Agenda Item 3.4

STEERING GROUP REPORT

This document contains the report of the meeting of the ICG/IOTWS Steering Group, held in Perth, Australia on 12-13 February 2008. The ICG is requested to consider, comment and eventually endorse the recommendations issued by the Steering Group.
1. INTRODUCTION

1.1 Welcome Address by Chair

Dr Jan Sopaheluwakan, Chair of the ICG/IOTWS, welcomed the members of the Steering Group. He briefly reviewed the agenda and identified three major issues to address:

1) Status of the system and updates of the Implementation Plans
2) Working Group Interaction and rationalisation of Terms of Reference, and possible need for another working group to progress the work of the ICG
3) Discuss the interoperability of warning centres. This is a key issue for the working groups and the ICG

Dr Sopaheluwakan reminded the group that the Steering Group is not a decision-making body for the ICG and must refer recommendations to the ICG for consideration. However, the Steering Group plays a vital role in helping to coordinate and facilitate the activities of the Working Groups and providing recommendations to Member States of the ICG to facilitate its decisions at the ICG meetings.
1.2 Agenda
The Steering Group reviewed the agenda and made a few modifications. The modified agenda was adopted by the meeting and is listed in Annex I.

1.3 Secretariat Report
Mr Tony Elliott presented a review of the role of the ICG/IOTWS Secretariat, the AusAID Secondment programme, and the activities of the Secretariat during the past 12 months. He outlined the meetings and workshops organised and attended by the Secretariat, including modelling training courses and several workshops on tsunami risk assessment. The ICG/IOTWS Secretariat continues to be supported (AUD400K/year) and hosted by the Australian Bureau of Meteorology in Perth. He then discussed some of the challenges facing the Secretariat during the next 12 months, including funding constraints, increased workload for staff, and delays in developing a website.

The Steering Group then discussed the longer term issues facing the Secretariat beyond 2009 when they felt that focus of the ICG is likely to shift more towards operation and maintenance. The Secretariat would need to adjust and plan accordingly for this shift in emphasis.

The Steering Group requested more information about the activities of other ICGs through the IOC Tsunami Coordination Unit (TCU) website to facilitate coordination between the ocean basins. The current IOTWS website is difficult to navigate and does not contain all the necessary information for ICG members. This will facilitate the activities of the Working Groups.

Recommendation: TCU requested to update the content of the central web site more frequently to facilitate coordination between the various ICGs. The Steering Group requests to be consulted on web site user requirements for the IOTWS.

Mr Tony Elliott discussed the issues and problems the TCU has in getting MS to update and keep valid their list of Tsunami National Contacts (TNC) and Tsunami Warning Focal Points (TWFP). The TNC information is vital for the successful coordination and implementation of the IOTWS. The TWFP details must be current to ensure advisories issued by the Interim Advisory Service get to the right contacts in the National Tsunami Warning Centres (NTWC). In some cases the TWFP is the only nomination and is also being used as the TNC.

Recommendation: TCU to continue its efforts to ensure TNC and TWFP information is up-to-date.

The Steering Group requested the membership of Working Groups be formalised as soon as possible. Chairs and Vice-Chairs of Working Groups have difficulty in knowing who to contact, with the lack of membership continuity also causing difficulties in maintaining momentum at Working Group meetings.

Recommendation: ICG/IOTWS Secretariat to formally request the TNCs to nominate and confirm Working Group members.

1.4 UNESCAP Trust Fund Update
Mr Tony Elliott presented a brief update on the activities of the UNESCAP trust fund, including the activities it has funded to date. The fourth round of funding applications close
on February 15th 2008, and there will be another round of funding open later in 2008. The fund has received over $12 million in donations, including $10 million from the Thai Government and $2.5 million from Sweden. About $4.5 million has already been allocated.

In the last round of funding, IOC received approximately $444,000 to conduct workshops on Standard Operating Procedures (SOPs) for tsunami warning in four UNESCAP countries. Two of these countries, Myanmar and Pakistan, are members of the IOTWS. The project will commence in the next few months and will be concluded by November 2008.

