ocean Tsunami Warning and Mitigation System and help identify operational strengths and weaknesses in each country.”

The exercise, titled Exercise Indian Ocean Wave 2018 (IOWave18), will simulate Indian Ocean countries being put into a Tsunami Warning situation requiring government decision-making. It builds on previous Indian Ocean exercises conducted in 2009 (IOWave09), 2011 (IOWave11), 2014 (IOWave14), and 2016 (IOWave16) *and on prior national tsunami warning drills carried out on (dates) (delete if not applicable)*.

During the exercise the three Tsunami Service Providers (TSPs) of Australia, India and Indonesia will provide simulated tsunami threat information to all National Tsunami Warning Centres (NTWCs) in the Indian Ocean region. Each NTWC will then evaluate the information and formulate test national tsunami warnings, which will be disseminated to the disaster response agencies and coastal communities participating in the exercise. *Due care will be taken to ensure the public is not inadvertently alarmed (delete if not applicable)*.

Insert paragraph tailored for specific country. Could identify participating agencies and specific plans. Could describe current early warning programme, past evacuation drills (if any), ongoing mitigation and public education programmes, etc. Could describe tsunami threat, history of tsunami hazards, if any.

Should any actual tsunami threat occur during the time period of the exercise, the exercise will be terminated.

Following the exercise, a review and evaluation will be conducted by all participating countries and agencies.

“We see this exercise as an essential element in the routine maintenance of the Indian Ocean Tsunami Warning and Mitigation System,” said *(insert name of appropriate official)*.

“Our goal is to ensure the timely and effective notification of tsunamis, to educate communities at risk about safety preparedness, and to improve our overall coordination. We will evaluate what works well, where improvements are needed, make necessary changes, and continue to practice.”

The exercise is in the Work Plan of the Intergovernmental Coordination Group of the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS). ICG/IOTWMS is a body of UNESCO's Intergovernmental Oceanographic Commission.

IOWave18 Information: www.ioc-tsunami.org/iowave18 and www.iowave.org.

ANNEX II

EXERCISE FORMAT

TYPES OF EXERCISE

1. An Orientation Exercise lays the groundwork for a comprehensive exercise programme. It is a planned event, developed to bring together individuals and officials with a role or interest in multi-hazard response planning, problem solving, development of standard operational procedures (SOPs), and resource integration and coordination. An Orientation Exercise will have a specific goal and written objectives and result in an agreed upon Plan of Action.
2. A Drill is a planned activity that tests, develops, and/or maintains skills in a single or limited emergency response procedure. Drills generally involve operational response of single departments or agencies, organizations, or facilities, but may be a subset of full-scale exercises. Drills can involve internal notifications and/or field activities. Limited evacuation may or may not be conducted, such as within a school, pilot hotel, or village.
3. A Tabletop Exercise is a planned activity in which local officials, key staff, and organizations with disaster management responsibilities are presented with simulated emergency situations. It is usually informal, in a conference room environment, and is designed to elicit constructive discussion from the participants to assess plans, policies, and procedures. Individuals are encouraged to discuss decisions based on their organization's Standard Operating Procedures (SOPs) with emphasis on slow-paced problem solving, rather than rapid, real-time decision-making. A Tabletop Exercise should have specific goals, objectives, and a scenario narrative.
4. A Functional Exercise is a planned activity designed to test and evaluate individual functions, multiple activities within a function, or interdependent groups of functions among various agencies. It is based on a simulation of a realistic emergency situation. The Functional Exercise gives the decision-makers a fully simulated experience of being in a major disaster event. It should take place at the appropriate coordination locations (e.g. warning centres and emergency operations centres) and activate all the appropriate members designated by the plan. Organisations should test their SOPs using real-time simulation tsunami bulletins. Public evacuations may or may not be included. A Functional Exercise should have specific goals, objectives, and a scenario narrative.
5. A Full-scale Exercise is the culmination of a progressive exercise programme that has grown with the capacity of the community to conduct exercises. A Full-Scale exercise is a planned activity in a "challenging" environment that encompasses a majority of the tsunami warning and emergency management functions, and involves multiple layers of government (national, provincial, local). This type of exercise involves the actual mobilization and deployment of the appropriate personnel and resources needed to demonstrate operational capabilities. DMOs (Disaster Management Office) and other local command centres are required to be activated. It tests all aspects of emergency response, and should demonstrate inter-agency cooperation. A full-scale exercise is the largest, costliest and most complex exercise type. It may or may not include public evacuations.

