

**ICG/PTWS WORKING GROUP ON TSUNAMI WARNING AND MITIGATION  
IN THE SOUTHWEST PACIFIC OCEAN**

**First Working Group Meeting  
23 September 2006, Main Conference Room,  
Mendana Hotel, Hibiscus Avenue,  
Honiara, Solomon Islands**

**Minutes**

**Meeting opened at 8:30 am**

**Present:** Ken Gledhill (Chair), Phil Glassey, Doug Ramsay , Kelepi Mafi, Zhao Ming, Yin Chaomin, Song, Yanyun, Eroni Tapua, Arona Ngari, Shaun Williams, Lawrence Anton, Michael Hartfield, Mary Power, Sionetasi Pulehatoa, Billy Talagi, Roberta Thorburn, Daniel Jacksa, Phil Cummins, Philip Hall, Job Esau, William B Worwor, Noud Leenders

**Apologies:** Rick Bailey (Bureau of Meteorology, Australia; BoM), Esline Garaebiti (Vanuatu)

**Welcome and Introduction – Ken Gledhill**

This was the first meeting of the Pacific Tsunami Warning and Mitigation System (PTWS) Working Group on Tsunami Warning and Mitigation in the Southwest Pacific Ocean (SWP-TWG). The working group was formed at the PTWS meeting in Melbourne in early May 2006. The Terms of Reference for the working group are attached. The working group will be required to report progress at the PTWS meeting in Equator in October 2007.

It was agreed that this meeting would also serve the function of a STAR Tsunami Working Group Meeting.

**Review of Previous Meetings and Current Work**

There was a brief review of the background of the previous meetings and their outcomes

***Tsunami Awareness Workshop, Suva Fiji, 1-1 July 2004***

Two themes were identified, with objectives outcomes and a work plan. Many of these initiatives were stalled as a result of the 26 December 2004 Sumatra tsunami. Concern that the original intent of the working group was that a warning system be developed to meet regional needs and that SOPAC were to be the implementing agency.

***STAR Tsunami Working Group Recommendations, Proceedings of the 33 Session of SOPAC 17-24 September, 2004***

A STAR working group made recommendations to the 33 session (2004) of the SOPAC Governing Council based on the outcomes of the tsunami awareness workshop held in July 2004.

### ***Planning meeting 5 - 6 September 2005, Suva***

A draft strategy for enhancing early warning for Pacific island countries was prepared and presented to the SOPAC Governing council in Samoa in 2005. The strategy identified national and regional activities, implementing partners and a timeline. The Governing council did not endorse this strategy because north Pacific member countries were not initially consulted. The strategy will be presented to the SOPAC Governing Council in Honiara, Solomon Island September 2006.

### ***ICG/PTWS 21<sup>st</sup> Session and PIC Workshop, Melbourne May 2006***

There is no official record of the Pacific Island workshop held in conjunction with the ICG/PTWS meeting in Melbourne, May 1-2 2006. The PTWS meeting, held following the PIC workshop decided to set up this working group on tsunami warning and mitigation in the southwest Pacific Ocean under the auspices of ICG/PTWS. The TORs of this working group were defined as per the attached. Some at the Melbourne meeting are not represented here at this meeting. Some PIC countries were not represented at Melbourne. Only a small number of PIC countries are IOC or PTWC members.

### ***Progress on Suva 2004 themes – Phil Cummins***

Phil Cummins gave background of the themes developed from the Suva 2004 meeting and commented on progress

#### **Theme 1 Hazard and risk identification**

##### **1.1 Early warning system**

- Deferred due to 26 December 2004 tsunami

##### **1.2 Historical and paleotsunami data**

- No progress

#### **Theme 2 Response**

##### **2.1 Preparedness and effective response**

- SOPAC Community Risk programme has been working with some countries

##### **2.2 Regional and National capacity**

- Pacific Disaster Centre have prepared a Tsunami Awareness Kit
- Countries participated in Pacific Wave 2006 Exercise
- NOAA held a tsunami workshop in Guam in August 2006 in collaboration with SOPAC

***Capacity Building for Tsunami Risk Assessment in the South West Pacific - GA project funded by AusAid***

Phil Cummins presented details on an AusAid funded tsunami hazard study which will take place over the next four years although it is only funded initially for 1 year.