The Chair of Working Group 5, Geoff Crane, expressed the opinion that this project should consult with WG5 given its ToRs and the need for SOPs to be coordinated with the development of Regional Tsunami Watch Providers (RTWPs).

The Steering Group discussed the issue of sustainability of the IOTWS and noted the IOC’s efforts at securing additional funds for related activities.

**Action:** Working Group Chairs, in consultation and with the assistance of the ICG/IOTWS Secretariat, to identify issues and proposals within their work areas that support their Action Plans that could be supported by external funding sources.

### 2. WORKING GROUP REPORTS

#### 2.1 Working Group 1 (Seismic Measurements, Data Collection and Exchange)

Dr Spiro Spiliopoulos, Vice-Chair of WG1, presented the results of the intersessional meeting of WG 1 which was held in Singapore in October 2007. At the meeting, the working group reviewed data sharing, data formats and software. Dr Spiliopoulos showed a map of the currently available core seismic stations. Gaps in the western Indian Ocean are an issue, as is the need for training for accessing core station data.

The working group made several recommendations to the ICG about formats for data sharing, improved data sharing agreements, establishment of metadata databases, and requested IOC to organise seismology training for all Indian Ocean countries.

#### 2.2 Working Group 2 (Sea Level Measurements, Data Collection and Exchange)

Mr Ken Jarrott, Vice Chair of WG2 and Chair of the International Tsunameter Partnership, presented an overview of the current status of WG2. An intersessional meeting was held in Jakarta in September 2007. During the meeting, WG2 members proposed several changes to the Terms of Reference for the group.

**Action:** Working Group 2 to table revised Terms-of-Reference at ICG/IOTWS-V for ICG endorsement.

Progress and future plans included the development of instrument standards for the ITP, tabling of best practice for instrument standards, data delivery and performance. The action plans were extended and are listed in the meeting report. Data integration is an issue, as is sustainability of the deep ocean networks. Further issues are the technical maturity of deep ocean stations, data integration with warning centres and data archives, inter-country network optimisation, communications (including satellite stations for remote or off-shore stations), and overall sustainability. Communications are an issue, and agreements at the global level (e.g. with Inmarsat) are not being communicated down to the user-level.
Confirmation of national membership of the group is also an issue. National representatives need to be formally nominated and need to ensure continuity of the membership. Communal exchange forums are required, both internally and with other global TWS.

Following the presentation, there was a discussion about data archiving. Some participants felt that this was a national issue, but there are also several international agencies archiving sea level and seismic data. Rick Bailey advised that at the ICG/PTWS-XXII in Ecuador in September 2007, the meeting was advised by the GLOSS and World Data Centre for Geophysical Data representatives that the British Oceanographic Data Centre (BODC), which is the designated global sea level data centre under the Intergovernmental Ocean Data Exchange (IODE), has offered to archive the higher resolution sea level data recorded for tsunami monitoring.

Rick Bailey, also Chair of Working Group 2 for the ICG/PTWS, advised the group of the recommendation from ICG/PTWS-XXII for a global tsunami sea level workshop to help focus and coordinate the efforts of all the related Working Groups. As the report from ICG/PTWS-XXII has yet to be published by the TCU, the status of action on this recommendation is unknown. The Steering Group suggested the “International Tsunami Warning Conference” in Bali, Indonesia, in November 2008 might provide a good venue for such a workshop.

**Action:** Rick Bailey to follow up with TCU on status of recommendation from ICG/PTWS-XXII for a global tsunami sea level workshop and if required refer the matter to the recently established Tsunami and Other sea level related hazards Warning Systems (TOWS) group within IOC.

### 2.3 Working Group 3 (Risk Assessment)

Professor Sam Hettiarachchi, Chair of WG3, presented an update on the activities of the group. He started with a review of the workshop held in Bandung in July 2007, where 17 experts in earthquakes and palaeotsunami research considered the issues involved with production of a tsunami hazard map for the Indian Ocean. This project is being led by Geoscience Australia with funding from AusAID and with contributions from experts around the Indian Ocean region. Several experts will be visiting Geoscience Australia during the first half of 2008 to make contributions to the project.