NATIONAL EXERCISE EVALUATION

It is recommended that both a hot and a cold debrief be held following the exercise. Held immediately after an exercise, a hot debrief is an opportunity for all participants to provide feedback while the exercise is still fresh in their minds. A suggested format for this is:

- Have a short break for about 10 minutes after the end of the exercise.
- The in-country/agency Exercise Director gives his or her initial feedback.
- Obtain participant round-table feedback.
- Evaluators provide their feedback.
- Provide appropriate acknowledgements.

A cold debrief is a more formal debrief held within four weeks following the exercise. The debrief process should include:

- What happened during the exercise?
- What went well?
- What needs improvement?
- What plans, procedures or training programmes need amendments?
- What follow up is required, including identifying any capability gaps for future capacity building?
- Was the exercise realistic?
- How could the exercise have been improved?

ANNEX III
POST-EXERCISE EVALUATION

MEMBER STATE DETAILS

Country

DETAILS OF NATIONAL CONTACT FOR EXERCISE IOWAVE18

Name

Position

Agency

Email

Phone

Is there a second National Contact for Exercise IOWave18 in your country?

- ☐ Yes
- ☐ No

PLEASE PROVIDE THE DETAILS OF THE SECOND NATIONAL CONTACT FOR EXERCISE IOWAVE18.

Name

Position

Agency

Email

Phone

Which scenarios did your country exercise? (Select one or both.)

- ☐ Exercise Scenario 1: Makran Trench (06:00 UTC, 4 September 2018)
- ☐ Exercise Scenario 2: Sunda Trench (03:00 UTC, 5 September 2018)

Please select the survey section that you would like to complete:

- ☐ Member State Details
- ☐ Makran Trench Scenario: Participation
- ☐ Makran Trench Scenario: Objectives 1-3
- ☐ Makran Trench Scenario: Objectives 4-5
- ☐ Makran Trench Scenario: Objective 6 General
- ☐ Questions
- ☐ All survey sections have been completed. I would like to submit the completed survey.

I would like more information about the Exercise Objectives.

- ☐ Yes, please.
- ☐ No, thank you.

Level of Participation

Please indicate if the following statements reflect your level of in-country participation.

	Yes	No
National Disaster Management Organization was involved.	<input type="radio"/>	<input type="radio"/>
Local Disaster Management Organization(s) participated.	<input type="radio"/>	<input type="radio"/>
Media representatives participated.	<input type="radio"/>	<input type="radio"/>
The community was involved (not necessarily evacuation).	<input type="radio"/>	<input type="radio"/>
Public evacuation drills were conducted.	<input type="radio"/>	<input type="radio"/>

Comments

Please indicate the type of exercise(s) conducted. (More than 1 option can be selected.)

- ☐ Orientation Exercise
- ☐ Drill
- ☐ Tabletop Exercise
- ☐ Functional Exercise
- ☐ Full Scale Exercise

Comments

See Annex II for a detailed description of each type of exercise.

Objective 1:

Validate the dissemination by TSPs of Tsunami Bulletin Notification Messages to NTWCs via TWFPs of Indian Ocean countries and the reception by NTWCs of the TSP Messages.

1(a) Name of NTWC (organizational name):

1(b) For each of the four notification message delivery mediums was the information received in a timely manner for you to carry out your warning response SOPs?

