



United Nations  
Educational, Scientific and  
Cultural Organization



Intergovernmental  
Oceanographic  
Commission



The International  
Tsunami Information  
Center



National Oceanic  
and Atmospheric  
Administration

## **INTERNATIONAL TSUNAMI INFORMATION CENTER (ITIC)**

### **ITIC TRAINING PROGRAMME HAWAII (ITP-HAWAII) TSUNAMI EARLY WARNING AND MITIGATION SYSTEMS**

**30 August – 10 September 2010**

**Honolulu, Hawaii USA**

#### **COURSE MANUAL**

#### **DETAILED TABLE OF CONTENTS**

*(Electronic files in Tsunami Support Docs)*

### **COURSE MANUAL #1**

#### **1. Training Overview**

- a. ITP-Hawaii 2010 Overview
- b. Agenda
- c. Participants
- d. Lecture Team
- e. Logistics
- f. Course Manual Background and Acknowledgements

#### **2. IOC Systems: Pacific Tsunami Warning and Mitigation System**

- a. PTWS Information Sheet, Member States, Organizational Structure
- b. PTWS Operational Users Guide, Introduction and Administration, August 2010  
(electronic only, electronic document)
- c. PTWS Organizations (electronic only)
  - i. ITIC Activities Summary, January 2008 – July 2009
  - ii. Pacific Tsunami Warning Center (PTWC)  
History and Responsibilities  
PTWC Intersessional Report, October 2007 – February 2009
  - iii. Japan Meteorological Agency  
NWPTAC Intersessional Report, October 2007 – February 2009
- d. ICG/PTWS-XXIII (electronic only, documents at [http://ioc-unesco.org/index.php?option=com\\_oe&task=viewEventRecord&eventID=409](http://ioc-unesco.org/index.php?option=com_oe&task=viewEventRecord&eventID=409))
  - i. Executive Summary
  - ii. Annex IV: Recommendations
  - iii. Annex V: PTWS Medium Term Strategy 2009-2013
  - iv. Annex VI: PTWS Working Group Structure
  - v. PTWS Implementation Plan (draft)
- e. IOC
  - i. Information Sheet

- ii. One Planet One Ocean, Sustainable Development of Oceans and Coasts:  
A Commitment of 129 States, IOC, 2002

### **3. Tsunami Early Warning System: Overview**

- a. End-to-End Tsunami Warning – An Overview
- b. Tsunami Science and Modelling – Essentials
- c. A Global Tsunami Reduction Strategy: Building Effective Tsunami Warning and Mitigation Systems (Nov 2007)
- d. Guarding against tsunamis: What does it mean to be ready? (Geotimes, Nov 2006)
- e. End to End Tsunami Warning - Stakeholders, Roles and Responsibilities, Standard Operating Procedures, and their Linkage
- f. Concept of Operations for End-to-End Tsunami Response and Standard Operating Procedures for Tsunami Early Warning and Mitigation System
- g. Types of documentation to support Global Tsunami Warning Systems and/or National Tsunami Warning Centre and Tsunami Emergency Operations Centre operations
- h. Developing Early Warning Systems: A Checklist (ISDR, EWC III, 2006)
- i. End-to-end Tsunami Warning Considerations: Public Alert Systems
- j. Tsunami Education and Awareness

### **4. Hawaii Tsunami Warning and Mitigation System**

- a. Overview
- b. Tsunami Modeling and Inundation – Hawaii experience
- c. Coordination and Advice
  - i. Tsunami Technical Review Committee
  - ii. Hawaii Earthquake Advisory Committee
  - iii. Hawaii SCD Volunteer Programs
- d. Hawaii Emergency Alert System (EAS)
  - i. EAS Plan
- e. Earthquake / Sea Level Monitoring and Tsunami Warning
  - i. Pacific Tsunami Warning Center (electronic only)
  - ii. US Geological Survey (electronic only)
  - iii. University of Hawaii Sea Level Center
- f. Tsunami Emergency Response
  - i. Hawaii State Civil Defense (SCD) (electronic only)
  - ii. Department of Emergency Management, City & County of Honolulu  
Overview (electronic only), Tsunami Preparedness, Sirens
  - iii. Hawaii County Civil Defense
- g. Preparedness, Mitigation, Awareness
  - i. Evacuation and Sheltering – maps, policies, SOPs  
City and County of Honolulu
  - ii. Boat Safety  
US Coast Guard Hawaii Draft Tsunami Plan, 1993  
Hawaii Boaters Hurricane Safety Manual: Tsunami Section, 1998  
(see CM #2, Tab 3)
  - iii. Land use – Hilo, Hawaii
  - iv. Pacific Tsunami Museum (hard copy brochure, walking tour)
  - v. “What to do” – Hawaii safety flyers