***SOPAC Member Countries National Capacity Assessment: Tsunami Warning and Mitigation Systems funded by AusAid – Ken Gledhill***

Ken Gledhill gave a brief outline of this project based on a 4 slide power point sent to him by Rick Bailey of BoM. This is a survey of the capacity and capability of PIC's to receive and disseminate warnings. AusAid (Roberta Thorburn) commented that work had only just started on this initiative.

***SOPAC Activities***

It was noted that the TORs of the working group have links to the SOPAC Community Risk Programme and the SOPAC Oceans and Islands Programme.

There was a brief discussion of a SOPAC sponsored meeting on early warning for Pacific Island Countries held on 5-6 September, 2005. The meeting dealt with theme 5 of the Framework for Action 2005-2015 for Disaster Risk Reduction and Disaster Management.

The Director of SOPAC, Cristelle Pratt, briefly addressed the meeting outlining that SOPAC had initiated work on tsunami warning in July 2004, prior to the 26 December 2004 Asian tsunami and had developed a strategy for early warnings systems.

AusAID have provided funding over four years to support the above Hazard and Risk (GA) and Capacity projects (BoM/EMA), but hopes that there will be more intense collaboration with SOPAC and other organisations. She encouraged the meeting to have a frank dialogue on Early Warning systems, and envisioned that Regional and National hazard monitoring and warning dissemination systems will be strengthened as part of the PTWS initiative.

**Other Related Meetings and Documents**

12<sup>th</sup> Pacific Regional Disaster Management Meeting, 6<sup>th</sup> – 8<sup>th</sup> June 2005, Madang, Papua New Guinea – Outcome Statement.

Disaster Risk Reduction and Disaster Management – A Framework for Action 2005 – 2015 (Theme 5: Effective, Integrated and People-Focused Early Warning Systems)

**Action Plan – SWP-TWG**

An overall action plan for the working group needs to be developed based on the recommendations of the Tsunami Awareness Workshop held in July 2004 and other objectives such as PTWS. The action plan should include the identification of tsunami hazard and risk as part of the decision making process, the review of the capabilities and

requirements for tsunami warning in the region, capacity building and public education, as well as the more technical aspects of data collection and alert dissemination.

The above two projects funded by AusAid were already being formulated when the Melbourne 2006 workshop took place and that these initiatives were incorporated into the TOR of the Working Group.

It was agreed that these initiatives were to be accepted as part of the Action Plan. However, it was noted that some countries and other organisations were not represented at the Melbourne meeting, had not heard of the initiatives, and were the Australian projects consulting appropriately with PICs.

- It was decided that that some reporting mechanism to this working group was required and that the role of this Working Group was to monitor and guide the work.

The Chair asked of the meeting how regional tsunami warnings will be handled in the long term and particularly how would this be done in particular regard to TOR objectives 4 and 5 of the Melbourne meeting

4. to facilitate cooperation in the establishment and upgrading of seismic and sea level stations and networks in the region, and the interoperability of these systems;
5. to facilitate capacity building and the sharing of tsunami information in the region, including the free and open exchange of data;

Is a regional tsunami warning system required (as a sub-region of PTWS)? If so, what form should it take and what will the relationship be between the Pacific Tsunami Warning Centre, any proposed regional warning centre and national warning centres?

There was considerable discussion on this point relating to the development of detection and tracking of Tsunami and warning systems. PNG and Vanuatu argued that national systems needed to be strengthened in this process and Samoa asked who will support PIC to do this and issue warnings. What is the end product for PICs? Where does IOC stop and SOPAC start? Will SOPAC provide support for data exchange etc?

Noud Leenders reported that SOPAC has requested to PTWC that they lower warning threshold to M5.7. A SW Pacific tsunami warning centre was too resource intensive and it should be left to PTWC. Work done in the region should also include strengthening instrumentation in the south Pacific. SOPAC was focussing on warning dissemination and response.

It was recognised that PTWC could not give better warnings below the current threshold without more data and resources.

Australia needed instrumentation to the east on PICs for its own tsunami warning and if PICs wanted to receive the Australian warning then they could do so but it would not be specific to them.

The discussion was adjourned until after the capabilities presentations.

## Current Capability Presentations

Member countries gave presentations on their current capabilities, focusing on sensor networks, communications networks and the systems for disseminating warnings. This provided useful background.

