



UNESCO-IOC

Strengthening Tsunami Warning and Emergency Responses: Training Workshop on the Development of End-to-End Tsunami Standard Operating Procedures (SOPs)

8-10 December 2008

Institute of Meteorology, Hydrology and Environment
Hanoi, Vietnam

SESSION PLAN

Session	Start Time	End Time		Session Chair Lecturer
1-3			DAY 1:	
1			MORNING	Cunneen
	8:30	9:00	Registration	IOC, Vietnam
1.1	9:00	9:20	Opening Ceremonies	IOC, Vietnam
1.2	9:20	9:30	Course Overview	Kong
1.3	9:30	9:35	Logistics and other administrative items	Cunneen
2			Tsunami Warning and Emergency Response – Overview	Solidum,
2.1	9:35	10:15	End-to-End Tsunami Warning and Emergency Response – Overview <u>Objectives / Outcomes</u> Review the components of the end-to-end tsunami warning followed by response by public officials and the public <u>Topics</u> <ul style="list-style-type: none"> Requirements and activities of tsunami warning centres Requirements and activities of tsunami disaster management and emergency response organizations and the public sector during an alarm <u>Methodology (PowerPoint, CD, DVD, Other)</u> PowerPoint <u>Handouts / Reference Materials</u> <ul style="list-style-type: none"> Tab 4: TEWS Overview, especially <ul style="list-style-type: none"> End-to-End Tsunami Warning – An overview A Global Tsunami Reduction Strategy: Building Effective Tsunami Warning and Mitigation Systems End to End Tsunami Warning - Stakeholders, Roles and Responsibilities, Standard Operating Procedures, and their Linkage Developing Early Warning Systems: A Checklist End-to-end Tsunami Warning Considerations: Public Alert Systems Alerting Technologies Tsunami Education and Awareness Tab 5: Tsunami Warning Centres – An overview Tab 7: 10 Steps to Enable a Successful Tsunami Emergency Response 	Kong
	10:15	10:45	COFFEE / TEA BREAK	

2.2	10:45	11:30	Earthquake and Tsunami Science for tsunami warning <u>Objectives / Outcomes</u> <ul style="list-style-type: none"> Learn the difference between tsunami and normal sea wave Learn key science information for tsunami warning decision-making <u>Topics</u> <ul style="list-style-type: none"> Mechanism of tsunami source Fault type and source dimension Propagation speed Energy of the tsunami; Deep and Shallow Sea Tsunami Simulation Other sources and their frequency; volcano, landslide <u>Methodology (PowerPoint, CD, DVD, Other)</u> <ul style="list-style-type: none"> PowerPoint Video: Save Your Lives from Tsunami! JMA, 2004 <u>Handouts / Reference Materials</u> <ul style="list-style-type: none"> Tab 1: Tsunami Science and Modelling – Essentials Tsunami Awareness materials (hard copy and DVD: <ul style="list-style-type: none"> Tsunami, The Great Waves Tsunami Glossary 2008 Electronic: <ul style="list-style-type: none"> PTWS Operational Users Guide, Annex I: Tsunamis, draft 2007 Understanding Tsunamis, 2006 (P.Liu and L. Kong) TsunamiTeacher (DVD) 	Yamamoto
2.3	11:30	12:00	End-to-end Tsunami Warning – Stakeholders, Roles and Responsibilities, Standard Operating Procedures, and their linkage <u>Objectives / Outcomes</u> <ul style="list-style-type: none"> Provide a holistic view of tsunami warnings. Understand the types of warnings, the stakeholders in tsunami warning, inter-dependencies and relationships and how each relates to SOPs. <u>Topics</u> <ul style="list-style-type: none"> Types of warning Stakeholders Relationships – stakeholders and SOPs What activities are typically covered by SOPs <u>Methodology (PowerPoint, CD, DVD, Other)</u> PowerPoint <u>Handouts / Reference Materials</u> <ul style="list-style-type: none"> Tab 4: End-to-end Tsunami Warning – Stakeholders, Roles and Responsibilities, Standard Operating Procedures, and their Linkage 	Cunneen
	12:00	13:15	LUNCH	
			AFTERNOON	
3			Tsunami Risk Mitigation in the South China Sea region	Kong
3.1	13:15	14:00	Tsunami Hazards in the South China Sea region <u>Objectives / Outcomes</u> <ul style="list-style-type: none"> Summarize the earthquake and tsunami hazard of the South China Sea region <u>Topics</u> <ul style="list-style-type: none"> Seismicity and Tsunami history Tsunami hazard based on observations and modeling <u>Methodology (PowerPoint, CD, DVD, Other)</u> PowerPoint and video (?) <u>Handouts / Reference Materials</u> To be determined	Solidum
3.2	14:00	15:00	Case Study: Philippines Tsunami Risk Mitigation <u>Objectives / Outcomes</u> <ul style="list-style-type: none"> Learn how the Philippines is addressing their local and distant tsunami risks <u>Topics</u> <ul style="list-style-type: none"> Hazard and risk assessment Warning – monitoring, evaluation, and disseminations Emergency response and preparedness – national and local 	Solidum