## **5. Earthquake and Tsunami Science, Hazards and Risks**

- a. **Seismology**
  - i. Earthquake Seismology – An Overview, USGS, ITIC, 2008
  - ii. IRIS Education & Outreach (1 page each)
    - Why to Earthquakes Happen?
    - How Often Do Earthquakes Occur?
    - Seismic Events of Special Interest (pre-2004)
    - Exploring the Earth using Seismology
    - How are Earthquake Located?
    - How Does a Seismometer Work?
    - Sumatra – Andaman Island Earthquake (Mw9.0) recorded by GSN
  - iii. Earthquakes, 5<sup>th</sup> Edition, 2006 Centennial Update The 1906 Big One, Bruce Bolt, 2003 (hard copy book)
- b. **Tsunamis**
  - i. **Tsunami The Great Waves, IOC, 2008 (separate packet)**
  - ii. Tsunami Science and Modeling – Essentials (see CM #1, Tab 3)
  - iii. **Tsunami: Understanding the Giant Wave, Philip Liu, rev 2006 (Laura Kong)**
  - iv. Tsunami and Seiche, Earthquake Engineering Handbook, Chapter 9, 2002
  - v. Tsunamis, The Sea, Volume 15, 2008 (hard copy book)
- c. **Hazards and Risks**
- d. Tsunami Modeling and Inundation – Hawaii experience
  - i. Tsunami Modeling and Inundation – Hawaii experience (see CM #1, Tab 4)
  - ii. TsuDig Historical Tsunami Database GIS Tool (see CM #2, Tab 1) and WDC/NGDC Tsunami Historical Database web site

## **6. Tsunami Warning Center Operations: Case Studies, Guidance, Templates**

- a. Tsunami Warning Centres – An Overview
  - b. Tsunami Message Product Codes – WMO Headers
  - c. National Tsunami Warning Centre SOP Templates - 4 NTWC Cases: Seismic / No Seismic Monitoring - Local / Distant Tsunami Threats
  - d. NTWC Checklist for TWC operations (electronic only)
  - e. NTWC SOP (Guidance and Samples) – draft 2008 (electronic only)
  - f. PTWC Tsunami Warning Centre Operations Manual (electronic only)
  - g. PTWS Operational Users Guide – Selected Annexes (electronic only, see CM #1, Tab 2)
    - i. PTWS Operational Users Guide - TWC Operations Overview
    - ii. Annex III. Interpretation of PTWC Messages and Emergency Response Guidance
    - iii. Annex IV. Sea Level Measurement
    - iv. Annex VI. Tsunami Wave Forecasting
- System, processing, products, flow charts, checklists, and abbreviated SOPs (cheat sheets) (electronic only)
- h. Lessons Learned from Past Tsunami: Highlights from Indian and Pacific Oceans
  - i. Case Study – Local Tsunami: 17 July 2006, Java, Indonesia

## **7. Tsunami Warning Decision Support Tools**

- a. ITIC Tsunami Warning Decision Support Tools – Overview
- b. Real-time Earthquake Monitoring and Tsunami Message Display (CISN)  
CISN Quick Install
- c. Tsunami Alerts (RANET Heads-up SMS, Tsunami Bulletin Board, RSS feeds)
- d. Sea level monitoring (Tide Tool, IOC Sea Level Monitoring Facility web site)  
TideTool Quick Info sheet (see TWTools DVD)  
PTWC Sea Level Networks – Pacific, Indian Ocean, Atlantic (see TWTools DVD)
- e. Tsunami Travel time calculation (TTT, TsuDig) overview,  
TTT Readme and ttt\_auto Readme documents  
TTT Quick Info sheet (see TWTools DVD)
- f. Historical Tsunami Databases (WDC/NGDC TsuDig, online web site tools)

## **COURSE MANUAL #2**

### **1. Tsunami Emergency Response – Guidance and Templates**

- a. 10 Steps to Enable a Successful Tsunami Emergency Response
- b. Glossary – Disaster Management Organizations
- c. Tsunami Planning Template
- d. Case Study: New Zealand Tsunami Advisory and Warning Plan – Action Guides, Tsunami Notification Templates, including Media Releases, Tsunami Categories and Threat, Evacuation Zones - NZ Civil Defense and Emergency Management, 2009
- e. Tsunami Emergency Response SOPs
  - i. Roles and Responsibility Matrix
  - ii. Evacuation Checklist
  - iii. Emergency Response Matrix
  - iv. Tsunami Occurrence Checklist
  - v. Earthquake / Tsunami Information Checklist
  - vi. Tsunami Warning Checklist
  - vii. Timeline Template for Tsunami Emergency Response
- f. Honolulu, Hawaii, USA: Tsunami Evacuation and Sheltering SOPs (see CM #1, Tab 4)
- g. California, USA: Local Planning Guidance on Tsunami Response - Office of Emergency Services

### **2. Tsunami Emergency Response - Case Studies**

- a. Hawaii, USA: State Civil Defense Distant and Local Tsunami Response (see CM #1, Tab 4)
  - i. SOPs for Distant Generated Tsunami
  - ii. Distant-Generate Tsunami Response Checklist
  - iii. SOPs for Locally Generated Tsunami and Earthquake
  - iv. Locally Generated Tsunami Response Checklist
  - v. Urgent Local Tsunami Warning Emergency Broadcast Script
- b. Wakayama Prefecture, Japan: Local Government Tsunami Emergency Response Standard Operating Procedures
- c. Shizuoka Prefecture, Japan: Earthquake and Tsunami Disaster Prevention

