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# EXERCISE INDIAN OCEAN WAVE 23
## An Indian Ocean-wide Tsunami Warning and Communications Exercise

## 4–25 October 2023

## Volume 2                  Exercise Report

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## *Executive Summary*

The Indian Ocean tsunami of 26 December 2004 was one of the most devastating natural disasters ever, in which over 230,000 people were killed and more than 1 million people were displaced. Recognising the need for a tsunami early warning system in the Indian Ocean region, the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS) was set up in 2005 as a subsidiary body of the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO). Its main purpose was to establish and maintain a tsunami early warning and mitigation system to cater to the needs of member countries in the Indian Ocean region. At that time, arrangements were also put in place for the Pacific Tsunami Warning Center (PTWC) in Hawaii and the Japanese Meteorological Agency (JMA) in Tokyo to commence provision of an Interim Advisory Service (IAS) for the Indian Ocean, pending the establishment of the IOTWMS. During this time, the first Indian Ocean Wave Exercise (IOWave) was conducted in 2009 (IOC/2009/TS/88).

The Tsunami Service Providers (TSPs) of Australia, India and Indonesia commenced providing service for the Indian Ocean on 12 October 2011, coincident with Exercise Indian Ocean Wave 11 (IOWave11, IOC/2013/TS/99). From 31 March 2013, the TSPs of Australia, India and Indonesia assumed full operational responsibility and the IAS provided by PTWC and JMA ceased. The new full-capacity IOTWMS system was exercised during IOWave14 (IOC/2015/TS/113Vol. 1 and Vol. 2), IOWave16 (IOC/2016/TS/128Vol.1 and Vol.2), IOWave18 (IOC/2018/TS138Vol.1 and Vol.2), and again during IOWave20 (IOC/2020/TS//153Vol.1 and Vol.2).

The IOTWMS works as a "system of systems" with three TSPs generating interoperable tsunami advisory products simultaneously and making them available to the National Tsunami Warning Centres (NTWCs) of the Indian Ocean countries. It remains the responsibility of NTWCs to issue tsunami warnings for their countries. The tsunami warning centres of Australia, India and Indonesia have built up their capabilities for provision of Indian Ocean-wide tsunami advice and are the designated TSPs for the Indian Ocean region.

The IOWave exercises have been designed to test the receipt and dissemination of tsunami notifications along national tsunami warning chains, as well as test appropriate responses aligned with pre-established Standard Operating Procedures (SOPs). Throughout the exercises, the engagement of coastal communities in tsunami education campaigns, preparedness measures, and evacuation drills has grown. Moreover, awareness and adoption of the UNESCO-IOC Tsunami Ready Recognition Programme's (TRRP) twelve indicators addressing milestones in tsunami assessment, preparedness, and response have increased.

Key milestones in exercise participation were achieved during IOWave16 where over 60,000 people evacuated and subsequently during IOWave18 where over 119,000 people evacuated. IOWave20 was impacted by the ongoing Covid-19 pandemic; nonetheless, at least twenty counties participated with six reporting community involvement. During IOWave23 over 45,000 people participated in evacuation drills, including all genders, children, elderly, and people with disabilities

The occurrence of non-seismic and complex source tsunamis (e.g., 2018 Sulawesi, Indonesia; 2018 Anak Krakatau, Indonesia; 2022 Hunga Tonga–Hunga Haʻapai, Tonga), have served as a reminder that not all tsunamis are generated by undersea subduction earthquakes. For the first time, the IOWave23 exercise tested the response to a tsunami generated by a non-seismic tsunami source (i.e., volcanic eruption in the South Ocean) with new threat information products developed by the TSP operated by Australia.

Continuing with the regular ocean-wide exercises about once every two years, the Thirteenth session of the ICG/IOTWMS (ICG/IOTWMS-XIII/3) held from 28 November to 1 December, 2022 in Bali, Indonesia agreed to conduct the Exercise IOWave23 on 4, 11, 18, and 25 October 2023. The exercise comprised four scenarios including three seismic scenarios of magnitude ~9 earthquakes in the Andaman trench, Java trench, and Makran trench, and a volcanic eruption on Heard Island in the Kerguelen Islands region.

The objectives of the exercise were to validate:

1. Procedures in place to ensure tsunami warnings get to all in the community, including those with disabilities, all genders, elderly, and youth.

2. Level of community awareness, preparedness, and response.

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

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

5. 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.

6. Access by NTWCs to the tsunami bulletins and other products on the TSP websites, and the use of that information to produce national warnings.

7. Reporting by NTWCs to the TSPs of their National Tsunami Warning Status.

8. Receipt and understanding by NTWCs of new TSP service for tsunamis generated by non-seismic and complex sources.

The exercise was a success with 3 designated TSPs and 20 [out of 25] active Member States participating, mainly, Australia, Bangladesh, France (Indian Ocean Territories), India, Indonesia, Iran, Madagascar, Malaysia, Maldives, Mauritius, Myanmar, Oman, Pakistan, Seychelles, Singapore, South Africa, Sri Lanka, Tanzania, Thailand, and United Arab Emirates.

The exercise highlighted both the strengths and weaknesses of the IOTWMS, identified areas requiring further attention, and provided a benchmark of the present status of the end-to-end tsunami warning and mitigation system. Twenty Member States provided feedback via a post-exercise survey questionnaire.

**Key Findings**

Exercise Participation

At least 20 Member States participated in IOWave23. While all involved National Tsunami Warning Centres (NTWCs) and Disaster Management Organisations (DMOs), it was encouraging also to see exercising down to community level in 8 Member States, including specific testing of the UNESCO-IOC Tsunami Ready indicators in at least 7 Member States. Around a total of 45,000 people participated in evacuation drills, including all genders, children, elderly, and people with disabilities. Extensive national stakeholder engagement in each Member State, including with media, helped with successful exercise outcomes and greater government and community awareness of the tsunami threat and what to do. As part of the IOTWMS coordinated service, the TSPs in Australia, India, and Indonesia successfully issued

test tsunami threat bulletins for three seismic scenarios to all Member States. TSP-Australia was commended for their new products for tsunamis generated by non-seismic sources, which were tested for the first time during the Heard Island volcano scenario.

Fifteen Member States participated in only one scenario (i.e. Bangladesh, France Indian Ocean Territories, Iran, Madagascar, Maldives, Mauritius, Myanmar, Oman, Pakistan, Singapore, South Africa, Sri Lanka, Tanzania, Thailand, and United Arab Emirates), three Member States participated in two scenarios (i.e. Australia, Indonesia, and Seychelles), and two Member States participated in all four scenarios (i.e. India and Malaysia).

Objectives 1–2: At Risk Coastal Communities

Exercise IOWave23 has emphasised inclusivity in tsunami warnings, and in doing so aligned with the United Nations Early Warnings for All (EW4ALL) initiative to ensure that everyone on the planet is protected by early warning systems by 2027 and the World Tsunami Awareness Day (WTAD) 2023 theme of fighting inequality for a resilient future. Over half of the responding Member States reported used of inclusive messaging to ensure tsunami warning messages issued to the public were able to be accessed and understood by people with disabilities, all genders, elderly and youth.

An important goal of the UN Ocean decade tsunami programme is to ensure 100% of communities at risk are prepared and resilient to tsunamis by 2030. By exercising down to community level in Exercise IOWave23 and evaluating the indicators of the UNESCO-IOC Tsunami Ready recognition programme communities are a step closer to reaching this goal. During Exercise IOWave23 seven Member States undertook community evacuations totally ~45,000 people and nine Member States assessed the Tsunami Ready indicators in around 50 communities.

Objectives 3–4: Standard Operating Procedures

Most of the IOTWMS Member States have established agencies responsible for disseminating tsunami warnings to national and local DMOs, the media, and the public. These agencies vary across Member States, especially in terms of public notification, which often employs multiple channels such as the NTWC, national and local DMOs, and media outlets. Tsunami alerts were distributed via several methods, with DMOs primarily receiving information through SMS, email, fax, social media, and loudspeakers. For the media and public, common communication methods include email, SMS, telephone, fax, and websites.

During IOWave23, the majority of reporting Member States collaborated with the media, utilizing both traditional channels like public television, press, and radio, as well as social media platforms such as WhatsApp, Facebook, and Twitter. Around half of the Member States also had media coverage that included event details, tsunami threats, and simulated interviews, with 91% finding media broadcasts beneficial.

In 17 reporting Member States, public safety messages, evacuation orders, and all-clear notifications were issued by 65%, 47%, and 59% of the participants, respectively. The primary channels for these messages were email, fax, and telephone. Additionally, 85% of the countries reported no issues in delivering public safety messages, evacuation orders, and all-clear notifications.

Objectives 5–8: National Tsunami Warning Centres

Dissemination of TSP messages to NTWCs by email, GTS (Global Telecommunications System) and SMS was successful, with average message reception rates of 90% across all scenarios for GTS and 91% for email with 100% of countries receiving messages from at least

one type of dissemination mode. The reception rate by SMS was lower with the average of only 38% across the scenarios. Fax had the lowest reception rate of all four delivery methods average of about 20%, as demonstrated lowest compared to all previous Communications Tests and IOWaves.

Access rates to the tsunami threat information on TSP websites by NTWCs remain high. 100% of reported countries were able to access the TSP website. 100% of countries were able to receive tsunami threat information from at least on TSP.

All TSP products were found useful for NTWCs formulating their national warnings. Among the most used are the Predicted Max Wave Amplitudes, Tsunami Wave Observations, Coastal Forecast Zone Threat Levels, Predicted Arrival Times T1 and T4

The Warning status reporting by NTWCs to a TSP website rate was 75% for all scenarios during Exercise IOWave23. This rate is higher than that of IOWave20. In comparison, it is near to average reporting rate of previous IOWaves and Communication Tests.

Non-seismic and complex source tsunami tested first time by TSP Australia, of the reporting warning states, 50% accessed the TSP Australia products. Reported member states found the products were easily accessible and understandable.

Exercise Conduct

To assess the overall success of the exercise planning, organisation and conduct, Member States ranked activities of the IOWave23 Task Team from 4 (extremely good), 3 (very good), 2 (good) to 1 (poor). Exercise planning and communication with Member States including timeliness and usefulness of information provided by the ICG/IOTWMS Secretariat was assessed at 3.5. Exercise documentation prepared by the IOWave23 Task Team including manual, websites, and bulletins was assessed at 3.4. Exercise format and style including real-time operation and exercise messages similar to those in a real event was ranked at 3.5 The Exercise evaluation was assessed at 3.2. As all activities were assessed between very good and extremely good (3–4) the conduct of IOWave23 is successful.

Reported Benefits and Suggested Enhancements for Future Exercises

Member States reported many benefits from the exercise including:

a) Testing and updating communication channels and protocols in the end-to-end national tsunami warning chain
b) Testing and refining tsunami response Standard Operating Procedures within and between organisations
c) Testing and refining response procedures for a non-seismic tsunami
d) Enhancing the readiness of coastal communities to respond to tsunami threats
e) Evaluating the UNESCO-IOC Tsunami Ready indicators
f) Enhancing cooperation among stakeholders involved in tsunami response
g) Raising public awareness of tsunami threats and response procedures
h) Inclusion of vulnerable populations

Member States also suggested improvements for future exercises including:

a) Increase stakeholder involvement including communities, media, private sector and tourism
b) Conduct exercises at a different time of the year

c) Use a scenario involving weekend, nighttime or public holiday conditions
d) Regular awareness and preparedness programmes required at the community level
e) Expand the scope of disaster preparedness exercises to encompass a broader segment of society and diverse regions
f) Leverage on innovative advancements to disseminate disaster awareness and education across society
g) Provide technical support in scenario-based inundation and hazard mapping
h) Check and update the TSP dissemination databases, especially for SMS

# 1.      INTRODUCTION

Overall, 38% of the world's population live within 100 km of the coast or estuaries and these coastal communities are directly exposed to threats from natural disasters such as cyclones, storm surges, coastal erosion, and tsunamis. Though tsunamis are infrequent, the death toll from tsunamis is huge compared with other natural disasters. The 26 December 2004 Indian Ocean tsunami resulted in disastrous loss of life and property. More than 230,000 people died with the highest death toll in Indonesia, which was near the tsunami source. Casualties were also reported in countries as far away as Somalia, Tanzania and Kenya. The 11 March 2011 Tohoku, Japan tsunami, which is believed to be the costliest natural disaster in the world, resulted in more than 20,000 people dead or missing and US$210 billion of economic damage (estimated by Japan's Cabinet Office and Reconstruction Agency and reported by the World Bank, 2012). The tsunami in Turkey and Greece (30 October 2020) once again reminded us of the complexity facing the tsunami warning community. Moreover, the occurrence of non-seismic and complex source tsunamis (e.g., 2018 Sulawesi, Indonesia; 2018 Anak Krakatau, Indonesia; 2022 Hunga Tonga–Hunga Ha'apai, Tonga), have served as a reminder that not all tsunamis are generated by undersea subduction earthquakes.

The major challenge with tsunamis is that they are infrequent and can occur at any time. This requires great persistence in sustaining the process of capacity building, preparedness and readiness to make quick and informed decisions on community evacuations by governments and emergency responders. Because of this reason, instruction through mock tsunami drills is the best way to train coastal communities to prepare for devastating actual events and maintain awareness. A very high level of public awareness is essential, especially in the regions which are close to tsunami source locations. These communities need to be trained to act on their knowledge of natural signs plus awareness acquired through tsunami drills, rather than waiting for warnings from local officials. This situational awareness and ability to respond quickly is best achieved through pre-event education and mock drills. Tsunami drills not only educate the public on natural signs but also on where they would receive the official warnings, by which means, what those warnings indicate, how to understand them, and what they need to do in response.

## BACKGROUND

The Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS) was established through IOC Assembly Resolution IOC-XXIII-12 (2005). Under the guidance of the ICG/IOTWMS, Member States collaborated in the development of the Indian Ocean Tsunami Warning and Mitigation System (IOTWMS). The IOTWMS is a system of systems with each National Tsunami Warning Centre (NTWC) of the active Member States assessing the tsunami threat information provided by the three Tsunami Service Providers (TSPs) of Australia, India and Indonesia in conjunction with their own national information and providing advice to at-risk coastal communities through their national tsunami warning chain.

Recognizing the importance of tsunami exercises as a means to test the tsunami warning systems while increasing education and readiness, UNESCO/IOC conducted its first basin-wide exercise in the Pacific Ocean in May 2006. Seven Indian Ocean Wave (IOWave) Exercises have now taken place in 2009, 2011, 2014, 2016, 2018, 2020, and 2023.The end-to-end tsunami warning system capability was initially trialled and tested in the Indian Ocean-wide tsunami warning and response exercise IOWave09 (October 2009). It came into operation immediately following IOWave11 (October 2011). After several years of parallel operation of the new system with the IAS, the ICG/IOTWMS used Exercise IOWave14 (September 2014) to agree on full operation of the new system and cessation of the IAS. The ICG/IOTWMS subsequently conducted ocean-wide exercises during IOWave16 (September 2016), and IOWave18 (September 2018). Exercise IOWave18 improved upon the previous

exercises with all 24 active Member States participating, a record 119,000 people evacuating, and communities in India and Oman piloting the Indian Ocean Tsunami Ready framework, which evolved to become the UNESCO-IOC Tsunami Ready Recognition Programme. Exercise IOWave20 (September 2020) occurring coincident with the global pandemic providing Member States and opportunity to update and validate their business continuity plans for responding to natural disasters during a pandemic.

Exercise IOWave23 comprised of three earthquake scenarios: Java trench, Andaman trench, and Makran trench, placing all Member States of the Indian Ocean basin under threat at some stage for at least one of the scenarios. For the first time, an additional non-seismic scenario was exercised. The four scenarios were conducted one week apart and allowed the individual Member States to decide the level of threat, type and number of exercises to participate in. Participation in multiple exercise scenarios, at least at the National Tsunami Warning Centre (NTWC) and National Disaster Mangement Organisation (NDMO) level, had the advantage of allowing SOP issues identified during the earlier scenarios to be corrected and exercised again. It also encouraged the testing of different elements and timelines of the SOPs, because the tsunami arrival times were varied for each scenario.

During the thirteenth session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS-XIII) held in Bali, Indonesia, from 28 November to 1 December 2022, it was decided to conduct an Indian Ocean-wide Tsunami Warning and Communication Exercise (IOWave23) during the second half of 2023. A Task Team was established to organise it, with membership comprising Australia, India, Indonesia, Iran, Pakistan, and Oman.

## EXERCISE CONDUCT AND PARTICIPATION

Exercise IOWave23 (IOC/2020/TS/181Vol.1) was conducted on 4, 11, 18 and 25 October 2023. At least twenty (20) IOTWMS Member States participated. The participating Member States were:

- National Tsunami Warning Centres (NTWCs): Australia, Bangladesh, France (Indian Ocean Territories), India, Indonesia, Iran, Madagascar, Malaysia, Maldives, Mauritius, Myanmar, Oman, Pakistan, Seychelles, Singapore, South Africa, Sri Lanka, Tanzania, Thailand, and United Arab Emirates.

- Tsunami Service Providers (also NTWCs for their own country): Australia, India, and Indonesia.

Each Member State nominated a National Exercise Contact who was expected to confirm the existing tsunami warning arrangements within their country, including the identification of operational points of contact for receipt and dissemination of tsunami warnings downstream from the NTWC. The designated National Contact was also responsible for coordinating input to the exercise evaluation. The details of the IOTWMS National Exercise Contacts for IOWave23 are contained in ANNEX I.

Three earthquake scenarios and one volcanic scenario were conducted at 1-week intervals during October 2023. Each scenario was held in real time. The scenario details are given in Table 1.

| Scenario | 1. Andaman Trench | 1. Makran Trench | 3. Heard Island Volcano | 4. Java Trench |
|---|---|---|---|---|
| Date | 4 October 2023 (Wednesday) | 11 October 2023 (Wednesday) | 18 October 2023 (Wednesday) | 25 October 2023 (Wednesday) |
| Time | 04:00 UTC | 06:00 UTC | 06:00 UTC | 02:00 UTC |
| Magnitude | ~M9 | ~M9 | n/a | ~M9 |
| Depth | 10 km | 10 km | n/a | 10 km |
| Latitude | 7.20N | 24.80N | 53.10S | 10.40S |
| Longitude | 92.90E | 58.20E | 73.52E | 112.80E |
| Location | Off west coast of Nicobar Islands, India | North-West Indian Ocean | Kerguelen Islands Region, Southern Ocean | South of Java, Indonesia |

Table 1. Scenario details for the four IOWave23 scenarios:
Andaman Trench, Makran Trench, Heard Island Volcano, and Java Trench.

Ten (10) ICG/IOTWMS Member States participated in the Andaman scenario, six (6) participated in the Makran scenario, six (6) participated in the Heard Island scenario, and seven (7) participated in the Java scenario.

- Andaman scenario participants: Bangladesh, India, Indonesia, Madagascar, Malaysia, Myanmar, Seychelles, Singapore, Sri Lanka, and Thailand.

- Makran scenario participants: India, Iran, Malaysia, Oman, Pakistan, and United Arab Emirates.

- Heard Island scenario participants: Australia, India, Malaysia, Seychelles, South Africa, and Tanzania.

- Java scenario participants: Australia, France (Indian Ocean Territories), India, Indonesia, Maldives, Maldives, and Mauritius.

All twenty reporting countries (100%) included the National Tsunami Warning Center in the exercise, fifteen countries (75%) included the national disaster management organisation; nine countries (45%) included provisional disaster management organisation(s), thirteen countries (65%) included local disaster management organisation(s); nine countries (45%) involved the media, and eight countries (40%) involved the community but not necessarily in evacuations. The level of Member State participation in IOWave23 is provided in Annex III.

Member States reported on the type of exercise(s) conducted. Out of the twenty reporting Member States, 14 (70%) conducted tabletop exercises, 8 (40%) conducted drills, 6 (30%) conducted functional exercises, 3 (15%) conducted orientation exercises, and 3 (15%) conducted full scale exercises. The types of exercise conducted in each Member State are detailed in Annex III.

Following the exercise, a lessons-learnt workshop on Exercise IOWave23 was held online from 12 to 13 December 2023. Member States provided summaries of their experience in the exercise including participation, their national tsunami warning and mitigation system, organisation of the exercise, and lessons learnt.

## 2.    AT-RISK COASTAL COMMUNITIES

Exercise IOWave23 has aligned with key initiatives by emphasising inclusivity in tsunami warnings. Specifically, the United Nations Early Warnings for All (EW4ALL) initiative, which aims to ensure that everyone on the planet is protected by early warning systems by 2027 and the World Tsunami Awareness Day (WTAD) 2023 theme of fighting inequality for a resilient future.

Moreover, exercises are important for developing and enhancing community tsunami awareness, preparedness, and response activities such as addressed through the 12 indicators of the UNESCO-IOC Tsunami Ready Recognition Programme (TRRP).

This section corresponds with Annex IV – Survey Responses: At-Risk Coastal Communities. The detailed responses for each question are contained within the annex.

### 2.1    OBJECTIVE 1 – INCLUSIVENESS OF TSUNAMI WARNINGS

Objective 1: Validate procedures are in place to ensure tsunami warnings get to all in the community, including those with disabilities, all genders, elderly, and youth.

This objective was assessed by confirming tsunami warning messages issued to the public can be accessed and understood by people with disabilities, all genders, elderly and youth.

#### 2.1.1    Objective 1: Results

Nineteen Member States completed the online questionnaire for Objective 1. Nine of the responding Member States (53%) reported that tsunami warning messages issued to the public were able to be accessed and understood by people with disabilities, all genders, elderly and youth.

The reported measures to ensure warning reach all community members included website content with audio transcripts and closed captions, website access through screen readers and other assistive technology, and message dissemination to public through speakers.

The reported future measures to be implemented for inclusive messaging include to tailor messaging for people with disabilities such as non-audio warnings for beach evacuations (i.e., flags, lights, visual cues).

#### 2.1.2    Objective 1: Items for follow-up

- Member States should ensure people with disabilities, all genders, elderly and youth have access to tsunami warnings.

### 2.2    OBJECTIVE 2 – TSUNAMI RESILIENCE IN THE COMMUNITY

Objective 2: Validate the level of community awareness, preparedness, and response.

#### 2.1.3    Objective 2: Results

Objective 2 was assessed by asking each Member State about pre-exercise awareness and preparedness activities in the lead-up to Exercise IOWave23. Additionally, Member States were asked if the exercise was used as an opportunity to evaluate the UNESCO-IOC Tsunami Ready indicators in communities.

### 2.1.3.1 Pre-exercise preparedness activities

Sixteen Member States completed the online questionnaire for Objective 2. Nine of the responding Member States (56%) reported that pre-exercise awareness activities had been held. Of these, seven Member States (78%) reported that the activities catered for people with disabilities, all genders, elderly and youth.

Eight of the responding Member States (50%) reported that pre-exercise community preparedness activities had been held. The most common preparedness activities included community education seminars, tsunami education in schools, evacuation maps, and shelter facilities. Other less common preparedness initiatives included evacuation signage, tsunami exercise, and participatory evacuation planning.
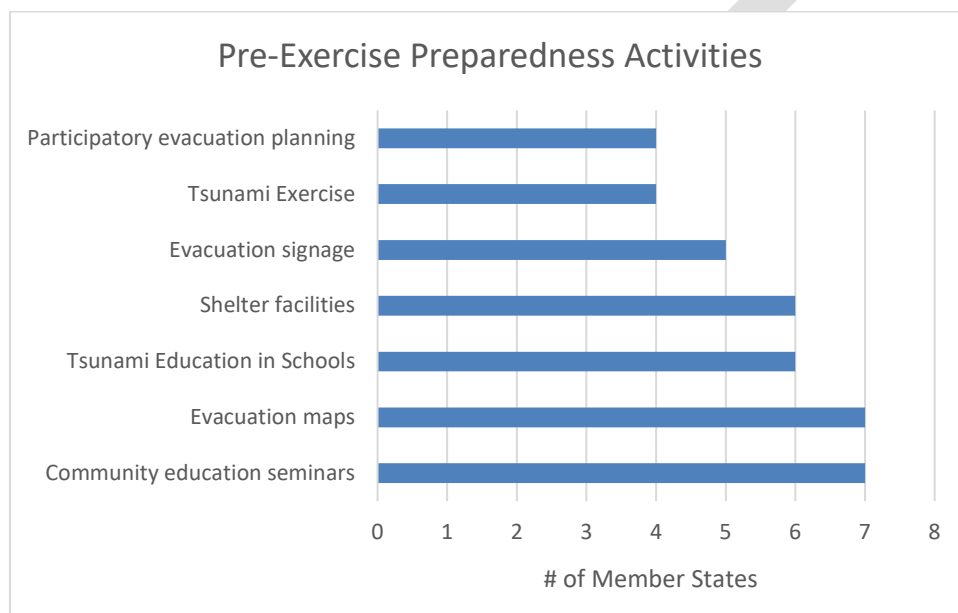


**Figure 2.1**. Pre-exercise preparedness activities reported by Member States.

Nine of the sixteen responding Member States (56%) reported that evacuation maps are available (though two Member States did not include these as a pre-exercise preparedness activity). Of these, seven Member States (78%) reported that the maps consider evacuation of people with disabilities, all genders, elderly and youth.

### 2.1.3.2 Pre-exercise activity support

Fourteen of the sixteen responding Member States (88%) reported pre-exercise support for tsunami preparedness activities. The most common supported activities were tsunami hazard mapping and tsunami inundation mapping. Limited support was available for evacuation route mapping, tsunami signage and vertical evacuation shelters. Oman and Tanzania indicated that there was not support for any tsunami preparedness initiatives immediately prior to the exercise.
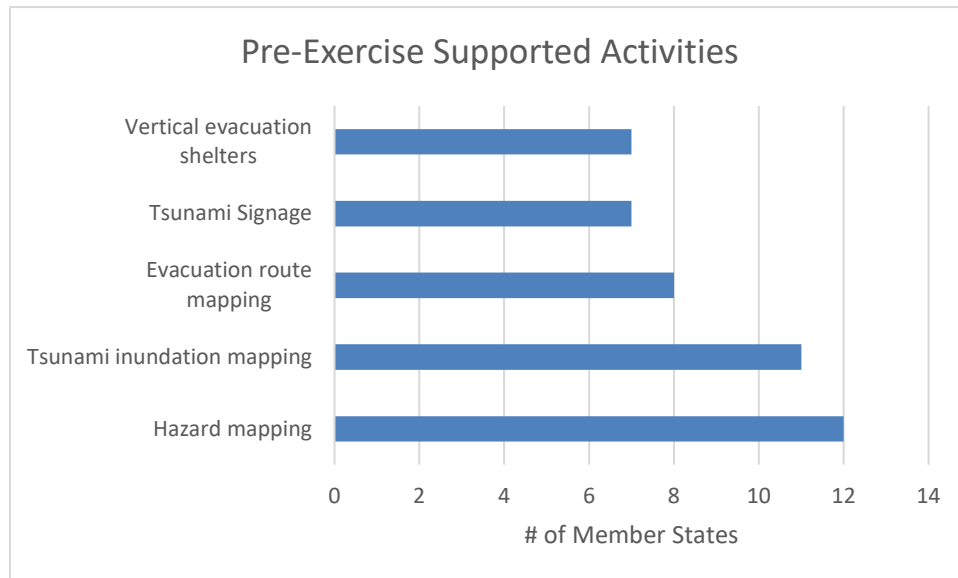
**Figure 2.2**. Pre-exercise supported activities.

### 2.1.3.3 UNESCO-IOC Tsunami Ready Recognition Programme

IOWave23 was a useful opportunity to assess readiness against the UNESCO-IOC Tsunami Ready indicators. Nine of the sixteen responding Member States (56%) reported evaluation of the Tsunami Ready indicators including Bangladesh, India, Indonesia, Iran, Maldives, Myanmar, Sri Lanka, Thailand, and the United Arab Emirates. In total, the assessments of Tsunami Ready indicators were carried out in at least 46 communities in the Indian Ocean region.

### 2.1.3.4 Community Evacuations

Community evacuation drills were conducted in seven countries, including India, Indonesia, Iran, Maldives, Mauritius, Sri Lanka, and United Arab Emirates. A total of ~45,000 people participated in evacuation drills, including all genders, children, elderly, and people with disabilities.

In India, around 40,000 people were evacuated to shelters/safe places during the Andaman trench scenario. 44 coastal villages from 13 districts of 4 coastal States / Union Territories of Odisha (32 villages), Andaman (5), Puducherry (4) and Tamil Nadu (3) were involved during the exercise on 4 October 2023. Community members, school students, and the elderly were involved in the evacuations.

In Indonesia, 11 coastal provinces participated in the Java trench scenario on 25 October. Over 1,650 community members participated in the evacuation drills. This included Kelurahan Serangan, Bali (136); Pelabuhan Benoa, Bali (48); Pantai Barat Pangandaran, Jawa Barat (100); Pelabuhan Perikanan Cikidang Pangandaran, Jawa Barat (104); Bandara Nusawiru, Jawa Barat (100); Desa Cikakak – Sukabumi, Jawa Barat (40); Pangarangan, Banten (106); Desa Muara Lebak, Banten (70); Kelurahan Murti Gading, Bantul (320); Kelurahan Glagah, Yogjakarta (200); Pantai Kukup Kemadang, Yogjakarta (50); Desa Sidaurip – Cilacap, Jawa Tengah (110); Desa Sarangon, Jawa Timur (70); Tambakrejo, Jawa Timur (100); and Desa Oesapa – Kupang, Nusa Tenggara Timur (100). An additional 23 communities undertook table-top exercises.

In Iran, about 500 people in Chabahar and Jask undertook community evacuations during the Makran trench scenario. Field sirens and public speakers were activated, and evacuation

procedures were put into action. The day prior to the exercise, pre-exercise training workshops were held in both communities to raise tsunami preparedness.

In the Maldives, Baa Kendhoo council made community safety a top priority during the Java trench scenario. More than 60 people participated in evacuation drills including the elderly and expatriates living on the island. The whole island community supported the exercise by engaging in sensitisation sessions. The day prior to the drill, a tsunami information session was held by the National Disaster Management Authority for students, parents, and teachers.

In Mauritius, vulnerable communities of coastal villages of Quatre Soeurs and Riviere Des Galets participated in a full-scale evacuation exercise during the Java trench scenario. Around 100 persons consisting of adults, children, elderly and disabled were moved to safe haven by the Police and Fire Service Officers who are the first responders. Schools and businesses in affected zones were closed and their personnel evacuated. Residents of the outer islands of Agalega participated in the exercise. In Rodrigues', about 200 persons were evacuated from Gravier, St Francois, and Pointes Cotton which targeted mostly costal residents and lodges. Pupils from a school in a place called Gravieralso participated.

In Sri Lanka, nearly 2,000 people participated in community and school evacuations during the Andaman trench scenario. The communities of Pudawaikkadu Village, Maruthankudah Village, and Sagarapura Village (Trincomalee District) included persons with disabilities, pregnant and lactating mothers, elderly, and children in the drill. The villages tested the UNESCO-IOC Tsunami Ready indicators. The students and staff at three schools participated in the drill. The schools were Nooriya Muslim College in Trincomalee District (400 students), Mahamaya Girls College in Matara District (977 students), and Madampagama Central College in Galle District (873 students).

In the United Arab Emirates, an evacuation exercise was held in Al Righailat community in the Emirate of Fujairah during the Makran trench scenario. In total, approximately 500 people participated including residents, visitors, local authorities, and non-governmental organisations. Participation included all community categories: men, women, children, elders, youth, and people with disabilities. The exercise was a valuable opportunity to test the UAE's tsunami warning and response system and to engage different communities.

### 2.1.4   Objective 2: Items for follow-up

- All Member States are encouraged to participate in the UNESCO-IOC Tsunami Ready Recognition Programme (or similar national initiative) to ensure that all at-risk coastal communities are prepared for and resilient to tsunami threats.
- All Member States are encouraged to undertake community evacuations in the next Indian Ocean Wave (IOWave) Exercise.

## 3. STANDARD OPERATING PROCEDURES

While fortunately tsunamis are relatively rare, exercises are required to ensure standard operational procedures are effective for a) generating and disseminating tsunami warnings and b) issuing public safety messages, ordering evacuation, and issuing all clear messages.

This section corresponds with Annex V – Survey Responses: Standard Operating Procedures. The detailed responses for each question are contained within the annex.

### 3.1 OBJECTIVE 3 –TSUNAMI WARNINGS

Objective 3: Validate the Standard Operating Procedures within countries for generating and disseminating tsunami warnings to their relevant emergency response agencies, other authorities, media, and the public.

This objective was assessed by confirming the generation and dissemination of tsunami warnings and information to five key recipients in each Member State:

1. National Disaster Management Organisation (NDMO)
2. Provincial Disaster Management Organisation (PDMO)
3. Local Disaster Management Organisation (LDMO)
4. Media
5. Public

#### 3.1.1 Objective 3: Results

*Nineteen Member States completed the online questionnaire for Objective 3. Each Member State reported on the agency that sends tsunami warning and information messages to each recipient, the number of messages sent, the time the first and last messages were sent, the method(s) of delivery, and the timeliness of the messages.*

*The reported responsible agencies for the generation/dissemination of tsunami warnings and information to downstream users are as follows:*

- *Thirteen Member States reported that the NTWC is responsible for the generation and dissemination of tsunami warnings to the NDMO.*

- *In contrast, the disseminating of tsunami warnings downstream to the PDMO is the responsibility of either the NTWC or the NDMO.*

- *Disseminating tsunami warnings to the LDMO is the responsibility of either the NTWC, the NDMO or the PDMO.*

- *Tsunami warning notifications to the media are largely the responsibility of the NTWC and to a lesser extent the NDMO; the PDMO and LDMO play a minimal role.*

- *Messages to the public are disseminated through varied and often mixed channels including via the NTWC, NDMO, PDMO, LDMO and media.*

*Figure 3.1 and Table 3.1 illustrate the division of responsibility for generation and dissemination of tsunami warning and information messages.*
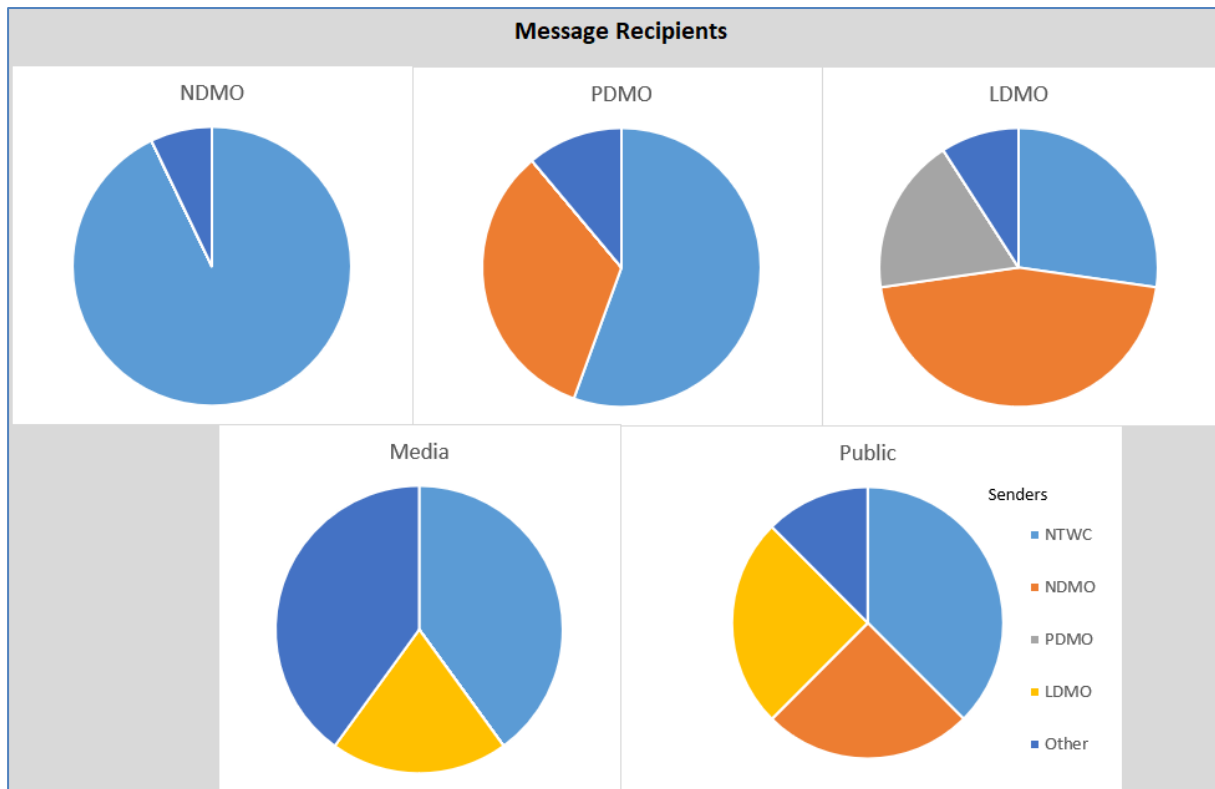
**Figure 3.1**. Responsible Agencies for Dissemination of Tsunami Warnings and Information to Disaster Management Organisaitons (National, Provincial, Local), Media, and the Public.

| | | Recipient | | | | |
|---|---|---|---|---|---|---|
| | | NDMO | PDMO | LDMO | Media | Public |
| **Sender** | **NTWC** | 93% | 63% | 30% | 40% | 50% |
| | **NDMO** | - | 38% | 50% | - | 33% |
| | **PDMO** | - | - | 20% | - | - |
| | **LDMO** | - | - | - | 20% | 33% |
| | **Other** | 7% | 13% | 10% | 40% | 17% |

**Table 3.1**. Responsible Agencies for Dissemination of Tsunami Warnings and Information to Disaster Management Organisations (National, Provincial, Local), Media, and the Public. The reported percentages represent the relative proportions of messages from the sender to the recipient with 100% being all of the disseminated messages to the recipient.

Although the methods of delivery of the tsunami warnings and information vary somewhat between Member States, overall trends in the delivery methods are apparent. Messages are largely disseminated via multiple delivery methods for redundancy. The most utilised delivery methods are email, SMS, telephone, fax, and webpages (in that order), particularly for inter-agency and media. However, SMS followed by email, fax, social media, and speakers are the preferred communications methods for notification of tsunami warnings and information to the Public. Furthermore, Indonesia notified that messages are being disseminated via WRS (Integrated platform for dissemination of earthquake information and tsunami warning). The survey found a lack of role for PDMOs to convey information to the media and the public. In the interest of disseminating earthquake and tsunami information, it is recommended that all parties continue to try to disseminate information so that no one is left behind.

