

**UNESCO INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION**  
**Intergovernmental Co-ordination Group for the Pacific Tsunami Warning and**  
**Mitigation System (ICG/PTWS)**

**Exercise Pacific Wave 06**  
**Preliminary Post Exercise Report**  
**13 June 2006**

**Background & Rationale**

Exercise Pacific Wave 06, a Pacific wide tsunami warning and communication exercise, was conducted over the period 16 and 17 May 2006.

The Exercise was conceived at a meeting of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS, formerly ICG/ITSU) held in Chile in October 2005. Recommendation ITSU-XX.3 recommended an end-to-end tsunami exercise organized by a Task Team, chaired by Australia and involving the Pacific Tsunami Warning Centre (PTWC) and sub-regional West Coast/Alaska Tsunami Warning Centre (WC/ATWC) and Northwest Pacific Tsunami Advisory Centre (NWPTAC) and representatives from each quadrant of the Pacific, to simulate each country being put into a tsunami warning situation requiring decision-making and to be taken to the step just prior to public notification.

The Indian Ocean Tsunami of December 2004 focused world attention to the very real threat posed by a tsunami to coastal communities. The meeting noted that whilst localised Tsunami Exercises have been conducted, never before had a Pacific Wide exercise been held and it was seen as an excellent opportunity to engage countries within the region. The timing of the event also has learning opportunities for the development of the Indian Ocean Tsunami Warning System.

**Exercise Objective**

The objective of the Exercise was to test, exercise, evaluate and review the operational lines of communication within the Pacific Tsunami Warning System's area of responsibility. This includes the Pacific Ocean, the Southern Ocean regions of the Pacific and all attached seas, including the Philippine Sea, East China Sea, Yellow Sea, Sea of Okhotsk, Bering Sea, South China Sea, Java Sea, Arafura Sea, Sulawesi Sea, Mindanao Sea, Sulu Sea, Celebes Sea, Bismarck Sea, Solomon Sea, Coral Sea, and Tasman Sea,

Altogether, 40 Pacific Basin countries and island states agreed to participate in one or both of the two scenarios. During the exercise, PTWC called or confirmed that their messages were received from a total of 48 Tsunami Warning Focal Point countries. In total, PTWC operational warning contacts included more than 60 countries or island states, with some having more than one Tsunami Warning Focal Point for the receipt of official messages from the regional and sub-regional tsunami warning centres (TWCs). The Communication Plan for the PTWS describes the operational components, services, and products of the warning system, and includes 7x24 Tsunami Warning Focal Point information for every point of dissemination. The ITIC works with the PTWC and other sub-regional warning centres and national contacts to keep this Plan up-to-date.

The Exercise was a functional style aimed to involve communication and decision making at the government level without disrupting or alarming the general public. However, individual countries could elect to extend the Exercise down to the level of actually warning the public.

The Exercise was coordinated from the Pacific Tsunami Warning Centre (PTWC) in Hawaii across 16 – 17 May 2006. Messages were sent by the PTWC, WC/ATWC, and NWPTAC of the Japan Meteorological Agency. Messages were sent out via the normal operational mediums and countries were encouraged to make critical and timely decisions and disseminate information and warnings through their standardised channels to relevant jurisdictions, agencies and organisations.

### **Scope of Report**

A thorough formal evaluation questionnaire was attached to the Exercise documentation in Appendix VIII. Participants were requested to complete this and forward it to the Task Team “Tsunami Mailbox”. Once collated, this information will form the basis for a full Evaluation Report due for completion by the end of the year.

This Preliminary Report provides brief interim feedback on the design and conduct of the exercise to assist members to apply some of the learnings and to assist in the direction of any future exercises.

