



UNESCO – IOC / NOAA INTERNATIONAL TSUNAMI INFORMATION CENTER (ITIC) ITIC TRAINING PROGRAMME INTERNATIONAL (ITP-INTL)

ITP-COOK ISLANDS 2023

TSUNAMI WARNING AND EMERGENCY RESPONSE: REVIEW AND UPDATE OF DISTANT, REGIONAL, AND LOCAL TSUNAMI STANDARD OPERATING PROCEDURES (SOPs)

Rarotonga, Cook Islands
09-13 January 2023

Resource Persons

Dr. Laura Kong, Director, International Tsunami Information Center (ITIC), Honolulu, HI, USA
Jiuta Korovulavula, Programme Officer, IOC Tsunami Unit, Fiji (Virtual)
New Zealand Emergency Management Agency (Virtual for Cook Island SOP sessions)

Training Overview

The training workshop will cover tsunami warning operations and the use of the PTWC Products for national tsunami threat decision-making, with specific attention on the warning and emergency response plan and standard operating procedures (SOPs) of the Cook Islands. Topics will include warning and response SOPs and challenges, warning decision support tools, warning messages and alerting, evacuation concepts and planning, and awareness strategies.

In response to the Hunga-Tonga Hunga-Ha'apai Volcano eruption and tsunami, the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (PTWS), established a [Task Team on Hunga-Tonga Hunga-Ha'apai \(HTHH\) Volcano Tsunami Hazard Response](#) under PTWS Working Group 2 to immediately develop the Hunga Tonga Hunga Ha'apai (HTHH) Interim Procedures and PTWS Products for responding to the possibility of future tsunamis originating from volcanic eruptions or processes similar to the HTHH event. These SOPs became effective on 15 March 2022 through IOC Circular Letter [2882](#), and are carried out by the PTWC acting as a PTWS Tsunami Service Provider (TSP). IOC Circular Letter [2902](#) (17 August 2022) provided the PTWC Interim Products and PTWS Products User's Guide. The Procedures Products were tested by members of Pacific Islands Countries and Territories Regional Working Group on Tsunami Warning and Mitigation (WG-PICT) on 9th November, 2022 as a Regional Exercise for the Exercise Pacific Wave 2022 (PacWave22-PICT).

The workshop will facilitate Cook Islands' review of both seismic (which account for 87% of the world's tsunamis) and non-seismic tsunami sources in their SOPs. Accordingly, the goal of this training is to increase the capacity of warning center and first responder operational staff to efficiently and effectively respond to tsunamis.

The key objectives of this workshop are to

- Review and update the Cook Islands Tsunami Warning and Emergency Response SOP, with consideration to the ICG/PTWS Local Source Tsunami Response Best Practice Guideline (draft 2019) and HTHH Interim Procedures and PTWS Products.

- Test the Cook Islands' tsunami SOPs through a table top exercise
- Understand how to interpret and use the PTWC Products for national tsunami threat decision-making
- Understand the tsunami warning and emergency response activities, their challenges, and limitations
- Review the science of earthquakes and tsunamis, Cook Island regional tectonics, seismicity, and tsunami hazards

FINAL PROVISIONAL AGENDA (8 January 2023)

Session	Start Time	End Time	Topic	Speaker
1-3			Monday, 09 January 2023	
			MORNING	
			Opening, Background, Science (ICG/PTWS, Tsunami Early Warning Systems, Science)	
	8:30	9:00	Registration	Cook Islands (CI)
1.1	9:00	9:30	Opening Ceremonies	IOC, ITIC, CI
	9:30	10:00	GROUP PHOTO, COFFEE / TEA BREAK	
1.2	10:00	10:15	Logistics and Administrative Items, Introductions Course Overview	CI Laura Kong, ITIC
2.1	10:15	10:45	ICG/PTWS-XXIX Outcomes, specifically for the PICT	Jiuta Korovulavula, IOC
2.2	11:00	11:45	Responding Rapidly and Effectively: Tsunami Warning and Emergency Response Requirements and Timeline-driven SOPs	Kong
2.3	11:45	12:30	Science of Earthquakes and Tsunamis, Regional Tectonics, Seismicity, and Earthquake Hazard.	Kong
	12:30	13:30	LUNCH	
			AFTERNOON	
			TWC Operations (Cook Islands SOPs, TWC SOPs)	
2.4	13:30	13:45	Overview and Introduction Cook Islands' Existing Tsunami TWC and TER SOP: Strengths and Weaknesses – From event debriefs, tsunami drills and PacWave exercise	CI Meteorological Service and EMCI
2.5	13:45	14:45	Discussion: CI SOPs – status, gaps, needs	Korovulavula, All
	14:45	15:00	COFFEE / TEA BREAK	
3.1	15:00	15:30	Tsunami Warning Center SOPs: What do Tsunami Warning Centers (TWCs) provide to Tsunami Emergency Response (TER) agencies?	Kong
3.2	15:30	16:30	Pacific Tsunami Warning Center (PTWC) – What happens at PTWC when there is a Pacific earthquake?	Kong video
3-6			Tuesday, 10 January 2023	
			MORNING: TWC Operations and Tools (TWC SOPs, Decision Support Tools), PTWC products	
3.3	9:00	9:30	TWC Operations: 1. Earthquake Monitoring: Real-Time Detection and Fast Source Characterizations, Magnitude and Fault Mechanism (W-Phase CMT), Limitations and Challenges. 2. Sea Level Monitoring - Methods, Instruments, Limitations, Challenges.	Kong
3.4	9:30	10:00	TWC Operations: 3. Travel time and Wave Amplitude Forecasting –Methods, Limitations, Uncertainty, Sensitivity Studies (Location, Depth, Magnitude)	Kong

