ICG/IOTWS Working Group 5

Workshop on “Issuing, Receiving and Utilising Tsunami Watches in the Indian Ocean – Now and the Future”

State Ministry of Research and Technology (RISTEK), Jakarta, Indonesia
4 – 6 September 2007

MINUTES OF MEETING

1. OPENING

Mr Geoff Crane, Chair of WG5 opened the meeting at 0930. He gave a special welcome to those new participants who had not previously attended WG5 sessions. And he particularly thanked the Government of Indonesia for hosting this session and providing such excellent facilities.

Dr Jan Sopaheluwakan, Chair of the ICG/IOTWS, gave the opening address and welcomed all participants to the session.

2. INTRODUCTION OF DELEGATES

All participants introduced themselves and indicated their affiliations.

3. REPORTS FROM MEMBER STATES

(a) Australia

Mr Geoff Crane advised that Australia was making steady progress through its four year tsunami warning development project. Significant milestones to date:

- In December 2006 Australia commenced preparing its own national tsunami warnings, based on the technical bulletins from PTWC
- In April 2007 Australia successfully deployed its first deep ocean tsunami detection system in the southern Tasman Sea
- In July 2007 Australia established the Joint Australian Tsunami Warning Centre (JATWC), combining the seismic monitoring capabilities of Geoscience Australia with the ocean monitoring and warning preparation and dissemination capabilities of the Bureau of Meteorology, to independently generate its own tsunami warnings
- Australia still gets messages from PTWC and JMA but from mid July they have become independent and GA is the basis for warnings disseminated to the public.

The Joint Australian Tsunami Warning Centre has a video conferencing link between the Bureau of Meteorology and Geoscience Australia, and links with other agencies are also possible.

Australia is willing to share all seismic information, including the calculated location, magnitude (Mwp, Mb and Ms), and moment tensor information. The calculated magnitudes compare well with those from PTWC.
Australia recognised the need to issue bulletins saying “no threat” for distant tsunamis otherwise media can cause over-reaction. This also helps to test the system.

(b) Kenya

Mr Ephantus Ngotho reported that Kenya is developing its own infrastructure to issue warnings as soon as received (from interim advisory service) by the Met Dept. When a warning is received the President must be notified. So far they have received warnings from 3 events but none has been serious for Kenya. 3 tide gauges and 1 seismic station are in the process of installation, and more are promised. They have deployed 5 drifting buoys in the Indian Ocean (through NOAA).

Colonel Shem Amadi introduced the Regional Disaster Warning Management Centre which has a membership of 12 African countries. They are looking at ways of coordinating efforts to improve the system.

Kenya is looking for a regional warning centre location with infrastructure. Kenya is a WMO regional telecommunications hub and already disseminates warnings to other countries from Nairobi. They have set up a process to coordinate systems at the national level. The US government is funding the centre. The Regional Disaster Management Centre will coordinate all disasters for 11 countries.

(c) Sri Lanka

Mr PM Jayatilaka reported on Sri Lanka’s progress.

- The Met Dept is responsible for receiving and issuing warnings.
- Warnings are received from PTWC and JMA
- Discussions are held with other departments to agree on issuing warnings to the general public
- The GTS has been upgraded (with US assistance) and is now the primary system
- Met Dept issues warning to the Disaster Management Centre (DMC) and the media. DMC then takes over warning dissemination to the general public.
- They prepare a bulletin for the DMC who by law look after warnings
- Locally, 3 warning towers have been set up with assistance from OCHA. Maintenance is a problem and reliability and sustainability are issues
- Last mile: DMC issues warnings to local police stations who warn general public.
- DMC push the siren buttons.

As per March 2005 event, if the event happens at night there is no way to transmit message to people.

(d) Oman

Mr Ahmed al Harthy from the Oman Met Dept reported for Oman
• GTS reception in Oman is good and warnings are received in a timely manner.
• As soon as a warning is received and auto-warning is issued to key stakeholders
• They have a mandate to build a multi-hazard warning centre and they are working closely with IOC on this.
• They hope to receive the green light from the Ministry of Finance soon. Once they have the funds, implementation will commence very soon.
• Referring to the time to receive warnings, this is always less than 1 minute for GTS. Email is 1-3 minutes and fax is >3 minutes.
• The Met Dept is linked to the WMO hub.
• Oman has some reservations about plans for the Regional Tsunami Watch Providers

(e) Indonesia

Dr Prih Harjadi reported for Indonesia.