Professor Hettiarachchi also summarised the results of the Risk Assessment workshop held in Dubai in October 2007. 30 risk assessment experts and national representatives attended the workshop which covered all aspects of tsunami risk assessment. The final session of the workshop was a discussion on development of guidelines for tsunami risk assessment. WG3 is working closely with UNDP to develop the guidelines.

Dr John Schneider emphasised the importance of palaeotsunami and historical tsunami events to help quantify the risk. An understanding of the risk is essential to building credible scenarios of potential tsunami events for use in preparation and mitigation efforts.

Dr Jane Cunneen informed the meeting that WG3 was considering undertaking paleotsunami work in the Makran region in 2008/2009, and is in the process of seeking funding.

WG3 plans to work more closely with WG4 and WG6 on intersecting issues, and hopes to hold joint workshops in future. The Steering Group was concerned that there needs to be more coordination and integration between those developing inundation models and those
doing the tsunami risk assessment. Inundation modellers need to consult with those conducting the hazard modelling in order to ensure the input of credible scenarios.

2.4 Working Group 4 (Modelling, Forecasting and Scenario Development)
Professor Chari Pattiaratchi presented an update on the activities of WG4. The aim of the group is to provide the tools, train the people and data to conduct inundation modelling for all the coasts of the Indian Ocean by 2015. The ComMIT interface has been developed by PMEL to allow modellers to use their own bathymetry. 60 participants from Indian Ocean countries have been trained to date – the group aims to train at least 2 people from each Indian Ocean country.

The main obstacle continues to be the lack of high resolution nearshore bathymetric and topographic data which are required for accurate inundation models.

The group would like to plan an Indian Ocean tsunami modelling symposium in November or December 2009, to commemorate the 5 year anniversary of the 2004 tsunami.

2.5 Working Group 6 (Mitigation, Preparedness and Response)
Mr Michelle Vielle, Chair of WG6, presented an update on the activities of the group. WG6 is the end-user of the projects of the other working groups, and is dependent on the outputs of the other groups. At the meeting in Mombasa in February 2007, 18 activities were identified for the Working Group’s Action Plan, most for 2007 and 2008. Some of these activities will be addressed during the Coastal Community Resilience (CCR) workshop that is to be held at the end of February 2008 in the Seychelles.

The main obstacle to progress is lack of participation from the MS. Updates on the status of mitigation activities have been requested, but no responses received. The Steering Group was concerned that the WG6 Action/Work Plan was broad and very extensive and would therefore be difficult to manage. It was also concerned that some of the Terms-of-Reference are not specific enough.

A joint workshop was proposed between WG3 and WG6, and Dr Sopaheluwakan offered Indonesia to host the meeting during the first quarter of 2009.

2.6 Working Group 5 (A System of Interoperable Advisory and Warning Centres)
Mr Geoff Crane, Chair of WG5 and of the WG5 Regional Tsunami Watch Provider (RTWP) Task Team, presented an update on the activities of both groups. WG 5 is considering holding an informal meeting on April 7 2008, the day before the ICG meeting.

The Task Team’s main objective is to prepare a draft implementation plan for RTWPs for MS to consider and endorse at ICG/IOTWS-V. It has held two meetings, the first in Melbourne in June 2007 and the second in Hyderabad in February 2008. WG5 held a workshop in conjunction with an intersessional meeting in Jakarta in September 2007, where WG5 members and MS were informed of progress of the RTWP Task Team and consulted to get user feedback. A joint session between WG5 and WG2 was also held in Jakarta in September 2007 to coordinate data requirements of tsunami warning centres and implementation of sea level monitoring networks.

The goal of the second RTWP Task Team meeting was to develop an implementation plan, which is currently being finalised. Mr Rick Bailey (Vice-Chair ICG/IOTWS and RTWP Task
Team Member) presented an update on the activities and provided a draft outline of the RTWP Implementation Plan for discussion (Annex II).

