

# UNESCO-IOC TRAINING IN SEISMOLOGY AND TSUNAMI WARNING CENTER STANDARD OPERATING PROCEDURES (TWC SOP)

25 - 29 August 2008  
Petaling Jaya, Malaysia  
Hosted by Malaysia Meteorological Department

## Objectives:

- The seismology module will stress fundamental principles in earthquake seismology, with exercises and hands-on activities on the real-time characterization of large earthquakes
- The TWC SOP module will focus on tsunami warning center standard operating procedures for tsunami early warning centers, with a summary provided on tsunami emergency response by agencies receiving alerts from the TWC. Small group activities are on the topics of information preparedness, such as for the media, and on TWC SOPs for routine and emergency (event) operations. A table-top/functional exercise will be conducted on Day 5 to enable the participants to demonstrate and use their learned skills in a real situation, and so prepare them to be able to develop and exercise their SOPs within their own centres.

**Participants:** 35 participants from Malaysia and ASEAN and Indian Ocean countries.

**UNESCO IOC Lecturers:** Yohko Igarashi, Seismologist, ITIC  
Laura Kong, Director, ITIC  
Masahiro Yamamoto, Senior Tsunami Advisor (from Day 2)

## PROVISIONAL AGENDA

Length (min)	Session	Start Time	End Time	Topic	Lecturer
	<b>1.0</b>			<b>DAY 1: OPENING, EARTHQUAKE SOURCE CHARACTERIZATION</b>	
				<b>MORNING:</b>	
30		8:30	9:00	Registration	MMD
60	<b>1.1</b>	9:00	10:00	Opening Ceremonies	MMD, IOC
				Photo Session	
15		10:00	10:15	COFFEE / TEA BREAK	
15	<b>1.2</b>	10:15	10:30	Introduction and Objectives	Laura Kong
				<b>EARTHQUAKE SOURCE CHARACTERIZATION</b>	
30	<b>1.3</b>	10:30	11:00	Real-time Earthquake Monitoring: Basic Principles and Standard Methods	Laura Kong
45	<b>1.4</b>	11:00	11:45	Lecture: Seismic Data Interpretation - Location	Yohko Igarashi
45	<b>1.5</b>	11:45	12:30	Exercise: Seismic Data Interpretation - Location	Igarashi, Kong
60		12:30	13:30	LUNCH	
				<b>AFTERNOON</b>	
45	<b>1.6</b>	13:30	14:15	Lecture: Seismic Data Interpretation - Magnitude	Yohko Igarashi
45	<b>1.7</b>	14:15	15:00	Exercise: Seismic Data Interpretation - Magnitude	Igarashi, Kong
15		15:00	15:15	COFFEE / TEA BREAK	
45	<b>1.8</b>	15:15	16:00	Lecture: Seismic Data Interpretation - Focal Mechanisms	Yohko Igarashi
45	<b>1.9</b>	16:00	16:45	Exercise: Seismic Data Interpretation - Focal Mechanisms	Igarashi, Kong

	<b>2.0</b>			<b>DAY 2: EARTHQUAKE SOURCE CHARACTERIZATION</b>	
				<b>MORNING</b>	
15	<b>2.1</b>	8:45	9:00	Review and Announcement	Laura Kong
30	<b>2.2</b>	9:00	9:30	Real-time Earthquake Monitoring for Tsunami Warning	Masahiro Yamamoto
60	<b>2.3</b>	9:30	10:30	Lecture and Exercise: Large Earthquake - location and magnitude	Igarashi, Kong, Yamamoto
15		10:30	10:45	COFFEE / TEA BREAK	
105	<b>2.3</b>	10:45	12:30	Lecture and Exercise: Large Earthquake - location and magnitude	Igarashi, Kong, Yamamoto
60		12:30	13:30	LUNCH	
				<b>AFTERNOON</b>	
90	<b>2.4</b>	13:30	15:00	Country Status on Tsunami Warning Operations and Standard Operating Procedures (Malaysia, Sri Lanka, Thailand, Vietnam) - 15-min Country presentations followed by 30-min General SOP Discussion	Malaysia, Sri Lanka, Thailand, Vietnam
150	<b>2.5</b>	15:00	17:30	Visit to Seismic Station	
	<b>3.0</b>			<b>DAY 3: TSUNAMI WARNING CENTRES: ROUTINE OPERATIONS, INFORMATION FLOW TO STAKEHOLDERS</b>	
				<b>MORNING</b>	
15	<b>3.1</b>	8:45	9:00	Review and Announcement	Laura Kong
30	<b>3.2</b>	9:00	9:30	National Tsunami Warning Centres – Overview on Standard Operating Procedures - Daily Operations, Flow Charts, Timelines	Laura Kong
30	<b>3.3</b>	9:30	10:00	TWC SOPs - Guidance and Samples for Routine operations, including procedures for operational readiness, data collection, and network maintenance	Masahiro Yamamoto
30	<b>3.4</b>	10:00	10:30	Breakout Groups: Using Templates to Create TWC SOPs (Roles & Responsibilities, Routine Operations, Ensuring Data Quality Control and Telecommunications Reliability, and other requirements)	Small Groups (Masahiro Yamamoto, Yohko Igarashi)
15		10:30	10:45	COFFEE / TEA BREAK	
30	<b>3.4</b>	10:45	11:15	Breakout Groups: Using Templates to Create TWC SOPs (Roles & Responsibilities, Routine Operations, Ensuring Data Quality Control and Telecommunications Reliability, and other requirements)	Small Groups (Masahiro Yamamoto, Yohko Igarashi)
30	<b>3.5</b>	11:15	11:45	Breakout Groups: Report back	
45	<b>3.6</b>	11:45	12:30	Warning Dissemination and Public Alerting mechanisms and technologies – Message Scheduling and Message Content, Warnings through GTS, RANET, and other existing reliable methods	Laura Kong
60		12:30	13:30	LUNCH	
				<b>AFTERNOON</b>	
30	<b>3.7</b>	13:30	14:00	Successful Tsunami Emergency Response: Understanding and acting on TWC messages, Evacuations, Education & Awareness	Laura Kong
30	<b>3.8</b>	14:00	14:30	TER SOPs: Case Studies - Japan (Wakayama, Shizuoka); Indonesia (Aceh)	Yohko Igarashi, Laura Kong
45	<b>3.9</b>	14:30	15:15	Warning Dissemination and Alerts – TWC and its responsibilities to decision-makers, media, and the public – US and Japan examples	Laura Kong, Masahiro Yamamoto
15		15:15	15:30	COFFEE / TEA BREAK	
30	<b>3.10</b>	15:30	16:00	Discussion and Feedback: Information Flow SOPs - Media and Public Information: Media Plans, Frequently-asked questions, and Information flow SOPs during an tsunami	Participants (Laura Kong)