### **Methodology**

A set of six questions was sent to all participating countries. Responses were received from 30 countries:

- |   |                      |
|---|----------------------|
| • Australia                                       | • Malaysia           |
| • Canada  | • Papua New Guinea   |
| • Chile   | • Peru               |
| • China (Hong Kong)                               | • Philippines        |
| • Colombia  | • Republic of Palau  |
| • Costa Rica                                      | • Republic of Korea  |
| • El Salvador                                     | • Russian Federation |
| • Ecuador   | • Samoa              |
| • Fiji  | • Singapore          |
| • French Polynesia                                | • Solomon Islands    |
| • Guatemala                                       | • Thailand           |
| • Japan   | • Tonga              |
| • Federated States of Micronesia<br>(FSM, Kosrae) | • USA                |
| • New Zealand                                     | • Vanuatu            |
|   | • Vietnam            |
| • Nicaragua                                       |                      |

The following six questions were asked:

1. Did you receive the relevant exercise bulletins?
2. Was the information clearly disseminated?
3. Did you find the exercise useful in confirming contact details and communication plans?
4. Did the bulletins provide sufficient realistic information for rapid decision-making?
5. Do you have any comments on the exercise?
6. What other initial points would you like to make?

**Question 1 Summary: Did you receive the relevant exercise bulletins?**

Responses to this question indicated that most participating countries received the exercise bulletins. Some of the comments highlighted the need to regularly confirm points of contact and details. One responder stated that there was some disparity between bulletin timings with some agencies running ahead of the PTWC and this has the potential to cause confusion. Another relevant suggestion was that a final bulletin could be sent to clearly state the end of the Exercise.

**Question 2 Summary: Was the information clearly disseminated?**

The responses emphasise the importance of delivering messages by a variety of means including email, fax and phone as in some areas a single mode cannot be relied on 100% of the time. Some comments also highlighted the need to clarify internal communication channels within countries. Some participants noted that as it was an exercise they were able to refer to the manual, however concerns exist that in a real event countries will be totally reliant on information disseminated in bulletins. Some countries expressed a desire for the manual to be interpreted into other languages, however a greater lead-time may allow this to be completed within individual countries.

**Question 3 Summary: Did you find the exercise useful in confirming contact details and communication plans?**

Generally the responses indicated that the exercise was a useful tool to confirm and validate relevant contacts and communication arrangements. A number of responders stated that the Exercise identified the need to investigate a variety of modes of message delivery within countries. It also identified key players who needed to be contacted but were not on original contact lists. The Exercise also highlighted the time it takes to separately fax or phone individuals, and as such countries need sufficient staff on call to facilitate the dissemination of messages.

**ICG/PTWS Secretariat (ITIC) Comment:**

The PTWC, WC/ATWC and NWPTAC used this Exercise to confirm their Tsunami Warning Focal Point emergency contact information. Contact information from the Exercise, the ICG/PTWS-XXI National Reports, the 7x24 Tsunami Warning Focal Point forms submitted by countries, and other recent communications are being compiled to update the Communications Plan for the Pacific Tsunami Warning and Mitigation System.

**Question 4 Summary: Did the bulletins provide sufficient realistic information for rapid decision-making?**

A number of responders stated the bulletins did not provide the detail that countries would require if they were to make critical decisions such as the need to evacuate areas of the population, however it was stated that most used the Exercise as a communications test and did not engage at the strategic decision-making level. It was suggested that the next Exercise be run in real time and provide more information on predicted wave heights. It was also suggested that bulletins could include more interpretive information on estimated wave heights at certain locations and that they be delivered using less technical and scientific terms i.e. a plain English version for non-scientists.

ICG/PTWS Secretariat (ITIC) Comment: Exercise participants should become familiar with the definitions of various tsunami bulletins (i.e. tsunami information; advisory; watch; warning bulletins). The different types of bulletins express degrees of earthquake and tsunami severity and threat, as well as wave arrival time estimations. It should be emphasised that Tsunami Warning Centres and tsunami bulletins do not order evacuations. According to the PTWS system, it is the responsibility of national and local authorities to interpret the threat

evaluations issued by the TWCs for applicability to their country as a whole, or to specific localities along their coasts with potential for tsunami damage, and then, if necessary, to issue public evacuation orders. Additionally, participants must be aware of the limitations of the TWC's capacity to detect earthquakes and tsunamis, and the possibility of "false warnings," or warnings being issued for non-destructive tsunamis.

**PTWS Officers Comment:**

Additionally, Exercise participants should be aware that currently TWC cannot predict tsunami wave heights for most events except for a few historical events that are well documented such as the 1960 Chile tsunami. To be able to provide accurate wave forecasts for the Pacific, all other sources must be studied, numerical modelling conducted and calibrated with actual tsunami data for all sources, operational wave forecasting software must be implemented in the warning centres, and inundation maps or estimates of run-up calculated. Any predictions of wave heights will need to also provide information of the accuracy of the estimates. Operational wave forecasting is being developed, but much work still needs to be done with techniques continue to be improved by researchers.