- i. Earthquake and Tsunami Preparedness
  - ii. Tokai Earthquake Preparedness – Operation, Effective Disaster Management, Drills
- d. Vertical Evacuation
  - i. Japan Guideline: Buildings Used for Tsunami Evacuation
  - ii. Volunteer Evacuation Building Agreement - Yaizu City, Shizuoka Prefecture
  - iii. Tsunami-resistant Structures - USA Activity Summary
  - iv. Engineering Design Guidance and Performance-based Tsunami Engineering
- e. Small Boat Safety
  - i. Japan Tsunami Response: Fishing Ports and Harbors
  - ii. Hawaii Boaters Hurricane Safety Manual: Tsunami Section, 1998 (see Course Manual #1, Tab 4)
  - iii. ITIC Tsunami Safety for Boaters
- f. Case Study: Aceh, Indonesia SOP development
- g. Community Based Disaster Risk Management

### **3. Alert Dissemination**

- a. Alerting Technologies
  - i. Emergency Managers Weather Information Network (EMWIN)
  - ii. Radio Internet Project (RANET)
  - iii. Technical Crib Sheet, September 2010
  - iv. RANET Weaver: Mobile Text messaging
  - v. RANET Chatty Beetle
  - vi. Pacific Communications Steering Committee minutes 2003
  - vii. New Zealand Civil Defense and Emergency Management, Public Alerting: Options Assessment, Information for the CDEM Sector [IS 1009], May 2009
  - viii. Siren comparison (US AHAB, French Polynesia ASSYSTEM) (electronic only)

### **4. Drills and Exercises**

- a. Exercise Types
- b. Exercise Preparations: Questions to Ask
- c. Tabletop Exercise Development Steps
- d. Exercise Planning Templates – US Department of Homeland Security Exercise and Evaluation Program, 2006
- e. Case Study: California, USA: Tsunami Warning Communications Exercise: State of California Exercise Program, 28 March, 2007

### **5. Public Information Flow, Media Interactions (not covered in training)**

- a. Media Plan and Template
- b. Fact Sheets, Media Tips – Television, Radio, Print, FAQs
- c. News Releases, Advisories, Reports to the Media
  - i. Case Study: Japan and USA, 15 Nov 2006, Kurils
- d. Role of Media in Alert Dissemination
  - i. Case Study: Japan, NHK
  - ii. Case Study: Hawaii, USA – Emergency Alert System (EAS) (see CM #1, Tab

## **6. Mitigation, Preparedness, Education, Awareness, Miscellaneous**

- a. Structural Engineering
  - i. Tsunami-resistant Structures: Engineering Design and Construction Guidance and Requirements for Vertical Evacuation – USA Efforts (see CM #2, Tab
  - ii. Development of Design Guidelines for Structures that Serve as Tsunami Vertical Evacuation Sites, 2005
  - iii. Guidelines for Design of Structures for Vertical Evacuation from Tsunamis, FEMA P646, 2008
  - iv. Vertical Evacuation from Tsunamis: A Guide for Community Officials, FEMA P646A, 2009
- b. Preparedness and Planning Guides (examples)
  - i. Earthquake Preparedness: Putting Down Roots in Earthquake Country, Your Handbook for the San Francisco Bay Region, USGS Gen Info Product 15, 2005 (electronic only)
  - ii. Preparing Your Community for Tsunamis, A Guidebook for Local Advocates, version 2, GeoHazards International - US National Academy of Sciences, 2007 (electronic only)
  - iii. Tsunami Preparedness: Information Guide for Disaster Planners, IOC Manuals and Guides 49, IOC, 2008 (English, Spanish, French) (hard copy, electronic)
  - iv. Hawaii Homeowner's Handbook to Prepared for Natural Hazards, version 1.1, Dennis J. Hwang and Darren K. Okimoto, UH Sea Grant College Program, 2007 (electronic only)
- c. Tsunami Awareness and Educational Materials DVD (ITIC) – separate packet  
Contains DVD and hard copy summary. Hard copies of Tsunami, The Great Waves (2008); Tsunami Glossary 2008; Tsunami Warning!; Surviving Tsunamis: Lessons Learned from Chile, Hawaii, and Japan; When the First Waves Arrive in Minutes, Indonesian Lessons on Surviving Tsunamis near Their Sources; Tsunami Safety Flyers; Posters: Global Tsunami Sources, Significant Earthquakes, Volcanic Eruptions; PTWS and ITIC brochures; and other materials
- d. Country materials (electronic only)
  - i. Indonesia materials – GTZ Preparedness, Drills, TEWS Information videos
  - ii. New Zealand materials – Civil Defense, Exercises, Alerting, Education, Preparedness, Recovery, Inst of Geological and Nuclear Sciences
  - iii. Philippines materials – community preparedness and awareness materials
  - iv. Samoa materials – public service announcements (Tsunami, Earthquake, Fire)
  - v. USA materials – Special Needs populations, Awareness, Washington state materials, California materials