In addition to conventional dissemination tools such as SMS and Email has high percentage, it would be better if all institutions utilize social media given its great influence on the rapid circulation of information.
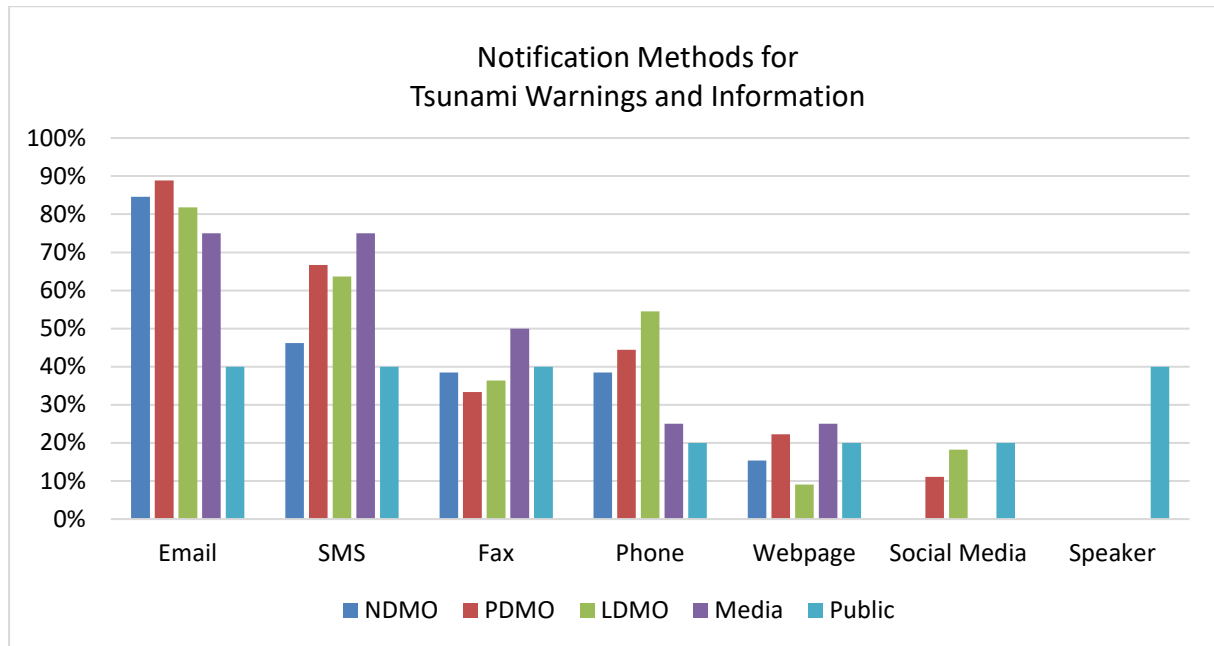


**Figure 3.2**. Percentage of reporting Member States using various notification methods for tsunami warnings and information to recipients including Disaster Management Organisaitons (National, Provincial, Local), Media, and the Public.

| Notification Method | Recipient | | | | | |
|---|---|---|---|---|---|---|
| | **NDMO** | **PDMO** | **LDMO** | **Media** | **Public** | **Average** |
| **Email** | 85% | 89% | 82% | 75% | 33% | 73% |
| **SMS** | 46% | 67% | 64% | 75% | 50% | 60% |
| **Fax** | 38% | 33% | 36% | 50% | 33% | 38% |
| **Phone** | 38% | 44% | 55% | 25% | 17% | 36% |
| **Webpage** | 15% | 22% | 9% | 25% | 17% | 18% |
| **Social Media** | 0% | 11% | 18% | 0% | 33% | 13% |
| **Speaker** | 0% | 0% | 0% | 0% | 33% | 7% |

**Table 3.2**. Percentage of reporting Member States using a variety of notification methods for tsunami warnings and information to recipients including Disaster Management Organisaitons (National, Provincial, Local), Media, and the Public.
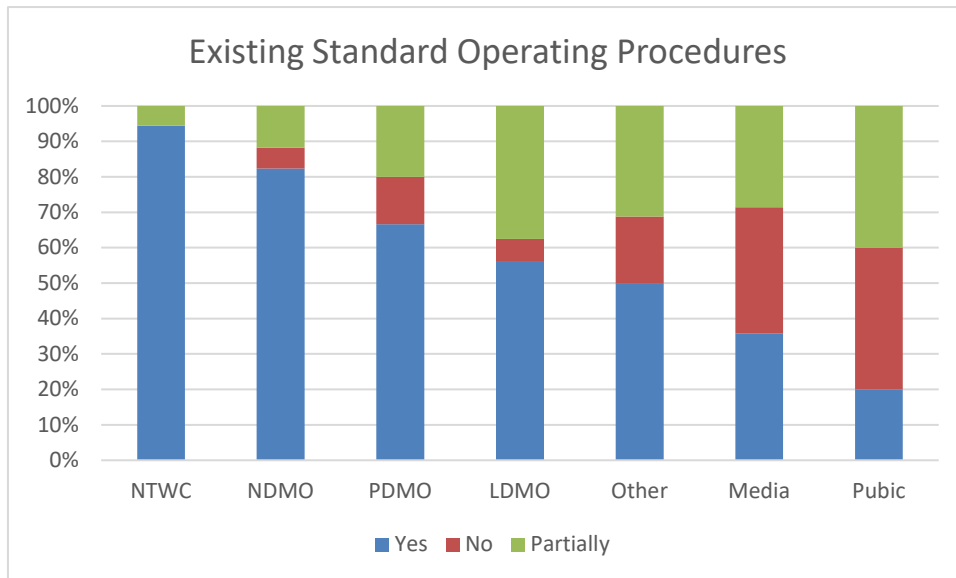
**Figure 3.3**. Existing Standard Operating Procedures for National Tsunami Warning Centres, Disaster Management Organisations (National, Provincial, Local), Media, and the Public.
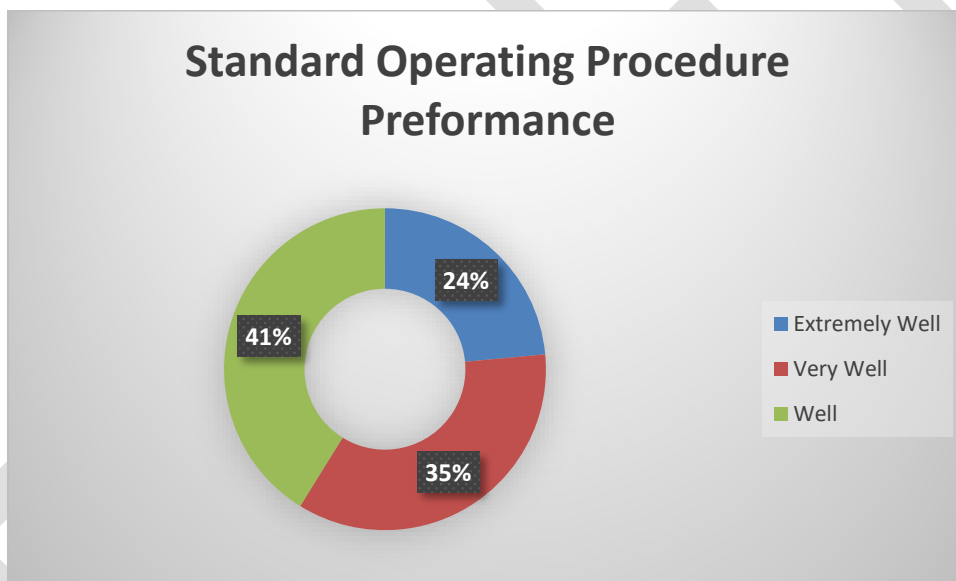


**Figure 3.4**. Overall performance of all Standard Operating Procedures within Member States.

All reporting Member States (100%) agreed that messages to the NTWC, PDMO, LDMO, Media, and Public were received in a timely manner.

All reporting Member States reported that their SOPs for generating and disseminating tsunami warning in-country performed very well or well. Nonetheless the exercise did highlight some issues in the SOPs that will be addressed in-country as a follow-up to the IOWave23 Exercise. General feedback was that the higher-level SOPs such as those between the NTWC and DMO functioned well, whereas individual and intra-agency SOPs of downstream stakeholders need to be created, expanded and/or refined.

An additional focus of the IOWave evaluation was Media participation. All 19 reporting Member States involved media to disseminate warnings in the IOWave23 Exercise. This ranged from the conventional public television, press and radio (in respectively 55%, 45% and 27% of reporting Member States) through to social media such as Facebook, Twitter ,and WhatsApp

(in respectively 36%, 36%, and 27% of reporting Member States). The growth in social media platforms continues to influence global communication including the dissemination of tsunami information.
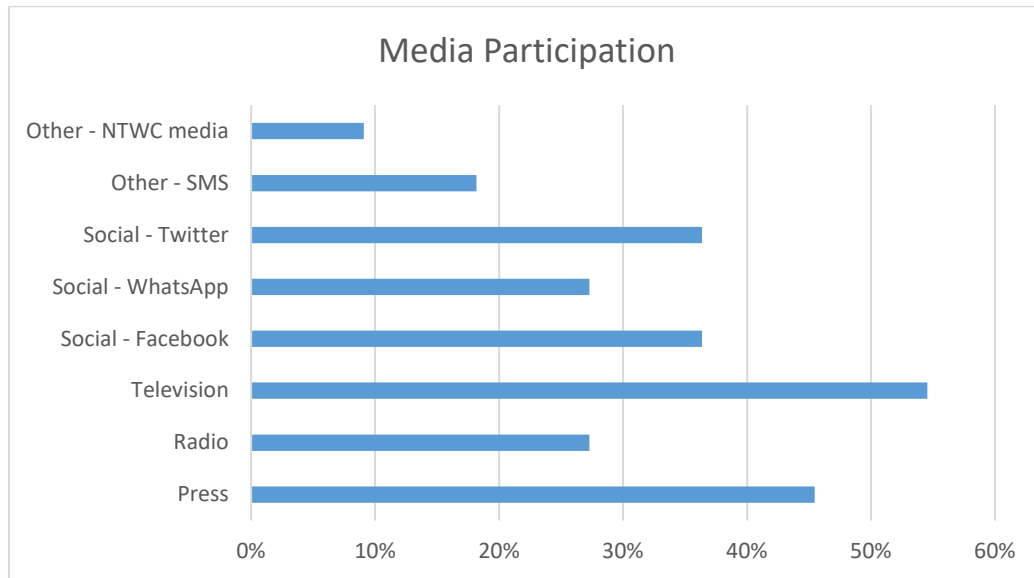


**Figure 3.5**. Media participation in the Exercise.

The media participated in IOWave23 both in the lead-up to the Exercise and on the day of the Exercise. Based on reporting Member State the media provided information on the schedule of events (82%) and pre-exercise tsunami awareness (82%) are higher than others. In roughly half of the reporting Member States, the media provided event coverage (45%), and tsunami threat information (36%) and mock interviews (36%). In roughly a quarter of the reporting Member States, the media provided tsunami evacuation information (27%) and all-clear information (27%).
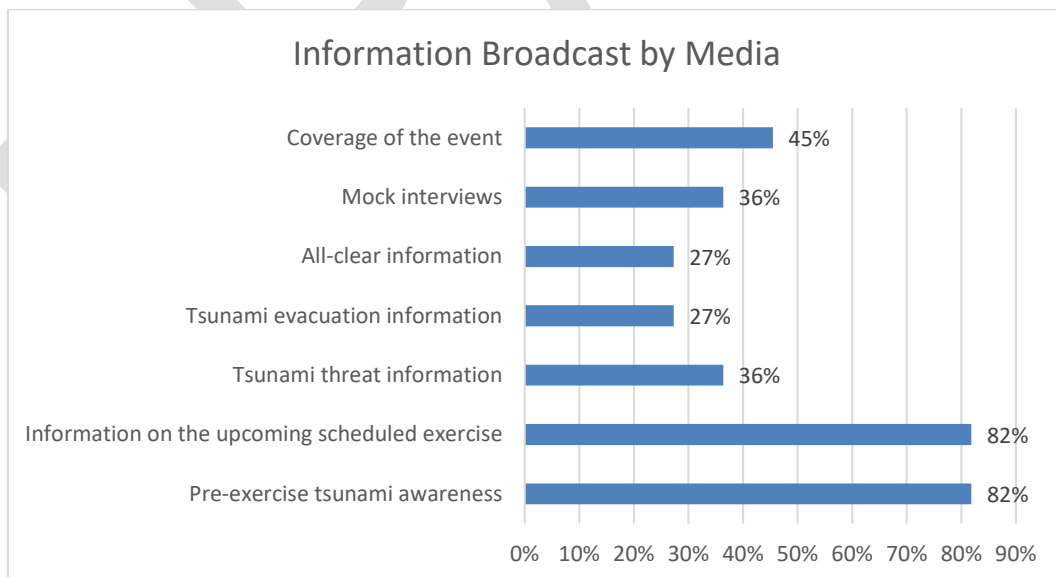


**Figure 3.6**. Information broadcast by the media

Of the Eleven reporting Member States 91% found the information broadcast by the media useful whereas 9% found the information partially useful and 0% did not find the information to be useful.

### *3.1.2 Objective 3: Items for follow-up*

- Rectify any issues found in SOPs during the exercise.

- Ensure the roles of all participating organizations are clearly defined within both individual and intra-agency SOPs.

- Develop and Validate SOPs for all participating stakeholders and agencies.

- Media involvement in future exercises and real events could be improved by ensuring they have SOPs if not already, or ensuring SOPs are updated if existing already.

- Involve media in tsunami awareness trainings and workshops in session prior at the national and regional levels.

- Establish a dedicated media call effectively manage communication and information dissemination during and after the event. Continuously monitor and analyze public reactions and social media trends to gauge public sentiment and inform decision making.

- Continue to involve the media in future tsunami exercises.

## 3.2 OBJECTIVE 4 – PUBLIC INFORMATION

Objective 4: Validate the Standard Operating Procedures within countries for the issuing of public safety messages, ordering evacuations and where possible issuing all-clear messages.

The objective was assessed by asking Member States if they issued public safety messages, ordered evacuations, and issued all-clear messages during IOWave23.

### *3.2.1 Objective 4: Results*

Of the 17 reporting Member States, 11 (65%) issued public safety messages, 8 (47%) issued evacuation orders, and 10 (59%) issued all-clear messages. The details of public safety messages, evacuation orders and all-clear messages are contained in Annex V. Details include the name of the issuing agency, the agency type, the message issue time, communication method(s), communication problems, message content, and the reason for issuing the message.

Public safety messages were mostly issued by NTWCs (59%), LDMOs (27%), and NDMOs (14%). Evacuation orders were mostly issued by NDMOs and LDMOs (44%) while lesser by NTWCs(13%) in that order. It's a normal condition since evacuation order has been issued by NDMOs dan LDMOs. All-clear messages were mostly issued by NTWCs and LDMOs (40%) to a lesser extent by NDMOs and Police (10%) in that order (refer to Table 3.3 and Figure 3.7). Again, there should not be more than one agency to issue all-clear messages and NTWCs probably only convey that message rather than issuing one themselves. Moreover, all-clear message may be mistaken as cancellation or finalisation of a tsunami message, which are very different.

| Issuing Agency Type | Public Safety Messages | Evacuation Orders | All-Clear Messages |
|---|---|---|---|
| **NTWC** | 59% | 13% | 40% |
| **NDMO** | 14% | 44% | 10% |
| **LDMO** | 27% | 44% | 40% |
| **Police** | 0% | 0% | 10% |

**Table 3.3.** Agency types responsible for issuing public safety messages, evacuation orders and all-clear messages during IOWave23.
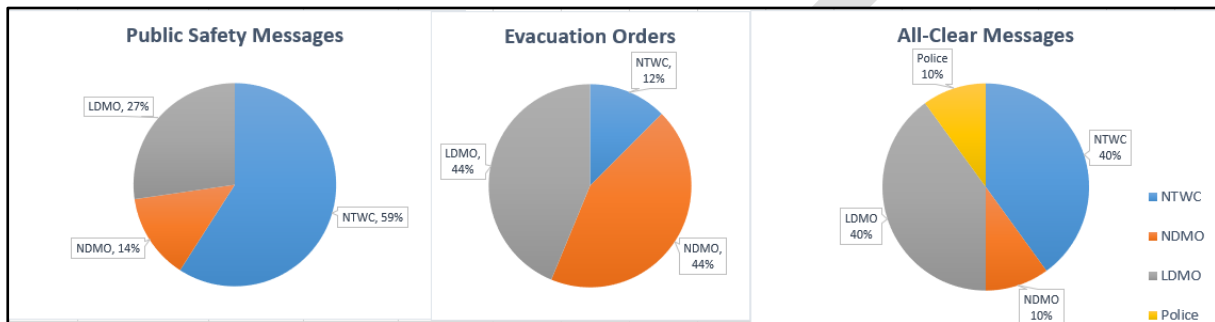


**Figure 3.7**. Agency types responsible for issuing public safety messages, evacuation orders and all-clear messages during IOWave23.

The methods of delivery of the public safety messages, evacuation orders, and all-clear messages vary between Member States (refer to Figure 3.7). Messages are largely disseminated via multiple delivery methods providing redundancy. The most utilised delivery methods for public safety messages during IOWave23 was email, fax, and telephone. Phone and fax were also commonly employed for public safety message delivery and to a slightly lesser extent were social media, webpage, SMS, warning system, and briefing.

The most utilised delivery methods for evacuation orders during IOWave23 were social media and SMS. Email and phone were also commonly employed for evacuation order delivery and to a lesser extent so were fax, webpage, speakers, warning system, siren, and police.

The most utilised delivery methods for all-clear messages during IOWave23 was email. Social media and SMS are also commonly employed for all-clear message delivery and to a lesser extent so are phone, fax, webpage, speakers, warning system, briefing, sirens, hotline, and megaphones.
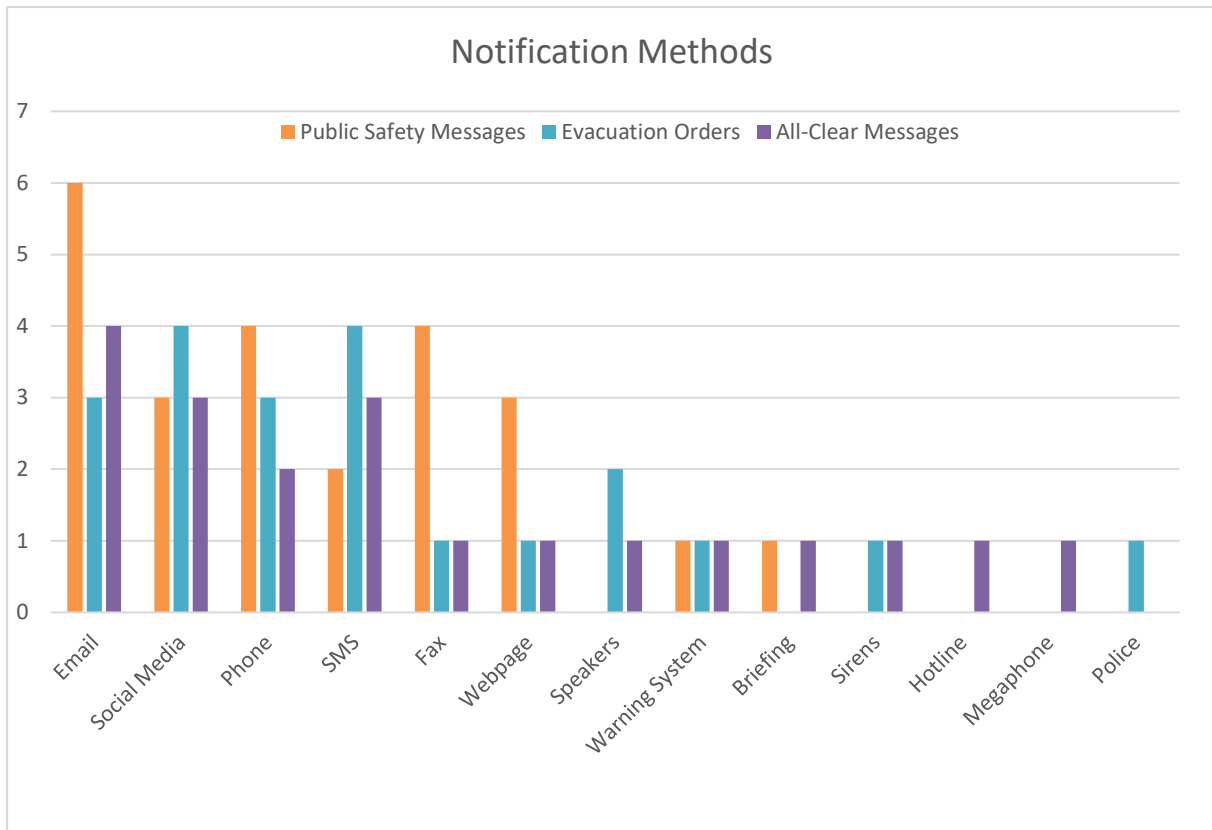
**Figure 3.8**. Notification methods of public safety messages, evacuation orders, and all-clear messages.

Most countries (85%) reported that there were no communication problems during the exercise. No countries reported communication problems while ordering evacuations. However, two Member States reported communication problems issuing public safety messages and one Member State reported communication problems while issuing all-clear messages (i.e. message delivery failure via megaphone).

### 3.2.2   Objective 4: Items for follow-up

By the participating countries

- SOPs for public safety messages, evacuation orders and all-clear messages to be developed in all Member States with clearly understood roles and responsibilities of each organization.

- Communication problems during issuing public safety messages to be addressed by Australia and Maldives.

- Communication problems during issuing all-clear messages to be addressed by Mauritius.

## 4. NATIONAL TSUNAMI WARNING CENTRES

This section corresponds with Annex VI – Survey Responses: National Tsunami Warning Centres. The detailed responses for each question are contained within the annex.

### 4.1 OBJECTIVE 5 – IOTWMS TSUNAMI SERVICE PROVIDER NOTIFICATION BULLETINS

Objective 5: Validate 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. 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.

#### 4.1.1 Objective 5: Results

#### 4.1.1.1 Timeliness of the Message Dissemination

The first part of the objective was assessed by asking NTWCs if the notification messages issued by the TSPs were timely for them to carry out their warning response SOPs. Table 4.1 summarises the NTWC responses for all exercise scenarios (Andaman, Makran, Heard Island, Java). The NTWCs for each Member State are contained in Annex VI.

| TSP Notification Messages | | Received in Time | Received Late | Not Received | Total MS Reporting |
|---|---|---|---|---|---|
| TSP-Australia | GTS | 95% | 0% | 5% | 20 |
| | Fax | 17% | 17% | 67% | 18 |
| | Email | 90% | 5% | 5% | 20 |
| | SMS | 63% | 0% | 37% | 19 |
| TSP-India | GTS | 88% | 6% | 6% | 16 |
| | Fax | 50% | 0% | 50% | 14 |
| | Email | 94% | 0% | 6% | 16 |
| | SMS | 47% | 0% | 53% | 15 |
| TSP-Indonesia | GTS | 94% | 0% | 6% | 16 |
| | Fax | 27% | 13% | 60% | 15 |
| | Email | 88% | 6% | 6% | 16 |
| | SMS | 43% | 14% | 43% | 14 |

**Table 4.1**. NTWC reporting of the percentage of TSP notification messages that were received in a timely manner, for all scenarios.

In all scenarios, TSP notification message receipt modes from most to least timely were GTS, email, SMS and Fax. Very little difference in timeliness was observed between GTS and Email, which were both above 88%.

### Reception of TSP Notification Messages

The second part of Objective 5 was to assess the success rate of NTWCs in receiving TSP notification messages for each delivery method.

The percentages of NTWCs receiving each TSP notification message are presented in Table 4.2 for all arrivals regardless of when they were received and for arrivals within 15 minutes of TSP messages being issued.

| TSP | ANDAMAN TRENCH | | | | MAKRAN TRENCH | | | |
|---|---|---|---|---|---|---|---|---|
| | Email | GTS | SMS | Fax | Email | GTS | SMS | Fax |
| Australia | 80% | 85% | 63% | 13% | 98% | 78% | 53% | 0% |
| India | 81% | 60% | 38% | 26% | 100% | 100% | 33% | 0% |
| Indonesia | 79% | 76% | 36% | 21% | 64% | 79% | 4% | 0% |
| Average | 80% | 74% | 46% | 20% | 88% | 86% | 30% | 0% |

| TSP | HEARD ISLAND | | | | JAVA TRENCH | | | |
|---|---|---|---|---|---|---|---|---|
| | Email | GTS | SMS | Fax | Email | GTS | SMS | Fax |
| Australia | 100% | 100% | 29% | 0% | 100% | 100% | 0% | 12% |
| India | n/a | n/a | n/a | n/a | 91% | 98% | 88% | 100% |
| Indonesia | n/a | n/a | n/a | n/a | 97% | 98% | 50% | 63% |
| Average | 100% | 100% | 29% | 0% | 96% | 99% | 46% | 58% |

**Table 4.2**. Percentage of TSP notification messages reported as received by NTWCs for each scenario.

Email was found to be the most effective method of communication to receive the TSP notification messages with average reception rates of 80%, 88%, 100% and 96% for the Andaman, Makran, Heard Islands and Java scenarios respectively. The average reception rate of Email was 91% for all scenarios. This was followed closely by GTS and then SMS, while Fax is the least effective out of all four communication methods. Additional points concerning email reception:

- There was little difference in the reception rates for messages received during the Andaman and other scenarios.

- There was little difference in the reception rate between messages received at any time and those received within 15 minutes of issue, indicating that most email messages were received within 15 minutes of issue.

- There was little difference in the Email reception rates for messages from the three TSP, for Makran scenario TSP India had a significantly higher reception rate (100%), for Heard Island and Java scenarios TSP Australia had a significantly higher reception rate (100%).

GTS was the second most effective method of communication with average reception rates for the four scenarios of 74%, 86%, 100%, and 99% Andaman, Makran, Heard Islands and Java respectively. The average reception rate of GTS for all scenarios was 90% which was very close to email reception.

SMS was the next most effective method with average reception rates of 46%, 30%, 29% and 46% for Andaman, Makran, Heard Islands and Java scenarios. The Email and GTS reception rates were similar in each scenario and most messages were received within 15 minutes. TSP Australia achieved higher Email and GTSSMS reception rates during the Heard Island and Java trench scenarios and TSP India achieved higher Email and GTS reception rates during the Makran scenario compared with the other TSPs.

Fax had the lowest reception rate of all four delivery methods, as demonstrated in almost all previous Communications Tests and IOWave exercises. More than 50% of NTWCs not received any fax message for any scenario. In addition, the rates of receiving fax messages within 15 minutes of issue were generally lower than those of receiving messages anytime, indicating many fax messages were not received in a timely manner.

### 4.1.1.2 Comparison with Previous Exercise and Tests – Message Delivery

The above findings of the relative strength of delivery method showed averaging improvement trend across the past exercises and communication tests, particularly with regard to the GTS and Email delivery method.
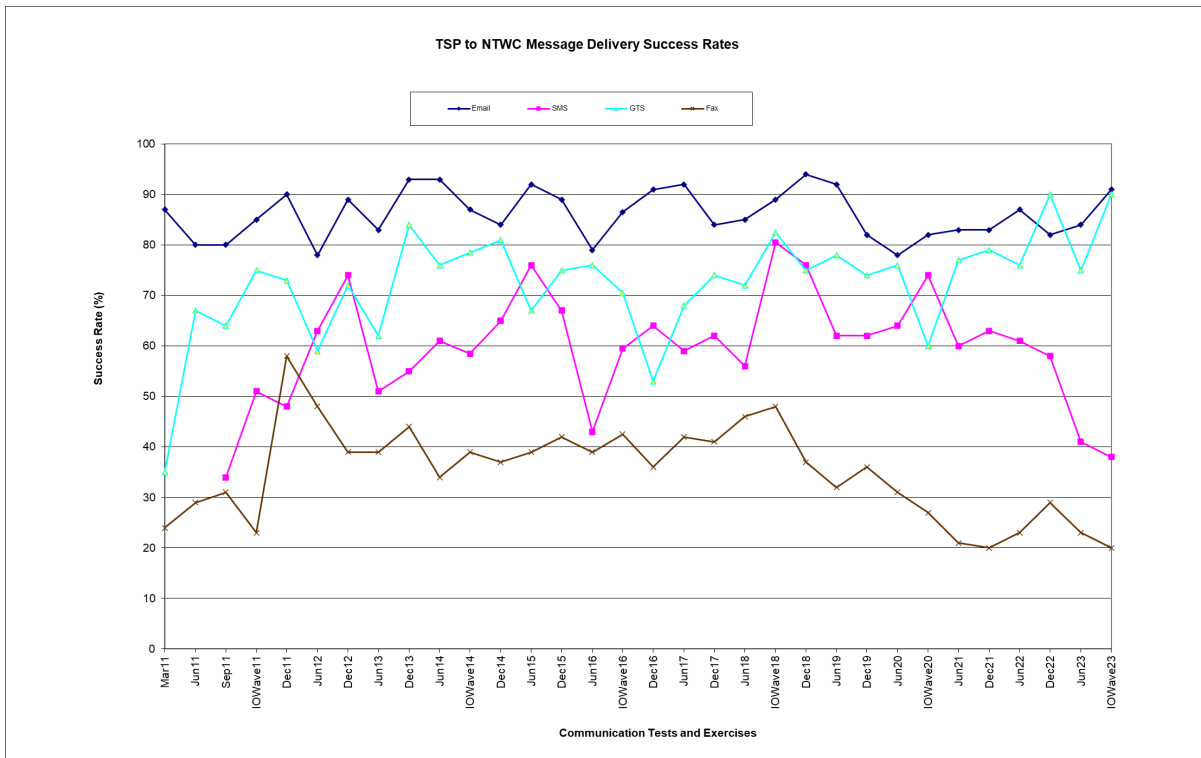


**Figure 4.1** TSP to NTWC message delivery success rates in this exercise compared with IOWave11, IOWave14, IOWave16, IOWave18, IOWave20 and the regular 6-monthly IOTWMS communications tests. Data are the average delivery rates for each medium across all TSPs and across all exercise scenarios.

### 4.1.2 Objective 5: Items for follow-up

Email Delivery

TSP Australia
- Investigate why Thailand received only one email.
- Investigate why Bangladesh and Pakistan did not receive some emails.

TSP India
- Investigate why Bangladesh, Mauritius, Sri Lanka and Thailand did not receive some emails.

TSP Indonesia
- Investigate why UAE did not receive any emails.
- Investigate why Bangladesh and India did not receive some emails.

GTS Delivery

Working Group 2 / Secretariat to work with WMO
- Investigate why Bangladesh did not receive any GTS messages.
- Investigate why India, Malaysia and Pakistan did not receive some GTS messages from TSP Australia.

- Investigate why Malaysia, Mauritius, Myanmar and Singapore did not receive some GTS messages from TSP India.
- Investigate why India, Malaysia, Singapore and Pakistan did not receive some GTS messages from TSP Indonesia

SMS Delivery

TSP Australia
- Investigate why India, Mauritius, Myanmar, South Africa, Tanzania and UAE did not receive any SMS messages
  - Investigate why Bangladesh, Madagascar, Malaysia and Pakistan did not receive some SMS messages.

TSP India
- Investigate why Malaysia, Myanmar, Singapore, Sri Lanka, Thailand and UAE did not receive any SMS messages
- Investigate why Bangladesh, Madagascar and Mauritius did not receive some SMS messages.

TSP Indonesia
- Investigate why India, Malaysia, Mauritius, Seychelles, Thailand, Pakistan and UAE did not receive any SMS messages
- Investigate why Bangladesh and Myanmar, did not receive some SMS messages.

Fax Delivery

Working Group 2
- Noting the low rate of fax reception in the exercise (and previous IOTWMS communication tests), stop the provision of fax from TSPs to TWFPs/NTWCs as recommend by TOWS-WG (22-23 February 2024) and notified by IOC Circular Letter No. 3006 (27 September 2024) regarding "Cessation of fax transmissions of tsunami information products by Tsunami Service Providers by 31 March 2025".

TSP Australia
- Investigate why Bangladesh, India, Malaysia, Seychelles, Pakistan, South Africa, Tanzania and UAE did not receive any SMS messages.
- Investigate why Myanmar, Mauritius, Singapore and Oman Thailand, did not receive some fax messages.

TSP India
- Investigate why Bangladesh, Malaysia, Myanmar, Seychelles, Thailand and UAE did not receive any SMS messages.
- Investigate why Singapore and Sri Lanka, did not receive some fax messages.

TSP Indonesia
- Investigate why Bangladesh, India, Malaysia, Seychelles, Thailand, Pakistan and UAE did not receive any SMS messages
- Investigate why Myanmar, Mauritius and Singapore did not receive some fax messages.

## 4.2 OBJECTIVE 6 – IOTWMS TSUNAMI SERVICE PROVIDER INFORMATION AND PRODUCTS

Objective 6: 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. Validate the reporting by NTWCs to the TSPs of their National Tsunami Warning Status.

### 4.2.1 Objective 6: Results

This objective has two parts. The first part is about whether NTWC can access each TSP website, and which information or products were accessed. The second part is about whether a NTWC used TSP tsunami threat information in the production of their national warnings, and which particular products were used.

### TSP Web Access

Seventeen (100%) of responding countries were able to access the TSP websites. TSP Australia was accessed the most, followed by TSP India and then TSP Indonesia. A summary of the TSP product types that NTWCs accessed is provided in Table 4.3 below.

| All Scenarios (17 out of 20 NTWCs Reporting) | | %Y |
|---|---|---|
| **TSP-Australia** | Bulletins | 100% |
| | Coastal Zone Threat Map | 100% |
| | Threat Table | 94% |
| | Maximum Amplitude Map | 86% |
| | Tsunami Travel Time Map | 94% |
| **TSP-India** | Bulletins | 73% |
| | Coastal Zone Threat Map | 71% |
| | Threat Table | 64% |
| | Maximum Amplitude Map | 57% |
| | Tsunami Travel Time Map | 64% |
| **TSP-Indonesia** | Bulletins | 93% |
| | Coastal Zone Threat Map | 93% |
| | Threat Table | 93% |
| | Maximum Amplitude Map | 79% |
| | Tsunami Travel Time Map | 86% |
| | **Any Product from Any TSP** | 100% |

**Table 2**.3 Percentage of NTWCs who viewed each TSP product type for each scenario. %Y = the percent of the reporting NTWCs that viewed the product.

No countries reported the use of additional TSP exchange products (e.g. spatial files) that are made available on the password protected websites.

### Comparison with Previous Exercises and Tests – Web Access

All reporting Member States (100%) accessed at least one TSP website. This is the equal highest access rate achieved (equal to IOWave20) when examining previous exercises and IOTWMS communication tests (Figure 4.2). However, only 75% of reporting Member States used of the TSP tsunami threat information in their national warnings.
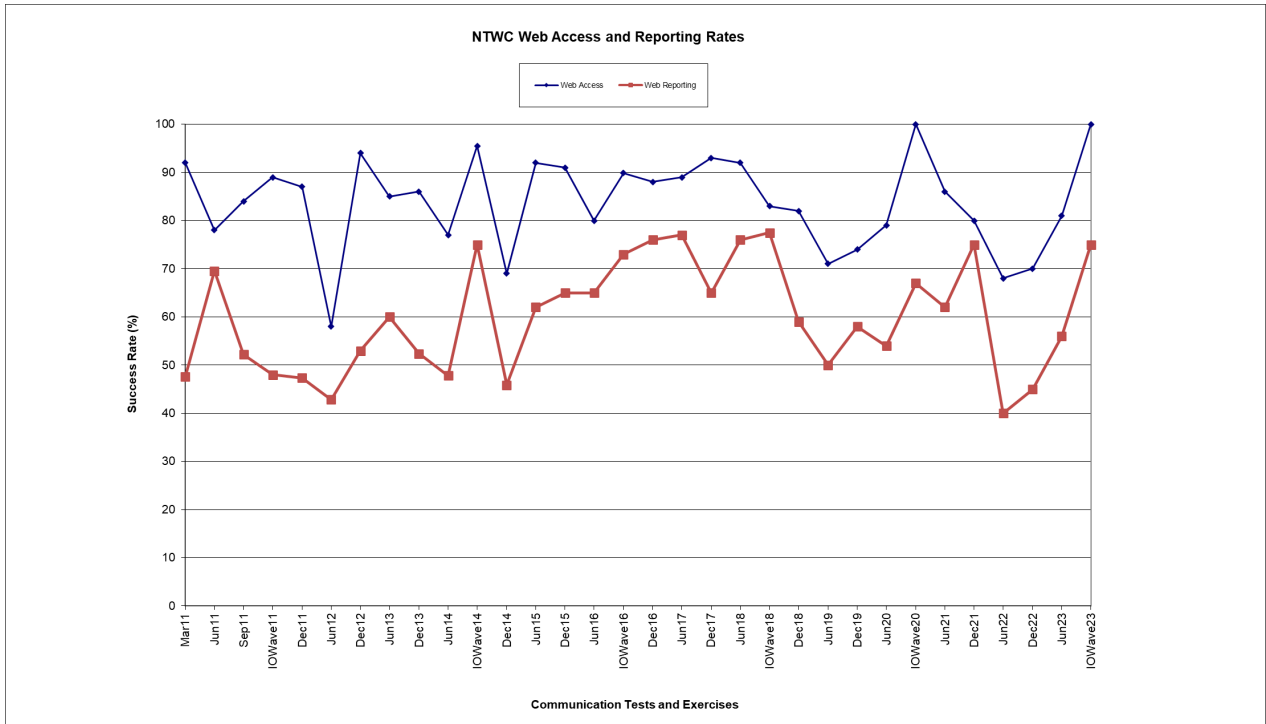
**Figure 4.2.** Success rate of NTWCs accessing TSP websites (blue line) and reporting warning status to TSPs (brown line) in IOWave23 compared with IOWave11, IOWave14, IOWave16, IOWave18, IOWave20 and 6-monthly IOTWMS communication tests.

## *TSP Products Used to Formulate National Warnings*

A summary of TSP products used to formulate national tsunami warning is provided in Table 4.4 below. Malaysia, Oman, Pakistan and Singapore did not use the threat information from the TSP websites to produce their national warnings since they may possess independent threat assessment capabilities for the exercise scenarios.

In this exercise all threat assessment information provided by TSPs was used by many NTWCs in formulating their own warnings. Among the most used are the Predicted Max Wave Amplitudes, Tsunami Wave Observations, Coastal Forecast Zone Threat Levels, the first wave (T1) Predicted Arrival Time, and the last wave (T4) Predicted Arrival.

### *4.2.2  Objective 6: Item for follow-up*

- Working Group 2 to consider how TSP web access rates are reported, that is, access to as single TSP website (as measured in IOWave20) or access to all three TSP websites (as measured in previous tests).

| All Scenarios (12 out of 20 NTWCs Reporting) | | %Y |
|---|---|---|
| TSP-Australia | Tsunami Wave Observations | 75% |
| | T1 Predicted Wave Arrival Time | 58% |
| | T2 Predicted Wave Arrival Time | 50% |
| | T3 Predicted Wave Arrival Time | 50% |
| | T4 Predicted Wave Arrival Time | 58% |
| | Predicted Max Wave Amplitudes | 75% |
| | CFZ Theat Levels | 50% |
| | Other | 8% |
| TSP-India | Tsunami Wave Observations | 70% |
| | T1 Predicted Wave Arrival Time | 50% |
| | T2 Predicted Wave Arrival Time | 40% |
| | T3 Predicted Wave Arrival Time | 40% |
| | T4 Predicted Wave Arrival Time | 40% |
| | Predicted Max Wave Amplitudes | 70% |
| | CFZ Theat Levels | 60% |
| | Other | 10% |
| TSP-Indonesia | Tsunami Wave Observations | 70% |
| | T1 Predicted Wave Arrival Time | 50% |
| | T2 Predicted Wave Arrival Time | 30% |
| | T3 Predicted Wave Arrival Time | 40% |
| | T4 Predicted Wave Arrival Time | 50% |
| | Predicted Max Wave Amplitudes | 60% |
| | CFZ Theat Levels | 60% |
| | Other | 10% |

**Table 4.4**. Percentage of NTWCs using TSP tsunami threat information to formulate national warnings in each scenario.

**4.3      OBJECTIVE 7 – NATIONAL TSUNAMI
         WARNING STATUS REPORTING**

Objective 7: Validate the reporting by NTWCs to the TSPs of their National Tsunami Warning Status.

### 4.3.1   Objective 7: Results

The overall NTWC warning status reporting rate was 75% for all scenarios during Exercise IOWave23. This rate is higher  than that of IOWave20 (see red curve on Figure 4.2). However, the IOWave23 reporting rates were slightly lower for individual scenarios with 56% for the Andaman scenario and  60% for the Java scenario. Other two scenarios reporting rates were higher i.e. Makran (80%) and Heard Island (75%).

All NTWC's warning status reports were displayed on the TSP Australia's public webpage www.bom.gov.au/tsunami/iotwms on the interactive global map.

Countries provided the following reasons not reporting their warning status on a TSP website:

•       Bangladesh: Not applicable

•       France: It is not included in the procedure.

•       Seychelles: The reporting form was not accessible on the TSP website during the Heard Island scenario.

•       Singapore: Not significantly affected by the tsunami.

The number of status reports that each NTWC provided to TSPs has been diverse. The same phenomenon has also been observed in previous exercises. While some NTWCs only reported once, countries like India, Madagascar, Seychelles reported more than 3 times in Andaman scenario; and India, Pakistan and United Arab Emirates for Makran scenario, and India, Indonesia and Mauritius for Java scenario in synchronisation with the number of warning updates they produced for their respective countries. So clearly there is a consistency issue there.

The timing of reporting their warning status also varied a lot from country to country. This variation may be related to the different timing of warnings being issued by each country, but it could also be due to some NTWCs not reporting immediately following their warning release.

### 4.3.2   Objective 7: Items for follow-up

•       ICG/IOTWMS continues to stress the importance of such warning status reporting by NTWCs for the overall effectiveness of the IOTWMS system

•       IOTWMS Regional SOP training workshops provides consistent training on when and how often for NTWCs to report their warning status to TSPs. The general principle is to report immediately after the first advice for your country, and then report whenever there is a change in that advice till the advice is lifted or cancelled.

## 4.4    OBJECTIVE 8 – NON-SEISMIC AND COMPLEX SOURCE TSUNAMIS

Objective 8: Validate receipt and understanding by NTWCs of new TSP service for tsunamis generated by non-seismic and complex sources.

### 4.4.1   Objective 8: Results

Of the reporting Member States, only two (India and Tanzania) accessed the TSP Australia products for tsunamis generated by non-seismic and complex sources. Both countries found the products to be easily accessible and understandable.

| HEARD ISLAND<br>(4 out of 6 NTWCs reporting) | %Y |
|---|---|
| Did the NTWC access the new TSP Australia products for tsunamis generated by non-seismic and complex sources? | 50% |
| Were the TSP Australia new products easily accessible and understood by the NTWC? | 100% |
| Were TSP Australia new products used by the NTWC to generate national tsunami warnings? | 100% |
| Were the national tsunami warnings disseminated to the DMOs and useful? | 50% |

***Table 4.5****.* Percentage of NTWCs using the new TSP Australia products for tsunamis generated by non-seismic and complex sources.

### 4.4.2   Objective 8: Items for follow-up

- About 50% of NTWC did not access the new TSP Australia products for non-seismic tsunami generation, TSP Australia may check for the access issues, if any.
- It is important to continue testing of non-seismic and complex source tsunami generation scenarios in future IOWave exercises
- TSPs India and Indonesia to consider testing the non-seismic products in future IOWave exercises.