	GTS	Fax	Email	SMS
TSP Australia	<div>Received in time</div> <div>Received late</div> <div>Not received</div>	<div>Received in time</div> <div>Received late</div> <div>Not received</div>	<div>Received in time</div> <div>Received late</div> <div>Not received</div>	<div>Received in time</div> <div>Received late</div> <div>Not received</div>
TSP India	<div>Received in time</div> <div>Received late</div> <div>Not received</div>	<div>Received in time</div> <div>Received late</div> <div>Not received</div>	<div>Received in time</div> <div>Received late</div> <div>Not received</div>	<div>Received in time</div> <div>Received late</div> <div>Not received</div>
TSP Indonesia	<div>Received in time</div> <div>Received late</div> <div>Not received</div>	<div>Received in time</div> <div>Received late</div> <div>Not received</div>	<div>Received in time</div> <div>Received late</div> <div>Not received</div>	<div>Received in time</div> <div>Received late</div> <div>Not received</div>

Comments

1(c) Please provide the TSP Australia Notification Message receipt times in UTC.

	Time Received (UTC)			
	GTS	Fax	Email	SMS
06:00 Announcement Message				
xx:xx Notification Message 1				
xx:xx Notification Message 2				
xx:xx Notification Message 3				
xx:xx Notification Message 4				
xx:xx Notification Message 5				
xx:xx Notification Message 6				
xx:xx Notification Message 7				
xx:xx Notification Message 8				
xx:xx Notification Message 9				
xx:xx Notification Message 10				
xx:xx Notification Message 11				
xx:xx Notification Message 12				
xx:xx Notification Message 13				

1(d) Please provide the TSP India Notification Message receipt times in UTC.

	Time Received (UTC)			
	GTS	Fax	Email	SMS
06:00 Announcement Message	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message5	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 6	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message7	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 8	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message9	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 10	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message11	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 12	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 13	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

1(e) Please provide the TSP Indonesia notification message receipt times in UTC.

	Time Received (UTC)			
	GTS	Fax	Email	SMS
6:00 Announcement Message	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 5	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 6	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 7	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 8	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 9	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 10	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 11	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 12	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
XX:XX Notification Message 13	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Objective 2

Validate the access by NTWCs to the tsunami bulletins and other products on the TSP websites, and the use of that information for the production of national warnings.

2(a) Please indicate which TSP exchange products you accessed on the password-protected websites.

	Bulletins	Coastal Zone ThreatMap	Threat Table	Maximum Amplitude Map	Tsunami Travel Time
TSP Australia	Yes No Unable to access	Yes No Unable to access	Yes No Unable to access	Yes No Unable to access	Yes No Unable to access
TSP India	Yes No Unable to access	Yes No Unable to access	Yes No Unable to access	Yes No Unable to access	Yes No Unable to access
TSP Indonesia	Yes No Unable to access	Yes No Unable to access	Yes No Unable to access	Yes No Unable to access	Yes No Unable to access

Were any other TSP exchange products (e.g. Spatial Files) accessed on the password-protected websites?

2(b) Was tsunami threat information from TSP websites (bulletins and other products) used in the production of your national warnings?

- ☐ Yes
- ☐ No

Please indicate which information was used:

	Tsunami Wave Observations	Predicted Wave Arrival Times				Predicted Maximum Wave Amplitudes	Coastal Forecast Zone Threat Levels	Other
		T1	T2	T3	T4			
TSP Australia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TSP India	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSP Indonesia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments

Please comment why the tsunami threat information from the TSP websites was not used.

Objective 3

Validate the reporting by NTWCs to the TSPs of their National Tsunami Warning status.

3(a) Did your NTWC send reports of its warning status to the TSPs?

- ☐ Yes
- ☐ No

3(b) At what time (UTC) did the NTWC first report its status?

3(c) How many status reports did the NTWC send to the TSPs?

