



INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

ICG/IOTWS SECRETARIAT

Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System

Regional Workshop on Standard Operating Procedures for Tsunami Warning and Emergency Response for Northern and Eastern Indian Ocean Countries

Jakarta, Indonesia

23-27 September 2013

REPORT

1 DAY 1 (23 September)

1.1 Opening Statements

Opening statements were given by Mr Tony Elliott (Head of the ICG/IOTWS Secretariat), Dr Hubert Gijzen (Director of UNESCO Indonesia) and Dr Andi Eka Sakya (Director General of BMKG).



Figure 1: Meeting participants, trainers and staff at the ICG/IOTWS Regional Workshop on Standard Operating Procedures for Tsunami Warning and Emergency Response for Northern and Eastern Indian Ocean Countries.

1.2 Introduction to the Workshop, Overview and Status of the IOTWS and Agenda Overview

Tony Elliott reported on the IOTWS status and introduced the workshop agenda. He noted that a key outcome of ICG/IOTWS-IX was that the three Regional Tsunami Service Providers (RTSPs) were requested to assume full operational responsibility for Indian Ocean tsunami advisories and that the Japan Meteorological Agency (JMA) and the Pacific Tsunami Warning Centre (PTWC) were requested to cease the Interim Advisory Service (IAS) from 31 March 2013.

1.3 Introduction to Regional Tsunami Service Provider (RTSP) Service and Demonstration of Products

Mr Peter Coburn discussed the roles and responsibilities of RSTPs. The first earthquake bulletin and tsunami threat assessment bulletin should be issued within 10 and 20 minutes, respectively. Mr Patanjali Kumar gave an overview of the Indian Tsunami Early Warning Centre (ITEWC) including an interactive website demonstration (www.incois.gov.in/Incois/tsunami). Mr Karyono provided an introduction to the Indonesian Tsunami Early Warning System (InaTEWS) including a website demonstration (<http://rtsp.bmkg.go.id>). It was noted that coastal zone threat information can vary between RTSPs as different tsunami propagation models are employed at each organisation. The trainers recommend that forecasts are based on the tsunami propagation model with the greatest wave heights and most conservative travel times.

1.4 Summary of IOTWS Communication Tests and RTSP Performance

Peter Coburn provided a summary of IOTWS Communication Tests and RTSP Performance from 1 November 2012 to 20 September 2013. Email had the best success rate, followed by GST, SMS and fax. There have been seven communication tests to date with the next one scheduled for 12 December 2013. It was noted that National Tsunami Warning Centres (NTWCs) have been identified in 25 of the 28 Member States.

1.5 Impact of RTSP Service on NTWC Products and SOPs

NTWCs were invited to present on the impact of RTSP service on NTWC products and SOPs. Mr Najeeb Ahmed Amir presented on the capabilities of Pakistan Meteorological Department in tsunami early warning system. Mr Badr Alli Alruhmi presented on the interim SOP for tsunami of the national MHEW centre of Oman. Mr AGMM Wilmalasuriya from Sri Lanka presented on the Department of Meteorology's procedures for issuing tsunami warnings and advisories. Mr Sarath La Kumara spoke about the role of Sri Lanka's media in tsunami response including communication with DMO on tsunami threats.

1.6 DMO Perspectives on SOPs: Current Practice

Ms Irina Rafliana presented on DMO perspectives on SOPs. Member State DMO representatives from Sri Lanka, Timor Leste, Thailand, Pakistan, and Oman commented on their current state of SOPs.

1.7 Media Perspectives on SOPs: Current Practice

Mr Ardito Kodijat and Mr Walter Welz presented on current media perspectives on SOPs. Issues included the need for information messages to be targeted at international visitors as well as local residents and the use of mobile phones to broadcast tsunami messages.



Figure 2: Meeting participants learning about SOPs on Day 1.

1.8 Tsunami Emergency Response SOPs

Dr Laura Kong provided a summary of the days presentations. She emphasised that in end-to-end tsunami warning stakeholder coordination is essential. For a seamless response, SOPs must be developed, shared and known. Handling the transfer of official information can be challenging.