## 5.    MEMBER STATE ACTIVITIES DURING EXERCISE IOWAVE23

IOTWMS Member States reported on their national activities for Exercise IOWave23 during the webinar on 'Lessons Learnt during Exercise Indian Ocean Wave 2023' held during 12-13 December 2023. The country summary reports are contained within this section. More information, including their country presentations at the webinar are available at the event website: https://oceanexpert.net/event/3998. Member States also provided a one-page country summary of their activities during the Exercise, which are contained in this Section.

**AUSTRALIA**

## Australia

### Scenarios Exercised:

☐ Andaman Trench (4 Oct)     ☑ Heard Island (18 Oct)
☐ Makran Trench (11 Oct)     ☑ Java Trench (25 Oct )

**IOWave23**



Dept of Fire and Emergency Services Natural Hazard District Officers in the Midwest studying the tsunami warning



NSW State Emergency Service State Command Centre participated as an observer in the exercise.



Joint Australian Tsunami Warning Centre (JATWC) participating in the exercise



DFES' Public Information and Recovery team working together to develop public information messaging

### National Tsunami Warning & Mitigation System

The Australian Tsunami Warning System is a national collaboration between the Australian Bureau of Meteorology, Geoscience Australia and the Department of Home Affairs which provides a comprehensive tsunami warning system delivering timely and effective tsunami warnings to the Australian population.

It is also a key element of the Indian Ocean Tsunami Warning and Mitigation System, and contributes to the facilitation of tsunami warnings for the South West Pacific.

These warnings are distributed to the State and Territory Emergency Services, relevant Government Agencies and through communication channels such as media, website, and social media sites to ensure the warnings are quickly and accurately distributed to the Australian people.

### National Organisation of Exercise IOWave23

Planning for the Indian Ocean Wave (IOWave) 2023 Exercise commenced in June with the appointment of the National Exercise Coordinator. An IOWave23 Planning Committee was established with members from:

- Bureau of Meteorology (The Bureau)
- Geoscience Australia (GA)
- National Emergency Management Agency (NEMA)
- Western Australian Department of Fire and Emergency Services (DFES)

The Planning Committee met fortnightly to discuss progress of the exercise development. The National Exercise Coordinator and the Bureau's Exercise Coordinator set about developing an Australian exercise Manual that worked in conjunction with UNESCO's Intergovernmental Oceanographic Commission Technical Series Exercise Indian Ocean Wave 23 Manual and Supplements.

The Bureau selected Scenario Four: Java Trench as the basis for their exercise and commenced planning for a functional exercise. The Department of Fire and Emergency Services commenced developing two discussion exercises based on scenarios three and four.

The exercise was well attended by the Bureau of Meteorology with many of their systems and state offices being tested on the day. In addition, the NEMA National Situation Room, DFES, Victorian State Emergency Service and Tasmania Police participated in the exercise. There were also several observers from different parts of the Bureau, NEMA, Indian Ocean Territories, Australian Antarctic Division and Airservices Australia.

### Exercise Participants

- Joint Australian Tsunami Warning Centre
- Bureau of Meteorology
- Geoscience Australia
- Department of Fire and Emergency Services
- National Emergency Management Agency – National Situation Room
- Indian Ocean Territories Emergency Management Team

### Lessons Learnt

- The communication links between the Bureau and some Emergency Services need reviewing.
- Clarification is required for which agencies have the authority to make evacuation orders.
- Workload distribution to be reviewed in the standard operating procedures (SOP).
- Event logging tools can be improved.

### Organisation Logo(s)



Government of Western Australia
Department of Fire & Emergency Services     DFES

Australian Government
Bureau of Meteorology

Australian Government
Geoscience Australia

Australian Government
National Emergency Management Agency

**BANGLADESH**

# Bangladesh

## Scenarios Exercised:

■ Andaman Trench (4 Oct)          ☐ Heard Island (18 Oct)
☐ Makran Trench (11 Oct)          ☐ Java Trench (25 Oct )

**IOWave23**

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*During IOWave23 Exercise at Seismic Observatory & Research Center*



## National Tsunami Warning & Mitigation System

As a NTWC BMD write a letter to the high officials of DDM, CPP, Coastguard, Port Authority to aware about the IOWave2023 exercise, then few days letter we make an online meeting with DDM how can we perform the exercise. We decide to make table-top exercise with local level. We completed End to End .

## National Organisation of Exercise IOWave23



## Exercise Participants
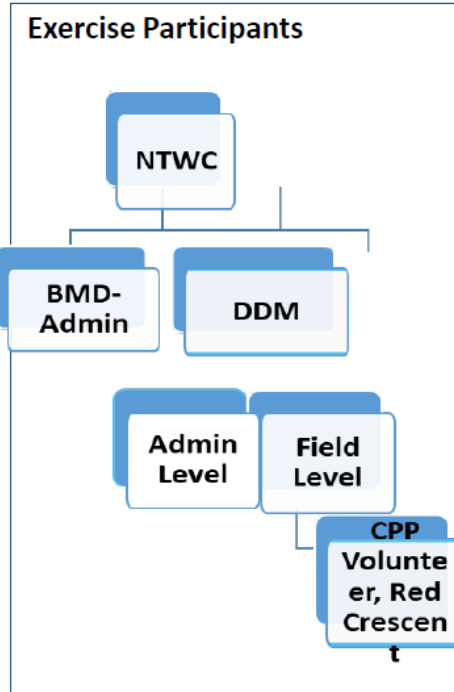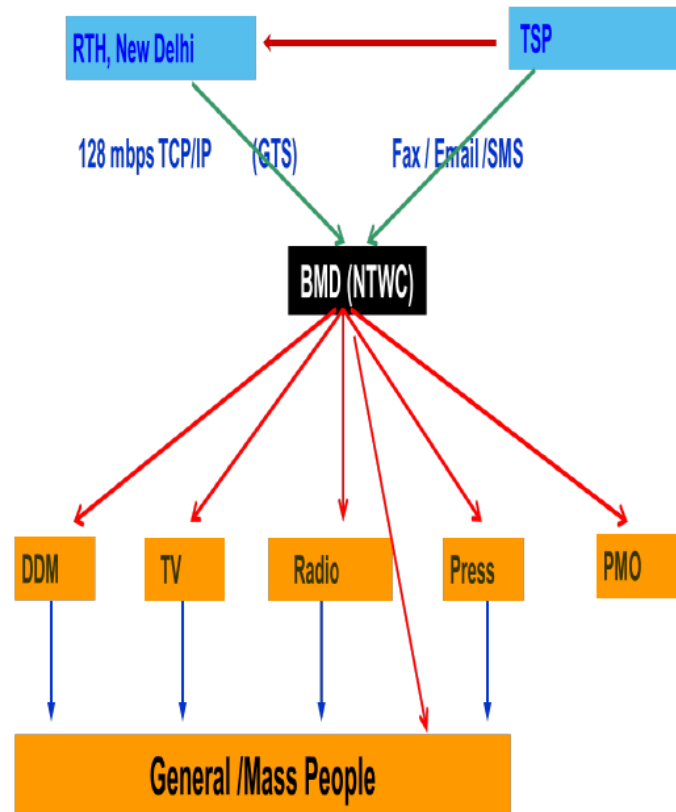


## Lessons Learnt

*This Exercise was very much helpful for Bangladesh because most of the local level disaster managers were not much aware what to do incase of real tsunami disaster. This exercise encouraged them how quickly send the messages to the stakeholder at the real time event.*

## Organisation Logo(s)

**FRANCE INDIAN OCEAN TERRITORIES**

# France

## Scenarios Exercised:

☐ Andaman Trench (4 Oct)          ☐ Heard Island (18 Oct)
☐ Makran Trench (11 Oct)          ☒ Java Trench (25 Oct )

**IOWave23**

**Indian Océan interregional service of Météo-France**

**Extract from the production list on our software MeteoFactory**

## National Tsunami Warning & Mitigation System

Meteo France Reunion and Toulouse receive tsunami warning messages from Indian, Australian and Indonesian TSP centers via SMT and e-mail.

Meteo France Reunion

- checks the criteria set out in the EMZ Réunion Tsunami Plan.

- calls by telephone the on-call managers of the EMZ, the Mayotte prefecture, the TAAF, Météo-France Réunion and the Mayotte center.

-broadcast alert messages and TSP site indications concerning our territory whenever new information is received from the TSP.

If alerts are triggered by the EMZ, then

- the EMZ relays the information to its contacts (communes, services, etc.).

- Meteo-France Réunion contacts Météo-France officials and weather centers in Mauritius, Madagascar, Comoros and Seychelles.

- Météo-France indicates the tsunami warning in its "General public" and marine or aeronautical productions.

## Exercise Participants

We checked the chain of transmission of warnings to the authorities when the criteria set out in the Tsunami plan were met.

Participation :

- Meteo-France (Réunion et Mayotte)

- Zone Headquarters La Réunion

- Préfecture de Mayotte

- TAAF préfecture (French Southern and Antarctic Lands)

## National Organisation of Exercise IOWave23

How was it planned?

One month before with all the participants

How was it executed?

With procedure sequence in real time

Was the exercise used to evaluate Tsunami Ready or similar indicators in your country?

No

Summary of what happened during the exercise

The diffusion worked well except the diffusion by mail from indonesia

The access to the web sites were OK

All the actions of the procedure sequence were OK

## Lessons Learnt

Areas of improvement : In addition to the messages of TSP, receive country - spécific message could save time.

**Organisation Logo(s)**

**METEO FRANCE**
À VOS CÔTÉS, DANS UN CLIMAT QUI CHANGE

**INDIA**

# India
## Scenarios Exercised:

☑ Andaman Trench (4 Oct)     ☐ Heard Island (18 Oct)
☑ Makran Trench (11 Oct)     ☐ Java Trench (25 Oct )

**IOWave23**



*IOWave23 Bulletins Dissemination at ITEWC*



*SEOC/DEOC Operations &Public announcement*



*Public evacuations and rescue operations*



*Tsunami awareness activities in relief shelters*

## National Tsunami Warning & Mitigation System

The Indian Tsunami Early Warning Centre (ITEWC) established at Indian National Center for Ocean Information Services (INCOIS), under Ministry of Earth Science (MoES), Govt. of India, Hyderabad and is operational since October 15, 2007. ITEWC is having all the necessary observational, computational and communication infrastructure which enables reception of real-time data from all the sensors, analysis of the data, generation and dissemination of tsunami advisories following a Standard Operating Procedure (SOP). ITEWC is responsible to provide tsunami advisories along with Australia and Indonesia to Indian Ocean rim Countries in the framework IOTWMS of IOC-UNESCO.

ITEWC is providing tsunami advisories (Warning/Alert/Watch) to National/State Disaster Management Organisations (DMOs). In the Warning chain, all the stake holders involved such as NDMA, State/Local DMOs, Broadcasting Media. State/Local DMOs are responsible for public evacuations.

In connection with tsunami preparedness, India implemented UNESCO's Tsunami Ready programme. Odisha State Disaster Management Authority (OSDMA), with the support of INCOIS, implemented Tsunami Ready in two villages (Venkatraipur and Noliasahi) of Odisha and these villages recognized as Tsunami Ready Communities by IOC-UNESCO in 2020. India is the first country to achieve this distinction among all Indian Ocean rim countries. Efforts are underway to extend tsunami ready programme to other vulnerable coastal communities.

## National Organisation of Exercise IOWave23

India has participated in IOWave23 tsunami mock exercise on two days at National level (i) Andaman Trench scenario on 4th Oct and (ii) Makran Trench scenario on 11th October 2023. As a TSP, ITEWC issued test bulletins to Indian Ocean countries for 3 scenarios.

As preparation to the, INCOIS organised pre-IOWave23 workshop on tsunami Standard Operating Procedure (SOP) for DMOs & Media during 13-14 September 2023. This was conducted in collaboration with NDMA and around 60 participants from various organization were attended. Prepared National Tsunami Exercise manual for IOWave23 and provided for all participated agencies. Coastal provinces officials organised local training and coordination meetings for Districts and village level officials.

On 4th October for Nicobar event, provinces of east coast of India and on 11th October for Off coast of Iran event, provinces of west coast of India DMOs/communities were participated. During the exercise, over 40,000 people from 42 coastal villages of east coast of India of Tamil Nadu, Odisha, Puducherry, and Andaman Islands participated and were evacuated to safe shelters. Overall response time less than 30 minutes to notify the public. Different modes of communication were used. In Odisha, Tsunami Ready indicators evaluated for 6 Tsunami ready implemented communities.

## Exercise Participants

DMOs of east coast India participated on 4 Oct and west coast of India participated on 11 Oct scenarios. Around 42 coastal villages from 12 districts of 4 coastal States/UTs of Odisha (32 villages), Andaman (3), Puducherry (4) and Tamil Nadu (3) were involved and evacuated during the exercise on 4 Oct 2023. More than 40,000 people were evacuated to shelters/safe places during mock exercise. Community people, school students, elderly personnel, etc. were involved in the evacuations.

NDMA, Navy, Coast Guard, National Disaster Response Force, Nuclear power plants, Port and Harbors, Fisheries departments, etc. were also participated.

## Lessons Learnt

Overall, IOwave23 tsunami mock exercise was great success, and which enhanced the awareness and preparedness among the coastal people of India. Response time to notify the public was varying from 5-30 minutes. Email was found to be most effective way of communication, followed by SMS and Fax. Dedicated Siren systems to be installed in the most vulnerable regions by DMOs. Regular mock exercise, trainings, awareness and preparedness programmes required at community level. Tsunami Ready programme need to be implemented in vulnerable coastal villages.



**INCOIS**

**INDONESIA**

## Indonesia
### Scenarios Exercised:

☐ Andaman Trench (4 Oct)  ☐ Heard Island (18 Oct)
☐ Makran Trench (11 Oct)  ☑ Java Trench (25 Oct)



*Map of participating locations*



*IOWave23 Bulletins Dissemination*



*Public evacuations and rescue*

### National Tsunami Warning & Mitigation System
InaTEWS is a national system managed by the Agency for Meteorology, Climatology and Geophysics (BMKG) to provide an effective & comprehensive tsunami warning to the Indonesian population. Speed and accuracy is the key to the early warning system. InaTEWS as a TSP for Indian Ocean countries offers web access to ocean-wide tsunami warning products.

The Tsunami Mitigation System involves national collaboration between BMKG, the National DMO agency (BNPB), local DMOs at province and city level, Bandung Institute of Technology (ITB), Agency for Research and Innovation (BRIN), Agency for Geospatial Informations (BIG), and medias (Metro TV, Inews). The warnings are distributed by stakeholders through multi channels such as media, websites and social media to ensure that warnings are distributed quickly and accurately to the people.

The warnings aredistributed by stakeholders through multi channels such as SMS, Email, and WRS application (Warning Receiver System) to ensure that warningsare distributed quickly and accurately to the people

### Exercise Participants
Overall, there were 27 DMOs and related institutions in the areas facing the Indian ocean participated in the table top exercise activity.

Additionally, there were also more than 1.600 people engaged in the tsunami drill activity spread across 15 different places. Three were internationally Tsunami Ready recognized by the UNESCO (Panggarangan, Banten; Glagah and Kemadang, Yogyakarta) and the other two (Serangan, Bali and Cikakak, Sukabumi) are Tsunami Ready certified nationally by the NTRB and are prepared for the international recognition.

### National Organisation of Exercise IOWave23
Coordination for the event started in April 2023 and more intensive approaching the day of the event. South of Java earthquake on Oct 25th was used as the tsunami scenario which would be impacting 10 provinces bordering the Indian ocean according to the simulation.

BMKG as the national coordinator of the event had meetings with Regional Geophyisical Stations, local DMOs, and NTRB panel and successfully engaged 27 local DMOs and other institutions such as local media to participate in the table top exercise. Meanwhile, around 1.600 people also involved in the tsunami drill in 15 different places.

On the day of the event, BMKG disseminated the 1st-4th tsunami warning via multiple medias, including the WRS-NG from the InaTEWS command center in Jakarta. Additionally, Zoom conference was also used for the coordination during the event. Several BMKG staff also sent to regions to act as a facilitator/observer.

### Lessons Learnt
We learned that further coordination should be done far before the day of the event so that nothing would be missed during the event. The deployment of WRS-NG in every related stakeholders also shows a great benefit for its ability in receiving and disseminating informations in near real time.

### Organisation Logo(s)

**IRAN**

## Iran

### Scenarios Exercised:
- ☐ Andaman Trench (4 Oct)
- ☑ Makran Trench (11 Oct)
- ☐ Heard Island (18 Oct)
- ☐ Java Trench (25 Oct )

**IOWave23**



Participation of several Stakeholders in IOWAVE 23 at Jask in Community level



Participation of several Stakeholders in IOWAVE 23 Chabahar in Community level

### Exercise            Participants

About 500 people were participated in IOWave23 exercise in two sites: totally 300 people involved in the exercise at three location in the Chabahar City, and 200 in the Jask City. In addition to the local coordinating organizations such as the governor's office and the Iranian Red Crescent Society, "Ordinary people" like students, beachgoers, fishermen, and vendors, among others, also participated in this exercise.

### National Tsunami Warning & Mitigation System

The Iranian National Institute for Oceanography and Atmospheric Science (INIOAS) has established a national center, INCOH, to forecast and issue warnings for hazardous marine phenomena in light of the significant marine hazards in the country. Due to the proximity of the Makran Trench to the Iranian coastline, construction of a National Tsunami Early Warning System began. This system simulates 824 tsunami scenarios using the ComMIT numerical model, producing results like inundation maps, tsunami wave heights, and arrival times for specific points, all accessible through a web application. When an earthquake occurs in the Makran Trench, the application receives data from the Institute of Geophysics of University of Tehran, looking for the most relevant tsunami scenario, and disseminates warnings and notifications based on the Tsunami Warning Chain and a prepared Standard Operating Procedure (SOP). Additionally, INCOH is connected to the Indian Ocean Tsunami Warning and Mitigation System (IOTWMS) to receive their tsunami warnings.

### National Organisation of Exercise IOWave23

On October 25, 2023, the IOWave23 tsunami exercise was conducted in Chabahar and Jask, Iran, simulating a fictional 9 Mw earthquake in the Makran Trench with significant coastal impact. The Iranian National Center for Ocean Hazards (INCOH) organized meetings with relevant organizations, including the National Disaster Management Organization (NDMO), Iranian Red Crescent Society, and Emergency Medical Services (EMS), to establish exercise start times and communication protocols.

A training pre-workshop was held on October 24th in Chabahar and Jask to educate participants from various organizations about IOWave23. The exercise began with the distribution of initial messages via SMS, Fax, and Telephone at 6:00 UTC. When the tsunami scenario started, portal sirens were activated in the field, and public speakers informed people about the danger and provided safety instructions.

Evacuation procedures were put into action, with buses and ambulances transporting evacuees to predetermined safe locations. Large printed evacuation maps were displayed at the exercise sites to guide participants in finding escape routes. A dedicated webpage offered additional information, including earthquake location, tsunami characteristics, inundation maps, evacuation routes, and tsunami bulletins.

Communication with authorities was maintained through telephone calls and the automated sending of Fax and SMS messages.

### Lessons Learnt

- Necessity of Enhancement of infrastructures for warning dissemination

- Necessity of dedicating special staffs in NTWC for each area at threat

- Indian Ocean Tsunami Ready should encourage for communities

-National and Local Media should involve to join the exercise in the future

**MADAGASCAR**

## Madagascar

### Scenarios Exercised:

- ■ Andaman Trench (4 Oct)
- ☐ Makran Trench (11 Oct)
- ☐ Heard Island (18 Oct)
- ☐ Java Trench (25 Oct )
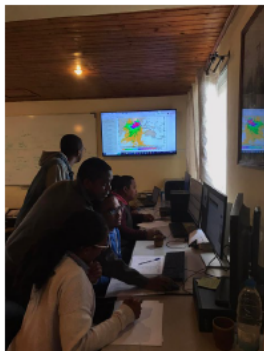
**IOWave23**



NTWC Madagascar participated to the IOWave23 with Andaman Scenario on October 4th 2023



NTWC Madagascar staff receiving information from TSPs, sending feedback and to NDMO

### National Tsunami Warning & Mitigation System

Tsunami Warning & Mitigation System in Madagascar starts from the Institute and Observatory of Geophysics of Antananarivo (IOGA/NTWC). We have our own earthquake and tsunami monitoring and these are combined with the information from TSPs. Information and warning are sent to the NDMO, which are responsible of warning and information dissemination to the national & local authorities and media, and the official call for evacuation. Tsunami is involved to the multi-hazard preparation. Exercises, training, workshop and few drills are already conducted.

### National Organisation of Exercise IOWave23

We had originally planned a functional exercise for IOWave23. However, due to budget constraints and the onset of the cyclone season in October, we had to focus preparing for this immediate disaster too. Instead, we conducted a tabletop exercise between the NTWC and NDMO. During this exercise, the NTWC staff received information through bulletins, notifications, SMS, and emails from TSPs and relayed information and warnings via SMS, calls, and email to the NDMO. Despite not being able to execute the functional exercise, IOWave23 significantly contributed to the enhancement of communication and the strengthening of the relationship between the NTWC and NDMO.

### Exercise Participants

The participants involved to the exercise were:

- The Institute and Observatory of Geophysics of Antananarivo (IOGA/NTWC)

- The National Disaster Management Office (BNGRC/NDMO)

- Observers

### Lessons Learnt

Generaly, IOWave23 worked well despite the few improvements needed such as tasks dispatching. To involve more at-risk communities in the future exercise, the frequency of outreach, training and workshop need to be increased, especialy: local stakeholders (local authorities, school teachers, religious leaders,..)



UNIVERSITE D'ANTANANARIVO

**IOGA**

INSTITUT ET OBSERVATOIRE DE GEOPHYSIQUE D'ANTANANARIVO

**MALDIVES**

# Maldives

☐ Andaman Trench (4 Oct)     ☐ Heard Island (18 Oct)
☐ Makran Trench (11 Oct)     ☑ Java Trench (25 Oct )

**IOWave23**


Desktop drill conducted with DM committee and CERT member of B.Kendhoo


Island community evacuated at the assembly area stated in DM plan, while CERT member attending them

## National Tsunami Warning & Mitigation System

The Indian Ocean Tsunami Warning Center sent a warning signal to the Maldives National Tsunami Warning Center (Meteorological Center (MMS)). This warning message will be sent by phone call, text message or fax to the National Disaster Management Authority (NDMA) and other stakeholders such as the Maldives Defense Force, Maldives Police Service, Maldives Red Crescent, and Media. An Emergency Operation Center will be activated under the leadership of NDMA. The warning messages will be passed on by NDMA to atoll council, who will then pass them on to island council. NDMA will also release press statements, advisories through media platforms. The council will notify the public of the warning message and the appropriate action to take based on the alert level.

Island community's tsunami readiness was assessed using the UNESCO-IOC Tsunami Ready Recognition Program, which supported in the evaluation of Island Disaster Management Plan.

## National Organisation of Exercise IOWave23

IOWave23 exercise was organized by National Disaster Management Authority (NDMA) with assistance from the Maldives Red Crescent, the Maldives Meteorological Services, and the B.Kendhoo Island Council. Maldives joined the Java Trench exercise.

Prior to the drill, Sensitization and awareness sessions were conducted to the staffs of different stakeholders of the island as well as school students, teachers and general public in about how to prepare for a tsunami and how tsunami warning system works. Following the awareness sessions, the DM committee and island CERT members participated in a desktop drill.

During the drill day, the exercise began with the first alert, the DM committee was activated, and the EOC was established in a short period of time. CERT members were alerted simultaneously. As mentioned in Island DM Plan CERT functioned as per instruction from EOC. CERTs divided themselves to sub groups of Early warning, search and rescue, first aid, shelter management, evacuation. CERT liaison in the EOC acted as the sources of information both to from CERT and DM committee.

The island council issued the necessary advisories in accordance with the alert message received from the NDMA until the tsunami alert was lifted.

This exercise allows the island community to asses its preparedness of DM committee, CERTs and general public in an event of a tsunami. It also assisted the island in determining whether the location designated as the safe zone in the DM plan is feasible.

What was notable throughout the exercise, even though it is an exercise, the CERTs ensured expatriates, tourists in the island were involved in the receiving warning messages (Test messages) in different languages.

## Exercise Participants

The island stakeholders; Kendhoo Council, kendhoo health center, Kendhoo utility service provider (FENAKA), and Kendhoo school participated in the exercise.

Community Emergency Response Team (CERT) actively participated in the exercise. Both in desktop drill and main evacuation drill as well.

The whole island community supported the exercise by engaging in sensitization sessions. More than 60 people participated in evacuation drill as well, including the elderly and expatriates living on the island.

### Lessons Learnt

Overall, the exercise was well-coordinated. Prior to the practice, the island community was well informed therefore participation was high. Throughout the exercise, expatriates guests were informed by giving alert messages their native language.

Looking at areas for improvement, it was discovered that the public warning messages were too long, requiring more time to finish, additionally while the loudspeaker systems works very well in normal situation, during rainy days the announcement might not be clear to some areas of the island. This identified the need of redundant system like an alarm etc.

Through out drill neither EOC nor CERT had not taken resources management in consideration. Drill also highlighted the need to strengthen the Incident Command System

During the debriefing the evaluator recommended to designate the selected safe zone with signage etc. or consider developing the place with shelter etc.

### Organisation Logo(s)

**NDMA**
NATIONAL DISASTER MANAGEMENT AUTHORITY

**MAURITIUS**

## Mauritius

### Scenarios Exercised:

- ☐ Andaman Trench (4 Oct)
- ☐ Makran Trench (11 Oct)
- ☐ Heard Island (18 Oct)
- ■ Java Trench (25 Oct )

**IOWave23**



National Crisis Committee, under the chairperson of the Hon. Vice Prime Minister, Minister responsible for Disaster Risk Management, met at 10h00 to take cognizance of the situation and to take timely decisions regarding evacuation of vulnerable coastal areas.



Evacuation exercise at Quatre-Soeurs Village, South-East of Mauritius
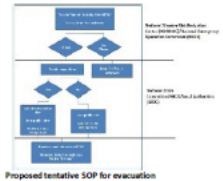
*Images Credit: NDRRMC/DC Grand Port*

## National Tsunami Warning & Mitigation System

The **Mauritius Meteorological Services** is the main warning agency for Tsunami in the Republic of Mauritius. The Tsunami Warning System in Mauritius has taken into consideration the degree of risk as well as the time factor. In virtue of its geographical location, Mauritius and Rodrigues have a lead-time of 5-7 hours before tsunami waves are likely to reach their coasts from either the Indonesian or the Makran source. The warning system consists of the following stages: Tsunami Watch, Tsunami Warning and Termination.

Main organisations involved during a Tsunami: Mauritius Metrological Services, National Disaster Risk Reduction & Management Centre/National Emergency Operation Command, Local Authorities, Mauritius Police Force, Ministry responsible for the subject of Health and Quality of Life, Mauritius Fire Rescue Services amongst others.

In the event of a Tsunami, the National Crisis Committee, which consist of members of high officials, will meet soonest possible to take decisive actions, especially with regards to evacuation of vulnerable coastal areas, based on simulated inundation maps provided by the Mauritius Meteorological Services.



Proposed tentative SOP for evacuation

## National Organisation of Exercise IOWave23

### Chronology of Warnings issued by Mauritius Meteorological Services (NTWC)

| SN | TYPE OF BULLETIN | TIME OF ISSUE (LOCAL TIME) |
|----|------------------|-----------------------------|
| 1 | EARTHQUAKE INFORMATION | 0608 |
| 2 | TSUNAMI WATCH BULL NO 1 | 0625 |
| 3 | TSUNAMI WARNIN BULL NO 2 | 0642 |
| 4 | TSUNAMI WARNING BULL NO 3 | 0830 |
| 5 | TSUNAMI WARNING BULL NO 4 | 1025 |
| 6 | TSUNAMI WARNING BULL NO 5 | 1320 |
| 7 | TSUNAMI WARNING BULL NO 6 | 1505 |
| 8 | TERMINATION BULL NO 7 | 1810 |

### Summary of Exercise

- NEOC Level I activated at 0651 hrs and upgraded to level III at 07.35 hrs under instructions of OIC NDRRMC.
- LEOCs: Port Louis and Savanne activated at 08.30 hrs, Grand Port and Black River and Riv du Rempart at 0900 hrs, Pamplemousses at 0905hrs.
- Rodrigues: REOC activated at 0730 hrs.
- National Crisis Committee chaired by Hon M.A Husnoo, Vice Prime Minister held on 25th October 2023 at 10.30 hrs at Main conference room NDRRMC.
- Evacuation: simulated 29742 people evacuated, including 77 from Agalega and 46 from St Brandon, 3618 in Rodrigues and 26,001 in Mauritius.
- Tourism Sector: Messages blast targeting about 20 000 licensees released by the tourism sector
- Port: All vessels have been notified to leave the harbour for high seas by MPA
- Termination of Tsunami Warning for Mauritius, Rodrigues and St. Brandon issued at 18 10 Hours.

## Exercise Participants

| SN | Agency | Activities |
|----|--------|-----------|
| 1 | District Councils of Flacq & Grand-Port Evacuation Exercise at Quatre-Soeurs (About 50 inhabitants) | Use of Quatre-Soeurs Refuge Centre |
| 2 | District Council of Savanne Evacuation Exercise at Rivière des Galets (60 inhabitants) | Use of Chamouny Village Hall as Evacuee centre. |
| 3 | Rodrigues (Approx 220 inhabitants) | Pointe Cotton (50 inhabitants), Graviers (100 inhabitants) and St Francois (70 inhabitants) |



Rodrigues Island

## Lessons Learnt

- To ensure proper dissemination of warnings from MMS.
- To ensure submission of Situation Reports by Local Authorities.
- To ensure familiarisation and proper filling of disaster related statistics forms.
- To ensure realistic reporting from Mauritius Port Authority, Ministry responsible for Education amongst others.
- To focus on post-impacts roles, responsibilities and actions

- To ensure arrangements made by Central Water Authority for provision of water in affected coastal regions.
- To ensure that Mauritius Fire Rescue Services complete all pumping in impacted residential areas.
- To ensure evacuee centres can accommodate disabled, senior citizen, babies amongst others.
- To ensure if vulnerable health centres/hospitals are evacuated.

## Organisation Logo(s)

**MYANMAR**

# Myanmar

## Scenarios Exercised:

☑ Andaman Trench (4 Oct)  ☐ Heard Island (18 Oct)
☐ Makran Trench (11 Oct)  ☐ Java Trench (25 Oct )



IOWave23



**Conducting Communication Exercise at IOWave 23 Exercise**



**Receiving and Disseminating Warning Messages at IOWave 23 Exercise**

## National Tsunami Warning & Mitigation System

NTWC of Myanmar is responsible to issue tsunami warning in Myanmar. NTWC of Myanmar issuing tsunami warning to the disaster prone areas by using the existing SOPs.

## National Organisation of Exercise IOWave23

NTWC of Myanmar was participated the communication test on Andaman Trench at 4th October 2023.

NTWC of Myanmar received the tsunami warning messages from RTSPs and disseminated the tsunami warning messages to five state/ regional DMH (Department of Meteorology and Hydrology) offices.

NTWC of Myanmar conducted this exercise with communication test.

Yes, the exercise was used to evaluate Tsunami Ready or similar indicators in your country.

NTWC of Myanmar disseminate the tsunami warning to five state/regional DMH offices in time and also tested the SOPs during the exercise

## Exercise Participants

All of NTWC staff from Naypyitaw and staff from five regional DMH (Department of Meteorology and Hydrology) office were participated IOWave23. Nearly 30 staff were participated on 4th October 2023 Exercise.

## Lessons Learnt

IOWave exercise is good to learn for real case. Communication system are need to improve. Peoples; who are living at the tsunami prone areas, should involved in future exercises.



**DMH**

**PAKISTAN**

# Name of Country

## Scenarios Exercised:

☐ Andaman Trench (4 Oct)          ☐ Heard Island (18 Oct)
🟥 Makran Trench (11 Oct)          ☐ Java Trench (25 Oct )

IOWave23



**Engage National Media Through Press releases & Main Stream Media Cover whole Exercise**

## National Tsunami Warning & Mitigation System

NTWC Pakistan Tested  SOP

And Warning Chain.

The following

Organization Involved

• NDMA

• National Media
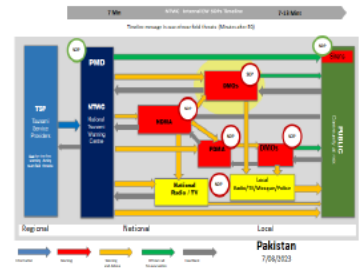


## National Organisation of Exercise IOWave23



*NDMA and electronic Media coverage for the  real time Monitoring. How was it planned?*

*Ans: it was planed very good because NTWC has planed to take on board to all stakeholder and we had issued invitation letter  among the all Stakeholders  for specially PDMA Baluchistan and Sindh and the drill targeted area was PASNI and planed for triggering of siren system and to include the Pasni committees and school But unfortunately due to beget constrain so it was not achieved.*

*How was it executed? After this Pakistan NTWC finally went for table top drill to evaluate Tsunami Ready .*

*Summary : during the drill, which was conducted, as routine drill but this  time, NTWC have engaged*

*Similarly , Miss Gazala Naeem was observed as a external observer .*

## Exercise Participants

Please explain which **segments of your society** participated in the exercise (number of people, were communities exercised, if so, please provide names of the communities and which specific sectoral groups were involved (i.e., schools, people-with-disabilities, private sector / businesses, elderly))

(No any communities was participate )

**Lessons Learnt**  What worked well? Ans : we were included all shift members to handle such kind of seniors, if occurred in near future. They took part very efficiently ( improvement).

How can more at-risk communities be involved in future exercises?   Ans: This is very serious issue, which is can only performed well with communities, the communities should take part and also all Government stakeholders should play their own roll seriously. Financial support should included, for execution of Full scale drills.

**Organisation Logo(s)**

**SEYCHELLES**



*Seychelles*

Scenarios Exercised:

- ■ Andaman Trench (4 Oct)
- □ Makran Trench (11 Oct)
- ■ Heard Island (18 Oct)
- □ Java Trench (25 Oct )

IOWave23



### National Tsunami Warning & Mitigation System

The Tsunami Warning system in the Seychelles is managed through a coordinated effort involving key institutions. The Seychelles Meteorological Authority (SMA) receives all information and warnings from Tsunami Service Providers (TSPs).

If a warning is issued for Seychelles, this information is then conveyed to the National Emergency Operation Centre (NEOC), which assumes the pivotal role of disseminating alerts to all first responders and media outlets. The NEOC is also tasked with the responsibility of issuing evacuation orders when necessary.

Within the Tsunami Warning Chain of the Seychelles, the primary entities that play integral roles include the Seychelles Meteorological Authority (SMA), the National Emergency Operation Centre (NEOC), the Ministry for Local Government and Community Affairs (MLGCA), and the National media.

These organizations collectively form a comprehensive network dedicated to ensuring the timely and effective communication of tsunami warnings and the mobilization of resources and response efforts as needed.

### Exercise Participants

Around 30 different entities participated into the exercise this included government, private, Non Governmental Organisations (NGOs) and parastatal entities.

### National Organisation of Exercise IOWave23

A national Coordination Committee (NCC) was established. The aim of the committee was to ensure the successful preparation and execution of the exercises. The committee met once a week to develop the exercise modality and the injects.

The Seychelles participated in two exercise the Andaman and Heard Island Scenario with a Table Top and Functional Exercise respectively. The table top exercise targeted stakeholders and first responders within all three Tsunami periods.

Compare to the Table top exercise the functional exercise was limited to entities within the Tsunami Warning Chain (TWC) only. The exercises did not take into account the Tsunami Ready Indicators.

### Lessons Learnt

The reviewing and updating of Standard Operating Procedures (SOPs) along with capacity building for all stakeholders in Tsunami preparedness, response and information management.

There is a need for multiple communication means for the sharing of all Tsunami related information. Improvement and inclusion of vulnerable communities within the different SOPs. More targeted communities to be involved. The exercise showed that there some commitment amongst the stakeholders.

**SINGAPORE**

## Singapore

### Scenarios Exercised:

☑ Andaman Trench (4 Oct)  ☐ Heard Island (18 Oct)
☐ Makran Trench (11 Oct)  ☐ Java Trench (25 Oct )

**IOWave23**

### National Tsunami Warning & Mitigation System

**Acronyms**
MSS – Meteorological Service Singapore
TSPs – Tsunami Service Providers
SCDF – Singapore Civil Defence Force
NEA – National Environment Agency

- MSS receives tsunami bulletins/advisories from TSPs

- MSS conducts Tsunami model runs using TOAST/SeisComP system, EasyWave model

*If tsunami expected to affect Singapore* →

**Alert and Warning**

- National Tsunami Response Plan is activated

- The Tsunami Task Force involving various government agencies will implement the Tsunami Response Plan, and calls for evacuation if needed

- MSS issues alerts and early warning based on expected Tsunami arrival times

*If there is civilian casualty* →

**Civil Emergency and Consequence Management**

- Search and rescue/ recovery led and coordinated by SCDF and police

- Clean-up led by various national agencies including the NEA

### Exercise Participants

**METEOROLOGICAL SERVICE SINGAPORE**

- The Meteorological Service Singapore (MSS) participated in the IOWave23 Exercise as the National Tsunami Warning Centre (NTWC)

- Only took part in the Andaman Trench exercise as Singapore is not affected by the other scenarios

- Modelled Tsunami wave propagation for Andaman Trench scenario provided also do not reach Singapore

### National Organisation of Exercise IOWave23

Focused on testing communication channels with the various TSPs
- No national warnings were produced
- Tabletop exercise with relevant agencies and stakeholders was conducted in 2022 in conjunction with PacWave22

Monitored and recorded the time stamps of the tsunami bulletins from TSPs via SMS, Email, GDS and Fax
- Most communication channels were functioning, and bulletins were received in time
- Singapore was not significantly affected by the tsunami waves in the scenario

### Lessons Learnt

**Benefits**
- Using this opportunity to orientate the operations staff to the various communication channels in the event of a tsunami
- Identifying the gaps in our communication channels to be rectified for future tsunami events
- Testing the systems and connectivity with TSPs for warning bulletins and alerts

**Areas of improvement**
- Conduct further studies using worst-case scenarios that include the impacts of tides and sea level changes on resultant tsunami wave heights
- Conduct inundation studies on the impact of Tsunami waves on floods
- Need to better understand the risk of non-EQ generated Tsunami waves (landslides/volcanic eruptions) that may occur nearer Singapore

**SRI LANKA**

## Sri Lanka

### Scenarios Exercised:

- ☒ Andaman Trench (4 Oct)
- ☐ Makran Trench (11 Oct)
- ☐ Heard Island (18 Oct)
- ☐ Java Trench (25 Oct )

**IOWave23**


EOC in operation during the exercise
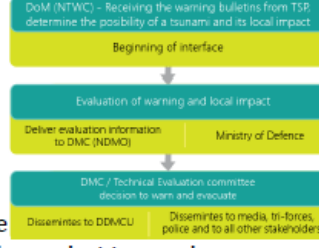

Designated evacuation centres and camp registration process


School evacuation exercise

### National Tsunami Warning & Mitigation System

- Department of Meteorology (NTWC) generates national tsunami bulletins
- Disaster Management Centre (NDMO) is mandated to issue evacuation order
- CTRIs were taken as a reference for preparing at-risk communities against tsunamis


DoM (NTWC) - Receiving the warning bulletins from TSP, determine the possibility of a tsunami and its local impact
Beginning of interface
Evaluation of warning and local impact
Deliver evaluation information to DMC (NDMO)    Ministry of Defence
DMC / Technical Evaluation committee decision to warn and evacuate
Dissemintes to DDMCU    Dissemintes to media, tri-forces, police and to all other stakeholders

### National Organisation of Exercise IOWave23

#### Exercise Planning & Execution:

**Awareness and Sensitization of Tsunami Operational Plans**
- Efforts extended to all 14 coastal districts in Sri Lanka

**Development of Seal-Off Plan**
- A plan to execute in case of a real incident - Authority granted to battalion heads for community evacuation and security

**Engagement with Non-Governmental Agencies**
- Collaboration due to financial constraints

**Appointment of Independent Observers**
- From the national to community level
- Evaluate exercise procedures, SOPs and communication channels

**Conduct the National Tabletop Exercise (TTE)**
- Simulated situations for response formulation

**Press Release and Media Briefing**
- Comprehensive release through major national media channels
- Media briefing to minimise confusion among coastal populations

#### Exercise Day – 4th October 2023 - Summary

- Tested communication from TSPs to NTWC, NTWC to NDMO, and NDMO to LDMO and other downstream entities and to the community level
- Conducted a functional Tsunami simulation, including people and resource movement, for a realistic on-ground response
- Practised evacuation in selected coastal communities in Trincomalee District and schools in Trincomalee, Galle, and Matara
- Tested the CTRIs of evacuated communities

### Exercise Participants = 1929 evacuees

**Community: 729 evacuees**
Senthoor & Jayanagar GN Divisions in Trincomalee:729 persons including PWD, Pregnant & lactating mothers Elderly & Children.