			<ul style="list-style-type: none"> Mitigation – hard and soft countermeasures <u>Methodology (PowerPoint, CD, DVD, Other)</u> PowerPoint <u>Handouts / Reference Materials</u> Philippines informational materials	
	15:00	15:30	COFFEE / TEA BREAK	
3.3	15:30	16:15	Tsunami warning and emergency response in Vietnam: Current State	Nguyen Hong Phuong
3.4	16:15	17:00	Vietnam Tsunami Hazards based on Pre-calculated Tsunami Scenarios	Vu Thanh Ca

			DAY 2:	
			MORNING	
4			Tsunami Warning Center Operations	Cunneen
4.1	8:30	9:15	Lessons Learned from past tsunami - Pacific and Indian Ocean examples <u>Objectives / Outcomes</u> <ul style="list-style-type: none"> Discuss and provide examples of how every tsunami is unique and has unique challenges Highlight the necessity for preparedness Illustrate the challenges of providing alerts for tele-tsunamis Discuss TWC Alert contents - evacuate or just clear the beach? <u>Topics</u> <ul style="list-style-type: none"> 1986 and 1994 – Hawaii – warning and evacuation 1998 Papua New Guinea 1993 Okushiri, Japan 2005 Taiwan 2006 Tonga, Java, Kurils 2007 Solomon Other lessons <u>Methodology (PowerPoint, CD, DVD, Other)</u> PowerPoint <u>Handouts / Reference Materials</u> Tab 6: Lessons Learned from Past Tsunami; Case Study: 2006 Java Tsunami	Kong
4.2	9:15	10:00	Pacific Tsunami Advisory Service – Standard Operating Procedures of the PTWC and JMA NWPTAC (South China Sea) <u>Objectives / Outcomes</u> Understand the service and meanings of messages from the PTWC, WC/ATWC, and JMA NWPTAC <u>Topics</u> <ul style="list-style-type: none"> SOPs and criteria for action Message content and interpretation Warning and Watch; definitions for Pacific NWPTAC: tsunami height information Tsunami travel time calculations Cancellation <u>Methodology (PowerPoint, CD, DVD, Other)</u> PowerPoint <u>Handouts / Reference Materials</u> <ul style="list-style-type: none"> Tab 3: PTWS Information Sheet Tab 5: <ul style="list-style-type: none"> Tsunami Message Product Codes – WMO Headers PTWS Operational Users Guide, Annex III: Interpretation of PTWC messages and Emergency response Guidance PTWS Operational Users Guide - PTWS System, including PTWC and JMA Communications Methods and Message Content (draft Nov 2007) (complete Guide electronic)	Yamamoto
	10:00	10:30	COFFEE / TEA BREAK	