Exercise 1 Tsunami Event Chronology Review was led by Dr Laura Kong. The exercise involved putting key responses to a local tsunami event in chronological order. Variations in chronologies reflected differences in national response SOPs and public preparedness. There was a discussion on the terminology for the end of an event (i.e. cancellation, lift up, all clear).

2 DAY 2 (24 September)

In the morning, NTWC participants formed a breakout group while DMO and media participants attended a plenary session. After lunch NTWC, DMO and media participants formed three separate breakout groups. A summary of the NTWC breakout group activities is provided.

2.1 NTWC Breakout Group

The NTWC breakout group consisted of 14 participants and four trainers. The morning session of the NTWC breakout group focused on RTSP Services.

Patanjali Kumar presented on coastal forecast zones and spatial data layers. All RTSPs utilise the same coastal forecast zones and coastal forecast points. A threat level is assigned to each coastal forecast zone and estimated arrival times and wave amplitudes are predicted for each coastal forecast point. This data is available as KML files that can be imported into Google Earth. All RTSPs use the same threat thresholds, which are based on predicted wave amplitudes and arrival times. The threshold for a *Threat Bulletin* is more than 0.5 m wave amplitude at coast (i.e. 1 m water depth). Discrepancies in forecasts arise because each RTSP uses its own models.

Mr Priyobudi presented on tsunami wave height prediction. The process of evaluating potential tsunami threats to determine threat levels was outlined. Variations in earthquake rupture parameters resulted in different tsunami propagation forecasts. InaTEWS uses two models to compute coastal forecast points: 1) for NTWCs, forecast points are calculated offshore at a constant bathymetry and 2) for in-country regional assessments, shallow water

forecast points are calculated nearer the coastline at a much finer spacing and varying bathymetries.

It was noted that shallow bathymetry is often privately owned by country, so RTSPs use Greens Law to approximate wave heights at coast.

NTWCs were advised to use the most conservative information (i.e. the earliest arrival times and maximum wave heights) for in-country tsunami threat assessments. In the future the model results of the RTSP will be compared to actual events to assess accuracy.

Peter Coburn discussed RTSP tsunami arrival time predictions. He noted that there are currently 571 coastal forecast zones with over 2,000 coastal forecast points. RTSP Australia uses the MOST tsunami propagation model and extracts wave heights and arrival time for each coastal forecast point. Predicted arrival times, predicted amplitudes, and RTSP bulletin types were presented.

- T1 = Time of arrival of first discernible tsunami wave (amplitude > +2cm)
- T2 = Time of arrival of first wave over +50cm amplitude on the beach
- T3 = Time of arrival of largest wave (“max beach”)
- T4 = Time of arrival of last wave over +50 cm amplitude
- Max Deep = Largest positive wave amplitude in the time series
- Max Beach = Max Deep height amplified on the beach using Greens law
- RTSP Bulletin Type 1: Earthquake Bulletin
- RTSP Bulletin Type 2: Potential Tsunami Threat Bulletin
- RTSP Bulletin Type 3: Confirmed Tsunami Threat Bulletin
- RTSP Bulletin Type 4: Final Tsunami Bulletin

The afternoon session of the NTWC breakout group began with a presentation by Peter Coburn on understanding the impacts of RTSP and NTWC products. The timelines of RTSP products issued during IOWave11 and the North Sumatra tsunami of 11 April 2012 were examined. NTWC representatives from Timor Leste, Oman, Bangladesh, Sri Lanka, Myanmar, Pakistan, Thailand, and Malaysia shared their experiences during the 11 April 2012 tsunami. It was noted that during the event, Phuket International Airport closed and diverted flights to nearby Penang International Airport, which remained open.

Dr Fauzi facilitated a panel discussion on decision making for tsunami generated in the near field, mid-field, and far field. Topics for discussion in the first session included RTSP products, access to websites, and understanding technical matters.

RTSP Products Feedback

- Timor Leste requested that their coastal threat zones be included in RTSP Indonesia’s products.
- Oman commented that differences in the format of faxes from RTSPs can cause confusion.
- Inclusion of country names in warning messages requires further discussion.
- Thailand does not receive fax and SMS bulletins from RTSPs.
- Some SMS providers cannot send messages to all countries.
- A RTSP mobile phone application requires further discussion.