**School Exercise: 1200 evacuees**
**An-Nooriya School:**
*373 including staff*
**Madapmpagama School:**
*526 including staff*
**Mahamaya Girl's School:**
*301 including staff*



### Lessons Learnt

- SOPs of NTWC, NDMO and the information flow to the community level were successfully validated, while gaps were identified with the revisions required
- Need for dissemination of impact-based warnings was identified
- Identified the need for community-level improvements, including a 24/7 operating early warning mechanism and the consideration of cost-effective alternatives or reinstating early warning towers

### Organisation Logo(s)


Disaster Management Centre
for Safer Communities & Sustainable Development in Sri Lanka
Ministry of Defence
Disaster Management Centre, Sri Lanka


Department of Meteorology, Sri Lanka

## TANZANIA

### Tanzania

**Scenarios Exercised:**

☐ Andaman Trench (4 Oct)  ☐ Heard Island (18 Oct)
☐ Makran Trench (11 Oct)  ☐ Java Trench (25 Oct )

**IOWave23**



**Top and Middle figures:** Disaster Management Committees at DarMAERT and Lindi Municipal Council respectively discussing appropriate measures to be taken following Tsunami Alert. **Bottom figure:** Hon. Jenista Joakim Mhagama clearing doubt to the public on Tsunami threat through TV interview.

### Exercise Participants

The following segment participated in the Exercise;

National Disaster Management Office - the Prime Minister's Office – Disaster Management Department (PMO – DMD), Tanzania Meteorological Authority (TMA) as NTWC, Dar es Salaam Multi-Agency Emergency Response Team (DarMAERT), Regional Administrative Secretary (RAS), Municipal Councils (i.e., Tanga, Dar es Salaam, Pwani, Lindi and Mtwara regions), Prime Minister's Office responsible for Policy, Parliamentary Affairs and Disaster Management Emergency Operation Coordinating Centre (EOCC), Tanzania Police Force (OC-99), Fire Police Force and Rescue, Tanzania Red Cross Society, **Hospitals:** [Amana (Dar es Salaam), Ligura (Mtwara), Bombo (Tanga) and Tumbi (Pwani), *(consider attached appendix for the geographical location)*], Ambulencies and TBC Radio.

### National Tsunami Warning & Mitigation System

Tanzania Meteorological Authority (TMA) is the government institution of the United Republic of Tanzania (URT) which was established by the Act No. 2 of the Tanzania Meteorological Authority of 2019. The Authority is the only mandated institution of the URT for the provision of meteorological services within the boundaries of the URT. Further, TMA is designated as the National Tsunami Warning Center responsible for monitoring, forecasting and issuance of Tsunami warnings in the URT to ensure that there is a single authoritative voice. In this regard, TMA uses Standard Operating Procedures (SOPs) to communicate Tsunami early warning information to the community at risk by first conveying the message via Disaster Management Office - the Prime Minister's Office – Disaster Management Department (PMO – DMD). PMO – DMD through existing SOPs will further coordinate the implementation plans that will help reduce the effects that may arise. In addition, PMO-DMD as coordinator is accountable in activating relevant authorities and Disaster Management Committees at the Regional, District, Ward and Village/Street levels to cooperate and take appropriate measures. Awareness and provision of guidance to public during the events are some of the activities that is coordinated by PMO-DMD in working closely with relevant stakeholders.

### National Organisation of Exercise IOWave23

Tanzania participated on 18th of October, 2023 Tsunami exercise by conducting a Drill Exercise that involved communications, coordination and testing of operational timeline Tsunami Standard Operating Procedures (SOPs). The main objective of the IOWAVE23 exercise was to measure the performance of the National Tsunami Warning Chain and build readiness to the community and the authorities involved in the provision of warning and disaster management to reduce the harm that might have occur in the country during Tsunami events. The scope of IOWAVE23 Exercise involved Tanzania Meteorological Authority as National Tsunami Warning Centre (NTWC), national Disaster Management Office - the Prime Minister's Office – Disaster Management Department (PMO – DMD) and different Disaster Management Committees from National to village level along the coastal regions (i.e., Dar es Salaam, Tanga, Pwani, Lindi and Mtwara Regions). During the exercise the NTWC, PMO – DMD, different Disaster Committees and stakeholders involved in the National Tsunami Warning Chain used the time driven information flow based on respective existing SOPs customized to guide actions during Tsunami Emergency.

TMA activated IOWAVE23 Exercise at 06:24 UTC by sending notification alert to PMO – DMD on the event of Volcano eruption at Kerguelen Island. At 06:49 UTC PMO – DMD responded by partial activating the Disaster Management Committees and relevant authorities for disaster management to be ready in case Tsunami occurs. At 08:33 UTC TMA sent an update to PMO – DMD on possible Tsunami threat along the entire coastal belt of Tanzania. Correspondingly, PMO – DMD at 08:51 UTC sent warning information on Tsunami threat to disaster management committees at regional level with advisories on appropriate measures to be taken to marine users and community along/near the coastal area. Meanwhile, official call for evacuation was part of the information conveyed. At 09:17 UTC TMA provided further update to PMO – DMD about the Warning of Tsunami waves to areas of Madangwa, Ruvu, Jimbo, Vumba, Songosongo, Zanzibar, Vumbi, Gazija, Kutani, Msasani, Bagamoyo, Bomalandni and western Konde. This information also indicated the time of arrival of the first wave at Madangwa (13:08 UTC). Updated information on the observed Tsunami wave in Mozambique was sent to PMO – DMD at 12:05 UTC to ensure there is closely follow up of the arrival of the first Tsunami wave in Tanzania. Consequently, PMO – DMD continued updating warning information, instructions and appropriate measures to be taken by Disaster Management Committees at regional level to ensure that this information cascades to local levels. Based on respective SOPs and working guidelines, relevant authorities from regional to local levels responded step by step on appropriate measures taken prior and after the arrival of the first wave through the chain of information. It included activities of identifying and inspecting possible evacuation sites and roots; and Preliminary Mobilization of resources. Emergency responders and Police report on status of preparedness to evacuate and care for vulnerable communities were also part of the information. The Director for PMO – DMD call for termination of the exercise at 15:07 UTC, directing relevant authorities to conduct initial assessment, all victims continue to be given first aid while allowing the community to proceed with their normal operations and roads kept open.

The exercise proved to be a useful tool in testing the strength/weakness of Tsunami warning chain in Tanzania. However, the timing of the exercise coincided with an ongoing exercise of raising awareness to relevant authorities involved in disaster management on El Nino National Contingency Plan. This situation provided difficulties in planning and for involvement of community. Preparatory meetings were held regularly ahead of the exercise including training to experts prior to the exercise. However, it should be noted that, during the exercise there was a leakage of information on Tsunami warning from the team involved in the exercise to the community. This situation created severe panic to the community thinking they were about to be threatened by tsunami. At 17 hours UTC the Minister of State in the Prime Minister's Office responsible for Policy, Parliamentary Affairs, Labour, Employment, Youth and the Disabled, Hon. Jenista Joakim Mhagama had to call for press interview to clear the doubt. She also directed relevant authorities involved in the exercise to ensure they observe code of conduct pertaining the exercise to avoid building unnecessary stress to the community.

### Lessons Learnt

Practically testing the National Tsunami Warning Chain for disaster management flow of information was very orderly. Inter-Agency Coordination was Very Good. Communication system and team work was very good among all involved institutions. Enhancing Municipal/region Capacity to manage disaster is a key to the Last Mile in Tsunami Warning and Mitigation. Improved techniques in conveying warning information through the National Tsunami Chain will be given high priority to avoid leakage of information to the public. It is recommended that, Regional Training workshop(s) that involves key responders will improve preparedness through cross learning. Resources to facilitate National pre-IOWAVE should be mobilized and coordinated at regional level.

### Organisation Logo(s)

**THAILAND**

# Thailand

## Scenarios Exercised:

☑ Andaman Trench (4 Oct)   ☐ Heard Island (18 Oct)
☐ Makran Trench (11 Oct)   ☐ Java Trench (25 Oct )

**IOWave23**



(1) Tsunami Functional Excerise with Disaster Prevention in 6 provinces focusing on the tsunami-prone areas.



(2) The IOWave23 exercise at the Operation Room and Central of the National Disaster Warning Center, Thailand.



## National Tsunami Warning & Mitigation System

In Thailand, there is a National Disaster Prevention and Mitigation Plan to handle various disasters, including tsunamis. There are also provincial, district, and sub-district level plans in the southern coastal regions exposed to the Andaman Sea, encompassing a total of 6 provinces, divided into 27 districts and 108 sub-districts. The process involves the National Disaster Warning Center, which is responsible for seismic monitoring, observing changes in sea level and ocean conditions that could indicate the formation of a tsunami. The issues warnings to the public through various communication channels, including offical document, Trunked radio, warning tower, SMS (short messages), fax, BAS (Broadcast Alert System) mobile application and Social Media. Evacuation plans and procedures are established to guide people to safe locations. At the provincial level, there are initiatives to create evacuation route signs leading to safe zones, and public awareness campaigns are conducted to inform local residents and tourists. Furthermore, Thailand collaborates with coordinate countries and international organizations to share information and coordinate responses to potential tsunamis that may affect the region.

Every year, DDPM conducts tsunami execises using scenarios from IOWave.

## Exercise Participants

The result from last Thailand Tsunami exercise.

The NDWC send a forecast arrival time of the first wave estimated approximately 1 hour to 6 Provinces (Ranong, Phang Nga, Phuket, Krabi, Trang and Satun). Using a tsunami prediction program to calculate the time for the waves to reach the coastline and issue advance warnings. From the training exercise, the total number of people who will be affected is 53,794 as follows: Ranong province had 7,000 people ,Phang Nga province had 24,000 people ,Phuket Province had 10,000 people ,Krabi province had 4,700 people ,Trang Province had 5,494 people and Satun province had 2,600 people.

## National Organisation of Exercise IOWave23

Usually, Thailand conducts a tsunami exercise every year. The exercise varies with a Functional Drill and conforms to the national plan, provincial plan, district plan, community plan, and also the Tsunami SOP at all levels. In 2023, we have a Tsunami Action Plan functional exercise (Picture 1) on the following dates:
1. 7th June 2023
2. 11th August 2023
3. 14th September 2023

The tsunami exercises depend on the budget year, which runs from 1st October to 30th September. For the IOWave23 (Picture 2) , we conducted only tabletop exercises, and participants from DDPM are involved in evaluating the bureau's SOP.

**Was the exercise used to evaluate Tsunami Ready or similar indicators in your country?**
For this exercise, Tsunami Ready evaluation was not conducted, but it will be conducted for Thailand tsunami exercise next time.

**Summary of what happened during the exercise**
During the exercise, all paticipants were enthusiastic and attention, following each bureau's SOP. Took notes and got conclusion on their SOP for real situation.

## Lessons Learnt

Currently we're working with earthquake observation vision, using the winITDB program to forecast arrival time of the wave at the beach. We expect that forecast arrival time and wave hight from TSP's pre-run model will be able to be used to develop forecast arrival time of wave to get a time that is as close to reality as possible.

## Organisation Logo(s)

## UNITED ARAB EMIRATES

# United Arab Emirates (UAE)

### Scenarios Exercised:

- ☐ Andaman Trench (4 Oct)
- ☑ Makran Trench (11 Oct)
- ☐ Heard Island (18 Oct)
- ☐ Java Trench (25 Oct )

IOWave23

**Figure 1.** Example of the warning messages and evacuation call received by the public from warning system of lead agency (MOI).

**Figure 2.** Community evacuation drill during Exercise IOWave23 in the UAE (MOI).

**Figure 3.** During IOWave23, 24/7 operation center for monitoring, warning dissemination, during the exercise (NCM).

### Exercise Participants

- **Organizations**: Ministry of Interior (MOI). National Center of Meteorology (NCM). National Emergency Crisis and Disaster Management Authority (NCEMA). Local Government Bodies. Other related Stakeholders in the Natural Disaster Plan.

- Approximately 500 people including residents, visitors, local authorities, and NGOs.

- Evacuation exercise in Al Righailat area in the Emirate of Fujairah, UAE.

- Participation from all community categories (Men, Women, children, elders, youngers and people of determination).

### Lessons Learnt

-Essential **Regular monitoring and evaluation** of the warning system's performance, and **periodic review and update** to account for changing conditions, to fine-tune the system, improve response times, and reduce false alarms.

-Importance of constant **catch-up** and **cooperation** with the regional and international tsunami early warning systems, by **exchanging the experiences and practices** between countries, bringing into line with the **latest technology** in the field, and developing **joint international strategies** to confront the tsunami.

### National Tsunami Warning & Mitigation System

The UAE has multiple mitigation measures in place:

-**EWS-UAE**: NCM is responsible for issuing tsunami warnings in the UAE to the NDMOs (MOI and NCEMA). Then MOI Multi-Hazard early warning system provides residents with advance notice of a tsunami, giving them time to evacuate to safety.

-**Evacuation plans**: LDMO (MOI) is responsible calling for evacuation in the UAE in the event of a tsunami warning. The MOI with their stakeholders has developed evacuation plans for all coastal areas in the UAE.

-**Public education**: MOI and NCM with other agencies conduct public education campaigns to raise awareness of tsunamis and how to stay safe.

The UAE has also established various **national initiatives** to assist vulnerable communities in preparing for tsunamis, including Tsunami drills, Tsunami awareness campaigns, and Tsunami hazard maps.

### National Organisation of Exercise IOWave23

Coordination among agencies: The exercise maintain the ability of the various agencies involved in the tsunami **warning and response** chain to coordinate their efforts effectively.

-The exercise was a success. The NCM and MOI was able to issue **timely and accurate tsunami warnings**, and **at-risk communities** were able to evacuate safely.

-The Exercise was a **valuable opportunity** to maintain the UAE's tsunami **warning and response system** and to engage different communities.

- Even though UAE is **classified as a low multi-hazard risk zone**, the UAE still involves, continuously, different communities and leading bodies in **periodic exercises** to raise awareness and constant reminding of the potential dangers that follow Hazards, especially tsunamis, to maintain **community sustainability** and **resilience** by enhancing **permanent preparedness** and **readiness** to respond in case of danger.

UNITED ARAB EMIRATES
THE SUPREME COUNCIL FOR NATIONAL SECURITY

MINISTRY OF INTERIOR

National Center of Meteorology

## 6.    LESSONS LEARNT AND RECOMMENDATIONS

Recognising that the outcomes from IOWave23 will contribute to a better understanding of the gaps in tsunami warning chains, as well as enhance tsunami preparedness across the Indian Ocean Region, the ICG/IOTWMS Secretariat and Indian Ocean Tsunami Information Centre (IOTIC) jointly organised the "Lessons Learnt during Exercise Indian Ocean Wave 2023" webinar during 12-13 December 2023.

The webinar focused on Member States' participation in the exercise, with country presentations from Australia, Bangladesh, India, Indonesia, Iran, Madagascar, Mauritius, Myanmar, Oman, Pakistan, Seychelles, Singapore, Sri Lanka, Tanzania, Thailand, and the United Arab Emirates. Panel discussions were also held on: a) New Tsunami Service Provider (TSP) products for non-seismic generated tsunami, b) Community involvement in IOWave exercises; c) Exercising UNECO-IOC Tsunami Ready indicators; and d) Recommendations for the next IOWave Exercise.

Recommendations for the upstream components of the tsunami warning system, including the TSPs and NTWCs:

i)   Member States should regularly review, update, and test contact information on national warning dissemination lists.
j)   National Tsunami Warning Centres should review and update Standard Operating Procedures (SOPs) based on lessons learnt during Exercise IOWave23.
k)   All IOTWMS TSPs should develop and implement products for tsunamis generated by non-seismic sources.
l)   As well as the workshops organised before the exercise to review and update the national tsunami warning chains and SOPs for each link in those chains for each Member States, further detailed training is required for NTWCs on TSP products, including how to deal with differences in predicted wave heights and how to best utilise the new non-seismic generated tsunami products.

Recommendations for the downstream tsunami warning system, including DMOs, communities, and media:

m)  Further implementation of UNESCO-IOC Tsunami Ready Recognition Programme, or similar national initiatives, supported by appropriate resources is urgently required to ensure communities receive warnings and know what to do to meet the goal of UN Ocean Decade Tsunami Programme of 100% at-risk communities prepared and resilient to tsunami threat by 2030, plus UN goal of "Early Warnings for All" by 2027.
n)  Community tsunami awareness and preparedness activities should be regularly conducted and accommodate all in the community, including all genders, all ages, and those with disabilities.
o)  Ensure communication between stakeholders in the national tsunami warning chains is effective.
p)  DMOs, communities, and media should review and update SOPs based on lessons learnt during Exercise IOWave23.

In terms of exercise planning, it was recommended to conduct future biennial IOWave exercises at alternative times of the year to allow the full participation of Member States that are occupied with other hazards during the September and October period. Member States were encouraged to undertake national exercises and drills in the alternate years, so that exercises of some form are at least undertaken annually.

The ICG/IOTWMS Steering Group discussed Exercise IOWave23 during its intersessional meeting (Hyderabad, 5-6 February 2024) in terms of whether future exercises could also be

multi-hazard in their implementation (e.g. tsunamis occurring at same time as a cyclone/hurricane). While implementation on an ocean basin scale and coordination of multiple injects from different programmes being coordinated under different international organisations was considered challenging, the Steering Group recommended that Member States consider holding national exercises under a multi-hard framework, including scenarios where different hazards are occurring simultaneously or where there is a cascading effect of hazards (e.g. volcano eruption, leads to a landslide, that also leads to the generation of a tsunami) .

The Steering Group also recommended to consider holding future exercise scenarios in different regions at different times of the year to avoid seasonal workload issues for DMOs and their communities.

Within the online survey, Member States also reported on recommendations for improvements to future IOWave exercises including:

a) Increase stakeholder involvement including communities, media, private sector and tourism
b) Conduct exercises at a different time of the year
c) Use a scenario involving weekend, nighttime or public holiday conditions
d) Regular awareness and preparedness programmes required at the community level
e) Expand the scope of disaster preparedness exercises to encompass a broader segment of society and diverse regions
f) Leverage on innovative advancements to disseminate disaster awareness and education across society
g) Provide technical support in scenario-based inundation and hazard mapping
h) Check and update the TSP dissemination databases, especially for SMS

ANNEX I – **NATIONAL EXERCISE CONTACTS**

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## ANNEX II – **IOC CIRCULAR LETTER 2945**

**IOC Circular Letter No 2945** IOC/VR/BA/RB/ah

(Available in English only)     4 May 2023

**To:**     ICG/IOTWMS[1] Tsunami National Contacts

**cc.:**    Official National Coordinating Bodies for liaison with the IOC
       Permanent Delegates/Observer Missions to UNESCO and National Commissions
         for UNESCO in ICG/IOTWMS Member States
       UNESCO Offices in Doha, Islamabad, Jakarta, New Delhi, and Tehran
       ICG/IOTWMS Chair and Vice-Chairs
       ICG/IOTWMS Working Group Chairs and Vice-Chairs
       ICG/IOTWMS Task Team IOWave23
       ICG/IOTWMS Tsunami Warning Focal Points
       ICG/IOTWMS National Tsunami Warning Centres

   **Subject:    Announcement of the Indian Ocean Tsunami Exercise (IOWave23)
   on 4, 11, 18, and 25 October 2023**

The IOC Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS) at its 13th session (Bali, Indonesia, 28 November–1 December 2022, decided to organise an Indian Ocean Wave Exercise in 2023 (IOWave23) and established a Task Team to plan and conduct the exercise. At its most recent intersessional meeting, held online on 4 April, and after consultation with key stakeholders, the Task Team IOWave23 decided to conduct IOWave23 with four different scenarios on 8, 11, 18, and 25 October 2023. The four scenarios will allow individual Member States to decide the type and number of exercise scenarios to participate in. This letter provides background information and details of the IOWave23 in which all ICG/IOTWMS Member States are encouraged to participate.

To date six IOWave exercises have been conducted (2009, 2011, 2014, 2016, 2018 and 2020). The exercises have been designed to test the receipt and dissemination of tsunami notifications along national tsunami warning chains, as well as test appropriate responses aligned with pre-established Standard Operating Procedures (SOPs). Throughout the IOWave Exercises, the engagement of coastal communities in tsunami education campaigns, preparedness measures, and evacuation drills has grown. Moreover, awareness and adoption of the UNESCO-IOC Tsunami Ready Recognition Programme (TRRP) guidelines have increased.

Key milestones in exercise participation were achieved during the IOWave16, where over 60,000 people participated in evacuation drills, and subsequently during the IOWave18 where the number of participants exceeded 119,000. The vast majority of community evacuations were conducted in India, with Australia, Comoros, Indonesia, Iran, Kenya, Mauritius, Oman,

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[1]    ICG/IOTWMS Member States include Australia, Bangladesh, Comoros, Djibouti, France, India, Indonesia, Iran (Islamic Republic of), Kenya, Madagascar, Malaysia, Maldives, Mauritius, Mozambique, Myanmar, Oman, Pakistan, Seychelles, Singapore, Somalia, South Africa, Sri Lanka, Tanzania, Thailand, Timor Leste, United Arab Emirates and Yemen.

Pakistan, Seychelles, Sri Lanka, Tanzania, Thailand, and Timor Leste also involving at-risk coastal communities in one or both exercises.

During IOWave20 held during the Covid-19 pandemic, Member States were encouraged to focus on testing communications protocols and conduct virtual tabletop exercises (as a minimum) to assess organisational Standard Operating Procedures, plans, and policies for tsunami warning and emergency response. Guidelines for tsunami response during the Covid-19 pandemic were published and the IOWave20 Task Team encouraged Member States to update and test their SOPs for a pandemic situation.

**Objectives**: IOWave23 will again simulate Indian Ocean countries being put in a tsunami threat situation. As a primary objective it will require the National Tsunami Warning Centre (NTWC) and the National and/or Provincial and/or Local Disaster Management Offices (NDMOs/PDMOs/LDMOs) in each country to implement their SOPs associated with their national tsunami warning chains. The exercise will test the preparedness for responding to tsunamis generated by seismic events (undersea earthquakes) and for the first time non-seismic events (e.g., tsunamis generated by volcanoes). SOP training workshops for Member States will be organised in July 2023. This will help ensure national tsunami warning chains and associated SOPs are reviewed and robust to help prepare Member States for IOWave23 and any future real tsunami events.

In addition to testing the SOPs and communication links at all levels of the national tsunami warning chain, another primary objective of IOWave23 is to enhance tsunami preparedness at the community level. To this end and where implemented, IOWave23 will also provide an opportunity for Member States to test the UNESCO-IOC Tsunami Ready Recognition Programme (TRRP) indicators or other related national initiatives in at-risk communities. Guidelines and associated training resources for the TRRP can be downloaded online from the International Tsunami Information Center (ITIC) web site (http://itic.ioc-unesco.org). An introduction to the TRRP for ICG/IOTWMS Member States was also provided at the Indian Ocean Tsunami Ready Workshop, held in Bali, Indonesia, 22–26 November 2022 (https://oceanexpert.org/event/3635). Further training on TRRP will be provided to Member States of the ICG/IOTWMS in due course.

**Dates and Scenarios**: IOWave23 will comprise four scenarios with simulated tsunami waves travelling across the Indian Ocean basin. Member States are invited to participate in one or more events, which will be run in real-time:

• Scenario 1  starting at 04:00 UTC on <u>Wednesday 4 October 2023</u>: Magnitude ~9 earthquake in the Andaman trench off the west coast of Nicobar Islands, India.

• Scenario 2  starting at 06:00 UTC on <u>Wednesday 11 October 2023</u>: Magnitude ~9 earthquake in the Makran trench of the North-West Indian Ocean.

• Scenario 3   starting at 06:00 UTC (eruption at 05:00 UTC) on <u>Wednesday 18 October 2023</u>: Volcanic eruption on Heard Island in the Kerguelen Islands Region.

• Scenario 4  starting at 02:00 UTC on <u>Wednesday 25 October 2023</u>: Magnitude ~9 earthquake in the Java trench to the south of Java, Indonesia.

**Specifics**: The IOTWMS Tsunami Service Providers (TSPs) of Australia, India, and Indonesia will provide IOWave23 bulletins and detailed tsunami threat advice on their password-protected websites. Notification messages will be sent to the national Tsunami Warning Focal Points (TWFP) as threat information is updated during the events. The IOWave23 Exercise Manual will be distributed by email in May 2023 with further details of the exercise scenarios and post-exercise evaluation. For your information, the guiding principles for the conduct of

the exercise are provided in Annex 1. A checklist of activities to enable Member States to prepare for the exercise is provided in Annex 2.

**Nomination of National Contact for IOWave23**: To ensure that the commitment of participating Member States is fully coordinated, we seek your nomination of a National Contact for IOWave23 with whom the IOC Secretariat will communicate about planning and the conduct of the exercise, including distribution of the IOWave23 Exercise Manual, via email. The designated National Contact for IOWave23 will be expected to confirm the accuracy of existing tsunami warning arrangements within your country, including the identification of operational points of contact for receipt and dissemination of tsunami warnings downstream from the NTWC. The designated National Contact for IOWave23 will also be responsible for coordinating input to the post-exercise evaluation, details of which will be circulated as part of the IOWave23 Exercise Manual.

I would be grateful if you could please provide the details of your National Contact for IOWave23 by 31 May 2023 to the UNESCO-IOC ICG/IOTWMS Secretariat by email: iotwms@unesco.org.

I would also encourage you to disseminate copies of this letter to the appropriate organisations and authorities within your country.

I would like to thank you in advance for your Member State's participation and contributions to this important initiative to help prepare Indian Ocean communities for the next tsunami threat.

Yours sincerely,


Vladimir Ryabinin

Executive Secretary


Enclosures:

Annex 1 – Guiding Principles for IOWave23 Exercise

Annex 2 – Checklist of activities to enable Member States' preparation for IOWave23 Exercise

**Annex 1: Guiding Principles for IOWave23 Exercise**

1.      The exercise will simulate each IOTWMS Member State being placed in a tsunami threat situation and require the National Tsunami Warning Centre (NTWC) and the National and/or Provincial and/or Local Disaster Management Office (NDMO/PDMO/LDMO) to implement their Standard Operating Procedures (SOPs).

2.      Member States are encouraged to conduct the exercise to community level to test SOPs and communications at all levels of the national tsunami warning chain. To enhance community preparedness at community level, Member States are also encouraged to test the indicators of UNESCO-IOC Tsunami Ready Recognition Programme (TRRP) or similar national initiatives in communities, where implemented. However, it is recommended to only conduct the exercise to the level prepared for, which at a minimum should include testing the SOPs and operational lines of communication at the NTWC and DMOs.

3.      The four exercise scenarios are:

   •  Scenario 1 starting at 04:00 UTC on Wednesday 4th October 2023: Magnitude ~9 earthquake in the Andaman trench off the west coast of Nicobar Islands, India. The simulated tsunami will take approximately 0 hours* to travel from its source to India; 1 hour to Indonesia; and 1.5 hours to travel to Thailand, Bangladesh, and Sri Lanka.

   •  Scenario 2 starting at 06:00 UTC on Wednesday 11th October 2023: Magnitude ~9 earthquake in the Makran trench of the North-West Indian Ocean. The simulated tsunami will take approximately 0 hours* to travel from its source to Iran, Pakistan, and Oman; 0.5 hours to travel to the United Arab Emirates; and 2 hours to travel to India.

   •  Scenario 3 starting at 06:00 UTC (eruption at 05:00 UTC) on Wednesday 18th October 2023: Tsunami generated by volcanic eruption on Heard Island in the Kerguelen Islands Region. The simulated tsunami will take approximately 1.5 hours to travel from its source to the French Islands; 6 hours to Madagascar, Mauritius, and Australia; and 6.5 hours to South Africa.

   •  Scenario 4 starting at 02:00 UTC on Wednesday 25th October 2023: Magnitude ~9 earthquake in the Java trench to the south of Java, Indonesia. The simulated tsunami will take approximately 0 hours* to travel from its source to Indonesia; 0.5 hours to travel to Australia; and 1.5 hours to travel to Timor-Leste.

   *  *Note that the expected arrival times have been approximated to the nearest 0.5 hour (30 minutes). Therefore, a time of 0 hours can be interpreted as less than 15 minutes.*

4.      Exercise bulletins and detailed tsunami threat advice will be generated in real-time by the IOTWMS Tsunami Service Providers (TSPs) (Australia, India, Indonesia) and made available on their password-protected websites. Notification Messages will be sent to the national Tsunami Warning Focal Points (TWFP) by the TSPs as the information is updated during the events.

5.      All Member States are strongly encouraged to participate to the extent possible in their country, particularly for the scenario that is "near-field" for them. Note that it may be very worthwhile to participate in multiple scenarios, if possible, because SOP issues

identified for one scenario can be corrected and exercised again in a subsequent scenario, and because the tsunami arrival times will vary for each scenario requiring potentially different responses.

6.  Due care should be taken not to inadvertently alarm the public.

7.  Participating Member States are requested to share information following the exercise regarding the procedures applied and the lessons learned, via the Exercise Evaluation (details to be provided in the IOWave23 Exercise Manual). The outcomes and performance measures to be reported will include:

- 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;

- Access by NTWCs to the tsunami bulletins and other products on the TSP websites, and the use of that information in the production of national warnings;

- Reporting by NTWCs to the TSPs of their National Tsunami Warning status;

- Validate the SOPs for generating and disseminating tsunami warnings to emergency response agencies, media, and the public;

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

- Validate the level of community awareness, preparedness, and response;

- Media response (if applicable).

**Annex 2: Checklist of activities to enable Member States' preparation for IOWave23 Exercise**

| No | Activity | Timeline |
|---|---|---|
| 1 | Announcement by IOC Circular Letter | May 2023 |
| 2 | Set up IOWave23 Exercise National Coordination Committee involving NTWC, LDMOs, NDMOs, and all other important stakeholders including private industry participants. | May 2023 |
| 3 | Decide on level of participation and identify communities for evacuation (where applicable). | May 2023 |
| 4 | Assign agency roles including exercise controller, key participants, and observers. | May 2023 |
| 5 | Nominate a National Contact for IOWave23. | May 2023 |
| 6 | Issue of IOWave23 Exercise Manual by the Secretariat. | May 2023 |
| 7 | Secure funding and support for community activities. | Ongoing |
| 8 | Develop a National IOWave23 Exercise Manual to plan/guide activities, including those at community level. | May 2020 |
| 9 | Address indicators of UNESCO-IOC Tsunami Ready Recognition Programme or similar national initiative (where appropriate). | Ongoing |
| 10 | Share IOWave23 Exercise in-country participation plans with the ICG/IOTWMS Secretariat. | June 2023 |
| 11 | UNESCO-IOC Standard Operating Procedure (SOP) Training Workshops (regionally online and nationally face-to-face). | July 2023 |
| 12 | Organise and hold pre-exercise national workshop(s) and meeting(s) with key stakeholders including media. | August – September 2023 |
| 13 | Ensure Standard Operating Procedures are in place and up to date. | August – September 2023 |
| 14 | Prepare a media press release. | One week before the exercise |
| 15 | Participate in IOWave23 Exercise. | 4 / 11 / 18 / 25 Oct. 2020 |
| 16 | Hold post-exercise hot and cold debriefs. | After the Exercise |
| 17 | Complete the IOWave23 online post-exercise evaluation. | November 2023 |
| 18 | Revise and improve SOPs in accordance with lessons learnt during the Exercise. | After the Exercise |

| 19 | IOC-UNESCO Post-IOWave23 Exercise Lessons Learnt Workshop (online). | November 2023 |
|----|----|----|

*Note: This checklist is intended to serve only as a broad reference and is not all-inclusive.*

## ANNEX III – **SURVEY RESPONSES: OVERVIEW**

### SCENARIOS EXERCISED

| SCENARIO | Tot | % | AUS | BAN | FR | IN | IND | IR | MAD | MAL | MD | MAU | MM | OM | PK | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Andaman Trench | 10 | 50 | o | ● | o | ● | ● | o | ● | ● | o | o | ● | o | o | ● | ● | o | ● | o | ● | o |
| Makran Trench | 6 | 30 | o | o | o | ● | o | ● | o | ● | o | o | o | ● | ● | o | o | o | o | o | o | ● |
| Heard Island | 6 | 30 | ● | o | o | ● | o | o | o | ● | o | o | o | o | o | ● | o | ● | o | ● | o | o |
| Java Trench | 7 | 35 | ● | o | ● | ● | ● | o | o | ● | ● | ● | o | o | o | o | o | o | o | o | o | o |
| Any Scenario | 20 | 100 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

Table III-1. Scenarios exercised by Member State.

### STAKEHOLDER PARTICIPATION

| STAKEHOLDERS | Tot | % | AUS | BAN | FR | IN | IND | IR | MAD | MAL | MD | MAU | MM | OM | PK | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NTWC | 20 | 100 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| NDMO | 15 | 75 | o | ● | o | ● | ● | ● | o | ● | ● | o | ● | ● | ● | o | ● | ● | ● | ● | ● | ● |
| PDMO | 9 | 45 | o | ● | ● | ● | ● | ● | o | o | o | o | ● | o | o | o | o | o | o | ● | o | ● |
| LMDO | 13 | 65 | ● | ● | ● | ● | ● | ● | o | o | ● | o | ● | o | ● | o | o | ● | ● | ● | o | ● |
| Media | 9 | 45 | o | o | o | ● | ● | o | o | o | ● | o | ● | ● | ● | o | o | ● | o | o | ● |
| Communities | 8 | 40 | o | o | o | ● | ● | o | o | ● | ● | ● | o | o | o | o | o | ● | o | o | ● |

Table III-2. Stakeholder participation by Member State.

**EXERCISE TYPES**

| EXERCISE TYPES | Tot | % | AUS | BAN | FR | IN | IND | IR | MAD | MAL | MD | MAU | MM | OM | PK | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tabletop | 14 | 70 | ● | ● | ● | ● | ● | o | ● | o | ● | ● | o | ● | ● | ● | o | ● | ● | o | ● | o |
| Drill | 8 | 40 | o | o | o | o | ● | ● | o | o | o | ● | ● | o | o | o | o | o | ● | ● | ● | ● |
| Functional | 6 | 30 | ● | o | ● | ● | o | o | o | ● | o | ● | o | o | o | o | o | o | ● | o | o | o |
| Orientation | 3 | 15 | o | o | o | ● | o | o | o | o | o | o | o | o | o | o | ● | o | ● | o | o | o |
| Full Scale | 3 | 15 | o | o | o | ● | o | o | o | o | ● | ● | o | o | o | o | o | o | o | o | o | o |

Table III-3. Types of exercises conducted by Member State.

## ANNEX IV – **SURVEY RESPONSES: AT-RISK COASTAL COMMUNITIES**

### INCLUSIVE MESSAGING

| INCLUSIVE MESSAGING | Tot | % | AUS | BAN | FR | IN | IND | IR | MAD | MD | MAU | MM | OM | SY | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | 9 | 53 | ● | ● | o | ● | o | ● | o | ● | ● | ● | o | o | o | ● | o | o | ● |

Table IV-1. Tsunami warning messages issued to the public were able to be accessed and understood by people with disabilities, all genders, elderly and youth.

### AWARENESS ACTIVITIES

| AWARENESS ACTIVITIES | Tot | % | AUS | BAN | IN | IND | IR | MAD | MD | MAU | OM | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Any | 9 | 56 | o | o | ● | ● | ● | ● | ● | ● | o | o | o | o | ● | ● | o | ● |
| Inclusive | 7 | 78 |  |  | ● | ● | o | o | ● | ● |  |  |  |  | ● | ● |  | ● |

Table IV-2. Pre-exercise tsunami awareness activities and their inclusiveness (i.e. catered for people with disabilities, all genders, elderly and youth).

**PREPAREDNESS ACTIVITIES**

| PREPAREDNESS ACTIVITIES | Tot | % | AUS | BAN | IN | IND | IR | MAD | MD | MAU | OM | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Any** | 8 | 50 | o | o | ● | ● | ● | o | ● | ● | o | o | o | o | ● | ● | o | ● |
| **Community education seminars** | 7 | 88 | | | ● | ● | ● | | ● | ● | | | | | o | ● | | ● |
| **Evacuation maps** | 7 | 88 | | | o | ● | ● | | ● | ● | | | | | ● | ● | | ● |
| **Tsunami Education in Schools** | 6 | 75 | | | ● | ● | ● | | o | o | | | | | ● | ● | | ● |
| **Shelter facilities** | 6 | 75 | | | ● | ● | ● | | o | ● | | | | | o | ● | | ● |
| **Evacuation signage** | 5 | 63 | | | o | ● | ● | | o | o | | | | | ● | ● | | ● |
| **Tsunami Exercise** | 4 | 50 | | | o | ● | ● | | o | ● | | | | | o | ● | | ● |
| **Participatory evacuation planning** | 4 | 50 | | | o | ● | o | | o | ● | | | | | o | ● | | ● |

Table IV-3. Pre-exercise tsunami preparedness activities.

| EVACUATION MAPS | Tot | % | AUS | BAN | IN | IND | IR | MAD | MD | MAU | OM | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Available** | 9 | 56 | o | ● | ● | o | ● | ● | ● | ● | o | o | o | o | ● | o | ● | ● |
| **Inclusive** | 7 | 78 | | o | ● | | o | ● | ● | ● | | | | | ● | | ● | ● |

Table IV-4. Tsunami evacuation maps are available and inclusive (i.e. consider evacuation of people with disabilities, all genders, elderly and youth.

| SUPPORTED ACTIVITIES | Tot | % | AUS | BAN | IN | IND | IR | MAD | MD | MAU | OM | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Any | 14 | 88 | • | • | • | • | • | • | • | • | o | • | • | • | • | o | • | • |
| Hazard mapping | 12 | 75 | • | • | • | • | • | • | o | • | o | o | • | • | • | o | • | • |
| Tsunami inundation mapping | 11 | 69 | • | • | • | • | • | • | o | • | o | • | • | o | • | o | o | • |
| Evacuation route mapping | 8 | 50 | • | o | • | • | • | • | o | • | o | o | o | o | • | o | o | • |
| Tsunami Signage | 7 | 44 | o | • | • | • | • | o | • | o | o | o | o | o | • | o | o | • |
| Vertical evacuation shelters | 7 | 44 | o | o | • | • | • | o | • | • | o | • | o | o | o | o | o | • |

Table IV-5. Tsunami preparedness activities that received support prior to the exercise.


## TSUNAMI READY INDICATORS

| Tsunami Ready Indicators | Tot | % | BAN | IN | IND | IR | MAD | MD | MAU | MM | OM | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Evaluated | 9 | 56 | • | • | • | • | o | • | o | • | o | o | o | o | • | o | • | • |
| # of Communities | 46 | | | 32 | 7 | 1 | 0 | 1 | 0 | | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 1 |

Table IV-6. Member States that evaluated the UNESCO-IOC Tsunami Ready Recognition Programme indicators during the exercise and the number of communities that undertook the evaluations.

**COMMUNITY EVACUATIONS**

| Community Evacuations | Tot | IN | IND | IR | MD | MAU | SLK | UAE |
|---|---|---|---|---|---|---|---|---|
| Conducted | 7 | ● | ● | ● | ● | ● | ● | ● |
| # of People | 45,010 | 40,000 | 1,650 | 500 | 60 | 300 | 2,000 | 500 |

Table IV-7. Member States that conducted community evacuation drills and the number of people participating.