The RTWP Implementation Plan will attempt to address many of the issues to be faced by the RTWPs. The goal is to guide the implementation of a tsunami watch system which can emulate the interim service, with enhanced capability to help advise those countries most at threat using modelled scenarios. The minimum service and capability requirements for RTWPs were defined and a concept of operations presented. Three service levels were defined for increasing levels of capability for RTWPs and a schedule for implementation of the service levels was outlined. A list of Performance Indicators for RTWPs is also being developed.

The proposed services to be provided by the RTWPs are divided into levels, which will be achieved as implementation progresses. RTWPs will initially shadow the Interim Advisory Service (PTWC and JMA) but once the RTWPs are fully operational the Interim Advisory service will shadow the RTWPs. More detailed information will be provided by the NTWCs at a higher level of implementation.

The RTWP Task Team has identified a number of technical and scientific issues, which will require tasking and action by several of the Working Groups (WG1, WG2, WG3, WG4, WG5) during the next intersessional period. The Steering Group had a discussion on the evaluation of threats, how to standardise responses between RTWPs, what this would mean at a national level, and what the thresholds are for different countries (may vary from country to country and depends on the threat). Standardisation of language is required to communicate the level of threat at the regional level, leaving the NTWCs to use their own terminology depending on local requirements and recognised cultural differences. Working Group 5 will need to continue work on interoperability of watch messages, information exchange and formats, standardisation of threat and forecast information formulation.

Action: Next version of the draft RTWP Implementation Plan to be circulated to Steering Group members for feedback before submission of final draft by 7th March as a working document for ICG/IOTWS-V.

3. WORKING GROUP INTERACTIONS

The Steering Group discussed possible areas of overlap between WG3 and WG6, as both groups include mitigation activities in their Terms of Reference. The Chairs of the two groups agreed that there is no significant overlap as WG3 focuses on the technical mitigation issues while WG6 focuses on the downstream mitigation and response issues. However, it was felt that there needs to be better communication between the two groups and a joint workshop was proposed for first quarter of 2009. Dr Sopaheluwakan reiterated Indonesia’s offer to host the workshop.


WG3 and WG4 have been discussing joint issues, and proposed a workshop to bring together representatives of WG1, 3, 4, and 6. At the ICG/IOTWS-III meeting in Bali in August 2006, WG4 made the following recommendation: “[To hold] a workshop (within the next 12 months) to bring together geologists, seismologists and tsunami modellers. This should include representatives from WG1, WG3, WG4 and WG6. The aim of the workshop is to define credible tsunami sources and associated probabilities of occurrence. The definition of a
“tsunami source” should include full characterization of the source, including depth, dips etc.” The Tsunami Hazard Map project currently underway at Geoscience Australia will provide input to the workshop.

Overlaps between WG3 and WG4 were then discussed by the Steering Group. There was a lively discussion about the need to use the model standards and benchmarks established by WG4 for the IOTWS to validate models, and how this impacts on their use in the warning centres.

The Steering Group agreed that better linkages and communication between the working groups is required but there are no significant gaps or overlaps at present. The Steering Group identified a need for better coordination between the other ICGs, especially in the areas of sea level, seismic, and warning centres. The establishment of the global coordination group for Tsunami and Other sea level related hazards Warning Systems (TOWS) by the IOC to help address such coordination issues was noted, as were present efforts to have the Chairs or Vice-Chairs from other ICGs attend meetings of their counterpart ICGs.

Dr Sopaheluwan summarised the discussions and reminded the WG chairs to provide updates for the Implementation Plan within 2 weeks. Working Groups should consider any changes to their Terms of Reference for endorsement by the ICG/IOTWS – at the moment only WG2 has flagged this.

**Action: WG chairs to provide updates to the ICG/IOTWS Secretariat for the IOTWS Implementation Plan by 28th February.**

4. OTHER ICG/IOTWS ACTIVITIES

4.1 COAST MAP IO Project
Mr Tony Elliott presented the background to the project. It is funded by Italy and is run through the IOC Tsunami Unit in Paris.

There are 12 partner countries involved in the project, which started in August 2007 and will run for one year. The idea is to build capacity in the member countries to collect and process high quality bathymetric data. The project value is about 1 million euros for one year. Capacity assessment missions have already been conducted for the participating countries, and three training courses are planned. The kick off meeting for the project was held in Bangkok in October 2007, at the Hydrographic Department in Bangkok. Due to the significant overlap with ICG/IOTWS activities, the Chair of WG4 was invited to participate in the Steering Committee for the project.