Access to RTSP Websites Feedback

- RTSPs should be encouraged to have more than one site and multiple servers.

Understanding Technical Matters Feedback

- RTSPs need to modify SOPs to handle slow earthquakes, multiple events, and earthquake mechanisms that are not the worst case (i.e. thrust)
- It was suggested that the Pakistan government be encouraged to share seismic, sea level and bathymetry data.

Topics for discussion in the second session included RTSP SOPs, NTWC SOPs, and TER SOPs. NTWCs were requested to include reporting their status to RTSPs (via the online warning status report) in their SOPs.

2.2 Plenary Session for DMO and Media

Dr Laura Kong provided a presentation on the tsunami warning chain, from NTWC to the community at risk, highlighting warnings and guidance, the role of stakeholders and the need for rapid decision making. She introduced a short exercise which required the participants to differentiate between official and unofficial sources for information.

Dr Harkunti Rahayu gave a presentation on event timelines and dealing with uncertainties for near field and distant tsunamis, using the Japan event of 11 March 2011 as an example of a near field event. For distant tsunamis she provided examples from 11 April 2012 event in the Indian Ocean.

Ms Henny Vidiarina next gave a presentation on the critical issues on links between NTWCs, DMOs and the media, based on work done by GIZ in Indonesia. Key conclusions were that issuing a warning without guidance is not effective and that the content and format of warnings directly affects the decision making process of the receivers.

Ardito Kodijat provided a presentation on community preparedness and education, emphasizing the need for information and guidance. He gave examples from the response to the Mentawai event of 2010 and the West of Sumatra event of 11 April 2012. He noted that information and guidance was essential before, during and after an event to ensure community preparedness.

2.3 DMO Breakout Group

Dr Harkunti gave a presentation on the role of DMOs in the tsunami warning chain. This was followed by examples of good practice case studies presented by Dr Suhardjono, Irina Rafliana, Laura Kong and Henny Vidiarina.

2.4 Media Breakout Group

Ardito Kodijat and Walter Welz presented on the role of the media in the tsunami warning chain. This was followed by examples of good practice case studies from the Indonesian Media Handbook, agreements between NTWC, DMO and media, and examples from the Asia-Pacific Broadcasting Union (ABU).

3 DAY 3 (25 September)

In the morning NTWC participants visited the BMKG Warning Centre while DMO and Media participants visited the National Agency for Disaster Management (BNBP) and Metro TV. Here the activities of the NTWC participants are summarised.

3.1 NTWC Site Visit to BMKG Warning Centre



Figure 3: NTWC meeting participants visit BMKG Warning Centre.

Fauzi reported on the magnitude 7.7 Pakistan earthquake and resulting tsunami that occurred on 24 September 2013. The earthquake was an oblique-strike-slip event that was located over 200 km inland in eastern Pakistan (USGS). A tsunami of ~20 cm amplitude was observed on the Muscat tide gauge. Smaller amplitude waves were also recorded on tide gauges in Cha Bahar and Jask (Iran) and on DART 23228 (Arabian Sea).

Ms Weniza introduced participants to the Indonesian Tsunami Early Warning System (InaTEWS) at BMKG. The decision support system integrates seismic, GNSS, buoys, tide gauges, the tsunami data base and geospatial data.

Peter Coburn led an exercise on obtaining earthquake details and tsunami threat information from the RTSP websites. Part one of the exercise involved obtaining data from the RTSP India website for NTWC Myanmar. Part two of the exercise involved obtaining data from all three RTSP websites for NTWC Sri Lanka. Participants commented that they found the exercise useful. Participants suggested that RTSP Australia should include forecasts for all Indian Ocean countries on the same screen and add lines to the table to increase legibility.

3.2 DMO and Media Site Visits to National Agency for Disaster Management (BNPB) and Metro TV



Figure 4: DMO and media participants visit Metro TV.

3.3 Plenary Session: NTWC, DMO and Media

In the afternoon, a plenary session was held for all workshop participants. Peter Coburn presented feedback from the NTWC breakout session.