ANNEX V – **SURVEY RESPONSES: STANDARD OPERATING PROCEDURES**

**DISSEMINATION OF TSUNAMI MESSAGES**

*To National Disaster Management Organisations*

| NDMO | | Percent | AUS_JAV | BAN_AND | IN_AND | IN_MAK | IND_JAV | IR_MAK | MAD_AND | MD_JAV | MAU_JAV |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Who sends tsunami messages to the NDMO? | NTWC | 93% | NTWC | NTWC | NTWC | NTWC | NTWC | NTWC | NTWC | NTWC | NTWC |
| | Other | 7% | | | | | | | | | |
| Number of messages sent | | - | - | 6 | 15 | 15 | 7 | 5 | 28 | 4 | 7 |
| Time 1st message sent after earthquake (UTC) | | - | 02:12 | 04:05 | 04:15 | 06:08 | 02:03 | 06:00 | 04:59 | 02:15 | 02:25 |
| Time last message sent after earthquake (UTC) | | - | 05:53 | 08:30 | 16:00 | 18:00 | 04:00 | 06:45 | 15:46 | 10:20 | 14:10 |
| Method of delivery | Email | 85% | ● | ● | ● | ● | ● | ○ | ● | ○ | ● |
| | Webpage | 15% | ● | ○ | ○ | ○ | ● | ○ | ○ | ○ | ○ |
| | SMS | 46% | ○ | ○ | ● | ● | ● | ● | ● | ● | ○ |
| | Fax | 38% | ○ | ● | ● | ● | ○ | ● | ○ | ○ | ● |
| | Phone | 38% | ○ | ○ | ● | ● | ○ | ● | ○ | ● | ○ |
| | TV | 0% | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | Radio | 0% | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | Social Media | 0% | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | Other - | 0% | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | Other - | 0% | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Were the messages received in a timely manner? | | 100% | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

| NDMO | | Percent | OM$_{MAK}$ | SY$_{AND}$ | SA$_{HI}$ | SRI$_{AND}$ | TAN$_{HI}$ | UAE$_{MAK}$ |
|---|---|---|---|---|---|---|---|---|
| Who sends tsunami messages to the NDMO? | NTWC | 93% | Other | NTWC | NTWC | NTWC | NTWC | NTWC |
| | Other | 7% | | | | | | |
| Number of messages sent | | - | 5 | | 13 | 5 | 7 | 5 |
| Time 1st message sent after earthquake (UTC) | | - | 06:06 | | 06:06 | 04:11 | 06:16 | 06:02 |
| Time last message sent after earthquake (UTC) | | | 11:00 | | 17:31 | 06:00 | 15:01 | - |
| Method of delivery | Email | 85% | ● | | ● | ● | ● | ● |
| | Webpage | 15% | o | | o | o | o | o |
| | SMS | 46% | ● | | o | o | o | o |
| | Fax | 38% | o | | o | ● | o | o |
| | Phone | 38% | o | | o | ● | o | ● |
| | TV | 0% | o | | o | o | o | o |
| | Radio | 0% | o | | o | o | o | o |
| | Social Media | 0% | o | | o | o | o | o |
| | Other - | 0% | o | | o | o | o | o |
| | Other - | 0% | o | | o | o | o | o |
| Were the messages received in a timely manner? | | 100% | Yes | Yes | Yes | Yes | Yes | Yes |

# DISSEMINATION OF TSUNAMI MESSAGES

## *To Provincial Disaster Management Organisations*

| PDMO | | Percent | AUS$_{JAV}$ | BAN$_{AND}$ | FR$_{JAV}$ | IN$_{AND}$ | IN$_{MAK}$ | IND$_{JAV}$ | IR$_{MAK}$ | MM$_{AND}$ | OM$_{MAK}$ | TAN$_{HI}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Who sends tsunami messages to the PDMO? | NDMO | 38% | NTWC | NDMO | NTWC & NDMO | | | NTWC | NTWC | NTWC | Other | NDMO |
| | NTWC | 63% | | | | | | | | | | |
| | Other | 13% | | | | | | | | | | |
| Number of messages sent | | - | | 6 | 13 | 15 | 15 | 7 | 5 | 6 | 5 | 7 |
| Time 1st message sent after earthquake (UTC) | | - | | 04:08 | 02:23 | 04:15 | 06:08 | 02:03 | 06:00 | 04:15 | 06:07 | 06:24 |
| Time last message sent after earthquake (UTC) | | - | | 08:32 | 11:50 | 16:00 | 18:00 | 04:00 | 06:45 | 12:00 | 11:01 | 15:07 |
| Method of delivery | Email | 89% | ● | ● | ● | ● | | ● | o | ● | ● | ● |
| | Webpage | 22% | ● | o | o | o | | ● | o | o | o | o |
| | SMS | 67% | o | ● | o | ● | | ● | ● | ● | ● | o |
| | Fax | 33% | o | o | o | ● | | o | ● | ● | o | o |
| | Phone | 44% | o | ● | ● | ● | | o | ● | o | o | o |
| | TV | 0% | o | o | o | o | | o | o | o | o | o |
| | Radio | 0% | o | o | o | o | | o | o | o | o | o |
| | Social Media | 11% | o | o | o | o | | o | o | o | o | ● |
| | Other - | 0% | o | o | o | o | | o | o | o | o | o |
| | Other - | 0% | o | o | o | o | | o | o | o | o | o |
| Were the messages received in a timely manner? | | 100% | Yes | Yes | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |

**DISSEMINATION OF TSUNAMI MESSAGES**

***To Local Disaster Management Organisations***

| LDMO | | Percent | BAN_AND | FR_JAV | IN_AND | IN_MAK | IND_JAV | IR_MAK | MD_JAV | MAU_JAV | OM_MAK |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Who sends tsunami messages to the LDMO? | PDMO | 20% | PDMO | | NTWC & PDMO | | NTWC | NTWC | NDMO | NDMO | Other |
| | NDMO | 50% | | | | | | | | | |
| | NTWC | 30% | | | | | | | | | |
| | Other | 10% | | | | | | | | | |
| Number of messages sent | | - | 6 | 13 | 15 | 15 | 7 | 5 | 4 | 7 | 5 |
| Time 1st message sent after earthquake (UTC) | | - | 04:15 | 02:23 | 04:15 | 06:08 | 02:03 | 06:00 | 02:33 | 02:25 | 06:05 |
| Time last message sent after earthquake (UTC) | | - | 08:34 | 11:50 | 16:00 | 18:00 | 04:00 | 06:45 | 10:33 | 14:10 | 11:01 |
| Method of delivery | Email | 82% | ● | ● | | ● | ● | o | o | ● | ● |
| | Webpage | 9% | o | o | | o | ● | o | o | o | o |
| | SMS | 64% | ● | o | | ● | ● | ● | ● | o | ● |
| | Fax | 36% | o | o | | ● | o | ● | o | ● | o |
| | Phone | 55% | ● | ● | | ● | o | ● | ● | o | o |
| | TV | 0% | o | o | | o | o | o | o | o | o |
| | Radio | 0% | o | o | | o | o | o | o | o | o |
| | Social Media | 18% | o | o | | o | o | o | o | o | o |
| | Other - | 0% | o | o | | o | o | o | o | o | o |
| | Other - | 0% | o | o | | o | o | o | o | o | o |
| Were the messages received in a timely manner? | | 100% | Yes | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |

| LDMO | | Percent | SY$_{AND}$ | SRI$_{AND}$ | TAN$_{HI}$ | UAE$_{MAK}$ |
|---|---|---|---|---|---|---|
| Who sends tsunami messages to the LDMO? | PDMO | 20% | | NDMO | NDMO | NDMO |
| | NDMO | 50% | | | | |
| | NTWC | 30% | | | | |
| | Other | 10% | | | | |
| Number of messages sent | | - | | 4 | 7 | 5 |
| Time 1st message sent after earthquake (UTC) | | - | | 04:16 | 06:24 | 06:04 |
| Time last message sent after earthquake (UTC) | | - | | 06:04 | 15:07 | - |
| Method of delivery | Email | 82% | | ● | ● | ● |
| | Webpage | 9% | | o | o | o |
| | SMS | 64% | | ● | o | o |
| | Fax | 36% | | ● | o | o |
| | Phone | 55% | | o | o | ● |
| | TV | 0% | | o | o | o |
| | Radio | 0% | | o | o | o |
| | Social Media | 18% | | ● | ● | o |
| | Other - | 0% | | o | o | o |
| | Other - | 0% | | o | o | o |
| Were the messages received in a timely manner? | | 100% | Yes | Yes | Yes | Yes |

# DISSEMINATION OF TSUNAMI MESSAGES

## *To Media*

| Media | | Percent | $AUS_{HI}$ | $AUS_{JAV}$ | $IN_{AND}$ | $IN_{MAK}$ | $IND_{JAV}$ | $IR_{MAK}$ | $MAU_{JAV}$ | $OM_{MAK}$ | $SY_{AND}$ | $SRI_{AND}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Who sends tsunami messages to the Media? | LDMO | 17% | NTWC & Other | | LDMO | | NTWC | | NDMO | Other | | NDMO |
| | NTWC | 33% | | | | | | | | | | |
| | Other | 33% | | | | | | | | | | |
| Number of messages sent | | - | | | 15 | 15 | 7 | | 7 | 5 | | |
| Time 1st message sent after earthquake (UTC) | | - | | | 04:18 | 06:12 | 02:03 | | 02:25 | 06:07 | | |
| Time last message sent after earthquake (UTC) | | - | | | 16:00 | 08:00 | 04:00 | | 14:10 | 11:00 | | |
| Method of delivery | Email | 75% | | | | ● | o | | ● | ● | | |
| | Webpage | 25% | | | | o | ● | | o | o | | |
| | SMS | 75% | | | | ● | ● | | o | ● | | |
| | Fax | 50% | | | | ● | o | | ● | o | | |
| | Phone | 25% | | | | ● | o | | o | o | | |
| | TV | 0% | | | | o | o | | o | o | | |
| | Radio | 0% | | | | o | o | | o | o | | |
| | Social Media | 0% | | | | o | o | | o | o | | |
| | Other - | 0% | | | | o | o | | o | o | | |
| | Other - | 0% | | | | o | o | | o | o | | |
| Were the messages received in a timely manner? | | 100% | | | | Yes | Yes | Yes | Yes | Yes | Yes | |

*To Public*

| Public | | Percent | AUS$_{HI}$ | AUS$_{JAV}$ | IN$_{AND}$ | IND$_{JAV}$ | IR$_{MAK}$ | MD$_{JAV}$ | MAU$_{JAV}$ | SRI$_{AND}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Who sends tsunami messages to the Public? | LDMO | 43% | NTWC & Other | | LDMO | NTWC | LDMO | NTWC & NDMO | NDMO | NDMO & LDMO |
| | NDMO | 43% | | | | | | | | |
| | NTWC | 43% | | | | | | | | |
| | Other | 14% | | | | | | | | |
| Number of messages sent | | - | | | 7 | 7 | 2 | 4 | 7 | 4 |
| Time 1st message sent after earthquake (UTC) | | - | | | 04:20 | 02:03 | 06:10 | 03:19 | 02:25 | 04:16 |
| Time last message sent after earthquake (UTC) | | - | | | 16:00 | 04:00 | 06:45 | 10:40 | 14:10 | 06:04 |
| Method of delivery | Email | 33% | | | ● | o | o | o | ● | o |
| | Webpage | 17% | | | o | o | o | o | ● | o |
| | SMS | 50% | | | ● | ● | o | o | o | ● |
| | Fax | 33% | | | ● | o | o | o | ● | o |
| | Phone | 17% | | | ● | o | o | o | o | o |
| | TV | 0% | | | o | o | o | o | o | o |
| | Radio | 0% | | | o | o | o | o | o | o |
| | Social Media | 33% | | | o | ● | o | o | o | ● |
| | Other - Speaker | 33% | | | o | o | ● | ● | o | o |
| | Other - | 0% | | | o | o | o | o | o | o |
| Were the messages received in a timely manner? | | 100% | | | Yes | Yes | Yes | Yes | Yes | Yes |

**STANDARD OPERATING PROCEDURES**

*Availability*

| Standard Operating Procedures | | | Percent | AUS | BAN | FR | IN | IND | IR | MAD | MD | MAU | MM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do the following authorities and organisations have SOPs in place to ensure tsunami warnings are efficiently transmitted along the national tsunami waringin chain in a timely manner? | NTWC | Yes | 94% | | | | | | | | | | |
| | | No | 0% | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | | Partially | 6% | | | | | | | | | | |
| | NDMO | Yes | 82% | | | | | | | | | | |
| | | No | 6% | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| | | Partially | 12% | | | | | | | | | | |
| | PDMO | Yes | 67% | | | | | | | | | | |
| | | No | 13% | Yes | Yes | Yes | Yes | Yes | Yes | Partially | Yes | No | |
| | | Partially | 20% | | | | | | | | | | |
| | LDMO | Yes | 56% | | | | | | | | | | |
| | | No | 6% | | Yes | Yes | Yes | Yes | Yes | Partially | Yes | Yes | |
| | | Partially | 38% | | | | | | | | | | |
| | Other Authorities | Yes | 50% | | | | | | | | | | |
| | | No | 19% | | | Yes | Yes | Yes | Partially | Partially | Yes | Partially | |
| | | Partially | 31% | | | | | | | | | | |
| | Media | Yes | 36% | | | | | | | | | | |
| | | No | 36% | | | | Partially | Yes | | Partially | Yes | Partially | |
| | | Partially | 29% | | | | | | | | | | |
| | Public | Yes | 20% | | | | | | | | | | |
| | | No | 40% | | | | Partially | Partially | Partially | Partially | Yes | Partially | |
| | | Partially | 40% | | | | | | | | | | |

| Standard Operating Procedures | | | Percent | OM | PAK | SY | SIN | SA | SRI | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do the following authorities and organisations have SOPs in place to ensure tsunami warnings are efficiently transmitted along the national tsunami waringin chain in a timely manner? | NTWC | Yes | 94% | Partially | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | | No | 0% | | | | | | | | | |
| | | Partially | 6% | | | | | | | | | |
| | NDMO | Yes | 82% | Partially | No | Partially | Yes | Yes | Yes | Yes | Yes | Yes |
| | | No | 6% | | | | | | | | | |
| | | Partially | 12% | | | | | | | | | |
| | PDMO | Yes | 67% | Partially | No | | | Partially | | Yes | Yes | Yes |
| | | No | 13% | | | | | | | | | |
| | | Partially | 20% | | | | | | | | | |
| | LDMO | Yes | 56% | Partially | No | Partially | | Partially | Yes | Partially | Partially | Yes |
| | | No | 6% | | | | | | | | | |
| | | Partially | 38% | | | | | | | | | |
| | Other Authorities | Yes | 50% | No | No | Partially | Yes | Yes | Partially | No | Yes | Yes |
| | | No | 19% | | | | | | | | | |
| | | Partially | 31% | | | | | | | | | |
| | Media | Yes | 36% | Yes | No | Partially | Yes | No | No | No | No | Yes |
| | | No | 36% | | | | | | | | | |
| | | Partially | 29% | | | | | | | | | |
| | Public | Yes | 20% | No | No | Partially | Yes | No | No | No | No | Yes |
| | | No | 40% | | | | | | | | | |
| | | Partially | 40% | | | | | | | | | |

## STANDARD OPERATING PROCEDURES

### *Performance*

| Member State | Performance | Comments |
|---|---|---|
| Australia | Well | The Bureau of Meteorolgoy and the Department of Fire and Emergency Services will review their SOPs following the exercise. |
| Bangladesh | Very Well | Bangladesh Government has Standing Order on Disaster (SOD), we floow the SOD rules when disasters happen. |
| France | Very Well | - |
| India | Very Well | - |
| Indonesia | Well | Standard Operating Procedures performance for generating and disseminating tsunami warning in Indonesia is well |
| Iran | Well | - |
| Madagascar | Well | - |
| Maldives | Well | - |
| Mauritius | Extremely Well | - |
| Myanmar | Very Well | - |
| Oman | Well | - |
| Pakistan | Very Well | - |
| Seychelles | Well | - |
| Singapore | - | The communications test with national Agencies was conducted in 2022 under PacWave22 |
| South Africa | Very Well | SAWS (NTWC) email was nly partially operative on the day of the test, due to physical moving from on HQ to a new building. However the test was still conducted successfully (remotely, between participants) in real time. |
| Sri Lanka | Very Well | The NDMO had some confusion with the bulletins sent from NTWC when deciding when to issue the evcuation order. Despite the fact that the Standard Operating Procedures (SOPs) clearly outlined the procedure for issuing the evacuation order, this confusion appeared to have stemmed from a mistake made by the duty officer. However, apart from the issue, the SOPs performed effectively. |
| Tanzania | Extremely Well | The Standard Operating Procedures performed well since the end-to-end |
| Thailand | Extremely Well | - |
| United Arab Emirates | Extremely Well | - |

**MEDIA INVOLVEMENT**

*Participation*

| Media | | Percent | IN | IND | IR | MAD | MD | MAU | MM | OM | PAK | SY | SIN | SA | SRI | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **What Media Participated in the Exercise?** | Press | 45% | ● | ● | ● | | o | ● | | o | o | o | | | o | | o | ● |
| | Radio | 27% | ● | o | o | | o | ● | | o | o | ● | | | o | | o | o |
| | Television | 55% | o | o | ● | | o | ● | | ● | ● | ● | | | o | | o | ● |
| | Social - Facebook | 36% | ● | o | o | | ● | o | | o | o | o | | | o | | ● | ● |
| | Social - WhatsApp | 27% | ● | o | o | | o | o | | o | o | o | | | ● | | o | ● |
| | Social - Twitter | 36% | ● | o | o | | ● | o | | ● | o | o | | | o | | o | ● |
| | Other - SMS | 18% | ● | o | o | | o | o | | o | ● | o | | | o | | o | o |
| | Other - NTWC media | 9% | o | o | o | | o | o | | ● | o | o | | | o | | o | o |

**MEDIA INVOLVEMENT**

*Information Broadcast*

| Media | | Percent | IN | IND | IR | MD | MAU | OM | PAK | SY | SRI | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **What information did the Media broadcast?** | Pre-exercise tsunami awareness | 82% | ● | ● | ● | o | o | ● | ● | ● | ● | ● | ● |
| | Information on the upcoming scheduled exercise | 82% | ● | ● | ● | ● | ● | ● | o | o | ● | ● | ● |
| | Tsunami threat information | 36% | ● | ● | o | o | o | o | ● | o | o | o | ● |
| | Tsunami evacuation information | 27% | ● | ● | o | o | o | o | o | o | o | o | ● |
| | All-clear information | 27% | ● | ● | o | o | o | o | o | o | o | o | ● |
| | Mock interviews | 36% | ● | ● | ● | o | o | o | ● | o | o | o | o |
| | Coverage of the event | 45% | ● | o | o | o | ● | ● | o | ● | o | o | ● |

# MEDIA INVOLVEMENT

## *Usefulness of Information*

| Media | | Percent | IN | IND | IR | MD | MAU | OM | PAK | SY | SRI | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Was the information broadcast by the media useful? | Yes | 91% | Yes | Yes | Yes | Partially | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | No | 0% | | | | | | | | | | | |
| | Partially | 9% | | | | | | | | | | | |

**MEDIA INVOLVEMENT**

*Improvements*

| Member State | Comments |
|---|---|
| Australia | In a real event, the media would be heavily involved in reporting on this incident and for dissemination of alerts and warnings.<br>The Australian Emergency Broadcaster will most likely have rolling coverage of the event. |
| India | Training and awareness programs to media personnel on tsunami information. |
| Indonesia | Media can give real time information. |
| Maldives | Media can be involved in planing the exercise. |
| Mauritius | In tsunami danger awareness and in alerting a larger portion of the ocmmunity in the case of real events. |
| Seychelles | Conducting session prior to the media sector. |
| South Africa | SAWS and NDMC had a concern that (given previous tests) there is a real tendency for the public and media to panic and for hoax messgs to be sent, therefore, the media was not included in this test. There is a lot of work/outreach/education to be done in this regard. |
| Sri Lanka | Need to develop and validate a SOP for tsunami early warning dissemination through media |
| United Arab Emirates | Establish a dedicated media call effectively manage communication and information dissemination during and after the event. Continuously monitor and analyze public reactions and social media trends to gauge public sentiment and inform decision making. |

# PUBLIC SAFETY MESSAGES

## Overview

| ACTIVITY | Total | Yes | % | AUS | BAN | IN | IND | IR | MAD | MAL | MD | MAU | MM | OM | PK | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Were **public safety messages** issued during the exercise? | 17 | 11 | 65% | ● | ● | ● | ● | ● | o | o | ● | ● | ● | o | o | o | ● | ● | o | ● |

## Communication Channels

| Public Safety Messages | Total | Yes | % | AUS | BAN | IN | IND | IR | MD | MAU | MM | SLK | TAN | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Briefing | 11 | 1 | 9% | o | o | o | ● | o | o | o | o | o | o | o |
| Email | 11 | 6 | 55% | ● | ● | o | o | o | o | ● | ● | ● | ● | o |
| Fax | 11 | 4 | 36% | o | o | o | o | ● | o | ● | ● | ● | o | o |
| Hotline | 11 | 0 | 0% | o | o | o | o | o | o | o | o | o | o | o |
| Megaphone | 11 | 0 | 0% | o | o | o | o | o | o | o | o | o | o | o |
| Phone | 11 | 4 | 36% | o | o | o | o | o | ● | o | ● | ● | o | ● |
| Police | 11 | 0 | 0% | o | o | o | o | o | o | o | o | o | o | o |
| Sirens | 11 | 0 | 0% | o | o | o | o | o | o | o | o | o | o | o |
| SMS | 11 | 2 | 18% | o | o | ● | o | o | o | o | o | o | o | ● |
| Social Media | 11 | 3 | 27% | o | o | ● | o | o | o | o | o | o | ● | ● |
| Speakers | 11 | 0 | 0% | o | o | o | o | o | o | o | o | o | o | o |
| Warning System | 11 | 1 | 9% | o | o | o | o | o | o | o | o | o | o | ● |
| Webpage | 11 | 3 | 27% | ● | o | ● | o | o | o | ● | o | o | o | o |

# PUBLIC SAFETY MESSAGES

## *Details*

| | Name of agency/authority that issues public saftey messages | Agency Type | Message Issue time (UTC) | Communication Method | Were there any communications problems? | Content of Message | Reason message issued | Comments |
|---|---|---|---|---|---|---|---|---|
| **AUS (Jav)** | Bureau of Meteorology | NTWC | 2:12 | Email, Website | Yes | Potential tsunami threat to Western Australia and earthquake summary | Initial Watch Bulletin | Communication issues occurred due to training environment. |
| | Bureau of Meteorology | NTWC | 2:17 | Email, Website | Yes | Tsunami threat to low lying areas of the marine enviroment | Tsunami Marine Threat | Communication issues occurred due to training environment. |
| | Bureau of Meteorology | NTWC | 2:19 | Email, Website | Yes | Marine threat - tsunami threat to the marine environment | National Tsunami Warning Summary | Communication issues occurred due to training environment. |
| | Bureau of Meteorology | NTWC | 2:27 | Email, Website | Yes | Updated tsunami warning for Western Australia - Land threat | Inclusion of Land Warning for Western Australia | - |
| | Bureau of Meteorology | NTWC | 2:28 | Email, Website | Yes | Land threat for low-lying coasta areas of Christmas Island | Christmas Island Tsunami Bulletin | - |
| **BAN (And)** | Bangladesh Meteorology Department | NTWC | 4:05 | Email | No | Earthquake Message | Earthquake | - |
| | Bangladesh Meteorology Department | NTWC | 4:35 | Email | No | Tsunami Message | Tsunami | - |
| | Bangladesh Meteorology Department | NTWC | 5:03 | Email | No | Tsunami Message | Tsunami | - |
| | Bangladesh Meteorology Department | NTWC | 7:15 | Email | No | Tsunami Message | Tsunami | - |
| | Bangladesh Meteorology Department | NTWC | 8:30 | Email | No | Tsunami Message | Tsunami | - |
| **IN (And)** | LDMO | LMDO | 4:25 | SMS, Social Media, webpages | No | Tsunami threat information and advice to move to higher ground | Evacuation and safety purpose | - |
| **IND (Jav)** | BMKG | NTWC | 1:00 | Briefing | No | Information about the tsunami threat and appropriate actions | Increase public awareness | Well done |
| | BPBD | LDMO | 1:00 | Briefing | No | Information about the tsunami threat and appropriate actions | Increase public awareness | Well done |
| **IR (Mak)** | INIOAS | NTWC | 6:10 | Fax | No | the high level of threat and safety recommendations | - | - |

| | Name of agency/authority that issues public saftey messages | Agency Type | Message Issue time (UTC) | Communication Method | Were there any communications problems? | Content of Message | Reason message issued | Comments |
|---|---|---|---|---|---|---|---|---|
| **MD (Jav)** | NDMA | NDMO | 7:33 | SMS, Phone | Yes | Tsuanmi warning message received from MMS, listen and follow instructions. Do not go to beach, prepared grab bag and be ready for evacuation announcement | Tsunami warning alert received from MMS | - |
| | Local Council | LDMO | 8:19 | SMS, Phone | Yes | Tsuanmi warning message received from MMS, listen and follow instructions. Do not go to beach, prepared grab bag and be ready for evacuation announcement | Tsunami warning alert received from NDMA | - |
| **MAU (Jav)** | Mauritius Meteorological Servises (MMS) | NTWC | 2:25 | Email, Fax, Webpage | No | Advise public to move from coastal area to higher grounds and vessels to move to high sea | Preliminary life saving action for public | - |
| | NDRRMC | NDMO | 4:00 | - | - | Follow directive of concerned authorities for safety | Life saving | - |
| **MM (And)** | NTWC | NTWC | 5:35 | Email, Fax, Phone | No | Run to higher inland areas | Safety for people | - |
| **SLK (And)** | Department of Meteorology | NTWC | 4:13 | Email, Fax, Phone | No | Information | for Exercise | - |
| | Department of Meteorology | NTWC | 4:18 | Email, Fax, Phone | No | Alert | for Exercise | - |
| | Department of Meteorology | NTWC | 4:34 | Email, Fax, Phone | No | Warning | for Exercise | - |
| **TAN (HI)** | Tanzania Meteorological Authority (TMA) | NTWC | From 06:14 to 15:02 | Email | No | Warning information from TMA to NDMO encompassed advisories to community at risk to tak appropriate actions. | To ensure there is no or minimum risk for the community at risk. | - |
| | Prime Minister's Office - Disaster Mangement Department (PMO-DMD) | NDMO | From 06:14 to 15:02 | Email, Social Media | No | Warning information from NDMO to PDMO and LDMO includes advisories on appropriate measures to be taken to ensure there is a minimum harm to community at risk. | To ensure there is no or minimum risk for the community at risk. | - |
| **UAE (Mak)** | Leadership Fujairah Police General | LDMO | 10:14 | SMS, Telephone, Social Media, Electronic public early warning system | No | Warning message (training exercise) due to a very strong earthquake in the Indian Ocean causing tsunami waves that are expected to reach the beaches of the Emerite of Fujairah at about 10:48, please follow safety procedures and do not approach the beaches. We wish you safety. (Fujairah Police). | Training Exercise (evacuation) | - |

**EVACUATION ORDERS**

*Overview*

| ACTIVITY | Total | Yes | % | AUS | BAN | IN | IND | IR | MAD | MAL | MD | MAU | MM | OM | PK | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Were **evacuation orders** issued during the exercise? | 17 | 8 | 47% | o | o | ● | ● | ● | o | o | ● | ● | o | o | o | o | ● | ● | o | ● |

*Communication Channels*

| Evacuation Orders | Total | Yes | % | IN | IND | IR | MD | MAU | SLK | TAN | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Briefing | 8 | 0 | 0% | o | o | o | o | o | o | o | o |
| Email | 8 | 3 | 38% | o | ● | o | o | o | ● | ● | o |
| Fax | 8 | 1 | 13% | o | o | o | o | o | ● | o | o |
| Hotline | 8 | 0 | 0% | o | o | o | o | o | o | o | o |
| Megaphone | 8 | 0 | 0% | o | o | o | o | o | o | o | o |
| Phone | 8 | 3 | 38% | o | o | o | ● | o | ● | o | ● |
| Police | 8 | 1 | 13% | o | o | o | o | ● | o | o | o |
| Sirens | 8 | 1 | 13% | ● | o | o | o | o | o | o | o |
| SMS | 8 | 4 | 50% | ● | ● | o | ● | o | o | o | ● |
| Social Media | 8 | 4 | 50% | ● | o | o | o | o | ● | ● | ● |
| Speakers | 8 | 2 | 25% | o | o | ● | ● | o | o | o | o |
| Warning System | 8 | 1 | 13% | o | o | o | o | o | o | o | ● |
| Webpage | 8 | 1 | 13% | o | ● | o | o | o | o | o | o |

# EVACUATION ORDERS

## *Details*

| | Name of agency/authority that issues public saftey messages | Agency Type | Message Issue time (UTC) | Communication Method | Were there any communications problems? | Content of Message | Reason message issued | Comments |
|---|---|---|---|---|---|---|---|---|
| IN (And) | LDMO | LDMO | 4:25 | Sirens, SMS, Social Media | No | Evacuate low lying areas and move to higher ground. | Evacuation and safety purpose | - |
| IND (Jav) | BMKG | NTWC | 2:03 | Email, Webpage, SMS | No | Tsunami warning message | An earthquake has the potential for a tsunami | There are no problems |
| IR (Mak) | country | LDMO | 6:15 | Speaker | No | To evacuate to safe zone | - | - |
| MD (Jav) | NDMA | NDMO | - | SMS, Phone | No | Make arrangements to evacuate public to safe zone and manage the area | - | - |
| | Local Council | LDMO | 10:33 | Announcements using loudspeakers | No | Please move to safe zone (location name). If anyone needs assistance please contact CERT leader. | - | - |
| MAU (Jav) | NDRRMC | NDMO | 5:00 | Police | No | Evacuate all people from risk zone | Life saving | - |
| SLK (And) | Disaster Management Centre | NDMO | 4:39 | Email, Fax, Phone, Social Media | No | Evacuation order | for Exercise | - |
| TAN (HI) | Prime Minister's Office - Disaster Mangement Department (PMO-DMD) | NDMO | From 06:14 to 15:02 | Email, Social Media | No | Community at risk to be allocated to safer environment | To ensure there is no or minimum risk for the community at risk. | - |

| | Name of agency/authority that issues public saftey messages | Agency Type | Message Issue time (UTC) | Communication Method | Were there any communications problems? | Content of Message | Reason message issued | Comments |
|---|---|---|---|---|---|---|---|---|
| UAE (Mak) | Leadership Fujairah Police General | LDMO | 10:20 | SMS, Telephone, Social Media, Electronic public early warning system | No | Warning message (training exercise) due to a very strong earthquake in the Indian Ocean causing tsunami waves that are expected to reach the beaches of the Emerite of Fujairah at about 10:48, please follow safety procedures and do not approach the beaches. , evacuate homes, and go to the designated evacuation area and adhere to the instructions of the competent authorities. We wish you safety. (Fujairah Police). | Training Exercise (evacuation) | - |

**ALL-CLEAR MESSAGES**

Overview

| ACTIVITY | Total | Yes | % | AUS | BAN | IN | IND | IR | MAD | MAL | MD | MAU | MM | OM | PK | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Were **all clear messages** issued during the exercise? | 17 | 10 | 59% | o | • | • | • | • | • | o | o | • | o | o | o | • | • | • | o | • |

Communication Methods

| All-Clear Messages | Total | Yes | % | BAN | IN | IND | IR | MAD | MAU | SA | SLK | TAN | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Briefing | 10 | 1 | 10% | o | o | • | o | o | o | o | o | o | o |
| Email | 10 | 4 | 40% | • | o | o | o | • | o | o | • | • | o |
| Fax | 10 | 1 | 10% | o | o | o | o | o | o | o | • | o | o |
| Hotline | 10 | 1 | 10% | o | o | o | o | o | o | o | o | o | • |
| Megaphone | 10 | 1 | 10% | o | o | o | o | o | • | o | o | o | o |
| Phone | 10 | 2 | 20% | o | o | o | o | o | o | o | • | o | • |
| Police | 10 | 0 | 0% | o | o | o | o | o | o | o | o | o | o |
| Sirens | 10 | 1 | 10% | o | • | o | o | o | o | o | o | o | o |
| SMS | 10 | 3 | 30% | o | • | o | o | • | o | o | o | o | • |
| Social Media | 10 | 3 | 30% | o | • | o | o | o | o | o | o | • | • |
| Speakers | 10 | 1 | 10% | o | o | o | • | o | o | o | o | o | o |
| Warning System | 10 | 1 | 10% | o | o | o | o | o | o | o | o | o | • |
| Webpage | 10 | 1 | 10% | o | o | o | o | o | o | • | o | o | o |

## ALL-CLEAR MESSAGES

### *Details*

| | Name of agency/authority that issues public saftey messages | Agency Type | Message Issue time (UTC) | Communication Method | Were there any communications problems? | Content of Message | Reason message issued | Comments |
|---|---|---|---|---|---|---|---|---|
| BAN (And) | Bangladesh Meteorological Department | NTWC | 4:05 | Email | No | Earthquake Message | Earthquake | - |
| | Bangladesh Meteorological Department | NTWC | 4:35 | Email | No | Tsunami Message | Tsunami | - |
| | Bangladesh Meteorological Department | NTWC | 5:03 | Email | No | Tsunami Message | Tsunami | - |
| | Bangladesh Meteorological Department | NTWC | 7:15 | Email | No | Tsunami Message | Tsunami | - |
| | Bangladesh Meteorological Department | NTWC | 8:30 | Email | No | Tsunami Message | Tsunami | - |
| IN (And) | LDMO | LDMO-C | 16:00 | Sirens, SMS, Social Media | No | Tsunami threat over | To come back to their homes | - |
| IND (Jav) | BPBD | LDMO-C | 4:00 | Briefing | No | People can return home | No more tsunami threat | - |
| IR (Mak) | country | LDMO-C | 6:45 | Speaker | No | Finishing the threat | - | - |
| MAD (And) | IOGA | NTWC | 15:46 | Email, SMS | No | No more tsunami waves but need to be careful of residual waves | This message is to NDMO to inform them that this is the last information from the NTWC and from this, the last all clear depends on them. | - |
| MAU (Jav) | Police | Other | 14:00 | Megaphone | Yes | Danger cleared | - | - |
| SA (HI) | NTWC | NTWC | 15:39 | Webpage | No | All clear, Threat level = 0 | Communication to TSP | Communication to TSP as per SOP |
| SLK (And) | Department of Meteorology | NTWC | 6:00 | Email, Fax, Phone | No | You are safe. Exercise is over. | for Exercise | - |

| | Name of agency/authority that issues public saftey messages | Agency Type | Message Issue time (UTC) | Communication Method | Were there any communications problems? | Content of Message | Reason message issued | Comments |
|---|---|---|---|---|---|---|---|---|
| **TAN (HI)** | Tanzania Meteorological Authority (TMA) | NTWC | From 06:14 to 15:02 | Email | No | Warning messages on tsunami threat | Ensure early action is timely observed | - |
| | Prime Minister's Office - Disaster Mangement Department (PMO-DMD) | NDMO | From 06:14 to 15:02 | Email, Social Media | No | Warning messages on tsunami threat | Ensure early action is timely observed | - |
| **UAE (Mak)** | Leadership Fujairah Police General | LDMO-C | - | SMS, Telephone, Social Media, Electronic public early warning system | No | - | Training Exercise (evacuation) | - |
| | NTWC (NCM) | NTWC | 9:00 | SMS, Hotline | No | - | Training Exercise (evacuation) | - |

ANNEX VI – **SURVEY RESPONSES: NATIONAL TSUNAMI WARNING CENTRES**

**NATIONAL TSUNAMI WARNING CENTRES**

| Country | National Tsunami Warning Centre |
|---|---|
| Australia | Joint Australian Tsunami Warning Centre |
| Bangladesh | Seismic Observatory and Research Centre |
| France | Meteo France DIROI |
| India | Indian National Centre for Ocean Information Services |
| Indonesia | BMKG (Meteorological, Climatological and Geophysics Agency) |
| Iran | Iranian National Institute for Oceanographic and Atmospheric Science |
| Madagascar | Institute and Observatory of Geophysics of Antananarivo |
| Malaysia | Malaysian Meteorological Department |
| Maldives | Maldives Meteorological Service |
| Mauritius | Mauritius Meteorological Services |
| Myanmar | Department of Meteorology and Hydrology |
| Oman | National Multi-Hazard Early Warning Centre |
| Pakistan | Pakistan National Tsunami Warning Centre Karachi |
| Seychelles | Seychelles Meteorological Authority |
| Singapore | Meteorological Services Singapore |
| South Africa | South African Weather Service |
| Sri Lanka | Department of Meteorology |
| Tanzania | Tanzania Meteorological Authority |
| Thailand | National Disaster Warning Cener |
| United Arab Emirates | National Center of Meteorology |

Table VI-1. National Tsunami Warning Centres

**TIMELINESS OF TSP NOTIFICATION DELIVERY MEDIUMS**

### *All Scenarios*

| TSP Notification Messages | | Received in Time | Received Late | Not Received | Total MS Reporting |
|---|---|---|---|---|---|
| **TSP-Australia** | **GTS** | 95% | 0% | 5% | 20 |
| | **Fax** | 17% | 17% | 67% | 18 |
| | **Email** | 90% | 5% | 5% | 20 |
| | **SMS** | 63% | 0% | 37% | 19 |
| **TSP-India** | **GTS** | 88% | 6% | 6% | 16 |
| | **Fax** | 50% | 0% | 50% | 14 |
| | **Email** | 94% | 0% | 6% | 16 |
| | **SMS** | 47% | 0% | 53% | 15 |
| **TSP-Indonesia** | **GTS** | 94% | 0% | 6% | 16 |
| | **Fax** | 27% | 13% | 60% | 15 |
| | **Email** | 88% | 6% | 6% | 16 |
| | **SMS** | 43% | 14% | 43% | 14 |

Table VI-2. Timeliness of TSP Notification Delivery Mediums for all scenarios (Andaman, Makran, Heard Island, Java) based on responses from NTWC on whether messages were received in a timely manner.

**TIMELINESS OF TSP NOTIFICATION DELIVERY MEDIUMS:**

*Andaman Trench Scenario*

| ANDAMAN TRENCH | | Received in Time | Received Late | Not Received | Total | BAN | IN | MAD | MAL | MM |
|---|---|---|---|---|---|---|---|---|---|---|
| TSP-Australia | GTS | 89% | 0% | 11% | 9 | Not received | Received in time | Received in time | Received in time | Received in time |
| | Fax | 25% | 13% | 63% | 8 | Not received | Not received | Not reported | Not received | Received Late |
| | Email | 89% | 0% | 11% | 9 | Received in time | Received in time | Received in time | Received in time | Received in time |
| | SMS | 67% | 0% | 33% | 9 | Received in time | Not received | Received in time | Received in time | Not received |
| TSP-India | GTS | 78% | 11% | 11% | 9 | Not received | Received in time | Received in time | Received in time | Received in time |
| | Fax | 38% | 0% | 63% | 8 | Not received | Received in time | Not reported | Not received | Not received |
| | Email | 89% | 0% | 11% | 9 | Received in time | Received in time | Received in time | Received in time | Received in time |
| | SMS | 56% | 0% | 44% | 9 | Received in time | Received in time | Received in time | Not received | Not received |
| TSP-Indonesia | GTS | 89% | 0% | 11% | 9 | Not received | Received in time | Received in time | Received in time | Received in time |
| | Fax | 33% | 11% | 56% | 9 | Not received | Not received | Received in time | Not received | Received Late |
| | Email | 100% | 0% | 0% | 9 | Received in time | Received in time | Received in time | Received in time | Received in time |
| | SMS | 63% | 13% | 25% | 8 | Received in time | Not received | Not reported | Not received | Received Late |

| ANDAMAN TRENCH | | Received in Time | Received Late | Not Received | Total | SY | SIN | SLK | THA |
|---|---|---|---|---|---|---|---|---|---|
| TSP-Australia | GTS | 89% | 0% | 11% | 9 | Received in time | Received in time | Received in time | Received in time |
| | Fax | 25% | 13% | 63% | 8 | Not received | Received in time | Received in time | Not received |
| | Email | 89% | 0% | 11% | 9 | Received in time | Received in time | Received in time | Not received |
| | SMS | 67% | 0% | 33% | 9 | Received in time | Received in time | Received in time | Not received |
| TSP-India | GTS | 78% | 11% | 11% | 9 | Received in time | Received in time | Received Late | Received in time |
| | Fax | 38% | 0% | 63% | 8 | Not received | Received in time | Received in time | Not received |
| | Email | 89% | 0% | 11% | 9 | Received in time | Received in time | Received in time | Not received |
| | SMS | 56% | 0% | 44% | 9 | Received in time | Not received | Received in time | Not received |
| TSP-Indonesia | GTS | 89% | 0% | 11% | 9 | Received in time | Received in time | Received in time | Received in time |
| | Fax | 33% | 11% | 56% | 9 | Not received | Received in time | Received in time | Not received |
| | Email | 100% | 0% | 0% | 9 | Received in time | Received in time | Received in time | Received in time |
| | SMS | 63% | 13% | 25% | 8 | Received in time | Received in time | Received in time | Received in time |

Table VI-3. Timeliness of TSP Notification Delivery Mediums for the Andaman Scenario based on responses from NTWC on whether or not messages were received in a timely manner.