4.2 Report on Survey of Member States response to the 12th September 2007 tsunami
Mr Tony Elliott presented the results of the survey of IOTWS Member States conducted by the ICG/IOTWS Secretariat following the 12 September 2007 earthquake and tsunami. 25 IOTWS member states were asked to complete a questionnaire, and the Secretariat received 21 responses.

The responses to each of the 20 questions in the questionnaire were compiled and present a picture of the reactions of each MS to the tsunami information bulletins disseminated by the Interim Advisory Service (PTWC and JMA). Mr Elliott considered that the main highlights of the results were that:
• Seismic and sea level detection network worked well
• All (21/21) received watch bulletins from PTWC/JMA
• 15 (21) of NTWCs received watch bulletin by GTS
• Many NTWCs doing own EQ analysis (12)
• Most MS took some action after bulletin (19)
• Many MS monitored sea level (13)
  – 5 by GTS
  – 5 by ODINAFRICA
  – 3 other
• Some MS used numerical models (8)
• Indonesia warning within 5 mins of EQ

Mr Elliott explained that the Secretariat initially planned to publish the results in December 2007 but an intervention by Australia shortly before the publication date resulted in a delay to publication. The Secretariat now plans to publish the report prior to the ICG/IOTWS-V meeting in April 2008. Mr Bailey explained that Australia’s intervention was to request that the report undergo a formal review process by MS, WG5 and the Steering Group prior to publication due to the critical nature of the results.

Mr Elliott invited comments from the Steering Group on his presentation of the results from the ICG/IOTWS Secretariat’s survey. All agreed on the value and necessity of such an assessment. However, some members of the Steering Group expressed concerns about the way several of the summary results were presented. Mr Rick Bailey considered that some of the summaries were misleading as presented, or based on insufficient information.

Mr Rick Bailey objected to the statement ‘the seismic and sea level detection network worked well’, because he was of the opinion that this had little basis as there are still gaps in the system that were observed during the event. Making such a statement may have political implications and affect chances of funding the further required instrumentation to establish the core network.

To ensure MS buy-in and to gain benefits of utilisation of designated experts of the ICG, Mr Bailey suggested that the MS of the ICG that responded to the survey and the Steering Group should review the draft report before publication. Members of the Steering Group wanted to assist the assessment by providing their review prior to publication. Mr Geoff Crane requested WG5, which has responsibility for establishment of the interoperable system of advisory and warning centres, be consulted prior to future surveys being conducted.

Dr Jan Sopaheluwakan recognised the need and initiative to at least start an assessment process, but the ICG needs to agree the process, although there were differing opinions in the Steering Group as to how this should be implemented.

**Action:** The ICG/IOTWS Secretariat to send the Steering Group the Draft 12 September 2007 Tsunami Assessment Report to review prior to the ICG/IOTWS-V meeting,

**Action:** ICG/IOTWS Secretariat to send the Draft 12 September 2007 Tsunami Assessment Report to the IOTWS MS that responded to the survey for comment to ensure the information they provided was correctly represented before publication.
There were concerns expressed about the time required for such a review. The Steering Group agreed that due to the limited time available before the ICG/IOTWS-V meeting, there will be a strict time limit of 1 week for responses.

**Recommendation:** That the ICG task the Steering Group to develop the required procedures for standardised post event reports.

### 4.3 Report on US IOTWS Transition Workshop

Mr Rick Bailey presented an overview of the outcomes of the US IOTWS Transition workshop, which was held in Bangkok in December 2007. The aim of the workshop was to showcase the results of the two-year US-IOTWS Programme in Indonesia, Thailand, Maldives, India and Sri Lanka, and to discuss sustainability issues following the end of the programme. The discussion focused on how to integrate the work of the US-IOTWS into the ICG/IOTWS. ICG/IOTWS Working Group chairs or their representatives, the Head of the IOC Tsunami Coordination Unit and the Head of the ICG/IOTWS Secretariat were invited to participate in a panel discussion chaired by Rick Bailey. The ICG/IOTWS faces similar sustainability problems, which confirms that it needs to address this issue at the next ICG meeting.