- Some NTWCs would like direct delivery of RTSP products over a secure mechanism.
- Some NTWCs would like “threatened” country names to be included in RTSP notification messages.
- RTSPs and NTWCs need SOPs for simultaneous events.
- RTSPs need to modify SOPs to handle events which are not the worst case (thrust), particularly for finalising such events (e.g. 11 April 2012 North Sumatra event).
- RTSPs request NTWCs to include a specific step in their SOPs for the reporting of their national warning status after each issue of their warnings.
- NTWCs reiterated the need for validation information on RTSP arrival time and wave height predictions.
- Member States should be encouraged to share near shore bathymetry data with RTSPs.

NTWC representatives from Pakistan, Bangladesh, Indonesia and Timor Leste reported on the impact of RTSP products on their SOPs.

Feedback from the DMO and Media plenary session was presented. Key issues included

- How to build trust from people to the warning: urban versus rural case
- Official versus unofficial ‘order for evacuation’
- The mandate to activate the siren should officially be given to whom (e.g. NDMO or local DMO)?
- Responsibility of DMO providing support infra warning chain

The media highlighted the need for identifying who is responsible at the national level for a media document related to tsunami preparedness and response.

Laura Kong discussed official versus unofficial information. She commented that information flow used to be linear but now it comes from multiple pathways (i.e. social media).

Irina Rafliana invited DMOs and the media to comment on how NTWCs SOP changes may affect them. DMOs need to develop SOPs for simultaneous events. The media requested direct access to RTSP products; this is not current policy and requires further discussion.

The day concluded with Tony Elliott outlining the activities of Day 4. The morning would consist of timeline based SOP development. The afternoon would involve presentations on how to plan, conduct and evaluate exercises followed by an introduction to the table top exercise of Day 5.

4 DAY 4 (26 September)

As a carry-over from agenda item 3.3, Laura Kong presented on the transmission of tsunami bulletins with emphasis on redundancy, equipment, cost, licencing, timeliness and resilience. Then she reviewed SOPs in relation to end-to-end tsunami warning systems.

4.1 NTWC, DMO and Media Meet Separately: Tsunami Warning Centre and Tsunami Emergency Response SOPs

Tony Elliott presented the groups for the SOP exercise, which included three NTWC, three DMO, and two media groups. The NTWC and DMO groups were 1) Indonesia, Pakistan and Oman, 2) Bangladesh, Myanmar and Thailand, and 3) Sri Lanka, Malaysia and Timor Leste. Group 1 would play the role of Indonesia focusing on a local event. Group 2 would play the role of Myanmar focusing on a regional event. Group 3 would play the role of Sri Lanka, also focusing on a regional event. The media were divided into two groups representing local and regional media.

Participants collaborated in the groups to develop SOPs and responses to media questions. The NTWC group developed timeline based SOPs for TWC operations. The DMO groups developed SOPs for tsunami emergency response. The media groups developed SOPs for broadcasting of emergency event news.

4.2 Plenary Session: Integrating SOPs on Warning Dissemination

Tony Elliott requested for Member States to provide their SOPs and bulletin examples (both templates and from real events) to the Secretariat.

Ardito Kodijat gave a presentation on exercises and drills in tsunami preparedness highlighting the importance of regularly exercising.

Presentations were given on the IOWave11 Exercise. Peter Coburn reviewed the communications results. Email was the most effective communication method followed by GTS, SMS and fax. The most commonly used NTWC communication method was fax which had a receipt rate of 37%. Dr Harkunti Rahayu presented on the documentation of the end-to-end processes and showed a video on IOWave11 in Indonesia and Thailand.

4.3 Introduction to Table-Top Exercise

Tony Elliott provided an introduction to the table top exercise including the scenario and rules of the game.

5 DAY 5 (27 September)

5.1 Table-Top Exercise

Exercise North Sumatra '13 commenced at 09:45 WIB (exercise time of 02:45 UTC). The scenario was a table top exercise in a compressed time of 2 hours and 15 minutes. The earthquake scenario was a M9.1 at 10 km depth off of Northern Sumatra. The groups formed on day 4 utilised the SOPs that were developed during earlier in the workshop. After the exercise, participants and observers were invited to present feedback on the exercise.