Why did your NTWC not report its warning status on a TSP website?

Objective 4:

Validate the SOPs within countries for generating and disseminating tsunami warnings to their relevant disaster response agencies, media, and the public.

4(a) In the following table, please indicate who is responsible for the generation and dissemination of tsunami warnings and information to each recipient listed in the left-hand column, and if exercised, the details of the warning delivery.

	Who sends tsunami messages to the recipient? (e.g. NTWC, NDMO, LDMO-P, LDMO-C and/or media)	Number of messages sent	Time 1st message sent (UTC)	Time last message sent (UTC)	Methods of delivery (e.g. email, webpage, sms, fax, phone, TV, radio, social media)	Were the messages received in a timely manner?
NDMO	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Yes No n/a
LDMO- P	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Yes No n/a
LDMO- C	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Yes No n/a
Media	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Yes No n/a
Public	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Yes No n/a
Comments	<input type="text"/>					

4(b) How well did your SOPs perform for generating and disseminating tsunami warnings within your country?

- ☐ Extremely Well ☐ Very Well ☐ Well ☐ Poor ☐ Very Poor

Comments

4(c) Does the Media have SOPs for tsunami?

- ☐ Yes
☐ No
☐ Partially

Comments

4 (d) What media participated in the exercise? (Select all that apply)

☐ Press (newspapers, magazines, journals, web-based)

☐ Radio

☐ Television

☐ Social - Facebook

☐ Social – WhatsApp

☐ Social – Twitter

☐ Other - Write In

☐ Other - Write In

Comments |

4(e) What information did the media broadcast?

- ☐ Pre-exercise tsunami awareness
- ☐ Information on the upcoming scheduled exercise
- ☐ Tsunami threat information
- ☐ Tsunami evacuation information
- ☐ All-clear information
- ☐ Mock interviews
- ☐ Coverage of the event
- ☐ Other - Write In
- ☐ Other - Write In

Comments

4(f) Was the information broadcast by the Media useful?

- ☐ Yes
- ☐ No
- ☐ Partially useful

Comments

4(g) How could Media involvement be improved in future exercises and real-events?

A large, empty rectangular box with a thin black border, intended for a written response to the question above it.

Objective 5:

Validate the SOPs within countries for the issuing of public safety messages, ordering evacuations and where possible issuing all-clear messages.

Agency abbreviations used are:

1. National Tsunami Warning Centre (NTWC)
2. National Disaster Management Organization (NDMO)
3. Local Disaster Management Organization – Provincial/Regional (LDMO-P)
4. Local Disaster Management Organization – City/District (LDMO-C)

5(a) Were public safety messages issued during the exercise? Public safety messages provide information about the tsunami threat and appropriate actions to take for each level of threat, but do not include evacuation orders or all-clear messages.

- ☐ Yes
- ☐ No

Please complete to following table for public safety messages issued during the exercise.

(Complete one row for each agency/authority that issued public safety messages as required.)

Name of agency/authority that issues public safety messages	Agency type	Time message issued (UTC)	Communication method (e.g. email, webpage, sms, fax, phone, tv, radio, social media)	Were there any communication problems?	Content of message	Reason message issued	Comments
<input type="text"/>	NTWC NDMO LDMO-P LDMO-C Other	<input type="text"/>	<input type="text"/>	Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	NTWC NDMO LDMO-P LDMO-C Other	<input type="text"/>	<input type="text"/>	Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	NTWC NDMO LDMO-P LDMO-C Other	<input type="text"/>	<input type="text"/>	Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	NTWC NDMO LDMO-P LDMO-C Other	<input type="text"/>	<input type="text"/>	Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>

5(b) Were evacuation orders issued during the exercise?

- ☐ Yes
- ☐ No

Please complete to following table for evacuation orders issued during the exercise.

(Complete one row for each agency/authority that issued evacuation orders as required.)