**Question 5 Summary: Do you have any comments on the planning of the exercise?**

Responders' commented that to plan an exercise of this size involving so many participating countries takes a significant amount of time and greater lead-time could also increase the amount of internal involvement within countries. This would allow a more comprehensive run through of the system from receipt of the bulletin, through the decision making process down to notifying agencies, warning the public and managing the evacuation. Exercising in real time was also expressed as preferred as it allows a more realistic response.

**Question 6 Summary: What other initial points would you like to make?**

Some very positive comments were received supporting the concept of running multi-national exercises on a regular basis. A number of participants used this as an opportunity to raise awareness of tsunami risk to a variety of agencies and organisations reinforcing the need to improve planning arrangements. Most participants noted that there were positive learnings from the exercise and it enabled them to identify areas requiring improvement. A number of participants stated that they look forward to future exercises allowing a full activation of their system.

**Overall comment**

**Achievements and Learnings from the Exercise**

The Exercise confirmed the dissemination and receipt process of warning messages from the PTWC, WC/ATWC, and NWPTAC to the involved countries and highlighted some opportunities for improvement.

Responses from participants confirmed that the exercise provided an excellent opportunity to clarify and confirm the 24-hour a day points of contact (7x24 Tsunami Warning Focal Points) for all involved countries. It also clarified the need to have sufficient staff on call in all countries to ensure bulletins can be actioned appropriately. Both the development and conduct of the Exercise provided a valuable opportunity for countries, agencies and individuals to network and share information and initiatives. This dialog should be encouraged and fostered as a tsunami event has the potential to impact across a wide region and effective networks would greatly assist during a real event.

## **Future Exercises and Planning**

Responses indicated that there is strong support for future exercises, but consideration should be given to increasing the lead-time and keeping countries updated on the development and aims and objectives of the exercise. Thought should also be given to value-adding to bulletins to assist countries to make informed decisions about actions and this should also be done in plain English avoiding the use of over technical jargon. Running an exercise in real time rather than compressed time would also assist in engaging the planning and decision-making process. It was suggested to consider conducting an Exercise on a yearly basis, and to alternate the location of the earthquake/tsunami from east to west to be able to have all areas to regularly experience a more real drill. Finally, it was suggested that it would be useful to enable some mechanism for media involvement since they are a key communicator for information.

## **Recommendations from this Report**

A number of relevant suggestions were received from the feedback. Below is a consolidation of recommendations from the major themes:

- Future exercises be developed and conducted building on the achievements of Exercise Pacific Wave 2006. Development of these exercises will consider broadening the objectives to include allowing sufficient time for strategic and critical decision-making. Consideration should also be given to running the exercise in real time;
- Countries are encouraged to develop and conduct individual tsunami exercises to regularly exercise their national arrangements and these could be conducted prior to International exercises to maximize their benefit;
- Participants ensure that their points of contact are regularly reviewed and updates circulated. Consideration should be given to the development of a regularly updated contacts register;
- Consideration be given to the inclusion of additional information into the bulletins to provide a simple English word-picture of the threat faced by the tsunami; and
- Networking between the agencies and the media continue, to enhance the profile of the critical work being conducted.

## **Closing Comments**

The Indian Ocean Tsunami of 24 December 2004 graphically demonstrated the potential threat faced by a tsunami. Exercise Pacific Wave 2006 provided the first opportunity for many participating countries to exercise their communication arrangements in such a regional activity. Many issues have been identified and some are being addressed. Hopefully we can seize the opportunity and continue to work together, network and share information to improve our capacity as a region to deal with tsunamis.

*Compilation by:*

*Mark Sullivan (Australia), Task Team Chair*

*PTWS Officers (Rodrigo Núñez (Chair, Chile), Fred Stephenson (Vice-Chair, Canada),*

*Francois Schindele (Past-Chair, France), Charles McCreery (PTWC), Laura Kong (ITIC Director), Emilio Lorca (ITIC Associate Director)*

*Brian Yanagi (ITIC)*