4.3	10:30	11:15	National Tsunami Warning Centres – Overview on Standard Operating Procedures - Daily Operations, Flow Charts, Timelines <u>Objectives / Outcomes</u> Identify the routine and emergency activities of TWC, and how these are most efficiently described through written, pre-decided standard operating procedures in order to carry out rapid, efficient, and responsible tsunami warning response. <u>Topics</u> <ul style="list-style-type: none"> • What are SOPs • What activities are typically covered by SOPs • Examples <u>Methodology (PowerPoint, CD, DVD, Other)</u> PowerPoint <u>Handouts / Reference Materials</u> Tab 5: <ul style="list-style-type: none"> ○ Tsunami Warning Centres – An overview ○ National Tsunami Warning Centre SOP Templates - 4 NTWC Cases: Seismic / No Seismic Monitoring - Local / Distant Tsunami Threats ○ NTWC SOP (Guidance and Samples) – draft Dec 2008 ○ TWC Operations Manual – excerpt PTWC example 	Kong
4.4	11:15	12:00	National Tsunami Warning Centres – Overview on Standard Operating Procedures - Daily Operations, Flow Charts, Timelines, Case Study: Philippines <u>Objectives / Outcomes</u> Learn the TWC SOPs used by the Philippines <u>Topics</u> <ul style="list-style-type: none"> • PHIVOLCS Tsunami Warning Operations • Event SOPs for local and distant tsunamis • Routine SOPs <u>Methodology (PowerPoint, CD, DVD, Other)</u> PowerPoint <u>Handouts / Reference Materials</u> To be determined	Solidum
	12:00	13:15	LUNCH	
			AFTERNOON	
4			Tsunami Warning Center Operations	Solidum
4.5	13:15	14:00	TWC Operations and SOPs – Active seismic monitoring and real-time earthquake source characterization <u>Objectives / Outcomes</u> Review TWC seismic operations for real-time earthquake monitoring and source characterization <u>Topics</u> <ul style="list-style-type: none"> • Seismic network • Real time data processing system • Definition and criteria of different alert levels / warnings • Development of SOP <u>Methodology (PowerPoint, CD, DVD, Other)</u> PowerPoint <u>Handouts / Reference Materials</u> <ul style="list-style-type: none"> • Tab 5: <ul style="list-style-type: none"> ○ NTWC SOP Templates - 4 NTWC Cases: Seismic / No Seismic Monitoring - Local / Distant Tsunami Threats ○ NTWC SOP (Guidance and Samples) – draft Dec 2008 ○ PTWS Operational Users Guide, Annexes II Earthquake Source Characterization ○ TWC Operations Manual – excerpt PTWC example ○ IASPEI New Manual Seismological Observatory Practice, 2002 + corrections (electronic) • Tab 11: Tsunami Warning Decision Support Tools – PTWC SMS Alerts, earthquake monitoring, tsunami databases 	Yamamoto

4.6	14:00	15:00	TWC Operations and SOPs - Sea level monitoring, tsunami confirmation and wave forecast <u>Objectives / Outcomes</u> Review TWC sea level and wave forecast operations procedures <u>Topics</u> <ul style="list-style-type: none"> • Sea Level network • Real time data processing system • Tsunami Travel Time calculation • Tsunami Database by tsunami simulation • Definition and criteria of different alert levels / warnings • Cancellation based on non-danger • Development of SOP <u>Methodology (PowerPoint, CD, DVD, Other)</u> PowerPoint <u>Handouts / Reference Materials</u> <ul style="list-style-type: none"> • Tab 5: <ul style="list-style-type: none"> ○ NTWC SOP Templates - 4 NTWC Cases: Seismic / No Seismic Monitoring - Local / Distant Tsunami Threats ○ NTWC SOP (Guidance and Samples) – draft Dec 2008 ○ PTWS Operational Users Guide, Annexes IV Sea Level Measurement, and V Methods of Tsunami Travel Time Calculation by PTWC, WC/ATWC, and JMA ○ TWC Operations Manual – excerpt PTWC example • Manual on Sea Level Measurement and Interpretation, Vol IV, An update to 2006, IOC Manuals and Guides 14 • Tab 11: Tsunami Warning Decision Support Tools – Sea Level Monitoring (IOC, Tide Tool), tsunami databases 	Kong
	15:00	15:30	COFFEE / TEA BREAK	
4.7	15:30	16:30	Breakout Groups: Using Templates to Develop Timeline of Processes and Actions as SOPs (Detection, Evaluation, Messages, Dissemination) <u>Objectives / Outcomes</u> Develop a TWC Timeline of detection, alarming, evaluation, decision-making, messaging, dissemination, and cancellation <u>Session Instructions:</u> In Groups, develop SOPs using information in NTWC SOP Templates and NTWC SOP (Guidance and Samples) Ch 3 and 4. <ul style="list-style-type: none"> • Identify timeline actions based on number of minutes after earthquake occurrence • Identify appropriate processes and techniques to be used to detect events and evaluate the threat • Consider and create standard Checklists and pre-scripted Message templates as a way to improve response • Identify how the public and media will be informed <u>Methodology (PowerPoint, CD, DVD, Other)</u> Group Discussion <u>Handouts / Reference Materials</u> Tab 5: <ul style="list-style-type: none"> ○ NTWC SOP Templates - 4 NTWC Cases: Seismic / No Seismic Monitoring - Local / Distant Tsunami Threats ○ NTWC SOP (Guidance and Samples) – draft Dec 2008 ○ PTWS Operational Users Guide, Annex III: Interpretation of PTWC messages and Emergency response Guidance Tab 4: <ul style="list-style-type: none"> ○ End to End Tsunami Warning - Stakeholders, Roles and Responsibilities, Standard Operating Procedures, and their Linkage End-to-end Tsunami Warning Considerations: Public Alert Systems <ul style="list-style-type: none"> ○ Tab 7: 10 Steps to Enable a Successful Tsunami Emergency Response 	All (Kong)
4.8	16:30	17:00	Break out Groups - Presentations of SOPs Presentation and Discussion on TWC SOPs	All