• Indonesia is also a recipient of warnings. For PTWC, they get warning generally between 17 – 20 minutes after the event, and a little bit longer from JMA.
• Indonesia is already disseminating warnings for local events but for distant events they get information from PTWC and JMA. When an email is received SMS messages are sent out to key people.
• For big distant EQs (eg. Kurils) they also detect but they don’t take any action.
• They use 3 modes for receiving warnings: GTS, email and fax. Fax is the least reliable
• PTWC/JMA updates are useful for big events, to determine if and when a tsunami will reach Indonesia.

For local tsunamis, BMG warns Police, Ministry of Internal Affairs an others, who issue an alert to TV stations who issue a tsunami warning as “breaking news”. For distant tsunamis, BMG sends SMS alert to selected agencies but not to TV stations.

(f) Malaysia

Dr Mohd Rosaidi Bin Che Abas (Rosaidi) reported for Malaysia.

• Malaysia’s situation is the same as Indonesia’s. For distant earthquakes they receive messages from PTWC and JMA
• When they receive message of strong earthquakes they send SMS out to emergency managers etc. If it turns out to be no threat they send out another SMS
• In Malaysia, the Met Dept (MMD) takes care of everything. They have 90 staff at their Early Warning Centre working 2 shifts.
• They will be putting their tide gauge and tsunameter buoy data on the GTS soon

Indonesia clarified the different approaches they use for local and distant tsunamis:
Local tsunami: BMG warns Police, Ministry of Internal Affairs and others, who issue an alert to TV stations who issue a tsunami warning as “breaking news”.

Distant tsunami: BMG sends SMS alert to selected agencies but not to TV stations.

3 REVIEW OF INTERIM SERVICE PERFORMANCE AND CAPABILITIES

The Group agreed that the Interim Tsunami Advisory Service should be reviewed by the recipient member states with the aim of finding out the type of information they would like to receive. The idea of including Tsunami Travel Time in the message was discussed.

Travel time can be calculated by NDWC using Tsunami Travel Time (TTT) tool. However, there are uncertainties with this due to uncertainty of rupture direction. It takes a day to calculate direction of rupture. Problems may occur if tsunami travel times are published and are mis-understood by the public.

The Group discussed the amount of time required to transition from the Interim Service to the Regional Tsunami Watch Providers (RTWPs). Some representatives felt that 2008 was too early for the transition, and there was general agreement that a transition period of 5-10 years would be required, with RTWPs running in parallel with the interim service. Legal liabilities will also need to be taken into consideration.

There is a need to consider national capabilities, and to update the table of RTWPs, National Providers (NP) and recipient countries. Planning a regional exercise may help develop national capabilities and highlight the gaps and deficiencies. Organisation of such events can take a lot of time. Meanwhile, the group should focus on analysis and cooperate with the other ICGs.

Mr al-Harthy (Oman) commented that Oman was quite happy with the service from PTWC and JMA (by GTS). However there were so many exercises, but no feedback.

Mr al-Harthy went on to comment that he felt that 2008 was too early to transition from the interim service and that the countries represented at this meeting were not enough to do justice to this. He believed that the Indian Ocean should have its own regional centre but that it was too premature for this to happen. Countries need time to prove to themselves that they can take on this service. He felt that we should focus more on national centres and develop local capability. For the Makran source, he asked who would take this on? He believed that a 5 – 10 year period was needed for a RTWP to run in parallel with PTWC and JMA and if Performance Indicators were met, then they can take over the service.

Mr Crane agreed that time running in parallel was needed. He also noted that countries close to the source would be pre-occupied with the event and distant centres might be better placed to provide regional warnings. He also commented that he believed that PTWC would probably keep the interim service going until 2010 but beyond that they would probably push us to move faster. He thought that they would not be keen to keep the interim service going for much longer.
Mr A.R. Subbiah (ADPC) agreed that there should be clear criteria for demonstrated capability and considered that a 5 – 10 year cycle was required.

Mr Crane commented that development of NDWC capability was important and agreed with Mr al-Harthy. He said that we should disseminate minutes and reports to all member states to make sure they know what we’re discussing.

Mr Subbiah felt that it was important to consider national capabilities. We should survey member states to find out what countries’ aspirations are – to simply pass on warnings to population or to analyse data in-country.