### Australia

- 4 year implementation plan
- Eventually a new 24/7 centre joint between Geoscience Australia (Canberra) and Bureau of Meteorology (Melbourne)
- Will share Australia warnings and data with others in the Pacific
- MOU with PNG to upgrade 2 seismographs and also one in Nuie
- Have a plan to upgrade other seismographs and tide gauges with possible DART buoys
- Hope to have SW Pacific online in 2007

### Cook Islands

- Relying in PTWC and currently satisfied with warnings
- Has two tide gauges 2 km apart
- Warnings go to Met Service and NDMO
- Met Service responsible for receiving and disseminating warnings
- Participated in Pacific Wave 2006 – warning received and to police within 3 minutes.

### Nuie

- Currently working on MoU with Australia to establish seismograph station
- Met service is focal point where warnings are received but also telecom as back up for 24/7 coverage
- Warnings go out via sat-phones and links with telephone, TV and radio being discussed
- Need a National tsunami plan
- Japanese seismic station – planned to be upgraded – Open Source data

### Fiji

- JICA seismographs currently being upgraded and some older US ones
- Only one broadband seismograph is telemetered
- 2 VHS received by Japan
- Has a CTBTO station but has to request data from Vienna
- Looking to exchange seismic data with Tonga as part of Japanese upgrade

### New Zealand

- Sea level gauges to be upgraded and data to GeoNet (24/7 geo-hazards monitoring system)
- Interoperability of instruments important for successful and easily maintained network
- Upgrading 6 seismograph stations (including Chatham Island) specifically to enhance tsunami warning system as part of the GeoNet project; 40 broadband stations already installed and operational with VSAT communications to two data centres

## PNG

- Tsunami especially local source generated from smaller earthquakes a significant hazard for PNG
- Do not have an adequate warning system and only feasible for distant source
- Currently has MoU with Australia to upgrade two seismographs, but they also need a large seismograph network for significant earthquake hazard
- Tide gauges are needed
- Lack of real time data and capability to use it

## Samoa

- Met service receives warnings and passes them on to geophysics section for verification
- 24/7 service
- Warnings disseminated to NDMO. And then goes to TV and radio stations. Considering GSM warning via telecom provider
- 1 GSN Iris seismograph
- 1 CTBTO station but cannot be accessed real time
- 1 tide gauge
- JICA are proposing new seismographs and tide gauge
- Some historic events and some paleotsunami data and database being developed

## Tonga

- Warnings go to Met Service and then to NDMO
- 1 tide gauge (seaframe)
- 3 out 5 seismographs operational. Vavu and Tongatapu are broadband
- Under resourced to utilise data but some training by Japanese
- Tonga and Fiji sharing data and upgrading in 2007 as part of JICA work
- Shortage of power is an issue
- Japanese get data online

## Vanuatu

- Warnings go to Met Service and the geohazards section which are part of Met Service. 24/7
- Have a warning dissemination plan via radio
- 3 seismic stations operational but installed 1980's
- 1 tide gauge at Port villa
- Some microzoning and tsunami hazard work has been done in Port Vila
- Currently emplacing National Action Plan for mainstreaming DRR (Disaster Risk Reduction)

## China (GSA)

- Here to learn and share experience of large seismograph network and telemetering data via VSAT
- Offering advice and assistance
- They are seismologists not tsunami experts

## Action point

It was agreed that coordination of donor activities in installing instrumentation is needed so appropriate instruments are installed that are easy to maintain, fit for purpose and interoperable.

Tonga and Fiji both pointed out that they had to meet their own countries objectives with monitoring and had to tie in with Japanese objectives, as they were the donor

### **Action Plan for Station Upgrades and Data Sharing**

A number of action points were drafted and discussed.

The proposals for the currently funded projects relating to TWS should be copied to this Working Group.

This Working Group should be consulted regarding future proposals.

Suggested that SOPAC take a major role in risk reduction and public awareness etc and will support other initiatives via this working group for instrumentation.

Some recommendations for SOPAC governing council needed regarding relationship between SOPAC and PTWS working Group.

Met Services involved in warning and are affiliated with SPERP. Need to consider all CROP agencies.