			DAY 3:	
			MORNING	Cunneen
5			Tsunami Emergency Response and Preparedness	
5.1	8:30	9:15	10 Steps to Enable a Successful Tsunami Emergency Response <u>Objectives / Outcomes</u> <ul style="list-style-type: none"> Learn the key components to enable a rapid tsunami emergency response Understand short term and long term planning considerations <u>Topics</u> <ul style="list-style-type: none"> Description of 10 Steps Terminologies <u>Methodology (PowerPoint, CD, DVD, Other)</u> Powerpoint <u>Handouts / Reference Materials</u> <ul style="list-style-type: none"> Tab 7: 10 Steps to Enable a Successful Tsunami Emergency Response TsunamiTeacher (DVD) 	Solidum
5.2	9:15	10:00	Warning Dissemination and Public Alerting mechanisms and technologies <u>Objectives / Outcomes</u> Describe effective and reliable methods for timely dissemination of tsunami warnings to authorities and for dissemination to local communities <u>Topics</u> <ul style="list-style-type: none"> What is the time order of information that should be given for tsunami warnings by TWC? What should be contained in each message? What communication methods are being used and what are their timeliness and reliability? Examples of downstream alerting <u>Methodology (PowerPoint, CD, DVD, Other)</u> PowerPoint <u>Handouts / Reference Materials</u> <ul style="list-style-type: none"> PTWS Operational Users Guide, Section 4.9 PTWC Product Dissemination Services (draft Nov 2007) (electronic) Tab 4: <ul style="list-style-type: none"> End-to-end Tsunami Warning Considerations: Public Alert Systems Alerting Technologies Examples of systems (Japan, USA, Malaysia, French Polynesia, and others) (electronic) 	Kong
	10:00	10:30	COFFEE / TEA BREAK	
5.3	10:30	11:15	Tsunami Emergency Response Case Studies - Understanding and acting on TWC Messages, DMO Actions (including Alerting, Evacuation, and Safe Return) and Use of Timelines in Emergency Response: Wakayama, Japan (local threat), Hawaii, USA (distant threat) <u>Objectives / Outcomes</u> <ul style="list-style-type: none"> Interpret TWC Messages into emergency response actions Understand the concepts and processes to enable a successful tsunami coastal evacuation Identify stakeholder agencies to produce evacuation products Understand the timeline differences in reacting to local, regional, distant tsunami scenarios Understand how SOPs implement rapid notification and implementation of evacuation steps <u>Topics</u> <ul style="list-style-type: none"> Timelines & Flowcharts Evacuation, Signage & maps, examples and standards Wakayama SOPs Hawaii SOPs <u>Methodology</u> PowerPoint <u>Handouts / Reference Materials</u>	Yamamoto, Kong