WG chairs were asked to note the sustainability issues raised at the workshop and consider the implications of these for their respective Action Plans.

### 4.4 Proposed Indian Ocean Wave '09 Exercise

Mr Rick Bailey recalled that the need for an Indian Ocean-wide exercise was discussed by WG5 during the ICG-IV meeting in Mombasa in February 2007. The Steering Group discussed possible timing for the exercise. It was agreed that it is important to hold some sort of exercise, so that the performance of the system can be measured. Indonesia is planning a nation-wide drill in November 2008, so it may not be suitable to hold another drill near that time. However, it was desirable to hold an exercise of some form in late 2008 or early 2009 so that the assessment of the system is available for the ICG/IOTWS-VI meeting in 2009.

As well as timing, the issue of scenarios for the exercise needs to be discussed. The experience by PTWS countries during the Pacific Ocean Wave exercise in 2006 demonstrated that it can be confusing to use more than one scenario for the same event. It was suggested instead that a series of exercises (perhaps one every year) could progressively examine the possible scenarios (e.g. Makran, Burma etc.). For the first scenario, the Sept 12 2007 event was suggested.

**Recommendation:** The ICG set up a task team at the ICG/IOTWS-V meeting to consider the proposed Indian Ocean 2009 Exercise. It is suggested that an Indian Ocean-wide table top exercise be conducted in the last week of November 2008, and a full exercise should be conducted in December 2009, to coincide with the fifth anniversary of the 2004 tsunami.

**Action:** Mr Rick Bailey and Mr Geoff Crane to draft a proposal for the exercise as a working document for the ICG, to be considered at the ICG/IOTWS-V meeting.
5. IOTWS STATUS AND ISSUES

The Chair opened this session by outlining the two major issues facing the ICG/IOTWS: sustainability, and the evolving capacity of member countries. The ICG needs to focus on how to help the less developed countries and how the mutual cooperation between member countries can be promoted or accelerated within the IOTWS. Public/private partnerships should be investigated as one method for addressing the sustainability issue.

The Chair also reported that Indonesia was planning an International Conference on Tsunami Warning in Bali in November 2008 to coincide with the official launch of the Indonesian Tsunami Early Warning System. The Indonesian organising committee would like encouragement and/or endorsement from the ICG. The Secretariat agreed to contact the conference organisers with suggestions for themes and workshops from the Steering Group.

Action: The ICG/IOTWS Secretariat consult with the Steering Group to develop suggestions for themes and workshops and consult with the organisers of the “International Conference on Tsunami Warning” to be held in Bali, November 2008.

5.1 Gaps and Deficiencies

The Steering Group agreed that it is difficult to identify gaps in the system without performance indicators for each of the working group areas, with measurable milestones and steps. The Implementation Plan needs to reflect how the entire system works together and should be more than just individual working group plans. It should show progress but also identify intended targets.

The Steering Group discussed the requirements for Implementation Plan updates from the working groups. The Secretariat circulated a template for the updates, and several changes were agreed upon.

5.2 ADPC

Mr Tony Elliott reported on the ADPC Regional Steering Group meeting which he attended in January 2008. He noted that the ADPC now has MOUs signed with 15 countries for the provision of their tsunami watch service.

ADPC has two international steering committees, one for the total multi-hazard centre and one for tsunami warning. Dr Chip McCreery, Director of the PTWC, and Mr Geoff Crane, Chair of ICG/IOTWS WG5 are both members of the tsunami steering committee, and Mr Crane is also a member of the multi-hazard committee.

Members of the Steering Group expressed concerns about the present level of technical capability at the ADPC and its ability to provide the service it is promising. They also expressed concern about the sustainability of ADPC activities in the long-term given its funding is not guaranteed.