Figure 5: Meeting participants, trainers and staff during *Exercise North Sumatra '13*

The NTWC groups reported that they had a difficult time replying to requests for information during the first ~30 minutes of the exercise. During this time the primary focus was on assessing the event and preparing the initial bulletins. All NTWC groups commented that they followed their SOPs.

The DMOs commented that they wanted more information, more quickly from the NTWCs. The DMOs could not reply to requests for information promptly as they had not received official bulletins on the earthquake and (potential) tsunami threat. All DMOs reported that they followed their SOPs.

The local media commented that they wanted to receive more information faster and preferably at the same time or before sources of unofficial information. Confirmation of the earthquake was prompt. However, confirmation of the tsunami took longer than ideal.

The regional media commented that they received timely alerts from RTSPs and requests for interviews were accepted. There was some conflicting information and gaps in information such as issued warnings. Information provided during interviews was not specific.

5.2 Workshop Summary

A workshop summary was provided by Peter Coburn, Harkunti Rahayu, and Ardito Kodijat. Key points included:

- 1) The IOWave14 Exercise will take place in second half of 2014.
- 2) The next IOTWS communications test will be held on 12 December 2013.
- 3) The next SOP workshop will be held during first half of 2014 in Hyderabad for western and northern Indian Ocean countries.
- 4) The next ICG/IOTWS meeting is scheduled for early 2015.

Tony Elliott highlighted post-workshop undertakings of IOTWS Member States. These included:

- Reviewing/changing SOPs in preparation for IOWave14
- NTWCs and DMOs forwarding their SOPs to the ICG/IOTWS Secretariat
- Training staff in the new RTSP service and especially in their own new/modified SOPs

5.3 Presentation of Certificates

Tony Elliott and Dr Suhardjono presented certificates to meeting participants.

5.4 Closing

Closing remarks were given Tony Elliott and Dr Suhardjono.

The meeting concluded at 17:00 WIB.

Workshop presentations and the details of meeting participants are available on the UNESCO website at www.ioc-unesco.org/SOPworkshop13.

Annex 1

**IOTWS Regional Workshop on Standard Operating Procedures for Tsunami Warning and Emergency Response
for Northern and Eastern Indian Ocean Countries
23-27 September 2013
Jakarta, Indonesia**

AGENDA

Venue: Mercure Hotel

Start	End	Agenda	Speakers/Moderators	Participants	Method
		Day 1 (23 September 2013)		All	Plenary Session
		Opening Statements			
9:30	9:40	1. ICG/IOTWS Secretariat	Tony Elliott		
9:40	9:50	2. Head of UNESCO Indonesia / Representative	Dr. Hubert Gijzen		
9:50	10:05	3. Head of BMKG / Representative	Dr. Andi Eka Sakya		
10:05	10:30	Group Picture			
10:30	11:00	COFFEE BREAK and Group Picture			
11:00	11:30	Introduction to Workshop, Overview and Status of the IOTWS and Agenda Overview	Tony Elliott	All	Presentations and practical demonstrations of RTSP products
		Introduction to Regional Tsunami Service Provider (RTSP) Service and Demonstration of Products			
11:30	12:30	Introduction to Regional Tsunami Service Providers (RTSPs) - Roles and Responsibilities of RTSP: 1. RTSP Services 2. RTSP Bulletin Contents 3. RTSP Product Format 4. RTSP Dissemination Method 5. Demonstration of RTSP Products	Peter Coburn, Karyono, Patanjali Kumar	All	

12:30	13:00	Summary of IOTWS Communications Tests and RTSP Performance since 12 October 2012	Peter Coburn		
13:00	14:00	LUNCH			
14:00	15:00	Impact of RTSP Service on NTWC Products & SOPs: 1. Receiving, Interpreting and Disseminating warnings 2. Impact on SOPs 3. Feedback to RTSPs and Lessons Learned	NTWCs	All	Presentations from NTWCs, discussion and feedback from DMOs and media
15:00	15:30	COFFEE BREAK			
15:30	16:00	DMO perspectives on SOPs: current practice	Irina Rafliana, DMOs	All	Discussion
16:00	16:30	Media perspectives on SOPs: current practice	Ardito Kodijat, Walter Welz, Media organisations	All	Discussion
16:30	17:00	Tsunami Emergency Response SOPs - overview of stakeholder roles and coordination, event operations, timelines and checklists	Laura Kong	All	Presentation