Mr Crane felt that planning an exercise may help development of national capabilities and highlight their deficiencies. The Pacific Wave exercise showed how much time it takes to organise these events. He also noted that there was a need to update the table of RTWPs, National Providers (NP) and recipient countries. What do the MS want to do now? Has there been any change since ICG-III? He felt that there were levels of independence, depending on what you want to do. Seismic analysis, numerical modelling are quite specialised. He suggested that this update should take place before the next Task Team meeting.

Mr Yamamoto commented that for local tsunamis, local capability should be developed (NP status).

4. PLANNING FOR IOTWS INTERIM SERVICE EXERCISE.

The Group discussed the possibility of holding an interim service exercise, and how far it should go. The countries taking part should be volunteers, and it would be up to each country to decide how fully they would participate (e.g. whether to hold a tabletop exercise or a full end-to-end exercise including evacuations). The minimum would be to test all the system agencies involved up to the point of issuing a warning, without actually issuing one. It was suggested that an outline of an exercise should be put forward to the ICG-V in 2008.

The Group suggested that participating countries could be informed of the date but not the time of the exercise to introduce an element of uncertainty. It was noted that this could be difficult because to the different time zones covering the region. The Pacific Wave exercise took 5 hours. The exercise should also be conducted for the Makran source.

Indonesia noted that it holds an exercise every 26 December. So far they have held this in Padang and Bali. This year the exercise will be in Bantang area in the Sunda Straits. This will be more complicated because of the chemical industry in this area.

The Group suggested that an ICG Task Team be set up to discuss the exercise, with WG5 providing management.
5. FUTURE RTWP SERVICE

The Chair explained that the initial aim of RTWPs was to replicate the interim service, according to the thresholds listed in the WG5 Task Team Melbourne report. He described the Australian system, which has 40 zones, and used this to explain how they use Tsunami Forecast Points and worst case model grid points. The model grid is 7km and this can result in the nearest model point being in deep water (eg Christmas Island grid point is over 1200m whereas Coff’s Harbour is 41m). 700 locations 100km apart along the source zone have been modelled for M 7.5, 8.0, 8.5 and 9.0. Australia is working on modelling the Makran source zone and this should be completed by the end of the year.

Seismic interpretation can’t determine rupture direction fast enough, so they assume that rupture is in both directions. PTWC and JMA use the following criteria for classifying tsunamis:

- >0.5m major tsunami
- 0.2 – 0.5m marine hazard
- <0.2m no significant effects

However Australia considers this too conservative and have adopted 0.7m as the threshold for a major tsunami. They use Green’s Law to convert offshore wave height to inshore. For typical tide gauge depth, wave height is about 2x the offshore amplitude.

The Australian national system is quite fine-tuned, but as yet cannot forecast for specific points around the Indian Ocean. It took Australia 3 months to run the scenarios for 700 locations.

It was suggested that a base set of tsunami forecast points could be put at tide gauge sites, for each RTWP to model. Tsunameter data could be used as well. It is important to have observed data to verify and upgrade warnings. PMEL and AIT are working with 15 countries to get local bathymetric data. They would like these countries to share with neighbouring countries and vice versa.

Indonesia noted that ITB are conducting the modelling and are checking this against historical data. However the model is only run into the shoreline, ie. no inundation.

6. TRANSITION STRATEGY

The Chair noted that some concern had been expressed that the transition was planned to take place too soon. There needs to be sustainability, but how long should the transition period last?

Referring to the joint meeting held the previous day with WG2 on sea level, the Chair commented that there had been more discussion on the metadata issue than expected. There was concern about the communication of data. WG2 are concerned about the use of the data. Archiving of data is important as well.
Indonesia raised the question of GTS latency. In the Indonesian experience, there was 15 minutes delay through the Japanese satellite for 5 tide gauge stations. They were having an internal discussion to determine who would take responsibility for exchanging data, BMG or Bakosurtanal. It was felt that only processed data should be sent to BMG from Bakosurtanal. The Chair commented that even PTWC were having difficulty with this issue. It was also noted that GTS has a switching facility which is predefined, and the correct priority has to be set.

The Group noted that it is useful to have Low Water/ High Water information for response purposes. So it is good to have raw data, not just processed data. The PTWC Tidetool software for sea level data is available for everyone to use, however some countries have difficulty accessing sea level data.

The Group suggested that there should be a WG or an international consortium to look into sustainability of the system and agreed that this should be raised at the ICG-V. Recipient countries were keen to see consistency of service between PTWC, JMA and the RTWPs. PTWC and JMA do not provide wave amplitude data for the Indian Ocean. RTWPs should have technical capacity and have sustainability.