# TIMELINESS OF TSP NOTIFICATION DELIVERY MEDIUMS:

## *Makran Trench Scenario*

| MAKRAN TRENCH | | Received in Time | Received Late | Not Received | Total | IN | IR | MAL |
|---|---|---|---|---|---|---|---|---|
| TSP-Australia | GTS | 100% | 0% | 0% | 5 | Received in time | | Received in time |
| | Fax | 0% | 40% | 60% | 5 | Not received | | Not received |
| | Email | 80% | 20% | 0% | 5 | Received in time | | Received in time |
| | SMS | 60% | 0% | 40% | 5 | Received in time | | Received in time |
| TSP-India | GTS | 100% | 0% | 0% | 5 | Received in time | | Received in time |
| | Fax | 60% | 0% | 40% | 5 | Received in time | | Not received |
| | Email | 100% | 0% | 0% | 5 | Received in time | | Received in time |
| | SMS | 20% | 0% | 80% | 5 | Received in time | | Not received |
| TSP-Indonesia | GTS | 100% | 0% | 0% | 5 | Received in time | | Received in time |
| | Fax | 0% | 20% | 80% | 5 | Not received | | Not received |
| | Email | 80% | 20% | 0% | 5 | Received in time | | Received in time |
| | SMS | 0% | 20% | 80% | 5 | Not received | | Not received |

| MAKRAN TRENCH | | Received in Time | Received Late | Not Received | Total | OM | PK | UAE |
|---|---|---|---|---|---|---|---|---|
| TSP-Australia | GTS | 100% | 0% | 0% | 5 | Received in time | Received in time | Received in time |
| | Fax | 0% | 40% | 60% | 5 | Received Late | Received Late | Not received |
| | Email | 80% | 20% | 0% | 5 | Received Late | Received in time | Received in time |
| | SMS | 60% | 0% | 40% | 5 | Not received | Received in time | Not received |
| TSP-India | GTS | 100% | 0% | 0% | 5 | Received in time | Received in time | Received in time |
| | Fax | 60% | 0% | 40% | 5 | Received in time | Received in time | Not received |
| | Email | 100% | 0% | 0% | 5 | Received in time | Received in time | Received in time |
| | SMS | 20% | 0% | 80% | 5 | Not received | Not received | Not received |
| TSP-Indonesia | GTS | 100% | 0% | 0% | 5 | Received in time | Received in time | Received in time |
| | Fax | 0% | 20% | 80% | 5 | Received Late | Not received | Not received |
| | Email | 80% | 20% | 0% | 5 | Received Late | Received in time | Received in time |
| | SMS | 0% | 20% | 80% | 5 | Received Late | Not received | Not received |

Table VI-4. Timeliness of TSP Notification Delivery Mediums for the Makran Scenario based on responses from NTWC on whether or not messages were received in a timely manner.

**TIMELINESS OF TSP NOTIFICATION DELIVERY MEDIUMS:**

*Heard Island Scenario*

| HEARD ISLAND | | Received in Time | Received Late | Not Received | Total | AUS | IN | MAL | SA | TAN |
|---|---|---|---|---|---|---|---|---|---|---|
| **TSP-Australia** | **GTS** | 100% | 0% | 0% | 4 | | Received in time | Received in time | Received in time | Received in time |
| | **Fax** | 0% | 0% | 100% | 4 | | Not received | Not received | Not received | Not received |
| | **Email** | 100% | 0% | 0% | 4 | | Received in time | Received in time | Received in time | Received in time |
| | **SMS** | 50% | 0% | 50% | 4 | | Received in time | Received in time | Not received | Not received |

Table VI-5. Timeliness of TSP Notification Delivery Mediums for the Heard Island Scenario based on responses from NTWC on whether or not messages were received in a timely manner.

# TIMELINESS OF TSP NOTIFICATION DELIVERY MEDIUMS:

## *Java Trench Scenario*

| JAVA TRENCH | | Received in Time | Received Late | Not Received | Total | AUS | FR | IN | IND |
|---|---|---|---|---|---|---|---|---|---|
| TSP-Australia | GTS | 100% | 0% | 0% | 5 | | Received in time | Received in time | Received in time |
| | Fax | 50% | 0% | 50% | 4 | | | Not received | Received in time |
| | Email | 100% | 0% | 0% | 5 | | Received in time | Received in time | Received in time |
| | SMS | 100% | 0% | 0% | 4 | | | Received in time | Received in time |
| TSP-India | GTS | 100% | 0% | 0% | 5 | | Received in time | Received in time | Received in time |
| | Fax | 75% | 0% | 25% | 4 | | | Received in time | Received in time |
| | Email | 100% | 0% | 0% | 5 | | Received in time | Received in time | Received in time |
| | SMS | 100% | 0% | 0% | 4 | | | Received in time | Received in time |
| TSP-Indonesia | GTS | 100% | 0% | 0% | 5 | | Received in time | Received in time | Received in time |
| | Fax | 50% | 0% | 50% | 4 | | | Not received | Received in time |
| | Email | 80% | 0% | 20% | 5 | | Not received | Received in time | Received in time |
| | SMS | 50% | 0% | 50% | 4 | | | Not received | Received in time |

| JAVA TRENCH | | Received in Time | Received Late | Not Received | Total | MAL | MD | MAU |
|---|---|---|---|---|---|---|---|---|
| TSP-Australia | GTS | 100% | 0% | 0% | 5 | Received in time | | Received in time |
| | Fax | 50% | 0% | 50% | 4 | Not received | | Received in time |
| | Email | 100% | 0% | 0% | 5 | Received in time | | Received in time |
| | SMS | 100% | 0% | 0% | 4 | Received in time | | Received in time |
| TSP-India | GTS | 100% | 0% | 0% | 5 | Received in time | | Received in time |
| | Fax | 75% | 0% | 25% | 4 | Not received | | Received in time |
| | Email | 100% | 0% | 0% | 5 | Received in time | | Received in time |
| | SMS | 100% | 0% | 0% | 4 | Received in time | | Received in time |
| TSP-Indonesia | GTS | 100% | 0% | 0% | 5 | Received in time | | Received in time |
| | Fax | 50% | 0% | 50% | 4 | Not received | | Received in time |
| | Email | 80% | 0% | 20% | 5 | Received in time | | Received in time |
| | SMS | 50% | 0% | 50% | 4 | Received in time | | Not received |

Table VI-6. Timeliness of TSP Notification Delivery Mediums for the Java Scenario based on responses from NTWC on whether or not messages were received in a timely manner.

**RECEIPT OF TSP NOTIFICATION MESSAGES**

*All Scenarios*

| TSP | ANDAMAN TRENCH | | | | MAKRAN TRENCH | | | |
|---|---|---|---|---|---|---|---|---|
| | Email | GTS | SMS | Fax | Email | GTS | SMS | Fax |
| Australia | 80% | 85% | 63% | 13% | 98% | 78% | 53% | 0% |
| India | 81% | 60% | 38% | 26% | 100% | 100% | 33% | 0% |
| Indonesia | 79% | 76% | 36% | 21% | 64% | 79% | 4% | 0% |
| Average | 80% | 74% | 46% | 20% | 88% | 86% | 30% | 0% |

| TSP | HEARD ISLAND | | | | JAVA TRENCH | | | |
|---|---|---|---|---|---|---|---|---|
| | Email | GTS | SMS | Fax | Email | GTS | SMS | Fax |
| Australia | 100% | 100% | 29% | 0% | 100% | 100% | 0% | 12% |
| India | n/a | n/a | n/a | n/a | 91% | 98% | 88% | 100% |
| Indonesia | n/a | n/a | n/a | n/a | 97% | 98% | 50% | 63% |
| Average | 100% | 100% | 29% | 0% | 96% | 99% | 46% | 58% |

Table VI-7. Receipt of TSP Notification Messages for all scenarios.

Note: TSPs India and Indonesia did not send notification messages for the Heard Island Scenario.

**Andaman Trench Scenario: GTS**

| ANDAMAN TRENCH | GTS Message No | | BAN | IN | MAD | MAL | MM | SY | SIN | SLK | THA | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TSP AUSTRALIA** | 04:00 | Test Start | - | 04:00 | | 04:00 | 04:02 | 04:00 | 04:00 | 04:00 | 04:00 | 7 | 88% | | 7 | 88% | |
| | 04:10 | Message 1 | - | 04:11 | | 04:10 | 04:12 | 04:11 | 04:10 | 04:10 | 04:12 | 7 | 88% | | 7 | 88% | |
| | 04:12 | Message 2 | - | 04:12 | | 04:12 | 04:13 | 04:13 | 04:12 | 04:12 | 04:14 | 7 | 88% | | 7 | 88% | |
| | 04:30 | Message 3 | - | 04:31 | | 04:30 | 04:31 | 04:30 | 04:30 | 04:40 | 04:32 | 7 | 88% | | 7 | 88% | |
| | 04:40 | Message 4 | - | 04:41 | | 04:40 | 04:21 | 04:43 | 04:40 | 04:45 | 04:42 | 7 | 88% | | 7 | 88% | |
| | 05:40 | Message 5 | - | 05:40 | | 05:40 | 05:41 | 05:41 | 05:40 | 05:42 | 05:41 | 7 | 88% | | 7 | 88% | |
| | 06:40 | Message 6 | - | 06:40 | | 06:40 | 06:41 | 06:42 | 06:40 | | 06:41 | 6 | 86% | | 6 | 86% | |
| | 06:41 | Message 7 | - | 07:42 | | 07:42 | 07:43 | 07:42 | 07:41 | | 07:42 | 6 | 86% | | 6 | 86% | |
| | 08:40 | Message 8 | - | 08:41 | | 08:40 | 08:41 | 08:41 | 08:40 | | 08:41 | 6 | 86% | | 6 | 86% | |
| | 09:40 | Message 9 | - | 09:41 | | 10:11 | 09:42 | 09:41 | 09:40 | | 09:42 | 6 | 86% | | 6 | 86% | |
| | 10:40 | Message 10 | - | 10:40 | | 10:40 | 10:42 | 10:42 | 10:40 | | 10:42 | 6 | 86% | | 6 | 86% | |
| | 11:40 | Message 11 | - | 11:41 | | 11:40 | 11:40 | 11:42 | 11:40 | | 11:42 | 6 | 86% | | 6 | 86% | |
| | 12:40 | Message 12 | - | 12:40 | | 12:40 | 12:41 | 12:41 | 12:40 | | 12:42 | 6 | 86% | | 6 | 86% | |
| | 13:40 | Message 13 | - | 13:40 | | 13:40 | 13:41 | 13:42 | 13:40 | | 13:42 | 6 | 86% | | 6 | 86% | |
| | 14:40 | Message 14 | - | 14:41 | | 14:40 | 14:41 | 14:41 | - | | 14:42 | 5 | 71% | | 5 | 71% | |
| | 15:10 | Message 15 | - | 15:40 | | 15:40 | 15:41 | 15:41 | 15:40 | | 15:42 | 6 | 86% | **85%** | 6 | 86% | **85%** |

Table VI-8.1. Summary of GTS messages received by each NTWC from TSP Australia for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

BAN=Bangladesh, IN=India, MAD=Madagascar, MAL=Malaysia, MM=Myanmar, SY=Seychelles, SIN=Singapore, SLK=Sri Lanka, THA=Thailand

| ANDAMAN TRENCH | GTS Message No | | BAN | IN | MAD | MAL | MM | SY | SIN | SLK | THA | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP INDIA | 03:59 | Test Start | - | - | | - | - | 04:00 | - | 04:05 | - | 2 | 25% | | 2 | 25% | |
| | 04:14 | Message 1 | - | - | | - | - | 04:15 | - | 04:18 | - | 2 | 25% | | 2 | 25% | |
| | 04:20 | Message 2 | - | - | | - | - | 04:21 | - | - | - | 1 | 13% | | 1 | 13% | |
| | 04:32 | Message 3 | - | - | | - | - | 04:34 | - | - | - | 1 | 13% | | 1 | 13% | |
| | 05:01 | Message 4 | - | 05:01 | | - | 05:04 | 05:01 | 05:01 | 05:01 | 05:03 | 6 | 75% | | 6 | 75% | |
| | 06:00 | Message 5 | - | 06:00 | | - | 06:03 | 06:01 | 06:00 | 06:08 | 06:02 | 6 | 75% | | 6 | 75% | |
| | 07:00 | Message 6 | - | 07:00 | | - | 07:03 | 07:01 | 07:00 | | 07:03 | 5 | 71% | | 5 | 71% | |
| | 08:00 | Message 7 | - | 08:01 | | - | 08:01 | 08:01 | 08:00 | | 08:03 | 5 | 71% | | 5 | 71% | |
| | 09:00 | Message 8 | - | 09:00 | | 09:00 | 09:03 | 09:01 | 09:00 | | 09:00 | 6 | 86% | | 6 | 86% | |
| | 10:00 | Message 9 | - | 10:00 | | 10:00 | 10:03 | 10:01 | 10:00 | | 10:00 | 6 | 86% | | 6 | 86% | |
| | 11:00 | Message 10 | - | 11:00 | | - | 11:01 | 11:00 | 11:00 | | 11:03 | 5 | 71% | | 5 | 71% | |
| | 12:00 | Message 11 | - | 12:00 | | - | - | 12:01 | 12:00 | | 12:03 | 4 | 57% | | 4 | 57% | |
| | 13:00 | Message 12 | - | 13:00 | | - | 13:04 | 13:01 | 13:00 | | 13:03 | 5 | 71% | | 5 | 71% | |
| | 14:00 | Message 13 | - | 14:00 | | - | 14:03 | 14:01 | - | | 14:03 | 4 | 57% | | 4 | 57% | |
| | 15:00 | Message 14 | - | 15:00 | | 15:00 | 15:02 | 15:01 | 15:00 | | 15:00 | 6 | 86% | | 6 | 86% | |
| | 15:59 | Message 15 | - | 15:59 | | 16:00 | 16:00 | 16:00 | 16:00 | | 16:01 | 6 | 86% | 60% | 6 | 86% | 60% |

Table VI-8.2. Summary of GTS messages received by each NTWC from TSP India for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

BAN=Bangladesh, IN=India, MAD=Madagascar, MAL=Malaysia, MM=Myanmar, SY=Seychelles, SIN=Singapore, SLK=Sri Lanka, THA=Thailand

| ANDAMAN TRENCH | GTS Message No | | BAN | IN | MAD | MAL | MM | SY | SIN | SLK | THA | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TSP INDONESIA** | 04:00 | Test Start | - | - | | - | - | 04:00 | - | 04:00 | - | 2 | 25% | | 2 | 25% | |
| | 04:08 | Message 1 | - | 04:09 | | 04:08 | 04:09 | 04:08 | 04:08 | 04:08 | 04:10 | 7 | 88% | | 7 | 88% | |
| | 04:13 | Message 2 | - | 04:13 | | 04:13 | 04:13 | 04:14 | 04:13 | 04:14 | 04:15 | 7 | 88% | | 7 | 88% | |
| | 04:30 | Message 3 | - | - | | - | 04:31 | 04:31 | 04:30 | 04:30 | 04:33 | 5 | 63% | | 5 | 63% | |
| | 05:00 | Message 4 | - | 05:01 | | 05;00 | 05:01 | 05:01 | 05:00 | 05:00 | 05:02 | 7 | 88% | | 7 | 88% | |
| | 06:00 | Message 5 | - | 06:00 | | 06:00 | 06:01 | 06:02 | 06:00 | 06:08 | 06:02 | 7 | 88% | | 7 | 88% | |
| | 07:00 | Message 6 | - | 07:00 | | 07:00 | 07:01 | 07:01 | 07:00 | | 07:02 | 6 | 86% | | 6 | 86% | |
| | 08:00 | Message 7 | - | 08:01 | | 08:00 | 08:00 | 08:00 | 08:00 | | 08:02 | 6 | 86% | | 6 | 86% | |
| | 09:00 | Message 8 | - | 09:00 | | - | 09:01 | 09:01 | 09:00 | | 09:02 | 5 | 71% | | 5 | 71% | |
| | 10:00 | Message 9 | - | 10:01 | | - | 10:02 | 10:01 | 10:00 | | 10:02 | 5 | 71% | | 5 | 71% | |
| | 11:00 | Message 10 | - | 11:00 | | 11:00 | 11:01 | 11:02 | 11:00 | | 11:02 | 6 | 86% | | 6 | 86% | |
| | 12:00 | Message 11 | - | 12:00 | | 12:00 | 12:01 | 12:00 | 12:00 | | 12:02 | 6 | 86% | | 6 | 86% | |
| | 13:00 | Message 12 | - | 13:00 | | 13:00 | 13:01 | 13:00 | 13:00 | | 13:02 | 6 | 86% | | 6 | 86% | |
| | 14:00 | Message 13 | - | 14:00 | | 14:00 | 14:01 | 14:00 | - | | 14:02 | 5 | 71% | | 5 | 71% | |
| | 15:00 | Message 14 | - | 15:00 | | - | 15:01 | 15:01 | 15:00 | | 15:02 | 5 | 71% | | 5 | 71% | |
| | 16:00 | Message 15 | - | 16:00 | | - | 16:01 | 16:01 | 16:00 | | 06:03 | 5 | 71% | **76%** | 5 | 71% | **76%** |

Table VI-8.3. Summary of GTS messages received by each NTWC from TSP Indonesia for the Andaman Trench scenario.

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Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

BAN=Bangladesh, IN=India, MAD=Madagascar, MAL=Malaysia, MM=Myanmar, SY=Seychelles, SIN=Singapore, SLK=Sri Lanka, THA=Thailand

## Andaman Trench Scenario: Fax

| ANDAMAN TRENCH | Fax Message No | | BAN | IN | MAD | MAL | MM | SY | SIN | SLK | THA | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TSP AUSTRALIA** | 04:00 | Test Start | - | - | | - | 04:01 | - | 04:00 | 04:05 | - | 3 | 38% | | 3 | 38% | |
| | 04:10 | Message 1 | - | - | | - | 04:25 | - | 04:10 | 04:15 | - | 3 | 38% | | 3 | 38% | |
| | 04:12 | Message 2 | - | - | | - | 04:49 | - | 04:12 | 04:16 | - | 3 | 38% | | 2 | 25% | |
| | 04:30 | Message 3 | - | - | | - | 05:00 | - | 04:30 | 04:45 | 05:19 | 4 | 50% | | 2 | 25% | |
| | 04:40 | Message 4 | - | - | | - | 05:11 | - | 04:40 | 05:00 | - | 3 | 38% | | 1 | 13% | |
| | 05:40 | Message 5 | - | - | | - | - | - | - | 05:45 | - | 1 | 13% | | 1 | 13% | |
| | 06:40 | Message 6 | - | - | | - | - | - | - | | - | 0 | 0% | | 0 | 0% | |
| | 06:41 | Message 7 | - | - | | - | - | - | - | | - | 0 | 0% | | 0 | 0% | |
| | 08:40 | Message 8 | - | - | | - | - | - | - | | - | 0 | 0% | | 0 | 0% | |
| | 09:40 | Message 9 | - | - | | - | - | - | - | | - | 0 | 0% | | 0 | 0% | |
| | 10:40 | Message 10 | - | - | | - | - | - | - | | - | 0 | 0% | | 0 | 0% | |
| | 11:40 | Message 11 | - | - | | - | - | - | - | | - | 0 | 0% | | 0 | 0% | |
| | 12:40 | Message 12 | - | - | | - | - | - | - | | - | 0 | 0% | | 0 | 0% | |
| | 13:40 | Message 13 | - | - | | - | - | - | - | | - | 0 | 0% | | 0 | 0% | |
| | 14:40 | Message 14 | - | - | | - | - | - | - | | - | 0 | 0% | | 0 | 0% | |
| | 15:10 | Message 15 | - | - | | - | - | - | - | | - | 0 | 0% | **13%** | 0 | 0% | **9%** |

Table VI-9.1. Summary of Fax messages received by each NTWC from TSP Australia for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

BAN=Bangladesh, IN=India, MAD=Madagascar, MAL=Malaysia, MM=Myanmar, SY=Seychelles, SIN=Singapore, SLK=Sri Lanka, THA=Thailand

| ANDAMAN TRENCH | Fax Message No | | BAN | IN | MAD | MAL | MM | SY | SIN | SLK | THA | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP INDIA | 03:59 | Test Start | - | 04:01 | | - | - | - | 03:59 | - | - | 2 | 25% | | 2 | 25% | |
| | 04:14 | Message 1 | - | 04:15 | | - | - | - | 04:14 | - | - | 2 | 25% | | 2 | 25% | |
| | 04:20 | Message 2 | - | 04:21 | | - | - | - | 04:20 | - | - | 2 | 25% | | 2 | 25% | |
| | 04:32 | Message 3 | - | 04:33 | | - | - | - | 04:32 | - | - | 2 | 25% | | 2 | 25% | |
| | 05:01 | Message 4 | - | 05:02 | | - | - | - | - | 05:05 | - | 2 | 25% | | 2 | 25% | |
| | 06:00 | Message 5 | - | 06:01 | | - | - | - | 06:00 | 06:10 | - | 3 | 38% | | 3 | 38% | |
| | 07:00 | Message 6 | - | 07:01 | | - | - | - | 07:00 | | - | 2 | 29% | | 2 | 29% | |
| | 08:00 | Message 7 | - | 08:02 | | - | - | - | 08:00 | | - | 2 | 29% | | 2 | 29% | |
| | 09:00 | Message 8 | - | 09:01 | | - | - | - | 09:00 | | - | 2 | 29% | | 2 | 29% | |
| | 10:00 | Message 9 | - | 10:01 | | - | - | - | 10:00 | | - | 2 | 29% | | 2 | 29% | |
| | 11:00 | Message 10 | - | 11:00 | | - | - | - | 11:00 | | - | 2 | 29% | | 2 | 29% | |
| | 12:00 | Message 11 | - | 12:01 | | - | - | - | 12:00 | | - | 2 | 29% | | 2 | 29% | |
| | 13:00 | Message 12 | - | 13:01 | | - | - | - | 13:00 | | - | 2 | 29% | | 2 | 29% | |
| | 14:00 | Message 13 | - | 14:02 | | - | - | - | - | | - | 1 | 14% | | 1 | 14% | |
| | 15:00 | Message 14 | - | 15:01 | | - | - | - | - | | - | 1 | 14% | | 1 | 14% | |
| | 15:59 | Message 15 | - | 16:02 | | - | - | - | 15:59 | | - | 2 | 29% | **26%** | 2 | 29% | **26%** |

Table VI-9.2. Summary of Fax messages received by each NTWC from TSP India for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

BAN=Bangladesh, IN=India, MAD=Madagascar, MAL=Malaysia, MM=Myanmar, SY=Seychelles, SIN=Singapore, SLK=Sri Lanka, THA=Thailand

| ANDAMAN TRENCH | Fax Message No | | BAN | IN | MAD | MAL | MM | SY | SIN | SLK | THA | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TSP INDONESIA** | 04:00 | Test Start | - | - | | - | - | - | - | 04:01 | - | 1 | 13% | | 1 | 13% | |
| | 04:08 | Message 1 | - | - | | - | 04:29 | - | - | 04:10 | - | 2 | 25% | | 1 | 13% | |
| | 04:13 | Message 2 | - | - | | - | 04:30 | - | - | 04:15 | - | 2 | 25% | | 1 | 13% | |
| | 04:30 | Message 3 | - | - | | - | 05:00 | - | 04:32 | 04:40 | - | 3 | 38% | | 2 | 25% | |
| | 05:00 | Message 4 | - | - | | - | 05:06 | - | - | 05:10 | - | 2 | 25% | | 2 | 25% | |
| | 06:00 | Message 5 | - | - | | - | 06:37 | - | - | 06:10 | - | 2 | 25% | | 1 | 13% | |
| | 07:00 | Message 6 | - | - | | - | 07:07 | - | 07:00 | | - | 2 | 29% | | 2 | 29% | |
| | 08:00 | Message 7 | - | - | | - | 08:00 | - | 08:00 | | - | 2 | 29% | | 2 | 29% | |
| | 09:00 | Message 8 | - | - | | - | - | - | 09:00 | | - | 1 | 14% | | 1 | 14% | |
| | 10:00 | Message 9 | - | - | | - | 10:23 | - | - | | - | 1 | 14% | | 0 | 0% | |
| | 11:00 | Message 10 | - | - | | - | 11:23 | - | - | | - | 1 | 14% | | 0 | 0% | |
| | 12:00 | Message 11 | - | - | | - | - | - | - | | - | 0 | 0% | | 0 | 0% | |
| | 13:00 | Message 12 | - | - | | - | - | - | - | | - | 0 | 0% | | 0 | 0% | |
| | 14:00 | Message 13 | - | - | | - | - | - | 14:00 | | - | 1 | 29% | | 1 | 14% | |
| | 15:00 | Message 14 | - | - | | - | 15:26 | - | 15:00 | | - | 2 | 29% | | 2 | 29% | |
| | 16:00 | Message 15 | - | - | | - | 16:14 | - | 16:00 | | - | 2 | 29% | **21%** | 2 | 29% | **15%** |

Table VI-9.3. Summary of Fax messages received by each NTWC from TSP Indonesia for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

BAN=Bangladesh, IN=India, MAD=Madagascar, MAL=Malaysia, MM=Myanmar, SY=Seychelles, SIN=Singapore, SLK=Sri Lanka, THA=Thailand

## Andaman Trench Scenario: Email

| ANDAMAN TRENCH | Email Message No | | BAN | IN | MAD | MAL | MM | SY | SIN | SLK | THA | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TSP AUSTRALIA** | 04:00 | Test Start | 04:02 | 04:00 | 04:00 | 04:00 | 04:00 | 04:01 | 04:00 | 04:00 | - | 8 | 89% | | 8 | 89% | |
| | 04:10 | Message 1 | - | 04:10 | 04:10 | 04:10 | 04:10 | 04:12 | 04:11 | 04:10 | - | 7 | 78% | | 7 | 78% | |
| | 04:12 | Message 2 | - | 04:12 | 04:12 | 04:12 | 04:12 | 04:13 | 04:13 | 04:12 | - | 7 | 78% | | 7 | 78% | |
| | 04:30 | Message 3 | 04:32 | 04:30 | 04:30 | 04:30 | 04:30 | 04:31 | 04:31 | 04:41 | - | 8 | 89% | | 8 | 89% | |
| | 04:40 | Message 4 | 05:05 | 04:40 | 04:40 | 04:41 | 04:40 | 04:41 | 04:41 | 04:46 | - | 8 | 89% | | 7 | 78% | |
| | 05:40 | Message 5 | - | 05:40 | 05:40 | 05:40 | 05:40 | 05:41 | 05:41 | 05:40 | - | 7 | 78% | | 7 | 78% | |
| | 06:40 | Message 6 | - | 06:40 | 06:40 | 06:40 | 06:40 | 06:41 | 06:41 | | - | 6 | 75% | | 6 | 75% | |
| | 06:41 | Message 7 | 07:11 | 07:42 | 07:42 | 07:42 | 07:41 | 07:41 | 07:42 | | - | 7 | 88% | | 1 | 13% | |
| | 08:40 | Message 8 | 08:20 | 08:40 | 08:40 | 08:40 | 08:40 | 08:41 | 08:41 | | - | 7 | 88% | | 7 | 88% | |
| | 09:40 | Message 9 | - | 09:41 | 09:41 | 09:41 | 09:40 | 09:41 | 09:41 | | - | 6 | 75% | | 6 | 75% | |
| | 10:40 | Message 10 | - | 10:41 | 10:40 | 10:41 | 10:41 | 10:41 | 10:41 | | - | 6 | 75% | | 6 | 75% | |
| | 11:40 | Message 11 | - | 11:41 | 11:40 | 11:41 | 11:41 | 11:41 | 11:41 | | - | 6 | 75% | | 6 | 75% | |
| | 12:40 | Message 12 | - | 12:40 | 12:40 | 12:40 | 12:40 | 12:42 | 12:41 | | - | 6 | 75% | | 6 | 75% | |
| | 13:40 | Message 13 | - | 13:40 | 13:40 | 13:40 | 13:40 | 13:44 | 13:41 | | - | 6 | 75% | | 6 | 75% | |
| | 14:40 | Message 14 | - | 14:40 | 14:40 | 14:40 | 14:40 | 14:42 | 14:41 | | - | 6 | 75% | | 6 | 75% | |
| | 15:10 | Message 15 | - | 15:40 | 15:40 | 15:40 | 15:40 | 15:44 | 15:41 | | 15:40 | 7 | 88% | **80%** | 7 | 88% | **75%** |

<u>Table VI-10.1</u>. Summary of Email messages received by each NTWC from TSP Australia for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

BAN=Bangladesh, IN=India, MAD=Madagascar, MAL=Malaysia, MM=Myanmar, SY=Seychelles, SIN=Singapore, SLK=Sri Lanka, THA=Thailand

| ANDAMAN TRENCH | Email Message No | | BAN | IN | MAD | MAL | MM | SY | SIN | SLK | THA | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP INDIA | 03:59 | Test Start | yes | 04:01 | 03:59 | 03:59 | 03:59 | 04:00 | 04:00 | 04:10 | 03:59 | 9 | 100% | | 9 | 100% | |
| | 04:14 | Message 1 | yes | 04:15 | 04:15 | 03:15 | 04:14 | 04:16 | 04:15 | 04:15 | 04:15 | 9 | 100% | | 9 | 100% | |
| | 04:20 | Message 2 | - | 04:21 | 04:20 | 04:20 | 04:20 | 04:22 | 04:21 | 04:21 | - | 7 | 78% | | 7 | 78% | |
| | 04:32 | Message 3 | yes | 04:33 | 04:32 | 04:32 | 04:32 | 04:33 | 04:33 | - | - | 7 | 78% | | 7 | 78% | |
| | 05:01 | Message 4 | - | 05:02 | 05:01 | 05:01 | 05:01 | 05:01 | 05:02 | 05:01 | - | 7 | 78% | | 7 | 78% | |
| | 06:00 | Message 5 | yes | 06:01 | 06:00 | 06:00 | 06:00 | 06:02 | 06:01 | 06:00 | - | 8 | 89% | | 8 | 89% | |
| | 07:00 | Message 6 | - | 07:01 | 07:00 | 07:01 | 07:00 | 07:02 | 07:01 | | - | 6 | 75% | | 6 | 75% | |
| | 08:00 | Message 7 | - | 08:02 | 08:00 | 08:00 | 08:00 | 08:02 | 08:01 | | - | 6 | 75% | | 6 | 75% | |
| | 09:00 | Message 8 | yes | 09:01 | 09:00 | 09:00 | 09:00 | 09:03 | 09:01 | | - | 7 | 88% | | 7 | 88% | |
| | 10:00 | Message 9 | - | 10:01 | 10:00 | 10:00 | 10:00 | 10:03 | 10:01 | | - | 6 | 75% | | 6 | 75% | |
| | 11:00 | Message 10 | - | 11:00 | 11:00 | 11:00 | 11:00 | 11:01 | 11:01 | | - | 6 | 75% | | 6 | 75% | |
| | 12:00 | Message 11 | - | 12:01 | 12:00 | 12:00 | 12:00 | 12:02 | 12:01 | | - | 6 | 75% | | 6 | 75% | |
| | 13:00 | Message 12 | - | 13:01 | 13:00 | 13:00 | 13:00 | 13:05 | 13:01 | | - | 6 | 75% | | 6 | 75% | |
| | 14:00 | Message 13 | - | 14:02 | 14:00 | 14:00 | 14:00 | 14:01 | 14:01 | | - | 6 | 75% | | 6 | 75% | |
| | 15:00 | Message 14 | - | 15:01 | 15:00 | 15:00 | 15:00 | 15:02 | 15:01 | | - | 6 | 75% | | 6 | 75% | |
| | 15:59 | Message 15 | yes | 16:02 | 15:59 | 15:59 | 16:00 | 16:02 | 15:59 | | - | 7 | 88% | 81% | 7 | 88% | 81% |

Table VI-10.2. Summary of Email messages received by each NTWC from TSP India for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

BAN=Bangladesh, IN=India, MAD=Madagascar, MAL=Malaysia, MM=Myanmar, SY=Seychelles, SIN=Singapore, SLK=Sri Lanka, THA=Thailand

| ANDAMAN TRENCH | Email Message No | | BAN | IN | MAD | MAL | MM | SY | SIN | SLK | THA | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP INDONESIA | 04:00 | Test Start | yes | - | - | - | - | 04:02 | - | 04:00 | - | 3 | 33% | | 3 | 33% | |
| | 04:08 | Message 1 | - | - | 04:08 | 04:08 | 04:08 | 04:10 | 04:08 | 04:08 | 04:08 | 7 | 78% | | 7 | 78% | |
| | 04:13 | Message 2 | yes | - | 04:13 | 04:13 | 04:13 | 04:15 | 04:13 | 04:14 | 04:13 | 8 | 89% | | 8 | 89% | |
| | 04:30 | Message 3 | yes | - | 04:30 | 04:30 | 04:30 | 04:33 | 04:30 | 04:30 | 04:30 | 8 | 89% | | 8 | 89% | |
| | 05:00 | Message 4 | - | - | 05:00 | 05:00 | 05:00 | 05:05 | 05:00 | 05:01 | 05:00 | 7 | 78% | | 7 | 78% | |
| | 06:00 | Message 5 | yes | - | 06:00 | 06:00 | 06:00 | 06:06 | 06:00 | 06:08 | 06:00 | 8 | 89% | | 8 | 89% | |
| | 07:00 | Message 6 | - | - | 07:00 | 07:00 | 07:00 | 07:03 | 07:00 | | 07:00 | 6 | 75% | | 6 | 75% | |
| | 08:00 | Message 7 | - | - | 08:00 | 08:00 | 08:00 | 08:05 | 08:01 | | 08:00 | 6 | 75% | | 6 | 75% | |
| | 09:00 | Message 8 | yes | - | 09:00 | 09:00 | 09:00 | 09:02 | 09:00 | | 09:00 | 7 | 88% | | 7 | 88% | |
| | 10:00 | Message 9 | - | - | 10:00 | 10:00 | 10:00 | 10:03 | 10:00 | | 10:00 | 6 | 75% | | 6 | 75% | |
| | 11:00 | Message 10 | - | - | 11:00 | 11:00 | 11:00 | 11:03 | 11:00 | | 11:00 | 6 | 75% | | 6 | 75% | |
| | 12:00 | Message 11 | yes | - | 12:00 | 12:00 | 12:00 | 12:02 | 12:00 | | 12:00 | 7 | 88% | | 7 | 88% | |
| | 13:00 | Message 12 | - | - | 13:00 | 13:00 | 13:00 | 13:06 | 13:00 | | 13:00 | 6 | 75% | | 6 | 75% | |
| | 14:00 | Message 13 | - | - | 14:00 | 14:00 | 14:00 | 14:01 | 14:00 | | 14:00 | 6 | 88% | | 7 | 88% | |
| | 15:00 | Message 14 | yes | - | 15:00 | 15:00 | 15:00 | 15:01 | 15:00 | | 15:00 | 7 | 88% | | 7 | 88% | |
| | 16:00 | Message 15 | yes | - | 16:00 | 16:00 | 16:00 | 16:01 | 16:01 | | 16:00 | 7 | 88% | 79% | 7 | 88% | 79% |

Table VI-10.3. Summary of Email messages received by each NTWC from TSP Indonesia for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided. Highlighted times indicate that the message was received more than 15 minutes after being issued.

Note: Member States in grey did not answer this question and are excluded from the total.

BAN=Bangladesh, IN=India, MAD=Madagascar, MAL=Malaysia, MM=Myanmar, SY=Seychelles, SIN=Singapore, SLK=Sri Lanka, THA=Thailand

**Andaman Trench Scenario: SMS**

| ANDAMAN TRENCH | SMS Message No | | BAN | IN | MAD | MAL | MM | SY | SIN | SLK | THA | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP AUSTRALIA | 04:00 | Test Start | 04:02 | - | 04:04 | 04:00 | - | 04:00 | 04:00 | 04:05 | 04:00 | 7 | 78% | | 7 | 78% | |
| | 04:10 | Message 1 | - | - | - | 04:10 | - | 04:10 | 04:10 | 04:10 | 04:10 | 5 | 56% | | 5 | 56% | |
| | 04:12 | Message 2 | - | - | - | 04:12 | - | 04:13 | 04:12 | 04:12 | 04:12 | 5 | 56% | | 5 | 56% | |
| | 04:30 | Message 3 | 04:32 | - | - | 04:30 | - | 04:31 | 04:30 | 04:40 | 04:30 | 6 | 67% | | 6 | 67% | |
| | 04:40 | Message 4 | 05:05 | - | 04:42 | 04:41 | - | 04:41 | 04:41 | 04:46 | 04:40 | 7 | 78% | | 6 | 67% | |
| | 05:40 | Message 5 | - | - | 05:45 | 05:40 | - | 05:41 | 05:40 | 05:40 | 05:40 | 6 | 67% | | 6 | 67% | |
| | 06:40 | Message 6 | - | - | 06:41 | 06:40 | - | 06:41 | 06:40 | | 06:40 | 5 | 63% | | 5 | 63% | |
| | 06:41 | Message 7 | 07:11 | - | 07:45 | 07:42 | - | 07:42 | 07:42 | | 07:42 | 6 | 75% | | 6 | 75% | |
| | 08:40 | Message 8 | 08:20 | - | 08:42 | 08:40 | - | 08:40 | 08:40 | | 08:41 | 6 | 75% | | 6 | 75% | |
| | 09:40 | Message 9 | - | - | 09:44 | 09:41 | - | 09:40 | 09:41 | | 09:41 | 5 | 63% | | 5 | 63% | |
| | 10:40 | Message 10 | - | - | 10:42 | - | - | 10:41 | 10:41 | | 10:41 | 4 | 50% | | 4 | 50% | |
| | 11:40 | Message 11 | - | - | 11:42 | - | - | 11:40 | 11:41 | | 11:41 | 4 | 50% | | 4 | 50% | |
| | 12:40 | Message 12 | - | - | 12:45 | 12:40 | - | 12:40 | 12:40 | | 12:41 | 5 | 63% | | 5 | 63% | |
| | 13:40 | Message 13 | - | - | 13:45 | - | - | 13:41 | 13:40 | | 13:41 | 4 | 50% | | 4 | 50% | |
| | 14:40 | Message 14 | - | - | 14:47 | 14:40 | - | 14:41 | 14:40 | | 14:41 | 5 | 63% | | 5 | 63% | |
| | 15:10 | Message 15 | - | - | 15:43 | 15:40 | - | 15:41 | 15:40 | | 15:40 | 5 | 63% | **63%** | 5 | 63% | **63%** |

<u>Table VI-11.1</u>. Summary of SMS messages received by each NTWC from TSP Australia for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

BAN=Bangladesh, IN=India, MAD=Madagascar, MAL=Malaysia, MM=Myanmar, SY=Seychelles, SIN=Singapore, SLK=Sri Lanka, THA=Thailand

| ANDAMAN TRENCH | SMS Message No | | BAN | IN | MAD | MAL | MM | SY | SIN | SLK | THA | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP INDIA | 03:59 | Test Start | yes | 04:00 | 03:40 | - | - | 04:00 | - | - | - | 4 | 44% | | 4 | 44% | |
| | 04:14 | Message 1 | yes | 04:15 | - | - | - | 04:15 | - | - | - | 3 | 33% | | 3 | 33% | |
| | 04:20 | Message 2 | - | 04:21 | - | - | - | 04:21 | - | - | - | 2 | 22% | | 2 | 22% | |
| | 04:32 | Message 3 | yes | 04:33 | - | - | - | 04:33 | - | - | - | 3 | 33% | | 3 | 33% | |
| | 05:01 | Message 4 | - | 05:01 | 05:03 | - | - | 05:02 | - | - | - | 3 | 33% | | 3 | 33% | |
| | 06:00 | Message 5 | yes | 06:00 | 06:05 | - | - | 06:01 | - | - | - | 4 | 44% | | 4 | 44% | |
| | 07:00 | Message 6 | - | 07:01 | 07:10 | - | - | 07:01 | - | | - | 3 | 38% | | 3 | 38% | |
| | 08:00 | Message 7 | - | 08:01 | 08:02 | - | - | 08:01 | - | | - | 3 | 38% | | 3 | 38% | |
| | 09:00 | Message 8 | yes | 09:01 | 09:01 | - | - | 09:01 | - | | - | 4 | 50% | | 4 | 50% | |
| | 10:00 | Message 9 | - | 10:00 | 10:09 | - | - | 10:01 | - | | - | 3 | 38% | | 3 | 38% | |
| | 11:00 | Message 10 | - | 11:00 | 11:03 | - | - | 11:01 | - | | - | 3 | 38% | | 3 | 38% | |
| | 12:00 | Message 11 | - | 12:01 | 12:02 | - | - | 12:01 | - | | - | 3 | 38% | | 3 | 38% | |
| | 13:00 | Message 12 | - | 13:00 | 13:05 | - | - | 13:01 | - | | - | 3 | 38% | | 3 | 38% | |
| | 14:00 | Message 13 | - | 14:02 | 14:11 | - | - | 14:01 | - | | - | 3 | 38% | | 3 | 38% | |
| | 15:00 | Message 14 | - | 15:01 | 15:05 | - | - | 15:01 | - | | - | 3 | 38% | | 3 | 38% | |
| | 15:59 | Message 15 | yes | 16:01 | 16:03 | - | - | 15:59 | - | | - | 4 | 50% | **38%** | 4 | 50% | **38%** |

Table VI-11.2. Summary of SMS messages received by each NTWC from TSP India for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

BAN=Bangladesh, IN=India, MAD=Madagascar, MAL=Malaysia, MM=Myanmar, SY=Seychelles, SIN=Singapore, SLK=Sri Lanka, THA=Thailand

| ANDAMAN TRENCH | SMS Message No | | BAN | IN | MAD | MAL | MM | SY | SIN | SLK | THA | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 04:00 | Test Start | yes | - | | - | - | - | - | 04:00 | - | 2 | 25% | | 2 | 25% | |
| | 04:08 | Message 1 | - | - | | - | 04:13 | - | 04:13 | 04:08 | - | 3 | 38% | | 3 | 38% | |
| | 04:13 | Message 2 | yes | - | | - | 04:30 | - | 04:24 | 04:14 | - | 4 | 50% | | 4 | 50% | |
| | 04:30 | Message 3 | yes | - | | - | - | - | 04:33 | 04:30 | - | 3 | 38% | | 3 | 38% | |
| | 05:00 | Message 4 | - | - | | - | 05:13 | - | 05:05 | 05:01 | - | 3 | 38% | | 3 | 38% | |
| | 06:00 | Message 5 | yes | - | | - | 06:04 | - | 06:04 | 06:08 | - | 4 | 50% | | 4 | 50% | |
| | 07:00 | Message 6 | - | - | | - | 07:10 | - | 07:10 | | - | 2 | 29% | | 2 | 29% | |
| | 08:00 | Message 7 | - | - | | - | 08:10 | - | 08:08 | | - | 2 | 29% | | 2 | 29% | |
| TSP INDONESIA | 09:00 | Message 8 | yes | - | | - | 09:06 | - | 09:07 | | - | 3 | 43% | | 3 | 43% | |
| | 10:00 | Message 9 | - | - | | - | 10:11 | - | 10:09 | | - | 2 | 29% | | 2 | 29% | |
| | 11:00 | Message 10 | - | - | | - | 11:05 | - | 11:09 | | - | 2 | 29% | | 2 | 29% | |
| | 12:00 | Message 11 | yes | - | | - | - | - | 12:10 | | - | 2 | 29% | | 2 | 29% | |
| | 13:00 | Message 12 | - | - | | - | 13:10 | - | 13:06 | | - | 2 | 29% | | 2 | 29% | |
| | 14:00 | Message 13 | - | - | | - | 14:11 | - | 14:07 | | - | 2 | 43% | | 3 | 43% | |
| | 15:00 | Message 14 | yes | - | | - | 15:08 | - | 15:04 | | - | 3 | 43% | | 3 | 43% | |
| | 16:00 | Message 15 | yes | - | | - | 16:06 | - | 16:06 | | - | 3 | 43% | 36% | 3 | 43% | 36% |

Table VI-11.3. Summary of SMS messages received by each NTWC from TSP Indonesia for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member State in grey did not answer this question and are excluded from the total.