6. ICG/IOTWS-V MEETING

Mr Tony Elliott reported on the progress towards the ICG/IOTWS-V meeting, which is scheduled for 8-10 April 2008 in Kuala Lumpur, Malaysia. The Memorandum of Understanding between Malaysia and IOC-UNESCO is still being negotiated, and could be delayed if there is an election called in Malaysia. The venue and hotels are still to be decided
by the hosts. An Agreement would need to be reached very soon (1-2 weeks) between the IOC and Malaysia, otherwise the meeting would need to be postponed.

The Agenda for the ICG/IOTWS-V meeting was discussed by the Steering Group and several minor changes were made to the timetable. The Chair requested Mr Rick Bailey present the Steering Group report at the meeting and he agreed.

Mr Che Moin Umar, on behalf of the Malaysian organisers, requested the Secretariat to designate a theme for the ICG-V meeting. The group decided on the theme: “Towards a sustainable warning system for the Indian Ocean”.

The Steering Group discussed the need to develop a strategic plan for the IOTWS under its Terms-of_Reference to guide and underpin its future development, taking into account major issues such as sustainability of the system. The Steering Group agreed it was in the best position to develop such a plan for the IOTWS.

**Action:** Rick Bailey to coordinate and lead development by the Steering Group of a Draft Strategic Plan for the IOTWS during the next intersessional period for review and consideration by MS at ICG/IOTWS-VI.

7. **SUMMARY OF ACTION ITEMS**

- Working Group Chairs, in consultation and with the assistance of the ICG/IOTWS Secretariat, to identify issues and proposals within their work areas that support their Action Plans that could be supported by external funding sources.

- Working Group 2 to table revised Terms-of-Reference at ICG/IOTWS-V for ICG endorsement.

- Rick Bailey to follow up with TCU on status of recommendation from ICG/PTWS-XXII for a global tsunami sea level workshop and if required refer the matter to the recently established Tsunami and Other sea level related hazards Warning Systems (TOWS) group within IOC.

- Next version of the draft RTWP Implementation Plan to be circulated to Steering Group members for feedback before submission of final draft by 7th March as a working document for ICG/IOTWS-V.

- Indonesia to host a joint WG3/WG6 “Workshop on Mitigation and Preparedness” in 2009.

- WG chairs to provide updates to the ICG/IOTWS Secretariat for the IOTWS Implementation Plan by 28th February.

- The ICG/IOTWS Secretariat to send the Steering Group the Draft 12 September 2007 Tsunami Assessment Report to review prior to the ICG/IOTWS-V meeting.

- ICG/IOTWS Secretariat to send the Draft 12 September 2007 Tsunami Assessment Report to the IOTWS MS that responded to the survey for comment to ensure the information they provided was correctly represented before publication.

- Mr Rick Bailey and Mr Geoff Crane to draft a proposal for the exercise as a working document for the ICG, to be considered at the ICG/IOTWS-V meeting.
The ICG/IOTWS Secretariat consult with the Steering Group to develop suggestions for themes and workshops and consult with the organisers of the “International Conference on Tsunami Warning” to be held in Bali, November 2008.

Rick Bailey to coordinate and lead development by the Steering Group of a Draft Strategic Plan for the IOTWS during the next intersessional period for review and consideration by MS at ICG/IOTWS-VI.

8. SUMMARY OF STEERING GROUP RECOMMENDATIONS TO THE ICG

1. TCU requested to update the content of the central web site more frequently to facilitate coordination between the various ICGs. The Steering Group requests to be consulted on web site user requirements for the IOTWS.

2. TCU to continue its efforts to ensure TNC and TWFP information is up-to-date.

3. ICG/IOTWS Secretariat to formally request the TNCs to nominate and confirm Working Group members.

4. ICG to task the Steering Group to develop the required procedures for standardised post event reports.

5. ICG to set up a task team at the ICG/IOTWS-V meeting to consider the proposed Indian Ocean 2009 Exercise. It is suggested that an Indian Ocean-wide table top exercise be conducted in the last week of November 2008, and a full exercise should be conducted in December 2009, to coincide with the fifth anniversary of the 2004 tsunami.