Name of agency/authority that issues evacuation orders	Agency type	Time message issued (UTC)	Communication method (e.g. email, webpage, sms, fax, phone, tv, radio, social media)	Were there any communication problems?	Content of message	Reason message issued	Comments
<input type="text"/>	NTWC NDMO LDMO-P LDMO-C Other	<input type="text"/>	<input type="text"/>	Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	NTWC NDMO LDMO-P LDMO-C Other	<input type="text"/>	<input type="text"/>	Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	NTWC NDMO LDMO-P LDMO-C Other	<input type="text"/>	<input type="text"/>	Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	NTWC NDMO LDMO-P LDMO-C Other	<input type="text"/>	<input type="text"/>	Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>

5(c) Were all-clear messages issued during the exercise?

- ☐ Yes
- ☐ No

Please complete to following table for all-clear messages issued during the exercise.

(Complete one row for each agency/authority that issued all clear messages as required.)

Name of agency/authority that issues evacuation orders	Agency type	Time message issued (UTC)	Communication method (e.g. email, webpage, sms, fax, phone, tv, radio, social media)	Were there any communication problems?	Content of message	Reason message issued	Comments
	NTWC NDMO LDMO-P LDMO-C Other			Yes No			
	NTWC NDMO LDMO-P LDMO-C Other			Yes No			
	NTWC NDMO LDMO-P LDMO-C Other			Yes No			
	NTWC NDMO LDMO-P LDMO-C Other			Yes No			

Objective 6:

Validate the level of community awareness, preparedness and response.

6(a) Have there been any pre-exercise community preparedness activities?

- ☐ Yes
- ☐ No

**What were the community preparedness activities between the last exercise and the current exercise?
(Select all that apply.)**

- ☐ Tsunami exercise
- ☐ Tsunami education in schools
- ☐ Participatory evacuation planning
- ☐ Community education seminars
- ☐ Evacuation maps
- ☐ Evacuation signage
- ☐ Shelter facilities
- ☐ Other - Write In

6(b) Has there been any support with regard to the following activities prior to the exercise and from whom?

	Supported activity		If supported, from whom:
	Yes	No	
Tsunami signage	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Vertical evacuation shelters	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="text"/>
Hazard mapping	<input type="radio"/>	<input type="radio"/>	<input type="text"/>
Tsunami inundation mapping	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="text"/>
Evacuation route mapping	<input type="radio"/>	<input type="radio"/>	<input type="text"/>

6(c) Was Exercise IOWave18 used as an opportunity to evaluate Indian Ocean Tsunami Ready (IOTR) indicators in pilot communities?

- ☐ Yes
- ☐ No

6(d) Name the pilot communities in which IOTR indicators were tested:

6(e) Please rank the following from 4 (extremely good), 3 (very good), 2 (good), 1 (poor) to 0 (very poor) in regard to each community that tested the IOTR indicators:

	4	3	2	1	0
Have a community tsunami risk reduction plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Have designated and mapped tsunami hazard zones	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Have a public display of tsunami information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Produce easily understood tsunami evacuation maps as determined appropriate by local authorities in collaboration with communities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Develop and distribute outreach and public education materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hold at least three outreach or educational activities annually	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conduct an annual tsunami community exercise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Address tsunami hazards in the community's Emergency Operations Plan (EOP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Commit to support the Emergency Operations Centre (EOC) during a tsunami incident, if an EOC is open and activated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Have redundant and reliable means for a 24-hour warning point (and EOC if activated) to receive official tsunami threats/information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Have redundant and reliable means for a 24-hour warning point and/or EOC to disseminate official tsunami alerts to the public.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6(f) Were community evacuations conducted in any areas?

- ☐ Yes
- ☐ No

How many communities or areas were evacuated?

Please list the areas and number of people evacuated:

6(g) Location of evacuation (name of town or community):

6(h) Please rank the following from 4 (extremely good), 3 (very good), 2 (good), 1 (poor) to 0 (very poor) in regard to the community that evacuated.