3.5	10:00	10:30	Decision Support Tools for Monitoring, Detection, Assessment – Earthquakes: Real-time Earthquake Display (CISN), USGS web site (CMT, ShakeMap, PAGER), Sea Level Monitoring (IOC web site, TideTool with Tsunami Travel Times)	Kong
	10:30	11:00	COFFEE / TEA BREAK	
3.6	11:00	11:30	Decision Support Tools for Monitoring, Detection, Assessment – continued	
3.7	11:30	12:00	Decision Support Tools for Assessment Tsunami Coastal Assessment Tool (TsuCAT)	Kong video
4.1	12:00	12:30	Pacific Tsunami Warning Center (PTWC) Products - Overview (video followed by discussion)	Kong video
	12:30	13:30	LUNCH	
			AFTERNOON	
			PTWC Products, Local Source Best Practice, TER	
4.2	13:30	14:00	Pacific Tsunami Warning Center (PTWC) Products - Staging (video followed by discussion)	Kong
4.3	14:00	14:15	PTWC Enhanced Products Guidance for National Warnings and Evaluation: Land and Marine Threats and Public Safety [PTWC Enhanced Products Users Guide for the PTWS, TS 105, rev 2, 2014]	Kong
5	14:15	14:45	Local-Source Tsunami Response Best Practice [PTWS-XXIX, v1, April 2019)	Kong
	14:45	15:00	COFFEE / TEA BREAK	
6.1	15:00	15:15	What do TERs do with TWC information? Challenges in Alerting, Evacuation, and Safe-to-Return (All-Clear)	Kong
6.2	15:15	16:00	TER SOPs: Overview of Stakeholder Roles and Coordination, Event Operations, Timelines, Checklists, Examples, Role of Exercises	Kong
6.3	16:00	16:30	Discussion: CI Alerting, Evacuation	Korovulavula, All
7-8			Wednesday, 11 January 2023	
			MORNING	
			HTHH SOPs, COOK ISLANDS SOPs REVIEW	
7.1	9:00	10:00	15 January 2022, HTHH Volcanic Eruption and Tsunami. HTHH Volcanic Tsunami Hazard Response: PTWS Interim Procedures and PTWC products User's Guide.	Kong
7.2	10:00	10:30	15 January 2022, HTHH Volcanic Eruption and Tsunami. HTHH Volcanic Tsunami Hazard Response: PacWave 22 PICT Regional Exercise	Korovulavula
	10:30	11:00	COFFEE / TEA BREAK	
8.1	11:00	11:45	DISCUSSION: Revisiting current SOPs: CI SOP – STATUS, GAPS AND NEEDS. Warning Communication Flow	Kong, Korovulavula, All
8.2	11:45	12:30	DISCUSSION: Revisiting current SOPs: CI SOP – STATUS, GAPS AND NEEDS. Warning Criteria and Warning Levels	Kong, Korovulavula, All
	12:30	13:30	LUNCH	
			AFTERNOON	
			COOK ISLANDS SOPs REVIEW	
8.3	13:30	14:45	DISCUSSION EXERCISE Review of Distant Source Tsunami SOP Table Top Exercise & Evaluation	Korovulavula, Kong, All
	14:45	15:00	COFFEE / TEA BREAK	

8.4	15:00	16:00	DISCUSSION EXERCISE Review of Regional and Local Source Tsunami SOP Table Top Exercise & Evaluation	Korovulavula, Kong, All
8.5	16:00	16:30	Discussion	All

8-10			Thursday, 12 January 2023	
			MORNING	
			COOK ISLANDS SOPs REVIEW	
8.6	9:00	9:30	DISCUSSION Development of Local, Regional & Distant-Source Tsunami Warning & Response Messages Alignment of Warning Criteria, Levels and Products with Public Warning & All Clear Messages	Kong, Korovulavula, All
8.7	9:30	10:30	DISCUSSION EXERCISE Review of Local, Regional & Distant-Source Tsunami SOP with Warning Products and Public Messages Table Top Exercise & Evaluation	Korovulavula, Kong, All
	10:30	11:00	COFFEE / TEA BREAK	
	11:00	11:30	continued	
8.8	11:30	11:45	Review of Warning Lists (Phone, Email, etc)	Korovulavula, Kong, All
8.9	11:45	12:30	Review of National Tsunami Response Plan Design and Workplan	Korovulavula, Kong, All
	12:30	13:30	LUNCH	
			AFTERNOON	
			Building Resiliency (Tsunami Ready, Way Forward), Closing	
9.1	13:30	14:30	Building Awareness & Community Preparedness – UNESCO/IOC Tsunami Ready Recognition Programme, Tsunami, Evacuation Maps, Plans and Procedures (TEMPP) training	Kong, Korovulavula
9.2	14:30	15:30	DISCUSSION Preparedness – status, gaps, needs Way Forward for Cook Islands	Korovulavula, Kong, All
10	15:30		Closing Ceremonies	IOC, ITIC, CI