Venue: Mercure Hotel

Start	End	Agenda	Speakers/Moderators	Participants	Method
		Day 2 (24 September 2013)			
9:00	9:15	Agenda Overview	Tony Elliott		
		Participants Divided into 3 Groups (NTWC, DMO & MEDIA)			
		NTWC			
9:15	10:30	Introduction to RTSP Services (I): 1. Coastal Forecast Zones and Spatial Data 2. RTSP Wave Height Predictions	Patanjali Kumar and Karyono	NTWC participants	
10:30	11:00	COFFEE BREAK			
11:00	12:30	Introduction to RTSP Services (II): 1. RTSP Arrival Time Predictions 2. RTSP Product Bulletins	Peter Coburn		

12:30	13:30	LUNCH			
13:30	14:15	Understanding Impacts on NTWC warning products on DMOs, media and public	Peter Coburn, Patanjali Kumar, Karyono	NTWC participants	
14:15	15:00	Decision Making (Near Field, Mid Field and Far Field Tsunami)	Panel discussion facilitated by Fauzi		
15:00	15:30	COFFEE BREAK			
15:30	17:00	Continued Decision Making (Near Field, Mid Field and Far Field Tsunami)	Panel discussion facilitated by Fauzi		
		Plenary Session for DMO and Media			
9:15	10:30	<ol style="list-style-type: none"> 1. The tsunami warning chain from NTWC to the community at risk: warning & guidance, stakeholders, decision making 2. Near field tsunamis: event timeline and dealing with uncertainties 3. Distant tsunamis: event timeline and dealing with uncertainties 4. Critical issues on links between NTWC, DMO and media 5. Community Preparedness and Education - the need for information and guidance 	Laura Kong Ardito Kodijat Harkunti Rahayu Henny Vidiarina Ardito Kodijat	DMO and Media participants	Presentations and discussions
10:30	11:00	COFFEE / TEA BREAK			
11:00	12:30	Exercises and Discussion: <ol style="list-style-type: none"> 1. Tsunami emergency response timeline - what happens, when? 2. Tsunami information - what is authoritative, official or informal? 3. What are tsunami event Frequently Asked Questions? 	Laura Kong, Ardito Kodijat	DMO and Media participants	Small group work and feedback
12:30	13:30	LUNCH			
		DMO			
13:30	14:30	The role of DMOs in the tsunami warning chain, tsunami preparedness & response	Harkunti Rahayu	DMO participants	Presentations and discussion
14:30	15:00	Good practices: <ol style="list-style-type: none"> 1. Indonesian Warning Service Guidebook 	Suhardjono		
15:00	15:30	COFFEE / TEA BREAK			

15:30	17:00	Good practices: 2. Local DMO SOP on Warning Dissemination: Aceh Case 3. New Zealand, Hawaii and Japan case studies 4. GIZ case study	Irina Rafliana Laura Kong Henny Vidiarina	DMO participants	Presentations and discussion
		Media	Ardito Kodijat and Walter Welz	Media participants	Presentations, group discussion and feedback
13:30	15:00	The role of Media in the tsunami warning chain, tsunami preparedness & response			
15:00	15:30	COFFEE / TEA BREAK			
15:30	17:00	Good practices: 1. Indonesian Media Handbook 2. Agreements & SOPs between NTWC, DMO and Media 3. Asia-Pacific Broadcasting Union (ABU)			

Venue: BMKG Warning Centre/BNPB/Metro TV/Mercure Hotel

Start	End	Agenda	Speakers/Moderators	Participants	Method
		Day 3 (25 September 2013)			
		Participants Divided into 3 Groups (NTWC, DMO & MEDIA)			
		NTWC (meeting at BMKG Warning Centre)			
8:00		Depart Mercure Hotel	Peter Coburn	NTWC participants	
9:00	10:30	Exercise I			
10:30	11:00	COFFEE BREAK			
11:00	12:00	Exercise II			
12:00	12:30	Return to Mercure Hotel			
12:30	13:30	LUNCH			