### **Recommendations of the ICG/PTWS Working Group on Tsunami Warning and Mitigation in the Southwest Pacific Ocean**

The following **recommendations** were agreed:

1. The working group acknowledges the current projects which relate to TOR 1, 2 and 3:
  - Tsunami capability assessment in the SW Pacific
  - Tsunami hazard and risk assessment in the SW Pacific

And requests that the organisations involved in carrying out the work provide progress reports to working group members by 30 June 2007 for deliberation before the PTWS meeting in October 2007.

We further request that copies of the proposals be provided to include with the minutes on the working group.

Progress needs to be made towards effective tsunami warning in the SW Pacific. The current PTWC standard/magnitude is 6.5 for shallow events needs to be lowered and this can only be done by improving the regional coverage of seismographs (this relates to TOR 4 and 5). The working group therefore further **recommends**:

2. That PTWC be requested to continue to provide coverage in the SW Pacific until a regional warning system capability has been established.

3. The region has identified that it may need warnings for shallow earthquakes below M 6.5 and perhaps down to a suggested magnitude limit of 5.7.
4. That existing instrumentation (sea level and seismic) in the region be identified, and a database of this information be made available.
5. Complete a gap analysis in the region to identify where stations (sea level and seismic) are required to allow effective detection of regional tsunami events.
6. A network design be carried out (seismic and sea level station) to allow the effective detection of regional tsunami events.
7. Coordination of donor contributions to allow the necessary work to be carried out to achieve the network required to provide effective tsunami detection in the region.

### **STAR Tsunami Working Group Recommendations**

STAR Tsunami Working Group made the following **recommendations** for consideration by the SOPAC Council:

1. SOPAC to be advised that the PTWS working group are to take a number of recommendations to PTWS that have implications for member countries and that SOPAC take a coordinating role
2. SOPAC to facilitate and support the initiatives of the PTWS group to carry out an initial survey of existing instrumentation for gap analysis and system design

**The meeting closed at 5:20 pm**



## Appendix One

### **RECOMMENDATION PTWS-XXI.5**

#### **WORKING GROUP ON TSUNAMI WARNING AND MITIGATION IN THE SOUTHWEST PACIFIC OCEAN**

The Intergovernmental Co-ordination Group for the Tsunami Warning and Mitigation System in the Pacific,

**Recognizing** that the Southwest Pacific Ocean has a significant threat from local, regional and distant tsunamis;

**Further recognizing** that local and regional tsunami alerts for some areas of the Southwest Pacific are not covered by the PTWC;

**Further recognizing** the strategic recommendations for addressing tsunami risks in the region agreed at the South Pacific Tsunami Awareness Workshop Forum Secretariat, Suva, Fiji, 1-3 July 2004;

**Noting** the interest of Member States in the Southwest Pacific region to enhance their tsunami warning and mitigation services;

**Acknowledges** that a number of countries in the region are developing National Tsunami Warning Systems with already existing and planned upgrades to seismic and sea-level networks and that the PTWC provides distant tsunami warnings for the Southwest Pacific;

**Further acknowledging** that there may be mutual benefits to these regions and to the Tsunami Warning and Mitigation System in the Pacific from the establishment of this working group;

**Further acknowledging** donor support, but encourages continued effort in donor harmonization;

**Decides** to establish an intercessional Working Group on the Southwest Pacific Ocean with the following Terms of Reference:

1. to evaluate capabilities of countries in these regions for providing end-to-end tsunami warning and mitigation services;
2. to ascertain requirements from countries in the Southwest Pacific Ocean for the tsunami warning and mitigation services;
3. to facilitate tsunami hazard and risk studies in the region;
4. to facilitate cooperation in the establishment and upgrading of seismic and sea level stations and networks in the region, and the interoperability of these systems;
5. to facilitate capacity building and the sharing of tsunami information in the region, including the free and open exchange of data;
6. to support the development of the centre of expertise in a multi-hazards context within SOPAC in line with the SOPAC strategies for enhancing early warning in the region.

**Recommends** that the Group be composed of representatives from members countries of SOPAC as members and observers and including, France, the Directors of ITIC and PTWC and Chaired by the Representative of New Zealand, with vice-chairs from Fiji and Samoa.

**Acknowledges** that PTWS is the Co-ordination Body for the Tsunami Warning System in the Pacific (TWSP) and **encourages** non-PTWS Member States to contact the IOC Secretariat to request membership of the ICG/PTWS.

## Appendix Two

### Working Group Participants

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