			<ul style="list-style-type: none"> • Tab 5: PTWS Operational Users Guide, Annex III. • Tab 7: NZ SOP; Tab 8: Hawaii response, Wakayama response • Tab 8: <ul style="list-style-type: none"> ○ Hawaii, USA: State Civil Defense Distant and Local Tsunami Response ○ Wakayama Prefecture, Japan: Local Government Tsunami Emergency Response Standard Operating Procedures 	
5.4	11:15	12:00	<p>Use of Exercises in Tsunami Preparedness: Exercise Development / Regional and National Exercises and Post-Exercise Evaluations, Exercise Pacific Wave 06 and Exercise Pacific Wave 08</p> <p><u>Objectives / Outcomes</u></p> <ul style="list-style-type: none"> • Emphasize the importance of stakeholder groups to conduct routine tsunami training exercises • Understand the different types of exercises <p><u>Topics</u></p> <ul style="list-style-type: none"> • Goal of tsunami training exercises • Five types of exercises and examples of exercise planning • Review results of PacWave06 and PacWave08 • Philippines examples of tsunami drills <p><u>Methodology (PowerPoint, CD, DVD, Other)</u></p> <p>PowerPoint and video of examples of different drills</p> <p><u>Handouts / Reference Materials</u></p> <p>Tab 9:</p> <ul style="list-style-type: none"> • Exercise Types • Tabletop Exercise Development Steps • Exercise Planning Templates – US Department of Homeland Security Exercise and Evaluation Program, 2006 • Tsunami Warning Communications Exercise: State of California Exercise Program, 28 March, 2007 	Solidum
	12:00	13:15	LUNCH	
			AFTERNOON	Solidum
5.5	13:15	14:00	<p>Tsunami Preparedness - Mitigation, Education and Awareness + video</p> <p><u>Objectives / Outcomes</u></p> <ul style="list-style-type: none"> • Emphasize the importance of education and awareness. • Understand concept of preparedness; learn different type off awareness and education tools and format • Learn about hard countermeasures to reduce the impact of tsunami <p><u>Topics</u></p> <ul style="list-style-type: none"> • Issues in education and awareness • Education format and activities • Outreach and public policies • Evacuation routes. sheltering; vertical evacuation, etc <p><u>Methodology (PowerPoint, CD, DVD, Other)</u></p> <p>PowerPoint and video</p> <p><u>Handouts / Reference Materials</u></p> <ul style="list-style-type: none"> • Tab 4: Tsunami Education and Awareness • Tab 11: Tsunami Awareness and Educational Material examples (electronic and hard copy) • Tab 8: <ul style="list-style-type: none"> ○ Shizuoka Prefecture, Japan: Earthquake and Tsunami Disaster Prevention ○ Vertical Evacuation ○ Small Boat Safety • Supporting electronic documents (Education, Awareness, Preparedness, Mitigation) 	Cunneen
5.6	14:00	15:00	<p>Roles of Media in Tsunami Warning – Japan and US examples</p> <p><u>Objectives / Outcomes</u></p> <p>Highlight the importance of collaboration and good communication with mass media for quick dissemination of warning and for not</p>	Kong, Yamamoto

			<p>generating unnecessary rumor/panic</p> <p><u>Topics</u></p> <ul style="list-style-type: none"> • Quick broadcasting immediately after an earthquake and for disseminating tsunami warning messages • Emergency Alert Systems and involvement of the media as part of effective dissemination system • Role of the media in public education • Media plan for engaging and interacting; example products (news releases, interview, TV, print tips, fact sheets, FAQa, press kits) <p><u>Methodology (PowerPoint, CD, DVD, Other)</u></p> <p>Powerpoint and video of TV broadcasting during an earthquake</p> <p><u>Handouts / Reference Materials</u></p> <p>Tab 10:</p> <ul style="list-style-type: none"> • Media Plan and Template • Case Study: Japan and USA, 15 Nov 2006, Kurils • Role of Media in Alert Dissemination • Case Study: Japan, NHK • Case Study: Hawaii, USA – Emergency Alert System 	
	15:00	15:30	COFFEE / TEA BREAK	
5.7	15:30	16:15	<p><u>Objectives / Outcomes</u></p> <p>Discuss priorities, needs, and resources for engaging the media as a partner in warning and awareness building</p> <p><u>Topics</u></p> <ul style="list-style-type: none"> • Media / Public Information Plan • FAQs and other key documents for during events (crisis) and non-event (awareness campaigns) • For events, what are activities (part of the SOPs) to ensure information flow before, during, and immediately after the event <p><u>Methodology (PowerPoint, CD, DVD, Other)</u></p> <p>Group Discussion</p> <p><u>Handouts / Reference Materials</u></p> <p>Tab 10: Media Plan and Template and examples</p>	All (Kong)
5.8	16:15	16:30	Workshop Summary Discussion	All
6			CLOSING CEREMONIES	Cunneen
6.1	16:30	16:45	Presentation of Certificates	All
6.2	16:45	17:00	Closing	IOC, Vietnam