The cancellation of warnings was an important issue, but reflected wave energy was a problem. Model scenarios should be used but the model domain needs to be large enough.

It was noted that recipients of warnings should acknowledge warnings, and PTWC would very much like this to happen. Oman said that JMA tests were very efficient but the results were not circulated. The PTWC tests were very confusing. Oman responds to some of the tests but they never get anything back from PTWC.

Malaysia reported that they receive messages from JMA and BMG. They in turn send messages to Singapore and Brunei. They are moving towards Phase II of their system. They are setting up a modelling section and will be computing propagation up to their tide gauge locations.

7. RECOMMENDATIONS.

1. There is an urgent need to have a technical memorandum on accessing sea level data over the GTS and training in the interpretation of sea level data for warning centres.
2. Develop a system of systems for Tsunami Warning Systems. The Terms of Reference for WG5 need to be re-affirmed (Kenya)
3. Sustainability issues need to be discussed with PTWC and JMA.
4. The member states should be surveyed to update their intentions vis a vis being National Watch Providers, Regional Watch Providers, or being National Warning Centres only.
5. The meeting noted that there could be a requirement to reassess national capacity for tsunami warning systems (update the 2005 Capacity Assessment)
6. The IOTWS Implementation Plan should be updated
7. The ICG/IOTWS Secretariat should resolve the satellite phone issue
8. Potential RTWPs should exchange earthquake parameter data as a start to the transition process.

The meeting closed at 1300hrs, 6th September.
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<tr>
<td><strong>Australia</strong></td>
<td></td>
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</tr>
<tr>
<td>Mr Geoff Crane</td>
<td>Bureau of Meteorology</td>
<td><a href="mailto:g.crane@bom.gov.au">g.crane@bom.gov.au</a></td>
</tr>
<tr>
<td>Dr Spiro Spiliopolous</td>
<td>Geoscience Australia</td>
<td><a href="mailto:spiro.spiliopolous@ga.gov.au">spiro.spiliopolous@ga.gov.au</a></td>
</tr>
<tr>
<td><strong>Indonesia</strong></td>
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<tr>
<td>Dr Prih Harjadi</td>
<td>BMG</td>
<td><a href="mailto:prih@bmg.go.id">prih@bmg.go.id</a></td>
</tr>
<tr>
<td>Mr Masturyanto</td>
<td>BMG</td>
<td><a href="mailto:kig@bmg.go.id">kig@bmg.go.id</a></td>
</tr>
<tr>
<td>Mr Sunarjo</td>
<td>BMG</td>
<td><a href="mailto:Sunaryo@bmg.go.id">Sunaryo@bmg.go.id</a></td>
</tr>
<tr>
<td><strong>Kenya</strong></td>
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<tr>
<td>Ephantus Ngotho</td>
<td>Kenya Meteorological Department</td>
<td><a href="mailto:engotha@meteo.go.ke">engotha@meteo.go.ke</a></td>
</tr>
<tr>
<td>Col. Shem Amadi</td>
<td>NE Africa Regional Disaster Management Centre</td>
<td><a href="mailto:coamadi@yahoo.com">coamadi@yahoo.com</a></td>
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<td><strong>Malaysia</strong></td>
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<tr>
<td>Dr Mohd Rosaidi Che Abas</td>
<td>Malaysia Meteorological Department</td>
<td><a href="mailto:rosaedi@kjc.gov.my">rosaedi@kjc.gov.my</a></td>
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<tr>
<td>Ahmed al Harthy</td>
<td>Oman Meteorological Department</td>
<td><a href="mailto:a.alharty@met.gov.om">a.alharty@met.gov.om</a></td>
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<tr>
<td>Mr Masahiro Yamamoto</td>
<td>Tsunami Unit Paris</td>
<td><a href="mailto:m.yamamoto@unesco.org">m.yamamoto@unesco.org</a></td>
</tr>
<tr>
<td>Mr Tony Elliott</td>
<td>ICG/IOTWS Secretariat</td>
<td><a href="mailto:t.elliott@unesco.org">t.elliott@unesco.org</a></td>
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<tr>
<td><strong>ADPC</strong></td>
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<tr>
<td>Mr Arjunapermal Subbiah</td>
<td>ADPC</td>
<td><a href="mailto:subbiah@adpc.net">subbiah@adpc.net</a></td>
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