BAN=Bangladesh, IN=India, MAD=Madagascar, MAL=Malaysia, MM=Myanmar, SY=Seychelles, SIN=Singapore, SLK=Sri Lanka, THA=Thailand

**Makran Trench Scenario: GTS**

| MAKRAN TRENCH | GTS Message No | | IN | IR | MAL | OM | PK | UAE | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP AUSTRALIA | 06:00 | Test Start | - | | 06:00 | 06:05 | 06:00 | 06:00 | 4 | 80% | | 4 | 80% | |
| | 06:00 | Message 1 | 06:10 | | - | 06:11 | 06:10 | 06:10 | 4 | 80% | | 4 | 80% | |
| | 06:10 | Message 2 | 06:12 | | 06:12 | 06:24 | 06:12 | 06:13 | 5 | 100% | | 5 | 100% | |
| | 06:15 | Message 3 | 06:15 | | - | 06:25 | 06:15 | 06:16 | 4 | 80% | | 4 | 80% | |
| | 06:30 | Message 4 | 06:31 | | - | 06:41 | 06:30 | 06:31 | 4 | 80% | | 4 | 80% | |
| | 07:30 | Message 5 | 07:30 | | 07:30 | | - | 07:31 | 3 | 75% | | 3 | 75% | |
| | 08:30 | Message 6 | 08:30 | | 08:30 | | - | 08:31 | 3 | 75% | | 3 | 75% | |
| | 09:30 | Message 7 | 09:30 | | 09:30 | | - | 09:31 | 3 | 75% | | 3 | 75% | |
| | 10:30 | Message 8 | 10:30 | | 10:30 | | - | 10:31 | 3 | 75% | | 3 | 75% | |
| | 11:30 | Message 9 | 11:30 | | 11:30 | | - | 11:31 | 3 | 75% | | 3 | 75% | |
| | 12:30 | Message 10 | 12:30 | | 12:30 | | - | 12:31 | 3 | 75% | | 3 | 75% | |
| | 13:30 | Message 11 | 13:30 | | 13:30 | | - | 13:31 | 3 | 75% | | 3 | 75% | |
| | 14:30 | Message 12 | 14:30 | | 14:30 | | - | 14:31 | 3 | 75% | | 3 | 75% | |
| | 15:30 | Message 13 | 15:30 | | 15:30 | | - | 15:31 | 3 | 75% | | 3 | 75% | |
| | 16:30 | Message 14 | 16:31 | | 16:30 | | - | 16:31 | 3 | 75% | | 3 | 75% | |
| | 17:30 | Message 15 | 17:31 | | 17:30 | | - | 17:31 | 3 | 75% | **78%** | 3 | 75% | **78%** |

Table VI-12.1. Summary of GTS messages received by each NTWC from TSP Australia for the Makran Trench scenario.

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Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

IN=India, IR=Iran, MAL=Malaysia, OM=Oman, PK=Pakistan, UAE=United Arab Emirates

| MAKRAN TRENCH | GTS Message No | | IN | IR | MAL | OM | PK | UAE | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TSP INDIA** | 06:00 | Test Start | 06:00 | | 06:00 | 06:06 | | 06:01 | 4 | 100% | | 4 | 100% | |
| | 06:07 | Message 1 | 06:08 | | 06:08 | 06:14 | | 06:09 | 4 | 100% | | 4 | 100% | |
| | 06:18 | Message 2 | 06:18 | | 06:19 | 06:29 | | 06:20 | 4 | 100% | | 4 | 100% | |
| | 06:30 | Message 3 | 06:30 | | 06:30 | 06:58 | | 06:31 | 4 | 100% | | 3 | 75% | |
| | 07:00 | Message 4 | 07:00 | | 07:00 | | | 07:01 | 3 | 100% | | 3 | 100% | |
| | 08:00 | Message 5 | 08:00 | | 08:01 | | | 08:02 | 3 | 100% | | 3 | 100% | |
| | 09:00 | Message 6 | 09:00 | | 09:00 | | | 09:01 | 3 | 100% | | 3 | 100% | |
| | 10:00 | Message 7 | 10:00 | | 10:00 | | | 10:01 | 3 | 100% | | 3 | 100% | |
| | 11:00 | Message 8 | 11:00 | | 11:00 | | | 11:01 | 3 | 100% | | 3 | 100% | |
| | 12:00 | Message 9 | 12:00 | | 12:00 | | | 12:01 | 3 | 100% | | 3 | 100% | |
| | 13:00 | Message 10 | 13:00 | | 13:00 | | | 13:01 | 3 | 100% | | 3 | 100% | |
| | 14:00 | Message 11 | 14:00 | | 14:00 | | | 14:01 | 3 | 100% | | 3 | 100% | |
| | 14:59 | Message 12 | 15:00 | | 15:00 | | | 15:01 | 3 | 100% | | 3 | 100% | |
| | 16:00 | Message 13 | 16:00 | | 16:00 | | | 16:01 | 3 | 100% | | 3 | 100% | |
| | 17:00 | Message 14 | 17:00 | | 17:00 | | | 17:01 | 3 | 100% | | 3 | 100% | |
| | 17:59 | Message 15 | 17:59 | | 18:00 | | | 18:00 | 3 | 100% | **100%** | 3 | 100% | **98%** |

Table VI-12.2. Summary of GTS messages received by each NTWC from TSP India for the Makran Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

IN=India, IR=Iran, MAL=Malaysia, OM=Oman, PK=Pakistan, UAE=United Arab Emirates

| MAKRAN TRENCH | GTS Message No | | IN | IR | MAL | OM | PK | UAE | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP INDONESIA | 06:00 | Test Start | - | | 06:00 | 06:05 | 06:06 | - | 3 | 60% | | 3 | 60% | |
| | 06:05 | Message 1 | 06:07 | | 06:06 | 06:06 | - | 06:07 | 4 | 80% | | 4 | 80% | |
| | 06:10 | Message 2 | 06:10 | | 06:10 | | 06:10 | 06:11 | 4 | 100% | | 4 | 100% | |
| | 06:30 | Message 3 | 06:31 | | 06:30 | | 06:30 | 06:31 | 4 | 100% | | 4 | 100% | |
| | 07:00 | Message 4 | 07:02 | | 07:00 | | 07:01 | 07:02 | 4 | 100% | | 4 | 100% | |
| | 08:00 | Message 5 | 08:00 | | 08:00 | | - | 08:01 | 3 | 75% | | 3 | 75% | |
| | 09:00 | Message 6 | 09:01 | | 09:00 | | - | 09:01 | 3 | 75% | | 3 | 75% | |
| | 10:00 | Message 7 | 10:00 | | 10:00 | | - | 10:01 | 3 | 75% | | 3 | 75% | |
| | 11:00 | Message 8 | 11:01 | | 11:00 | | - | 11:01 | 3 | 75% | | 3 | 75% | |
| | 12:00 | Message 9 | 12:00 | | 12:00 | | - | 12:01 | 3 | 75% | | 3 | 75% | |
| | 13:00 | Message 10 | 13:01 | | 13:00 | | - | 13:02 | 3 | 75% | | 3 | 75% | |
| | 14:00 | Message 11 | 14:01 | | 14:00 | | - | 14:01 | 3 | 75% | | 3 | 75% | |
| | 15:00 | Message 12 | 15:01 | | 15:00 | | - | 15:01 | 3 | 75% | | 3 | 75% | |
| | 16:00 | Message 13 | 16:01 | | 16:00 | | - | 16:01 | 3 | 75% | | 3 | 75% | |
| | 17:00 | Message 14 | 17:02 | | 17:00 | | - | 17:02 | 3 | 75% | | 3 | 75% | |
| | 18:00 | Message 15 | 18:00 | | 18:00 | | - | 18:01 | 3 | 75% | **79%** | 3 | 75% | **79%** |

Table VI-12.3. Summary of GTS messages received by each NTWC from TSP Indonesia for the Makran Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

IN=India, IR=Iran, MAL=Malaysia, OM=Oman, PK=Pakistan, UAE=United Arab Emirates

**Makran Trench Scenario: Fax**

| MAKRAN TRENCH | Fax Message No | | IN | IR | MAL | OM | PK | UAE | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP AUSTRALIA | 06:00 | Test Start | - | | - | 06:06 | - | - | 1 | 20% | | 1 | 20% | |
| | 06:00 | Message 1 | - | | - | 06:13 | - | - | 1 | 20% | | 1 | 20% | |
| | 06:10 | Message 2 | - | | - | 06:25 | - | - | 1 | 20% | | 1 | 20% | |
| | 06:15 | Message 3 | - | | - | 06:27 | - | - | 1 | 20% | | 1 | 20% | |
| | 06:30 | Message 4 | - | | - | 06:42 | - | - | 1 | 20% | | 1 | 20% | |
| | 07:30 | Message 5 | - | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 08:30 | Message 6 | - | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 09:30 | Message 7 | - | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 10:30 | Message 8 | - | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 11:30 | Message 9 | - | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 12:30 | Message 10 | - | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 13:30 | Message 11 | - | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 14:30 | Message 12 | - | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 15:30 | Message 13 | - | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 16:30 | Message 14 | - | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 17:30 | Message 15 | - | | - | - | - | - | 0 | 0% | 6% | 0 | 0% | 6% |

Table VI-13.1. Summary of Fax messages received by each NTWC from TSP Australia for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

IN=India, IR=Iran, MAL=Malaysia, OM=Oman, PK=Pakistan, UAE=United Arab Emirates

| MAKRAN TRENCH | Fax Message No | | IN | IR | MAL | OM | PK | UAE | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TSP INDIA** | 06:00 | Test Start | 06:01 | | - | 06:07 | | - | 2 | 50% | | 2 | 50% | |
| | 06:07 | Message 1 | 06:09 | | - | 06:16 | | - | 2 | 50% | | 2 | 50% | |
| | 06:18 | Message 2 | 06:19 | | - | 06:30 | | - | 2 | 50% | | 2 | 50% | |
| | 06:30 | Message 3 | 06:31 | | - | 06:59 | | - | 2 | 50% | | 1 | 25% | |
| | 07:00 | Message 4 | 07:01 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 08:00 | Message 5 | 08:01 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 09:00 | Message 6 | 09:02 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 10:00 | Message 7 | 10:01 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 11:00 | Message 8 | 11:01 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 12:00 | Message 9 | 12:02 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 13:00 | Message 10 | 13:01 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 14:00 | Message 11 | 14:02 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 14:59 | Message 12 | 15:00 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 16:00 | Message 13 | 16:01 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 17:00 | Message 14 | 17:00 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 17:59 | Message 15 | 18:00 | | - | | | - | 1 | 33% | **38%** | 1 | 33% | **36%** |

Table VI-13.2. Summary of Fax messages received by each NTWC from TSP India for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

IN=India, IR=Iran, MAL=Malaysia, OM=Oman, PK=Pakistan, UAE=United Arab Emirates

| MAKRAN TRENCH | Fax Message No | | IN | IR | MAL | OM | PK | UAE | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP INDONESIA | 06:00 | Test Start | - | | - | 06:45 | - | - | 1 | 20% | | 0 | 0% | |
| | 06:05 | Message 1 | - | | - | 06:59 | - | - | 1 | 20% | | 0 | 0% | |
| | 06:10 | Message 2 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 06:30 | Message 3 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 07:00 | Message 4 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 08:00 | Message 5 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 09:00 | Message 6 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 10:00 | Message 7 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 11:00 | Message 8 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 12:00 | Message 9 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 13:00 | Message 10 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 14:00 | Message 11 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 15:00 | Message 12 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 16:00 | Message 13 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 17:00 | Message 14 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 18:00 | Message 15 | - | | - | | - | - | 0 | 0% | 3% | 0 | 0% | 0% |

Table VI-13.3. Summary of Fax messages received by each NTWC from TSP Indonesia for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

IN=India, IR=Iran, MAL=Malaysia, OM=Oman, PK=Pakistan, UAE=United Arab Emirates

### Makran Trench Scenario: Email

| MAKRAN TRENCH | Email Message No | | IN | IR | MAL | OM | PK | UAE | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP AUSTRALIA | 06:00 | Test Start | 06:00 | | 06:00 | | 06:00 | 06:01 | 4 | 100% | | 4 | 100% | |
| | 06:00 | Message 1 | 06:10 | | 06:10 | | 06:10 | 06:10 | 4 | 100% | | 4 | 100% | |
| | 06:10 | Message 2 | 06:12 | | 06:12 | | 06:15 | 06:13 | 4 | 100% | | 4 | 100% | |
| | 06:15 | Message 3 | 06:15 | | 06:15 | | 06:15 | 06:16 | 4 | 100% | | 4 | 100% | |
| | 06:30 | Message 4 | 06:30 | | 06:31 | | - | 06:31 | 3 | 75% | | 3 | 75% | |
| | 07:30 | Message 5 | 07:30 | | 07:30 | | 07:30 | 07:31 | 4 | 100% | | 4 | 100% | |
| | 08:30 | Message 6 | 08:30 | | 08:30 | | 08:30 | 08:31 | 4 | 100% | | 4 | 100% | |
| | 09:30 | Message 7 | 09:31 | | 09:31 | | 09:30 | 09:31 | 4 | 100% | | 4 | 100% | |
| | 10:30 | Message 8 | 10:30 | | 10:30 | | 10:30 | 10:31 | 4 | 100% | | 4 | 100% | |
| | 11:30 | Message 9 | 11:30 | | 11:30 | | 11:30 | 11:31 | 4 | 100% | | 4 | 100% | |
| | 12:30 | Message 10 | 12:30 | | 12:30 | | 12:30 | 12:31 | 4 | 100% | | 4 | 100% | |
| | 13:30 | Message 11 | 13:30 | | 13:30 | | 13:30 | 13:31 | 4 | 100% | | 4 | 100% | |
| | 14:30 | Message 12 | 14:30 | | 14:30 | | 14:30 | 14:31 | 4 | 100% | | 4 | 100% | |
| | 15:30 | Message 13 | 15:30 | | 15:30 | | 15:30 | 15:31 | 4 | 100% | | 4 | 100% | |
| | 16:30 | Message 14 | 16:31 | | 16:30 | | 16:30 | 16:31 | 4 | 100% | | 4 | 100% | |
| | 17:30 | Message 15 | 17:30 | | 17:30 | | 17:30 | 17:31 | 4 | 100% | 98% | 4 | 100% | 98% |

Table VI-14.1. Summary of Email messages received by each NTWC from TSP Australia for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

IN=India, IR=Iran, MAL=Malaysia, OM=Oman, PK=Pakistan, UAE=United Arab Emirates

| MAKRAN TRENCH | Email Message No | | IN | IR | MAL | OM | PK | UAE | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TSP INDIA** | 06:00 | Test Start | 06:00 | | 06:00 | | | 06:01 | 3 | 100% | | 3 | 100% | |
| | 06:07 | Message 1 | 06:08 | | 06:08 | | | 06:08 | 3 | 100% | | 3 | 100% | |
| | 06:18 | Message 2 | 06:18 | | 06:18 | | | 06:19 | 3 | 100% | | 3 | 100% | |
| | 06:30 | Message 3 | 06:30 | | 06:30 | | | 06:31 | 3 | 100% | | 3 | 100% | |
| | 07:00 | Message 4 | 07:00 | | 07:00 | | | 07:01 | 3 | 100% | | 3 | 100% | |
| | 08:00 | Message 5 | 08:01 | | 08:01 | | | 08:01 | 3 | 100% | | 3 | 100% | |
| | 09:00 | Message 6 | 09:00 | | 09:00 | | | 09:01 | 3 | 100% | | 3 | 100% | |
| | 10:00 | Message 7 | 10:00 | | 10:00 | | | 10:01 | 3 | 100% | | 3 | 100% | |
| | 11:00 | Message 8 | 11:00 | | 11:00 | | | 11:01 | 3 | 100% | | 3 | 100% | |
| | 12:00 | Message 9 | 12:00 | | 12:00 | | | 12:01 | 3 | 100% | | 3 | 100% | |
| | 13:00 | Message 10 | 13:00 | | 13:00 | | | 13:01 | 3 | 100% | | 3 | 100% | |
| | 14:00 | Message 11 | 14:00 | | 14:00 | | | 14:01 | 3 | 100% | | 3 | 100% | |
| | 14:59 | Message 12 | 14:59 | | 15:00 | | | 15:00 | 3 | 100% | | 3 | 100% | |
| | 16:00 | Message 13 | 16:00 | | 16:00 | | | 16:01 | 3 | 100% | | 3 | 100% | |
| | 17:00 | Message 14 | 17:00 | | 17:00 | | | 17:01 | 3 | 100% | | 3 | 100% | |
| | 17:59 | Message 15 | 17:59 | | 17:59 | | | 18:00 | 3 | 100% | **100%** | 3 | 100% | **100%** |

Table VI-14.2. Summary of Email messages received by each NTWC from TSP India for the Andaman Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

IN=India, IR=Iran, MAL=Malaysia, OM=Oman, PK=Pakistan, UAE=United Arab Emirates

| MAKRAN TRENCH | Email Message No | | IN | IR | MAL | OM | PK | UAE | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TSP INDONESIA** | 06:00 | Test Start | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 06:05 | Message 1 | 06:05 | | 06:06 | | 06:06 | - | 3 | 75% | | 3 | 75% | |
| | 06:10 | Message 2 | 06:10 | | 06:10 | | 06:10 | - | 3 | 75% | | 3 | 75% | |
| | 06:30 | Message 3 | 06:30 | | 06:30 | | 06:30 | - | 3 | 75% | | 3 | 75% | |
| | 07:00 | Message 4 | - | | 07:02 | | 07:01 | - | 2 | 50% | | 2 | 50% | |
| | 08:00 | Message 5 | 08:00 | | 08:00 | | 08:00 | - | 3 | 75% | | 3 | 75% | |
| | 09:00 | Message 6 | - | | 09:00 | | 09:00 | - | 2 | 50% | | 2 | 50% | |
| | 10:00 | Message 7 | - | | 10:00 | | 10:00 | - | 2 | 50% | | 2 | 50% | |
| | 11:00 | Message 8 | 11:00 | | 11:00 | | 11:00 | - | 3 | 75% | | 3 | 75% | |
| | 12:00 | Message 9 | 12:00 | | 12:00 | | 12:00 | - | 3 | 75% | | 3 | 75% | |
| | 13:00 | Message 10 | 13:00 | | 13:00 | | 13:00 | - | 3 | 75% | | 3 | 75% | |
| | 14:00 | Message 11 | 14:00 | | 14:00 | | 14:00 | - | 3 | 75% | | 3 | 75% | |
| | 15:00 | Message 12 | - | | 15:00 | | 15:00 | - | 2 | 50% | | 2 | 50% | |
| | 16:00 | Message 13 | 16:00 | | 16:00 | | 16:00 | - | 3 | 75% | | 3 | 75% | |
| | 17:00 | Message 14 | 17:01 | | 17:01 | | 17:02 | - | 3 | 75% | | 3 | 75% | |
| | 18:00 | Message 15 | 18:00 | | 18:00 | | 18:00 | - | 3 | 75% | **64%** | 3 | 75% | **64%** |

Table VI-14.3. Summary of Email messages received by each NTWC from TSP Indonesia for the Makran Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided. Highlighted times indicate that the message was received more than 15 minutes after being issued.

Note: Member States in grey did not answer this question and are excluded from the total.

IN=India, IR=Iran, MAL=Malaysia, OM=Oman, PK=Pakistan, UAE=United Arab Emirates

**Makran Trench Scenario: SMS**

| MAKRAN TRENCH | SMS Message  No | | IN | IR | MAL | OM | PK | UAE | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 06:00 | Test Start | 06:00 | | 06:00 | | 06:00 | - | 3 | 75% | | 3 | 75% | |
| | 06:00 | Message 1 | 06:10 | | - | | 06:10 | - | 2 | 50% | | 2 | 50% | |
| | 06:10 | Message 2 | 06:12 | | 06:12 | | 06:12 | - | 3 | 75% | | 3 | 75% | |
| | 06:15 | Message 3 | 06:15 | | 06:15 | | 06:15 | - | 3 | 75% | | 3 | 75% | |
| | 06:30 | Message 4 | 06:30 | | 06:30 | | - | - | 2 | 50% | | 2 | 50% | |
| | 07:30 | Message 5 | 07:30 | | 07:30 | | 07:30 | - | 3 | 75% | | 3 | 75% | |
| | 08:30 | Message 6 | 08:30 | | - | | 08:30 | - | 2 | 50% | | 2 | 50% | |
| TSP AUSTRALIA | 09:30 | Message 7 | 09:31 | | 09:30 | | 09:30 | - | 3 | 75% | | 3 | 75% | |
| | 10:30 | Message 8 | 10:30 | | 10:30 | | 10:30 | - | 3 | 75% | | 3 | 75% | |
| | 11:30 | Message 9 | 11:30 | | 11:30 | | - | - | 2 | 50% | | 2 | 50% | |
| | 12:30 | Message 10 | 12:30 | | 12:30 | | - | - | 2 | 50% | | 2 | 50% | |
| | 13:30 | Message 11 | 13:30 | | 13:30 | | - | - | 2 | 50% | | 2 | 50% | |
| | 14:30 | Message 12 | 14:30 | | - | | - | - | 1 | 25% | | 1 | 25% | |
| | 15:30 | Message 13 | 15:30 | | - | | - | - | 1 | 25% | | 1 | 25% | |
| | 16:30 | Message 14 | 16:31 | | - | | - | - | 1 | 25% | | 1 | 25% | |
| | 17:30 | Message 15 | 17:30 | | - | | - | - | 1 | 25% | **53%** | 1 | 25% | **53%** |

Table VI-15.1. Summary of SMS messages received by each NTWC from TSP Australia for the Makran Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

IN=India, IR=Iran, MAL=Malaysia, OM=Oman, PK=Pakistan, UAE=United Arab Emirates

| MAKRAN TRENCH | SMS Message No | | IN | IR | MAL | OM | PK | UAE | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TSP INDIA** | 06:00 | Test Start | 06:01 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 06:07 | Message 1 | 06:08 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 06:18 | Message 2 | 06:18 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 06:30 | Message 3 | 06:31 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 07:00 | Message 4 | 07:00 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 08:00 | Message 5 | 08:01 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 09:00 | Message 6 | 09:01 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 10:00 | Message 7 | 10:00 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 11:00 | Message 8 | 11:01 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 12:00 | Message 9 | 12:01 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 13:00 | Message 10 | 13:01 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 14:00 | Message 11 | 14:01 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 14:59 | Message 12 | 15:00 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 16:00 | Message 13 | 16:01 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 17:00 | Message 14 | 17:00 | | - | | | - | 1 | 33% | | 1 | 33% | |
| | 17:59 | Message 15 | 18:00 | | - | | | - | 1 | 33% | **33%** | 1 | 33% | **33%** |

Table VI-15.2. Summary of SMS messages received by each NTWC from TSP India for the Makran Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

IN=India, IR=Iran, MAL=Malaysia, OM=Oman, PK=Pakistan, UAE=United Arab Emirates

| MAKRAN TRENCH | SMS Message No | | IN | IR | MAL | OM | PK | UAE | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP INDONESIA | 06:00 | Test Start | - | | - | 06:13 | - | - | 1 | 20% | | 1 | 20% | |
| | 06:05 | Message 1 | - | | - | 06:28 | - | - | 1 | 20% | | 0 | 0% | |
| | 06:10 | Message 2 | - | | - | 06:42 | - | - | 1 | 20% | | 0 | 0% | |
| | 06:30 | Message 3 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 07:00 | Message 4 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 08:00 | Message 5 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 09:00 | Message 6 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 10:00 | Message 7 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 11:00 | Message 8 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 12:00 | Message 9 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 13:00 | Message 10 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 14:00 | Message 11 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 15:00 | Message 12 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 16:00 | Message 13 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 17:00 | Message 14 | - | | - | | - | - | 0 | 0% | | 0 | 0% | |
| | 18:00 | Message 15 | - | | - | | - | - | 0 | 0% | **4%** | 0 | 0% | **1%** |

Table VI-15.3. Summary of SMS messages received by each NTWC from TSP Indonesia for the Makran Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member State in grey did not answer this question and are excluded from the total.

IN=India, IR=Iran, MAL=Malaysia, OM=Oman, PK=Pakistan, UAE=United Arab Emirates

## Heard Island Scenario: GTS

| HEARD ISLAND | GTS Message No | | AUS | IN | MAL | SA | TAN | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP AUSTRALIA | 06:00 | Test Start | | 06:00 | 06:00 | 06:00 | 06:00 | 4 | 100% | | 4 | 100% | |
| | 06:05 | Message 1 | | 06:05 | 06:05 | 06:06 | 06:05 | 4 | 100% | | 4 | 100% | |
| | 06:30 | Message 2 | | 06:30 | 06:30 | 06:31 | 06:30 | 4 | 100% | | 4 | 100% | |
| | 07:30 | Message 3 | | 07:31 | 07:30 | 07:31 | 07:30 | 4 | 100% | | 4 | 100% | |
| | 08:30 | Message 4 | | 08:30 | 08:30 | 08:31 | 08:30 | 4 | 100% | | 4 | 100% | |
| | 09:30 | Message 5 | | 09:31 | 09:30 | 09:31 | 09:30 | 4 | 100% | | 4 | 100% | |
| | 10:30 | Message 6 | | 10:31 | 10:30 | 10:31 | 10:30 | 4 | 100% | | 4 | 100% | |
| | 11:30 | Message 7 | | 11:31 | 11:30 | 11:31 | 11:30 | 4 | 100% | | 4 | 100% | |
| | 12:30 | Message 8 | | 12:30 | 12:30 | 12:31 | 12:30 | 4 | 100% | | 4 | 100% | |
| | 13:30 | Message 9 | | 13:30 | 13:30 | 13:31 | 13:30 | 4 | 100% | | 4 | 100% | |
| | 14:30 | Message 10 | | 14:31 | 14:30 | 14:31 | 14:30 | 4 | 100% | | 4 | 100% | |
| | 15:30 | Message 11 | | 15:30 | 15:30 | 15:31 | 15:32 | 4 | 100% | | 4 | 100% | |
| | 16:30 | Message 12 | | 16:30 | 16:30 | 16:31 | 16:30 | 4 | 100% | | 4 | 100% | |
| | 17:30 | Message 13 | | 17:31 | 17:30 | 17:31 | 17:30 | 4 | 100% | **100%** | 4 | 100% | **100%** |

Table VI-16.1. Summary of GTS messages received by each NTWC from TSP Australia for the Heard Island scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, IN=India, MAL=Malaysia, SA=South Africa, TAN=Tanzania

*Heard Island Scenario: Fax*

| HEARD ISLAND | Fax Message No | | AUS | IN | MAL | SA | TAN | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP AUSTRALIA | 06:00 | Test Start | | | | - | - | 0 | 0% | | 0 | 0% | |
| | 06:05 | Message 1 | | | | - | - | 0 | 0% | | 0 | 0% | |
| | 06:30 | Message 2 | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 07:30 | Message 3 | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 08:30 | Message 4 | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 09:30 | Message 5 | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 10:30 | Message 6 | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 11:30 | Message 7 | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 12:30 | Message 8 | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 13:30 | Message 9 | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 14:30 | Message 10 | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 15:30 | Message 11 | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 16:30 | Message 12 | | - | - | - | - | 0 | 0% | | 0 | 0% | |
| | 17:30 | Message 13 | | - | - | - | - | 0 | 0% | 0% | 0 | 0% | 0% |

Table VI-17.1. Summary of Fax messages received by each NTWC from TSP Australia for the Heard Island scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, IN=India, MAL=Malaysia, SA=South Africa, TAN=Tanzania

## Heard Island Scenario: Email

| HEARD ISLAND | Email Message No | | AUS | IN | MAL | SA | TAN | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TSP AUSTRALIA** | 06:00 | Test Start | | 06:00 | 06:00 | 06:00 | 06:00 | 4 | 100% | | 4 | 100% | |
| | 06:05 | Message 1 | | 06:05 | 06:05 | 06:06 | 06:05 | 4 | 100% | | 4 | 100% | |
| | 06:30 | Message 2 | | 06:30 | 06:30 | 06:31 | 06:30 | 4 | 100% | | 4 | 100% | |
| | 07:30 | Message 3 | | 07:31 | 07:31 | 07:31 | 07:30 | 4 | 100% | | 4 | 100% | |
| | 08:30 | Message 4 | | 08:31 | 08:31 | 08:31 | 08:30 | 4 | 100% | | 4 | 100% | |
| | 09:30 | Message 5 | | 09:31 | 09:30 | 09:31 | 09:30 | 4 | 100% | | 4 | 100% | |
| | 10:30 | Message 6 | | 10:31 | 10:30 | 10:31 | 10:30 | 4 | 100% | | 4 | 100% | |
| | 11:30 | Message 7 | | 11:30 | 11:30 | 11:31 | 11:30 | 4 | 100% | | 4 | 100% | |
| | 12:30 | Message 8 | | 12:31 | 12:30 | 12:31 | 12:30 | 4 | 100% | | 4 | 100% | |
| | 13:30 | Message 9 | | 13:31 | 13:30 | 13:31 | 13:30 | 4 | 100% | | 4 | 100% | |
| | 14:30 | Message 10 | | 14:30 | 14:30 | 14:31 | 14:30 | 4 | 100% | | 4 | 100% | |
| | 15:30 | Message 11 | | 15:33 | 15:33 | 15:31 | 15:32 | 4 | 100% | | 4 | 100% | |
| | 16:30 | Message 12 | | 16:30 | 16:30 | 16:31 | 16:30 | 4 | 100% | | 4 | 100% | |
| | 17:30 | Message 13 | | 17:31 | 17:31 | 17:31 | 17:30 | 4 | 100% | **100%** | 4 | 100% | **100%** |

Table VI-18.1. Summary of Email messages received by each NTWC from TSP Australia for the Heard Island scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, IN=India, MAL=Malaysia, SA=South Africa, TAN=Tanzania

**Heard Island Scenario: SMS**

| HEARD ISLAND | SMS Message No | | AUS | IN | MAL | SA | TAN | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TSP AUSTRALIA** | 06:00 | Test Start | | 06:00 | - | - | - | 1 | 25% | | 1 | 25% | |
| | 06:05 | Message 1 | | 06:05 | - | - | - | 1 | 25% | | 1 | 25% | |
| | 06:30 | Message 2 | | 06:30 | - | - | - | 1 | 25% | | 1 | 25% | |
| | 07:30 | Message 3 | | 07:30 | 07:30 | - | - | 2 | 50% | | 2 | 50% | |
| | 08:30 | Message 4 | | 08:30 | - | - | - | 1 | 25% | | 1 | 25% | |
| | 09:30 | Message 5 | | 09:30 | - | - | - | 1 | 25% | | 1 | 25% | |
| | 10:30 | Message 6 | | 10:30 | - | - | - | 1 | 25% | | 1 | 25% | |
| | 11:30 | Message 7 | | 11:31 | - | - | - | 1 | 25% | | 1 | 25% | |
| | 12:30 | Message 8 | | 12:30 | - | - | - | 1 | 25% | | 1 | 25% | |
| | 13:30 | Message 9 | | 13:30 | - | - | - | 1 | 25% | | 1 | 25% | |
| | 14:30 | Message 10 | | 14:30 | - | - | - | 1 | 25% | | 1 | 25% | |
| | 15:30 | Message 11 | | 15:32 | 15:33 | - | - | 2 | 50% | | 2 | 50% | |
| | 16:30 | Message 12 | | 16:30 | - | - | - | 1 | 25% | | 1 | 25% | |
| | 17:30 | Message 13 | | 17:30 | - | - | - | 1 | 25% | **29%** | 1 | 25% | **29%** |

Table VI-19.1. Summary of SMS messages received by each NTWC from TSP Australia for the Heard Island scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, IN=India, MAL=Malaysia, SA=South Africa, TAN=Tanzania

## Java Trench Scenario: GTS

| JAVA TRENCH | GTS Message No | | AUS | FR | IND | MD | MAU | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TSP AUSTRALIA** | 02:00 | Test Start | | 01:59 | 02:00 | | 02:01 | 3 | 100% | | 3 | 100% | |
| | 02:04 | Message 1 | | 02:05 | 02:04 | | 02:05 | 3 | 100% | | 3 | 100% | |
| | 02:16 | Message 2 | | 02:17 | 02:16 | | 02:16 | 3 | 100% | | 3 | 100% | |
| | 02:25 | Message 3 | | 02:26 | 02:25 | | 02:26 | 3 | 100% | | 3 | 100% | |
| | 02:34 | Message 4 | | 02:35 | 02:34 | | 02:36 | 3 | 100% | | 3 | 100% | |
| | 02:47 | Message 5 | | 02:48 | 02:47 | | 02:48 | 3 | 100% | | 3 | 100% | |
| | 03:50 | Message 6 | | 03:51 | 03:50 | | 03:52 | 3 | 100% | | 3 | 100% | |
| | 04:53 | Message 7 | | 04:54 | 04:50 | | 04:54 | 3 | 100% | | 3 | 100% | |
| | 05:52 | Message 8 | | 05:54 | 05:50 | | 05:54 | 3 | 100% | | 3 | 100% | |
| | 06:50 | Message 9 | | 06:51 | 06:50 | | 06:51 | 3 | 100% | | 3 | 100% | |
| | 07:50 | Message 10 | | 07:52 | 07:50 | | 07:51 | 3 | 100% | | 3 | 100% | |
| | 08:50 | Message 11 | | 08:52 | 08:50 | | 08:51 | 3 | 100% | | 3 | 100% | |
| | 09:50 | Message 12 | | 09:53 | 09:50 | | 09:51 | 3 | 100% | | 3 | 100% | |
| | 10:50 | Message 13 | | 10:51 | 10:50 | | 10:51 | 3 | 100% | | 3 | 100% | |
| | 11:50 | Message 14 | | 11:51 | 11:50 | | 11:51 | 3 | 100% | | 3 | 100% | |
| | 12:50 | Message 15 | | 12:51 | 12:50 | | 12:51 | 3 | 100% | | 3 | 100% | |
| | 13:50 | Message 16 | | 13:51 | 13:50 | | 13:51 | 3 | 100% | **100%** | 3 | 100% | **100%** |

<u>Table VI-20.1</u>. Summary of GTS messages received by each NTWC from TSP Australia for the Java Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, FR=France, IND=Indonesia, MD=Maldives, MAU=Mauritius

| JAVA TRENCH | GTS Message No | | AUS | FR | IND | MD | MAU | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TSP INDIA** | 01:59 | Test Start | | 01:59 | 02:00 | | 02:00 | 3 | 100% | | 3 | 100% | |
| | 02:10 | Message 1 | | 02:10 | 02:10 | | 02:11 | 3 | 100% | | 3 | 100% | |
| | 02:21 | Message 2 | | 02:21 | 02:21 | | 02:22 | 3 | 100% | | 3 | 100% | |
| | 02:34 | Message 3 | | 02:35 | 02:34 | | 02:36 | 3 | 100% | | 3 | 100% | |
| | 03:00 | Message 4 | | 03:00 | 03:00 | | 03:01 | 3 | 100% | | 3 | 100% | |
| | 04:00 | Message 5 | | 04:00 | 04:00 | | 04:01 | 3 | 100% | | 3 | 100% | |
| | 05:00 | Message 6 | | 05:00 | 05:00 | | 05:01 | 3 | 100% | | 3 | 100% | |
| | 06:00 | Message 7 | | 06:00 | 06:00 | | 06:01 | 3 | 100% | | 3 | 100% | |
| | 07:00 | Message 8 | | 07:00 | 07:00 | | 07:01 | 3 | 100% | | 3 | 100% | |
| | 08:00 | Message 9 | | 08:00 | 08:00 | | 08:01 | 3 | 100% | | 3 | 100% | |
| | 09:00 | Message 10 | | 09:00 | 09:00 | | 09:01 | 3 | 100% | | 3 | 100% | |
| | 10:00 | Message 11 | | 10:00 | 10:00 | | 10:01 | 3 | 100% | | 3 | 100% | |
| | 11:00 | Message 12 | | 11:00 | 11:00 | | 11:00 | 3 | 100% | | 3 | 100% | |
| | 12:00 | Message 13 | | 12:00 | 12:00 | | 12:01 | 3 | 100% | | 3 | 100% | |
| | 13:00 | Message 14 | | 13:00 | 13:00 | | 13:01 | 3 | 100% | | 3 | 100% | |
| | 14:02 | Message 15 | | 14:02 | 14:02 | | - | 2 | 67% | **98%** | 2 | 67% | **98%** |

Table VI-20.2. Summary of GTS messages received by each NTWC from TSP India for the Java Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, FR=France, IND=Indonesia, MD=Maldives, MAU=Mauritius

| JAVA TRENCH | GTS Message No | | AUS | FR | IND | MD | MAU | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 02:00 | Test Start | | 02:01 | 02:00 | | - | 2 | 67% | | 2 | 67% | |
| | 02:08 | Message 1 | | 02:08 | 02:08 | | 02:08 | 3 | 100% | | 3 | 100% | |
| | 02:13 | Message 2 | | 02:14 | 02:13 | | 02:13 | 3 | 100% | | 3 | 100% | |
| | 02:30 | Message 3 | | 02:32 | 02:30 | | 02:30 | 3 | 100% | | 3 | 100% | |
| | 03:00 | Message 4 | | 03:00 | 03:00 | | 03:00 | 3 | 100% | | 3 | 100% | |
| | 04:00 | Message 5 | | 04:01 | 04:00 | | 04:01 | 3 | 100% | | 3 | 100% | |
| | 05:00 | Message 6 | | 05:00 | 05:00 | | 05:01 | 3 | 100% | | 3 | 100% | |
| TSP INDONESIA | 06:00 | Message 7 | | 06:02 | 06:00 | | 06:01 | 3 | 100% | | 3 | 100% | |
| | 07:00 | Message 8 | | 07:01 | 07:00 | | 07:00 | 3 | 100% | | 3 | 100% | |
| | 08:00 | Message 9 | | 08:00 | 08:00 | | 08:01 | 3 | 100% | | 3 | 100% | |
| | 09:00 | Message 10 | | 09:00 | 09:00 | | 09:01 | 3 | 100% | | 3 | 100% | |
| | 10:00 | Message 11 | | 10:01 | 10:00 | | 10:02 | 3 | 100% | | 3 | 100% | |
| | 11:00 | Message 12 | | 11:01 | 11:00 | | 11:02 | 3 | 100% | | 3 | 100% | |
| | 12:00 | Message 13 | | 12:02 | 12:00 | | 12:01 | 3 | 100% | | 3 | 100% | |
| | 13:00 | Message 14 | | 13:00 | 13:00 | | 13:01 | 3 | 100% | | 3 | 100% | |
| | 14:00 | Message 15 | | 14:01 | 14:00 | | 14:01 | 3 | 100% | **98%** | 3 | 100% | **98%** |

Table VI-20.3. Summary of GTS messages received by each NTWC from TSP Indonesia for the Java Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, FR=France, IND=Indonesia, MD=Maldives, MAU=Mauritius

## *Java Trench Scenario: Fax*

| JAVA TRENCH | Fax Message No | | AUS | FR | IND | MD | MAU | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 02:00 | Test Start | | | | | - | 0 | 0% | | 0 | 0% | |
| | 02:04 | Message 1 | | | | | 02:05 | 1 | 100% | | 1 | 100% | |
| | 02:16 | Message 2 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 02:25 | Message 3 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 02:34 | Message 4 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 02:47 | Message 5 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 03:50 | Message 6 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 04:53 | Message 7 | | | | | - | 0 | 0% | | 0 | 0% | |
| TSP AUSTRALIA | 05:52 | Message 8 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 06:50 | Message 9 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 07:50 | Message 10 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 08:50 | Message 11 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 09:50 | Message 12 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 10:50 | Message 13 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 11:50 | Message 14 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 12:50 | Message 15 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 13:50 | Message 16 | | | | | 13:50 | 1 | 100% | **12%** | 1 | 100% | **12%** |

Table VI-21.1. Summary of Fax messages received by each NTWC from TSP Australia for the Java Trench scenario.