9. CLOSE

The meeting was closed at 5:30 pm on Wednesday 13 February 2008.
**ANNEX 1**

**Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System**

**Steering Group Meeting**

**Bureau of Meteorology, Perth, Western Australia**

**12th – 13th February 2008**

**PRELIMINARY AGENDA**

**Tuesday 13th February**

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<td>- Matters arising from report of previous meeting</td>
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<td><strong>UNESCAP Trust Fund Update</strong></td>
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<td>10:30 – 11:00</td>
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<td>11:00 – 12:30</td>
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<td>- WG3</td>
<td>Chari Pattiaratchi</td>
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<td>- WG4</td>
<td>Michel Vielle</td>
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<td>- WG6</td>
<td>Geoff Crane</td>
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<td>- WG5</td>
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<tr>
<td>12:30 – 14:00</td>
<td>Lunch</td>
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<td><strong>Session 3</strong></td>
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<tr>
<td>14:00 – 15:30</td>
<td><strong>Report from WG5 Task Team on Development of an Implementation Plan for the provision of Tsunami Watches for the Indian Ocean</strong></td>
<td>Rick Bailey/Geoff Crane</td>
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<td>- Report on Hyderabad meeting</td>
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<td>- Recommendations to ICG</td>
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<td>- Next steps</td>
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<td>15:30 – 16:00</td>
<td>Tea Break</td>
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<tr>
<td></td>
<td><strong>Session 4</strong></td>
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<tr>
<td>16:00 – 17:30</td>
<td><strong>Working Group Interaction</strong></td>
<td>Jan Sopaheluwakan</td>
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<td></td>
<td>- Interactions</td>
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<td>- Overlaps</td>
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<td>Rationalising WG Terms of Reference</td>
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<td>Time</td>
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<td>Leader</td>
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<td>09:00 – 10:30</td>
<td>Report on survey of Member State responses to the 12th September 2007 Tsunami</td>
<td>Tony Elliott</td>
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<td>Report on US-IOTWS Transition Workshop, Bangkok, December 2007</td>
<td>Rick Bailey</td>
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<td>Update on COAST MAP IO Project</td>
<td>Tony Elliott/Chari Pattiaratchi</td>
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<td>Proposed Indian Ocean Wave ’09 Exercise</td>
<td>Rick Bailey</td>
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<td>10:30 – 11:00</td>
<td>Tea Break</td>
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<th>Time</th>
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<tr>
<td>14:00 – 15:30</td>
<td>IOTWS Strategic Planning</td>
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<td>- IOTWS direction</td>
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<td>- Timelines for completion</td>
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<td>- System Sustainability</td>
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<td>- Funding priorities</td>
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<td>- Secretariat Support</td>
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<tr>
<th>Time</th>
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<td>15:30 – 16:00</td>
<td>Tea Break</td>
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| Time          | ICG-V, Kuala Lumpur                                                      | Jan Sopaheluwakan and Rick Bailey |
|--------------|--------------------------------------------------------------------------|
| 16:00 – 17:30| - ICG Agenda and Timetable                                               |
|              | - Steering Group Report                                                  |
|              | - Formation of new Working Groups                                        |
|              | - WG Sessional Meetings                                                  |
ANNEX 2
Draft RTWP Implementation Plan Outline

EXECUTIVE SUMMARY

1. Background
   1.1. History of the IOTWS
   1.2. Interim Tsunami Advisory Service
   1.3. Development of Interoperable “System-of-Systems”
      1.3.1. ICG/IOTWS Working Group 5
      1.3.2. WG5 RTWP Task Team

2. Objective

3. Vision

4. Service Requirements

5. Concept of Operations
   5.1. Regional Tsunami Watch Providers
   5.2. National Tsunami Watch Centres (NTWC)

6. Operational Elements
   6.1. Seismic data analysis
   6.2. Sea level data analysis
   6.3. Tsunami modelling and forecasting
   6.4. Tsunami watch and warning preparation
   6.5. Data and information exchange and dissemination

7. Standard Operating Procedures

8. Capability Requirements

9. Phased Implementation
   9.1. Service Levels
   9.2. Schedule

10. Performance Indicators


12. References

13. Acknowledgments

ANNEXES