4 3 2 1 0

Availability of tsunami evacuation protocols
such as inundation/evacuation maps

☐ ☐ ☐ ☐ ☐

The level of community awareness of the
tsunami risk

☐ ☐ ☐ ☐ ☐

6(i) Have community members received any prior evacuation training?

☐ Yes

Comment

☐ No

6(j) Are there SOPs for community evacuation in place?

☐ Yes

☐ No

Please provide the details:

6(k) How were community members notified that an evacuation order was issued? (Select all that apply.)

- ☐ Siren
- ☐ Door-to-door
- ☐ Public announcement
- ☐ Radio / TV
- ☐ Mobile Phone / Social Media
- ☐ Evacuation times set prior to the exercise
- ☐ Other - Write In
- ☐ Other - Write In

6(l) What time was the evacuation order issued?
(Specify UTC or local time.)

6(m) At what time was the evacuation?
(Specify UTC or local time.)

6(n) What time did the community receive the evacuation notification?
(Specify UTC or local time.)

6(o) What is the estimated number of people that evacuated?

6(p) Who evacuated? (Select all that apply)

- ☐ Beachgoers
- ☐ Boat Users
- ☐ Home Residents
- ☐ Businesses
- ☐ Schools
- ☐ Hospitals
- ☐ Elderly People's Homes
- ☐ Hotels
- ☐ Other - Write In
- ☐ Other - Write In

6(q) Where did the evacuees go to?

6(r) Did the community receive an all-clear message?

☐ Yes

☐ No

At what time did the community receive the all-clear message?
(Specify UTC or local time.)

6(s) How was the all-clear message issued to public?
(Specify the mode of communication.)

6(t) Did the community have a shelter management plan?

☐ Yes

☐ No

6(u) At what time did the people return to their residences?
(Specify UTC or local time.)

6(v) Did the evacuation process happen smoothly?

- ☐ Yes
- ☐ No

If no, please provide the details of the problems encountered during evacuation:

6(w) How could future evacuation exercises be improved?

General Questions

7(a) Please rank the following from 4 (extremely good), 3 (very good), 2 (good), 1 (poor) to 0 (very poor).

	4	3	2	1	0
Exercise planning and communication with Member States: Timeliness and usefulness of information provided by the ICG/IOTWMS Secretariat.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exercise documentation: Manual, websites, bulletins	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Exercise format and style: Real-time operation, exercise messages similar to real event	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Post-exercise evaluation: Web-based survey	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments

7(b) Our country benefited by the exercise by:

- 1)
- 2)
- 3)

7(c) Future exercises could be improved by:

- 1)
- 2)
- 3)

End of IOWave18 Post-Exercise Evaluation.

If yes, please rank the following from

4 (extremely good), 3 (very good), 2 (good), 1 (poor) to 0 (very poor).

4 3 2 1 0

Information for the post-exercise evaluation provided by the exercise
observers

☐ ☐ ☐ ☐ ☐

Comments

ANNEX IV

LIST OF ACRONYMS

EOC	Emergency Operations Centre
EOP	Emergency Operations Plan
ERI	External Relations and Information department
ETA	Estimated Tsunami Arrival Times
ICG/IOTWMS	Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System
IOC	Intergovernmental Oceanographic Commission
IOTIC	Indian Ocean Tsunami Information Centre
IOTR	Indian Ocean Tsunami Ready
IOWave18	Indian Ocean Wave 2018
LDMO	Local Disaster Management Offices
NDMO	National Disaster Management Offices
NTWC	National Tsunami Warning Centre
SOP	Standard Operating Procedures
TEMPP	Tsunami Evacuation Maps, Plans and Procedures
TSP	Tsunami Service Providers
TWFP	Tsunami Warning Focal Points
UNESCO	United Nations Educational, Scientific and Cultural Organisation