				event	
30	<b>3.11</b>	16:00	16:30	Breakout Groups: Information Flow SOPs - Media and Public Information: Report back from Media SOP breakout	Participants (Laura Kong)
30	<b>3.12</b>	16:30	17:00	Breakout Groups: Report back	
			19:45	Dinner – Rebung Restaurant	MMD
	<b>4.0</b>			<b>DAY 4: TSUNAMI WARNING CENTRE SOPS FOR CRISIS OPERATIONS (EVENTS)</b>	
				<b>MORNING</b>	
15	<b>4.1</b>	8:45	9:00	Review and Announcement	
30	<b>4.2</b>	9:00	9:30	Lessons Learned from past tsunami - Use of timelines for assessing information flow effectiveness	Laura Kong, Masahiro Yamamoto
30	<b>4.3</b>	9:30	10:00	TWC Standard Operating Procedures - Timeline-driven activities and prodecures during event alarms: Guidance and Samples for Crisis (Event) operations, including procedures for real-time data collection, event alarm response and warning dissemination	Masahiro Yamamoto
30	<b>4.4</b>	10:00	10:30	Pacific Tsunami Advisory Service (South China Sea) and Interim Indian Ocean Tsunami Advisory Service – Standard Operating Procedure (SOP)	Laura Kong
15		10:30	10:45	COFFEE / TEA BREAK	
30	<b>4.5</b>	10:45	11:15	TWC Operations – Active seismic monitoring and real-time earthquake source characterization	Masahiro Yamamoto
45	<b>4.6</b>	11:15	12:00	TWC Operations - Sea level monitoring, tsunami confirmation and wave forecast	Laura Kong
30	<b>4.7</b>	12:00	12:30	Creating SOPs: Timeline-driven SOPs - Using Templates to Develop Timeline of Processes and Actions as SOPs (Messages, Checklists, Information Dissemination) Breakout and Group Discussion on improving present country SOPs	Small Groups (Masahiro Yamamoto, Laura Kong, Yohko Igarashi)
60		12:30	13:30	LUNCH	
				<b>AFTERNOON</b>	
105	<b>4.7</b>	13:30	15:15	Creating SOPs: Timeline-driven SOPs - Using Templates to Develop Timeline of Processes and Actions as SOPs (Messages, Checklists, Information Dissemination) Breakout and Group Discussion on improving present country SOPs	Small Groups (Masahiro Yamamoto, Laura Kong, Yohko Igarashi)
15		15:15	15:30	COFFEE / TEA BREAK	
30	<b>4.8</b>	15:30	16:00	Presentation of Break out Group SOPs	Breakout Group Chairs
30	<b>4.9</b>	16:00	16:30	Use of Exercises in Tsunami Preparedness: Exercise Development / Regional and National Exercises and Post-Exercise Evaluations	Laura Kong
15	<b>4.10</b>	16:30	16:45	Table Top / Functional Exercise – Background and Scenario for Day 5	Exercise Controllers
	<b>5.0</b>			<b>DAY 5: TABLE TOP / FUNCTIONAL EXERCISE, SUMMARY, CLOSING</b>	
				<b>MORNING</b>	
15	<b>5.1</b>	8:45	9:00	Review and Announcement	Laura Kong
30	<b>5.2</b>	9:00	9:30	Table Top / Functional Exercise Set-up according to Stakeholder Warning and Response Groups	Exercise Controllers
60	<b>5.3</b>	9:30	10:30	Table Top Exercise - Timeline-driven decision making and discussion	Small Groups
15		10:30	10:45	COFFEE / TEA BREAK	
60	<b>5.3</b>	10:45	11:45	Table Top / Functional Exercise - Timeline-driven decision	Small Groups

				making and discussion	
30	<b>5.4</b>	11:45	12:15	Table Top / Functional Exercise – Evaluation	Exercise Controllers
135		12:15	14:30	LUNCH	
				<b>AFTERNOON</b>	
60	<b>5.5</b>	14:30	15:30	Table Top / Functional Exercise – Evaluation (cont'd), Summary and Next Steps	Breakout Group Chairs, Exercise Controllers and Observers
30	<b>5.6</b>	15:30	16:00	Workshop Summary Discussion	All
				<b>CLOSING CEREMONIES</b>	
15	<b>5.7</b>	16:00	16:15	Presentation of Certificates	All
15	<b>5.8</b>	16:15	16:30	Closing	MMD, IOC
			16:30	COFFEE / TEA	All