		DMO and Media Site visits			
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8:00	12:30	Site visit to National Agency for Disaster Management (BNPB) and Metro TV		DMO and Media Participants	
12:30	13:30	LUNCH			
		Plenary Session: NTWC, DMO AND MEDIA			
13:30	14:15	Report from NTWC to DMO and Media on impact of RTSP products for NTWCs SOPs	NTWCs	All	
14:15	15:00	Feedback from DMO and Media to NTWC	DMO and media		
15:00	15:30	COFFEE BREAK			
15:30	16:15	Emergency Communication considerations - robustness, reliability and redundancy	Laura Kong/Irina Rafliana		
16:15	17:00	Rapid and Effective Tsunami Warning Dissemination to Save Lives - Challenges for decision makers, media and the public	Laura Kong/Irina Rafliana		

Venue: Mercure Hotel

Start	End	Agenda	Speakers/Moderators	Participants	Method
		Day 4 (26 September 2013)			
9:00	9:15	Agenda Overview	Tony Elliott		
		NTWC, DMO, Media meet separately: Tsunami Warning Centre and Tsunami Emergency Response SOPs			
9:15	10:30	1. NTWC: TWC Operations, timeline based event SOPs 2. DMO: Stakeholder identification, Tsunami Emergency Response SOPs 3. Media: Identification of authoritative sources, SOPs for broadcasting of emergency event news	All trainers	Divide into NTWC, DMO and Media groups	Presentations, small group work, completion of templates
10:30	11:00	COFFEE / TEA BREAK			

		NTWC, DMO, Media meet separately: Tsunami Warning Centre and Tsunami Emergency Response SOPs			
11:00	11:30	1. NTWC: TWC Operations, timeline based event SOPs 2. DMO: Stakeholder identification, Tsunami Emergency Response SOPs 3. Media: Identification of authoritative sources, SOPs for broadcasting of emergency event news	All trainers	Divide into NTWC, DMO and Media groups	Presentations, small group work, completion of templates
		Plenary Session: Integrating SOPs on Warning Dissemination			
11:00	12:30	Lessons from Participants: Developing SOPs (cases from NTWCs, DMOs and Media)	Fauzi, Laura Kong. Selected participants as presenters	All	Discussion
12:30	13:30	LUNCH			
		Introduction to Table-Top Exercise			
13:30	15:00	How to Plan, Conduct and Evaluate Exercise	Laura Kong, Ardito Kodijat, Tony Elliott	All	
15:00	15:30	COFFEE / TEA BREAK			
15:30	16:15	The role of Indian Ocean Wave exercises	Peter Coburn, Harkunti Rahayu	All	
16:15	17:00	Introduction to Table Top Exercise : Scenario and Rules of the Game	Tony Elliott	All	

Venue: Mercure Hotel

Start	End	Agenda	Speakers/Moderators	Participants	Method
		Day 5 (27 September 2013)			
		Table-Top Exercise			
9:00	9:30	Pre-Exercise briefing and setup	Tony Elliott		
9:30	9:45	COFFEE/TEA BREAK			
9:45	11:45	Table-Top Exercise	Fauzi (controller), Tony Elliott, Laura Kong	RTSPs, NTWCs, DMOs, Media	NTWCs, DMOs and media divide into small groups
11:45	12:15	Post-Exercise report preparation	Exercise Groups	RTSPs, NTWCs, DMOs, Media	
12:15	14:00	LUNCH			
14:00	15:00	Exercise evaluation	Group Chairs	All	
15:00	15:30	COFFEE / TEA BREAK			
15:30	16:30	Workshop Summary and Preparation for IOWave14	Peter Coburn, Harkunti Rahayu	All	
16:30	16:45	Presentation of Certificates	TBD	All	
16:45	17:00	Closing	IOC, BMKG	All	

Annex 2

**IOTWS Regional Workshop on Standard Operating Procedures for Tsunami Warning
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23-27 September 2013
Jakarta, Indonesia**

MEETING PARTICIPANTS

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