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Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, FR=France, IND=Indonesia, MD=Maldives, MAU=Mauritius

| JAVA TRENCH | Fax Message No | | AUS | FR | IND | MD | MAU | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 01:59 | Test Start | | | | | 01:59 | 1 | 100% | | 1 | 100% | |
| | 02:10 | Message 1 | | | | | 02:10 | 1 | 100% | | 1 | 100% | |
| | 02:21 | Message 2 | | | | | 02:21 | 1 | 100% | | 1 | 100% | |
| | 02:34 | Message 3 | | | | | 02:34 | 1 | 100% | | 1 | 100% | |
| | 03:00 | Message 4 | | | | | 03:00 | 1 | 100% | | 1 | 100% | |
| | 04:00 | Message 5 | | | | | 04:00 | 1 | 100% | | 1 | 100% | |
| | 05:00 | Message 6 | | | | | 05:00 | 1 | 100% | | 1 | 100% | |
| TSP INDIA | 06:00 | Message 7 | | | | | 06:00 | 1 | 100% | | 1 | 100% | |
| | 07:00 | Message 8 | | | | | 07:00 | 1 | 100% | | 1 | 100% | |
| | 08:00 | Message 9 | | | | | 08:00 | 1 | 100% | | 1 | 100% | |
| | 09:00 | Message 10 | | | | | 09:00 | 1 | 100% | | 1 | 100% | |
| | 10:00 | Message 11 | | | | | 10:00 | 1 | 100% | | 1 | 100% | |
| | 11:00 | Message 12 | | | | | 11:00 | 1 | 100% | | 1 | 100% | |
| | 12:00 | Message 13 | | | | | 12:00 | 1 | 100% | | 1 | 100% | |
| | 13:00 | Message 14 | | | | | 13:00 | 1 | 100% | | 1 | 100% | |
| | 14:02 | Message 15 | | | | | 14:02 | 1 | 100% | **100%** | 1 | 100% | **100%** |

Table VI-21.2. Summary of Fax messages received by each NTWC from TSP India for the Java Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, FR=France, IND=Indonesia, MD=Maldives, MAU=Mauritius

| JAVA TRENCH | Fax Message No | | AUS | FR | IND | MD | MAU | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP INDONESIA | 02:00 | Test Start | | | 02:00 | | - | 1 | 50% | | 1 | 50% | |
| | 02:08 | Message 1 | | | 02:08 | | 02:08 | 2 | 100% | | 2 | 100% | |
| | 02:13 | Message 2 | | | 02:13 | | - | 1 | 50% | | 1 | 50% | |
| | 02:30 | Message 3 | | | 02:30 | | - | 1 | 50% | | 1 | 50% | |
| | 03:00 | Message 4 | | | 03:00 | | - | 1 | 50% | | 1 | 50% | |
| | 04:00 | Message 5 | | | 04:00 | | 04:00 | 2 | 100% | | 2 | 100% | |
| | 05:00 | Message 6 | | | 05:00 | | 05:00 | 2 | 100% | | 2 | 100% | |
| | 06:00 | Message 7 | | | 06:00 | | - | 1 | 50% | | 1 | 50% | |
| | 07:00 | Message 8 | | | 07:00 | | - | 1 | 50% | | 1 | 50% | |
| | 08:00 | Message 9 | | | 08:00 | | - | 1 | 50% | | 1 | 50% | |
| | 09:00 | Message 10 | | | 09:00 | | - | 1 | 50% | | 1 | 50% | |
| | 10:00 | Message 11 | | | 10:00 | | - | 1 | 50% | | 1 | 50% | |
| | 11:00 | Message 12 | | | 11:00 | | - | 1 | 50% | | 1 | 50% | |
| | 12:00 | Message 13 | | | 12:00 | | - | 1 | 50% | | 1 | 50% | |
| | 13:00 | Message 14 | | | 13:00 | | - | 1 | 50% | | 1 | 50% | |
| | 14:00 | Message 15 | | | 14:00 | | 14:00 | 2 | 100% | **63%** | 2 | 100% | **63%** |

<u>Table VI-21.3</u>. Summary of Fax messages received by each NTWC from TSP Indonesia for the Java Trench scenario.

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Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, FR=France, IND=Indonesia, MD=Maldives, MAU=Mauritius

## Java Trench Scenario: Email

| JAVA TRENCH | Email Message No | | AUS | FR | IND | MD | MAU | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 02:00 | Test Start | | 01:59 | | | 02:00 | 2 | 100% | | 2 | 100% | |
| | 02:04 | Message 1 | | 02:05 | | | 02:05 | 2 | 100% | | 2 | 100% | |
| | 02:16 | Message 2 | | 02:17 | | | 02:16 | 2 | 100% | | 2 | 100% | |
| | 02:25 | Message 3 | | 02:26 | | | 02:26 | 2 | 100% | | 2 | 100% | |
| | 02:34 | Message 4 | | 02:35 | | | 02:35 | 2 | 100% | | 2 | 100% | |
| | 02:47 | Message 5 | | 02:48 | | | 02:48 | 2 | 100% | | 2 | 100% | |
| | 03:50 | Message 6 | | 03:51 | | | 03:50 | 2 | 100% | | 2 | 100% | |
| | 04:53 | Message 7 | | 04:54 | | | 04:54 | 2 | 100% | | 2 | 100% | |
| TSP AUSTRALIA | 05:52 | Message 8 | | 05:54 | | | 05:53 | 2 | 100% | | 2 | 100% | |
| | 06:50 | Message 9 | | 06:51 | | | 06:50 | 2 | 100% | | 2 | 100% | |
| | 07:50 | Message 10 | | 07:51 | | | 07:50 | 2 | 100% | | 2 | 100% | |
| | 08:50 | Message 11 | | 08:52 | | | 08:50 | 2 | 100% | | 2 | 100% | |
| | 09:50 | Message 12 | | 09:53 | | | 09:51 | 2 | 100% | | 2 | 100% | |
| | 10:50 | Message 13 | | 10:52 | | | 10:51 | 2 | 100% | | 2 | 100% | |
| | 11:50 | Message 14 | | 11:51 | | | 11:51 | 2 | 100% | | 2 | 100% | |
| | 12:50 | Message 15 | | 12:51 | | | 12:51 | 2 | 100% | | 2 | 100% | |
| | 13:50 | Message 16 | | 13:51 | | | 13:51 | 2 | 100% | **100%** | 2 | 100% | **100%** |

Table VI-22.1. Summary of Email messages received by each NTWC from TSP Australia for the Java Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, FR=France, IND=Indonesia, MD=Maldives, MAU=Mauritius

| JAVA TRENCH | Email Message No | | AUS | FR | IND | MD | MAU | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP INDIA | 01:59 | Test Start | | 01:59 | | | - | 1 | 50% | | 1 | 50% | |
| | 02:10 | Message 1 | | 02:10 | | | 02:10 | 2 | 100% | | 2 | 100% | |
| | 02:21 | Message 2 | | 02:21 | | | 02:21 | 2 | 100% | | 2 | 100% | |
| | 02:34 | Message 3 | | 02:35 | | | 02:35 | 2 | 100% | | 2 | 100% | |
| | 03:00 | Message 4 | | 03:30 | | | - | 1 | 50% | | 1 | 50% | |
| | 04:00 | Message 5 | | 04:00 | | | 04:00 | 2 | 100% | | 2 | 100% | |
| | 05:00 | Message 6 | | 05:00 | | | 05:00 | 2 | 100% | | 2 | 100% | |
| | 06:00 | Message 7 | | 06:00 | | | 06:00 | 2 | 100% | | 2 | 100% | |
| | 07:00 | Message 8 | | 07:00 | | | 07:00 | 2 | 100% | | 2 | 100% | |
| | 08:00 | Message 9 | | 08:00 | | | 08:00 | 2 | 100% | | 2 | 100% | |
| | 09:00 | Message 10 | | 09:00 | | | 09:00 | 2 | 100% | | 2 | 100% | |
| | 10:00 | Message 11 | | 10:00 | | | 10:00 | 2 | 100% | | 2 | 100% | |
| | 11:00 | Message 12 | | 11:00 | | | 11:00 | 2 | 100% | | 2 | 100% | |
| | 12:00 | Message 13 | | 12:00 | | | 12:00 | 2 | 100% | | 2 | 100% | |
| | 13:00 | Message 14 | | 13:00 | | | 13:00 | 2 | 100% | | 2 | 100% | |
| | 14:02 | Message 15 | | 14:02 | | | - | 1 | 50% | **91%** | 1 | 50% | **91%** |

Table VI-22.2. Summary of Email messages received by each NTWC from TSP India for the Java Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, FR=France, IND=Indonesia, MD=Maldives, MAU=Mauritius

| JAVA TRENCH | Email Message No | | AUS | FR | IND | MD | MAU | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP INDONESIA | 02:00 | Test Start | | | 02:00 | | - | 1 | 50% | | 1 | 50% | |
| | 02:08 | Message 1 | | | 02:08 | | yes | 2 | 100% | | 2 | 100% | |
| | 02:13 | Message 2 | | | 02:13 | | 02:13 | 2 | 100% | | 2 | 100% | |
| | 02:30 | Message 3 | | | 02:30 | | 02:30 | 2 | 100% | | 2 | 100% | |
| | 03:00 | Message 4 | | | 03:00 | | 03:00 | 2 | 100% | | 2 | 100% | |
| | 04:00 | Message 5 | | | 04:00 | | 04:00 | 2 | 100% | | 2 | 100% | |
| | 05:00 | Message 6 | | | 05:00 | | 05:00 | 2 | 100% | | 2 | 100% | |
| | 06:00 | Message 7 | | | 06:00 | | 06:00 | 2 | 100% | | 2 | 100% | |
| | 07:00 | Message 8 | | | 07:00 | | 07:00 | 2 | 100% | | 2 | 100% | |
| | 08:00 | Message 9 | | | 08:00 | | 08:00 | 2 | 100% | | 2 | 100% | |
| | 09:00 | Message 10 | | | 09:00 | | 09:00 | 2 | 100% | | 2 | 100% | |
| | 10:00 | Message 11 | | | 10:00 | | 10:02 | 2 | 100% | | 2 | 100% | |
| | 11:00 | Message 12 | | | 11:00 | | 11:02 | 2 | 100% | | 2 | 100% | |
| | 12:00 | Message 13 | | | 12:00 | | 12:00 | 2 | 100% | | 2 | 100% | |
| | 13:00 | Message 14 | | | 13:00 | | 13:00 | 2 | 100% | | 2 | 100% | |
| | 14:00 | Message 15 | | | 14:00 | | 14:00 | 2 | 100% | 97% | 2 | 100% | 97% |

Table VI-22.3. Summary of Email messages received by each NTWC from TSP Indonesia for the Java Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided. Highlighted times indicate that the message was received more than 15 minutes after being issued.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, FR=France, IND=Indonesia, MD=Maldives, MAU=Mauritius

## *Java Trench Scenario: SMS*

| JAVA TRENCH | SMS Message No | | AUS | FR | IND | MD | MAU | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 02:00 | Test Start | | | | | - | 0 | 0% | | 0 | 0% | |
| | 02:04 | Message 1 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 02:16 | Message 2 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 02:25 | Message 3 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 02:34 | Message 4 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 02:47 | Message 5 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 03:50 | Message 6 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 04:53 | Message 7 | | | | | - | 0 | 0% | | 0 | 0% | |
| TSP AUSTRALIA | 05:52 | Message 8 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 06:50 | Message 9 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 07:50 | Message 10 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 08:50 | Message 11 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 09:50 | Message 12 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 10:50 | Message 13 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 11:50 | Message 14 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 12:50 | Message 15 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 13:50 | Message 16 | | | | | - | 0 | 0% | 0% | 0 | 0% | 0% |

Table VI-23.1. Summary of SMS messages received by each NTWC from TSP Australia for the Java Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, FR=France, IND=Indonesia, MD=Maldives, MAU=Mauritius

| JAVA TRENCH | SMS Message No | | AUS | FR | IND | MD | MAU | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP INDIA | 01:59 | Test Start | | | | | 02:00 | 1 | 100% | | 1 | 100% | |
| | 02:10 | Message 1 | | | | | 02:11 | 1 | 100% | | 1 | 100% | |
| | 02:21 | Message 2 | | | | | 02:21 | 1 | 100% | | 1 | 100% | |
| | 02:34 | Message 3 | | | | | 02:35 | 1 | 100% | | 1 | 100% | |
| | 03:00 | Message 4 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 04:00 | Message 5 | | | | | 04:01 | 1 | 100% | | 1 | 100% | |
| | 05:00 | Message 6 | | | | | 05:01 | 1 | 100% | | 1 | 100% | |
| | 06:00 | Message 7 | | | | | 06:01 | 1 | 100% | | 1 | 100% | |
| | 07:00 | Message 8 | | | | | 07:01 | 1 | 100% | | 1 | 100% | |
| | 08:00 | Message 9 | | | | | 08:01 | 1 | 100% | | 1 | 100% | |
| | 09:00 | Message 10 | | | | | - | 0 | 0% | | 0 | 0% | |
| | 10:00 | Message 11 | | | | | 10:01 | 1 | 100% | | 1 | 100% | |
| | 11:00 | Message 12 | | | | | 11:01 | 1 | 100% | | 1 | 100% | |
| | 12:00 | Message 13 | | | | | 12:41 | 1 | 100% | | 1 | 100% | |
| | 13:00 | Message 14 | | | | | 13:01 | 1 | 100% | | 1 | 100% | |
| | 14:02 | Message 15 | | | | | 14:03 | 1 | 100% | **88%** | 1 | 100% | **88%** |

Table VI-23.2. Summary of SMS messages received by each NTWC from TSP India for the Java Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, FR=France, IND=Indonesia, MD=Maldives, MAU=Mauritius

| JAVA TRENCH | SMS Message No | | AUS | FR | IND | MD | MAU | Tot | % | Ave | Tot* | %* | Ave* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP INDONESIA | 02:00 | Test Start | | | 02:00 | | - | 1 | 50% | | 1 | 50% | |
| | 02:08 | Message 1 | | | 02:08 | | - | 1 | 50% | | 1 | 50% | |
| | 02:13 | Message 2 | | | 02:13 | | - | 1 | 50% | | 1 | 50% | |
| | 02:30 | Message 3 | | | 02:30 | | - | 1 | 50% | | 1 | 50% | |
| | 03:00 | Message 4 | | | 03:00 | | - | 1 | 50% | | 1 | 50% | |
| | 04:00 | Message 5 | | | 04:00 | | - | 1 | 50% | | 1 | 50% | |
| | 05:00 | Message 6 | | | 05:00 | | - | 1 | 50% | | 1 | 50% | |
| | 06:00 | Message 7 | | | 06:00 | | - | 1 | 50% | | 1 | 50% | |
| | 07:00 | Message 8 | | | 07:00 | | - | 1 | 50% | | 1 | 50% | |
| | 08:00 | Message 9 | | | 08:00 | | - | 1 | 50% | | 1 | 50% | |
| | 09:00 | Message 10 | | | 09:00 | | - | 1 | 50% | | 1 | 50% | |
| | 10:00 | Message 11 | | | 10:00 | | - | 1 | 50% | | 1 | 50% | |
| | 11:00 | Message 12 | | | 11:00 | | - | 1 | 50% | | 1 | 50% | |
| | 12:00 | Message 13 | | | 12:00 | | - | 1 | 50% | | 1 | 50% | |
| | 13:00 | Message 14 | | | 13:00 | | - | 1 | 50% | | 1 | 50% | |
| | 14:00 | Message 15 | | | 14:00 | | - | 1 | 50% | **50%** | 1 | 50% | **50%** |

Table VI-23.3. Summary of SMS messages received by each NTWC from TSP Indonesia for the Java Trench scenario.

Tot = number of NTWCs who received the message, % = percentage of NTWCs who received the message, Ave = average percentage of NTWCs who received the message, * = corrected figure (Tot, %, Ave) that only includes the messages received withing 15 minutes of the issue time, - message not received, grey space = no answer provided.

Note: Member State in grey did not answer this question and are excluded from the total.

AUS=Australia, FR=France, IND=Indonesia, MD=Maldives, MAU=Mauritius

**TSP EXCHANGE PRODCUCT ACCESSED BY NTWCS**

*All Scenarios*

| All Scenarios (17 out of 20 NTWCs Reporting) | | %Y | Total | AUS | BAN | FR | IN | IND | IR | MAD | MAL | MD | MAU | MM | OM | PK | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP-Australia | Bulletins | 100% | 16 | | • | • | • | • | | • | • | | • | • | • | • | • | • | | • | • | • | • |
| | Coastal Zone Threat Map | 100% | 16 | | • | • | • | • | | • | • | | • | • | • | | • | • | • | • | • | • | • |
| | Threat Table | 94% | 16 | | • | • | ○ | • | | • | • | | • | • | • | | • | • | • | • | • | • | • |
| | Maximum Amplitute Map | 86% | 14 | | ○ | • | ○ | • | | • | • | | • | • | • | | • | • | | • | | • | • |
| | Tsunami Travel Time Map | 94% | 16 | | ○ | • | • | • | | • | • | | • | • | • | | • | • | • | • | • | • | • |
| TSP-India | Bulletins | 73% | 15 | | • | • | • | • | | • | • | | • | • | ○ | • | ○ | • | | ○ | | • | ○ |
| | Coastal Zone Threat Map | 71% | 14 | | • | • | • | • | | • | • | | • | • | ○ | | ○ | • | | ○ | | • | ○ |
| | Threat Table | 64% | 14 | | • | • | ○ | • | | • | • | | • | • | ○ | | ○ | • | | ○ | | • | ○ |
| | Maximum Amplitute Map | 57% | 14 | | ○ | • | ○ | • | | • | • | | • | • | ○ | | ○ | • | | ○ | | • | ○ |
| | Tsunami Travel Time Map | 64% | 14 | | ○ | • | • | • | | • | • | | • | • | ○ | | ○ | • | | ○ | | • | ○ |
| TSP-Indonesia | Bulletins | 93% | 15 | | • | • | • | • | | • | • | | • | • | • | • | ○ | • | | • | | • | • |
| | Coastal Zone Threat Map | 93% | 14 | | • | • | • | • | | • | • | | • | • | • | | ○ | • | | • | | • | • |
| | Threat Table | 93% | 14 | | • | • | • | • | | • | • | | • | • | • | | ○ | • | | • | | • | • |
| | Maximum Amplitute Map | 79% | 14 | | ○ | • | ○ | • | | • | • | | • | • | • | | ○ | • | | • | | • | • |
| | Tsunami Travel Time Map | 86% | 14 | | ○ | • | • | • | | • | • | | • | • | • | | ○ | • | | • | | • | • |
| | Any Product from Any TSP | 100% | 17 | | • | • | • | • | | • | • | | • | • | • | • | • | • | • | • | • | • | • |

Table VI-24.1. TSP exchange products accessed by NTWCs.

• = yes, ○ = no, Total = total number of NTWCs who answered the question, %Y = percentage of NTWC that access the exchange product relative to total

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, BAN=Bangladesh, FR=France, IN=India, IND=Indonesia, IR=Iran, MAD=Madagascar, MAL=Malaysia, MAU=Mauritius, MM=Myanmar, OM=Oman, PK=Pakistan, SY=Seychelles, SIN=Singapore, SA=South Africa, SLK=Sri Lanka, THA=Thailand, UAE=United Arab Emirates

| %Y | Total | AUS | BAN | FR | IN | IND | IR | MAD | MAL | MD | MAU | MM | OM | PK | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0% | 4 | | | | o | o | | | | | | | o | | o | | | | | | |

Table VI-24.2. Other TSP exchange products (e.g. spatial files) accessed by NTWCs.

• = yes, º = no, Total = total number of NTWCs who answered the question, %Y = percentage of NTWC that access the exchange product relative to total

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, BAN=Bangladesh, FR=France, IN=India, IND=Indonesia, IR=Iran, MAD=Madagascar, MAL=Malaysia, MAU=Mauritius, MM=Myanmar, OM=Oman, PK=Pakistan, SY=Seychelles, SIN=Singapore, SA=South Africa, SLK=Sri Lanka, THA=Thailand, UAE=United Arab Emirates

**TSUNAMI THREAT INFORMAITON FROM TSP WEBSITES USED BY NTWCS TO PRODUCE NATIONAL WARNINGS**

*All Scenarios*

| %Y | Total | AUS | BAN | FR | IN | IND | IR | MAD | MAL | MD | MAU | MM | OM | PK | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 75% | 16 | | • | • | • | • | | • | o | | • | • | o | o | • | o | • | • | • | • | |

Table VI-24.3. Overview of countries that used TSP tsunami threat information (bulletins and other products) to produce national warnings.

• = yes, o = no, Total = total number of NTWCs who answered the question, %Y = percentage of NTWC that access the exchange product relative to total

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, BAN=Bangladesh, FR=France, IN=India, IND=Indonesia, IR=Iran, MAD=Madagascar, MAL=Malaysia, MAU=Mauritius, MM=Myanmar, OM=Oman, PK=Pakistan, SY=Seychelles, SIN=Singapore, SA=South Africa, SLK=Sri Lanka, THA=Thailand, UAE=United Arab Emirates

| All Scenarios (12 out of 20 NTWCs Reporting) | | %Y | Total | AUS | BAN | FR | IN | IND | IR | MAD | MAL | MD | MAU | MM | OM | PK | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP-Australia | Tsunami Wave Obervations | 75% | 12 | | • | • | o | o | | • | | | • | o | | | • | | • | • | • | • | |
| | T1 Predicted Wave Arrival Time | 58% | 12 | | o | • | o | o | | • | | | o | o | | | • | | • | • | • | • | |
| | T2 Predicted Wave Arrival Time | 50% | 12 | | • | o | o | o | | • | | | o | o | | | • | | o | • | • | • | |
| | T3 Predicted Wave Arrival Time | 50% | 12 | | o | o | o | o | | • | | | • | o | | | • | | o | • | • | • | |
| | T4 Predicted Wave Arrival Time | 58% | 12 | | o | o | o | o | | • | | | • | o | | | • | | • | • | • | • | |
| | Predicted Max Wave Amplitudes | 75% | 12 | | • | • | o | o | | • | | | • | o | | | • | | • | • | • | • | |
| | CFZ Theat Levels | 50% | 12 | | • | o | o | o | | • | | | • | o | | | • | | o | • | o | • | |
| | Other | 8% | 12 | | o | o | o | o | | o | | | o | o | | | o | | o | o | o | • | |

Table VI-24.4. Tsunami Threat Information from TSP Websites used by NTWCs to Produce National Warnings during all scenarios.

| All Scenarios (12 out of 20 NTWCs Reporting) | | %Y | Total | AUS | BAN | FR | IN | IND | IR | MAD | MAL | MD | MAU | MM | OM | PK | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSP-India | Tsunami Wave Obervations | 70% | 10 | | • | • | • | ○ | | • | | | • | • | | | ○ | | | ○ | | • | |
| | T1 Predicted Wave Arrival Time | 50% | 10 | | ○ | • | • | ○ | | • | | | ○ | • | | | ○ | | | ○ | | • | |
| | T2 Predicted Wave Arrival Time | 40% | 10 | | • | ○ | • | ○ | | • | | | ○ | ○ | | | ○ | | | ○ | | • | |
| | T3 Predicted Wave Arrival Time | 40% | 10 | | ○ | ○ | • | ○ | | • | | | • | ○ | | | ○ | | | ○ | | • | |
| | T4 Predicted Wave Arrival Time | 40% | 10 | | ○ | ○ | • | ○ | | • | | | • | ○ | | | ○ | | | ○ | | • | |
| | Predicted Max Wave Amplitudes | 70% | 10 | | • | • | • | ○ | | • | | | • | • | | | ○ | | | ○ | | • | |
| | CFZ Theat Levels | 60% | 10 | | • | • | • | ○ | | • | | | • | • | | | ○ | | | ○ | | • | |
| | Other | 10% | 10 | | ○ | ○ | ○ | ○ | | ○ | | | ○ | ○ | | | ○ | | | ○ | | • | |
| TSP-Indonesia | Tsunami Wave Obervations | 70% | 10 | | • | • | ○ | • | | • | | | • | ○ | | | ○ | | | • | | • | |
| | T1 Predicted Wave Arrival Time | 50% | 10 | | ○ | • | • | • | | • | | | ○ | ○ | | | ○ | | | • | | • | |
| | T2 Predicted Wave Arrival Time | 30% | 10 | | ○ | ○ | • | • | | • | | | ○ | ○ | | | ○ | | | ○ | | • | |
| | T3 Predicted Wave Arrival Time | 40% | 10 | | ○ | ○ | ○ | ○ | | • | | | • | ○ | | | ○ | | | • | | • | |
| | T4 Predicted Wave Arrival Time | 50% | 10 | | ○ | ○ | ○ | • | | • | | | • | ○ | | | ○ | | | • | | • | |
| | Predicted Max Wave Amplitudes | 60% | 10 | | • | • | ○ | ○ | | • | | | • | ○ | | | ○ | | | • | | • | |
| | CFZ Theat Levels | 60% | 10 | | • | ○ | ○ | • | | • | | | • | ○ | | | ○ | | | • | | • | |
| | Other | 10% | 10 | | ○ | ○ | ○ | ○ | | ○ | | | ○ | ○ | | | ○ | | | ○ | | • | |

Table VI-24.4 (continued). Tsunami Threat Information from TSP Websites used by NTWCs to Produce National Warnings during all scenarios.

• = yes, ○ = no, Total = total number of NTWCs who answered the question, %Y = percentage of NTWC that access the exchange product relative to total

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, BAN=Bangladesh, FR=France, IN=India, IND=Indonesia, IR=Iran, MAD=Madagascar, MAL=Malaysia, MAU=Mauritius, MM=Myanmar, OM=Oman, PK=Pakistan, SY=Seychelles, SIN=Singapore, SA=South Africa, SLK=Sri Lanka, THA=Thailand, UAE=United Arab Emirates

# NTWC NATIONAL TSUNAMI WARNING STATUS REPORTS TO TSPS

## *All Scenarios*

| STATUS REPORTING (16 out of 20 NTWCs reporting) | Total | Yes | % | AUS | BAN | FR | IN | IND | IR | MAD | MAL | MD | MAU | MM | OM | PK | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Status Report Sent to a TSP** | 16 | 12 | 75% | | ○ | ○ | • | • | | • | ○ | | • | • | • | • | • | ○ | • | • | • | | • |

Table IX-1. NTWC National Tsunami Warning Status Reports to TSPs during any IOWave23 scenario

## *Andaman Trench Scenario*

| ANDAMAN TRENCH (9 out of 9 NTWCs reporting) | %Y | BAN | IN | MAD | MAL | MM | SY | SIN | SLK | THA |
|---|---|---|---|---|---|---|---|---|---|---|
| Did your NTWC send reports of its warning Status to the TSPs? | 56% | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| At what time (UTC) did the NTWC first report its status? | - | - | 04:24 | 04:33 | - | 04:00 | 04:25 | - | 05:00 | - |
| How many status reports did the NTWC send to the TSPs? | - | - | 14 | 13 | - | - | 4 | - | 1 | - |

Table IX-2. NTWC National Tsunami Warning Status Reports to TSPs during the Andaman Trench scenario

AUS=Australia, BAN=Bangladesh, FR=France, IN=India, IND=Indonesia, IR=Iran, MAD=Madagascar, MAL=Malaysia, MAU=Mauritius, MM=Myanmar, OM=Oman, PK=Pakistan, SY=Seychelles, SIN=Singapore, SA=South Africa, SLK=Sri Lanka, THA=Thailand, UAE=United Arab Emirates

Total = total number of NTWCs who answered the question, %Y = percentage of NTWC sent a status report relative to total

Note: Member States in grey did not answer this question and are excluded from the total.

## Makran Trench Scenario

| MAKRAN TRENCH (5 out of 6 NTWCs reporting) | %Y | IN | IR | MAL | OM | PK | UAE |
|---|---|---|---|---|---|---|---|
| Did your NTWC send reports of its warning Status to the TSPs? | 80% | Yes | | No | Yes | Yes | Yes |
| At what time (UTC) did the NTWC first report its status? | - | 06:30 | | - | 13:30 | - | 06:36 |
| How many status reports did the NTWC send to the TSPs? | - | 14 | | - | 1 | 5 | 12 |

Table IX-3. NTWC National Tsunami Warning Status Reports to TSPs during the Makran Trench scenario

## Heard Island Scenario

| HEARD ISLAND (4 out of 6 NTWCs reporting) | %Y | AUS | IN | MAL | SA | SY | TAN |
|---|---|---|---|---|---|---|---|
| Did your NTWC send reports of its warning Status to the TSPs? | 75% | | Yes | | Yes | No | Yes |
| At what time (UTC) did the NTWC first report its status? | - | | 06:34 | | 06:46 | - | 06:42 |
| How many status reports did the NTWC send to the TSPs? | - | | 1 | | 2 | - | 1 |

Table IX-4. NTWC National Tsunami Warning Status Reports to TSPs during the Heard Island scenario

AUS=Australia, BAN=Bangladesh, FR=France, IN=India, IND=Indonesia, IR=Iran, MAD=Madagascar, MAL=Malaysia, MAU=Mauritius, MM=Myanmar, OM=Oman, PK=Pakistan, SY=Seychelles, SIN=Singapore, SA=South Africa, SLK=Sri Lanka, THA=Thailand, UAE=United Arab Emirates

Total = total number of NTWCs who answered the question, %Y = percentage of NTWC that access the exchange product relative to total

Note: Member States in grey did not answer this question and are excluded from the total.

## Java Trench Scenario

| JAVA TRENCH (5 out of 7 NTWCs reporting) | %Y | AUS | FR | IN | IND | MAL | MD | MAU |
|---|---|---|---|---|---|---|---|---|
| Did your NTWC send reports of its warning Status to the TSPs? | 60% | | No | Yes | Yes | No | | Yes |
| At what time (UTC) did the NTWC first report its status? | - | | - | 02:26 | 02:03 | - | | 02:10 |
| How many status reports did the NTWC send to the TSPs? | - | | - | 14 | 7 | - | | 7 |

Table IX-5. NTWC National Tsunami Warning Status Reports to TSPs during the Java Trench scenario

AUS=Australia, BAN=Bangladesh, FR=France, IN=India, IND=Indonesia, IR=Iran, MAD=Madagascar, MAL=Malaysia, MAU=Mauritius, MM=Myanmar, OM=Oman, PK=Pakistan, SY=Seychelles, SIN=Singapore, SA=South Africa, SLK=Sri Lanka, THA=Thailand, UAE=United Arab Emirates

Total = total number of NTWCs who answered the question, %Y = percentage of NTWC that access the exchange product relative to total

Note: Member States in grey did not answer this question and are excluded from the total.

**TSP AUSTRALIA PRODUCTS FOR NON-SEISMIC AND COMPLEX SOURCE TSUNAMIS**

*Heard Island Scenario*

| HEARD ISLAND (4 out of 6 NTWCs reporting) | %Y | AUS | IN | MAL | SA | SY | TAN |
|---|---|---|---|---|---|---|---|
| Did the NTWC access the new TSP Australia products for tsunamis generated by non-seismic and complex sources? | 50% | | Yes | | No | No | Yes |
| Were the TSP Australia new products easily accessible and understood by the NTWC? | 100% | | Yes | | - | - | Yes |
| Were TSP Australia new products used by the NTWC to gerate national tsunami warnings? | 100% | | Yes | | - | - | Yes |
| Were the national tsunami warnings disseminated to the DMOs and useful? | 50% | | No | | - | - | Yes |

<u>Table X-1</u>. TSP Australia products for non-seismic and complex source tsunamis during the Heard Island scenario

%Y = percentage of countries that answered the question ''yes'' relative to total

Note: Member States in grey did not answer this question and are excluded from the total.

AUS=Australia, IN=India, MAL=Malaysia, SY=Seychelles, SA=South Africa, TAN=Tanzania

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**Feedback**

| Country | Response |
|---------|----------|
| Tanzania | It is the first time for TMA to participate in non-seismic sources kind of exercise in generating warning guidance with regard to tsunami. Exercise with seismic source had added advantage as it provides the magnitude of the earthquake, which further provides an opportunity to run our local model to trace potential areas at risk. However, TSP Australia provided very good guidance (appropriate information), which enabled TMA to confiture warning information without any difficulties. |

## ANNEX VII: **GENERAL QUESTIONS**

| General Questions | Total | Ave. | AUS | BAN | FR | IN | IND | IR | MAD | MAL | MD | MAU | MM | OM | PK | SY | SIN | SA | SLK | TAN | THA | UAE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Exercise planning and communication with Member States: Timeliness and usefulness of information from the ICG/IOTWMS Secretariat | 19 | 3.5 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | | 4 | 3 | 4 | 4 | 3 | 4 |
| Exercise documentation: Manual, websites, bulletins | 19 | 3.4 | 2.5 | 3 | 4 | 4 | 3 | 3 | 3 | 4 | 3 | 4 | 4 | 2 | 3 | | 3 | 4 | 3 | 4 | 4 | 4 |
| Exercise format and style: Real-time operation, exercise messages similar to real events | 19 | 3.5 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 3 | 2 | 3 | | 3 | 4 | 4 | 4 | 4 | 4 |
| Post-exercise evalaution: Web-based survey | 19 | 3.2 | 2 | 3 | 4 | 4 | 2 | 3 | 3 | 4 | 3 | 4 | 3 | 2 | 3 | | 3 | 2 | 4 | 4 | 3 | 4 |

Table X.1. General Questions: Member States ranked the activities from 4 (extremely good), 3 (very good), 2 (good) to 1 (poor)

AUS=Australia, BAN=Bangladesh, FR=France Indian Ocean Territories, IN=India, IND=Indonesia, IR=Iran, MAD=Madagascar, MAL=Malaysia, MD=Maldives, MAU=Mauritius, MM=Myanmar, OM=Oman, PK=Pakistan, SY=Seychelles, SIN=Singapore, SA=South Africa, SLK=Sri Lanka, TAN=Tanzania, THA=Thailand, UAE=United Arab Emirates

Total = total number of NTWCs who answered the question, Ave = average rank across all member states that answered the question

Note: Member State in grey did not answer this question and are excluded from the total.

ANNEX VIII: **IN-COUNTRY BENEFITS OF THE EXERCISE**

AUSTRALIA

- The Heard Island scenario outlined the complexity of a) tsunamis and b) the challenges we would face if there was a tsunami in the southern Indian Ocean with the lack of ability to track the tsunami.
- A good way to test our communication channels.
- A way to test the SOPs that have been updated since the last exercise.

BANGLADESH

- No response provided

FRANCE INDIAN OCEAN TERRITORIES

- Good review of practices

INDIA

- Overall, the IOWave23 exercise was a great success, which enhanced the awareness and preparedness among the coastal people and tested the end-to-end warning chain.
- The core objectives were exercised, and performance evaluated. 44 coastal communities participated and around 40,000 people evacuated during the exercise.
- Tested UNESCO Tsunami Ready indicators.
- Enhanced the awareness and preparedness among coastal communities.

INDONESIA

- Develop SOP of earthquake and tsunami warning
- Increase awareness and preparedness of communities
- Develop infrastructure for tsunami mitigation

IRAN

- Evaluation of our tsunami warning chain
- Cooperation of more organizations in this exercise
- Updating communication protocol between stakeholders

MADAGASCAR

- Improving communication between NTWC and NDMO.
- While our budget may not have allowed for a full-scale or functional exercise, this exercise has provided valuable insights on how to enhance and expand future tabletop exercises.

MALAYSIA

- This full exercise documentation could be referenced should there be future exercises within our country even without and Indian Ocean Wave event.

MALDIVES

- Able to check/alert warning timings by National Tsunami Warning Center (MMS)
- Able to test evacuation center, route, and the island disaster management plan of B. Kendhoo.

MAURITIUS

- Testing the SOP of key stakeholders
- Raising awareness of public to tsunami
- Better coordination among first responders

MYAMAR

- Improvements to our communication system
- Practice of existing SOP
- Practice for our staff

OMAN

- Testing the communication with stakeholders and TSPs
- Testing/evaluating the SOP in the warning chain
- Test/evaluation of the Tsunami system and preparedness

PAKISTAN

- No response provided

SEYCHELLES

- No response provided

SINGAPORE

- Using this opportunity to orientate the operations staff to the various communication channels in the event of a tsunami.
- Identifying the gaps in our communication channels to be rectified for future tsunami events.
- Testing the systems and connectivity with TSPs for warning bulletins and alerts.

SOUTH AFRICA

- It was beneficial for south Africa to deal with a (simulated) point-source volcanic-triggered event, as this is a type of event which could potentially threaten our domestic coastline.
- Email reception and transmission from NTWC to partner sites such as NDMC and CGS was partially impaired on the day, due to external factors, however the test objectives were still accomplished (as the members had built up a good level of confidence during the scheduled IOTWMS 6-monthly tests).

SRI LANKA

- Identifying the gaps in the existing SOPs in NDMO.
- Identifying the need of impact-based early warning rather than sending four bulletins to the community level.
- Identifying the need to establish an effective legal framework for disseminating warning messages to both the public and the media, while it is necessary to conduct an awareness campaign that spans from the national level down to the community level.

TANZANIA

- Identifying the strength of the National Warning Chain
- Identifying the weakness of the National Warning Chain
- Identifying the activeness of different stakeholders involved in the National Warning Chain

THAILAND

- To create tsunami awareness.
- To test SOP.

UNITED ARAB EMIRATES

- Relying on electronic system for public warning.
- Devise and implement comprehensive public awareness, strategies to educate the community about natural disaster risks and preparedness measures.
- Conduct regular training sessions on national disaster preparedness plans to ensure widespread understanding and adherence to established protocols.
- Targets specific to society, including vulnerable populations, with tailored awareness campaigns to address their unique needs and concerns.
- Regularly evaluate and refine plans, support agencies, and shelter facilities to maintain a high level of readiness and effectiveness in the face of natural disasters.

ANNEX IX: **IMPROVEMENTS FOR FUTURE EXERCISES**

AUSTRALIA

- Our aim is to have a functional exercise in 2025.

BANGLADESH

- More exercises with stakeholders

FRANCE INDIAN OCEAN TERRITORIES

- No response provided

INDIA

- Most recipients agreed that the execution of the exercise was very satisfactory and requested to conduct regular mock exercises.
- Exercise duration can be reduced from 12 hours to 4-5 hours.
- Involving more communities.
- Exercise can be conducted in non-monsoon season.
- Regular awareness and preparedness programs required at community level.

INDONESIA

- Tsunami for non-tectonic scenario
- Involvement of elderly and people with disabilities
- Blackout communications scenario

IRAN

- No response provided

MADAGASCAR

- Involving new entities (media, other stakeholders)
- New information to the NDMO (details and clear)

MALAYSIA

- No response provided

MALDIVES

- Holding internal exercises
- Scaling up the exercise by involving other stakeholders

MAURITIUS

- Increasing sensitisation campaign targeting more people
- Increase the number of drills

MYANMAR

- Need to receive all messages.
- Better to check the contact mobile list SMS, especially of TSP Australia and India.

OMAN

- Private sector and tourism participation
- Involving the local community

PAKISTAN

- No response provided

SEYCHELLES

- No response provided

SINGAPORE

- Using worst-case scenarios that include the impacts of tides and sea level changes on resultant tsunami wave heights.

SOUTH AFRICA

- Sending of the usual SMS messages to a wider group of in-country participants

SRI LANKA

- An exercise scenario involving nighttime or public holiday conditions necessitates the provision of appropriate tools and resources for conducting such exercises.
- If feasible, it would be ideal to develop a near-field tsunami scenario tailored specifically for Sri Lanka. This is especially relevant because Sri Lanka currently lacks a Standard Operating Procedure (SOP) for effectively disseminating information in such scenarios. (Also, the southern region of Sri Lanka lies on the Indo-Australia Plate, which has recently exhibited signs of cracks and experienced earthquakes with magnitudes below 6.5.)
- Providing technical support to develop scenario-based inundation and hazard maps would be valuable. Currently, decision-making related to evacuation and information dissemination in marginal scenarios poses challenges for Sri Lanka.

TANZANIA

- Enhance improvements of the strength identified in the National Warning Chain.
- Noting appropriate measures to improve some weakness noted in the National Warning Chain.
- Enhance activeness of different stakeholders involved in National Warning Chain.

THAILAND

- No response provided

UNITED ARAB EMIRATES

- Expand the scope of disaster preparedness exercises to encompass a broader segment of society and diverse regions within the Emirates of Fujairah.
- Leverage innovative advancements to disseminate disaster awareness and education across society.