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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of UNESCO)

**INTERNATIONAL CO-ORDINATION GROUP FOR THE TSUNAMI WARNING SYSTEM IN
THE PACIFIC (ICG/TSU) OFFICERS MEETING**
26-29 January 1999, Honolulu, Hawaii, USA

SUMMARY REPORT

TABLE OF CONTENTS

SUMMARY REPORT

		Page
1.	OPENING/ADOPTION OF THE AGENDA	1
2.	REVIEW OF THE IMPLEMENTATION OF THE ITSU-XVI DECISIONS	1
3.	REPORT OF THE THIRTY-FIRST SESSION OF THE IOC EXECUTIVE COUNCIL (17-27 NOVEMBER 1998, PARIS, FRANCE)	3
4.	PREPARATION FOR ITSU-XVII	4
4.1	DISCUSSION OF THE DRAFTS OF THE PROVISIONAL AGENDA AND LIST OF DOCUMENTS	4
4.2	PREPARATION OF THE ANNOTATED AGENDA	4
4.3	TIMETABLE WITH RESPONSIBILITIES FOR ITSU-XVII DOCUMENT PREPARATION	4
4.4	LOCAL ARRANGEMENTS FOR ITSU-XVII	4
5.	CO-OPERATION WITH THE IUGG TSUNAMI COMMISSION	5
6.	ICG/ITSU AND CARIBBEAN AND EUROPEAN COUNTRIES	5
7.	CONSIDERATION OF THE ICG/ITSU OFFICERS ELECTION	6
8.	PLACE AND DATES FOR ITSU-XVIII	6
9.	OTHER BUSINESS	7
10.	ADOPTION OF THE SUMMARY REPORT	7
11.	CLOSURE	7

ANNEXES

I.	AGENDA	
II.	LIST OF PARTICIPANTS	
III.	TIMETABLE	
IV.	LIST OF DOCUMENTS	
V.	ACTION SHEET (JANUARY 1999 UPDATE)	
VI.	ITSU-XVII PROVISIONAL AGENDA	
VII.	ITSU-XVII PROVISIONAL LIST OF DOCUMENTS WITH RESPONSIBILITIES AND DESPATCH DEADLINES	
VIII.	IOC CIRCULAR LETTER No. 1579, 20 JULY 1998	

1. OPENING/ADOPTION OF THE AGENDA

The Chairman of the International Co-ordination Group for the Tsunami Warning System in the Pacific (ICG/ITSU), Mr. H. Gorziglia, opened the Officers Meeting hosted by International Tsunami Information Centre (ITIC) in Honolulu, Hawaii, USA at 10:00 on 26 January 1999. He welcomed the participants and identified as objectives the review of the progress achieved by the ICG/ITSU during the intersessional period and the identification of actions needed for the successful preparation and implementation of ITSU-XVI.

The Agenda was adopted as given in Annex I. The List of Participants is presented in Annex II. The Technical Secretary presented the Timetable and List of Documents and after discussion they were agreed upon as presented in Annexes III and IV.

The local organizer informed the participants of local arrangements.

2. REVIEW OF THE IMPLEMENTATION OF THE ITSU-XVI DECISIONS

The ICG/ITSU Chairman presented for review the Action Sheet based on the decisions of ITSU-XVI (IOC/ITSU Officers/10). An updated version of the Action Sheet is found in Annex V.

The participants agreed on the following actions be urgently taken for the implementation of some still pending matters.

Para. 22:

The International Tsunami Information Centre (ITIC) Director was requested to take all necessary measures to finalize the publication of two issues of the Tsunami Newsletter before ITSU-XVII and prepare as an ITSU-XVII working document a proposal for the modification of the ITIC periodical publication. The ITIC Director was requested further to have the Chairman and the IOC Executive Secretary informed of the progress in implementing his responsibilities as identified in Recommendation ITSU-XVI.4.

Paras. 29 & 147:

The ICG/ITSU Chairman was requested to prepare a letter to the Member States of the Group requesting them to contribute to the IOC Trust Fund to support the Tsunami Programme in the Pacific and implement the agreed-upon actions as they are presented in Recommendations ITSU-XVI.1 and ITSU-XVI.4.

Paras. 37-39:

The decision of Chile to extend the Expert Tsunami Data Base (ETDB) development to cover the Eastern South Pacific was acknowledged and the ETDB Project Leader and the Chairman were requested to take measures for the implementation of this project. The Chairman was also requested to contact the ITSU National Contacts in Japan, Indonesia and Philippines for encouraging them to nominate ETDB Regional Co-ordinators in order to provide assistance to the ETDB Project Leader in implementing his tasks. The ETDB Project Leader was requested to formulate a list of responsibilities for Regional Co-ordinators and submit this list to the Chairman as soon as possible.

Para. 40:

The US National Contact will take necessary actions and inform the Chairman accordingly.

Para. 43:

The Officers noted with concern that in spite of all efforts of the US National Contact there was no improvement in the delivery of tsunami watches and warnings within China and China does not confirm receiving messages from Pacific Tsunami Warning Centre (PTWC). The Chairman and Technical Secretary

were requested, with the assistance of the US National Contact, to explore other ways of solving the problem and report to ITSU-XVII the results of these efforts.

Paras. 45, 51, 75, 91:

The IOC Executive Secretary was requested to remind national contacts to include in the ITSU-XVII national reports, actions identified by ITSU-XVI, namely information and experience gained in new communication technology development, and provide ITSU-XVII with mareograms/digital data and sea observations for the events of magnitude 6 or more.

Paras. 47, 54:

It was recommended to include the decisions of ITSU-XVI relevant to the modification of the Communication Plan and on four criteria approach in the coming issue of the ITIC Newsletter. The Director PTWC was requested to take urgent action for implementing these ITSU-XVI directives by sending a circular letter to the Member States on behalf of the ICG/ITSU Chairman.

Para. 58:

The Pacific Tsunami Museum (PTM) should be invited to take part in the First International Meeting of Aquariums, Museums and Science Centres (5-10 June 1999, Boulogne-sur-Mer, France) and contribute to the discussion of the role of museums in increasing awareness of and providing education in natural and human made disasters. The ITIC Director was requested to include information about the meeting and about the PTM in the coming issue of the Tsunami Newsletter. This Newsletter will also contain information on the achievement in reorganizing the ITIC Library.

Para. 81:

It was decided that the Training Course within Kurile-Kamchatka Project will be arranged from 25 April - 8 May 1999 at ITIC for two Russian experts. During the Course the testing of equipment will be arranged. The experts will be able to take the equipment hand carried on the way to Russia. Installation of the equipment was recommended for July/August 1999. The IOC Executive Secretary was requested to urgently inform the Russian team of the view of the Officers and send an invitation to the experts to start arrangements for the smooth implementation of the project.

Para. 87:

The participants noted the plans of the International Union of Geodesy and Geophysics (IUGG) Tsunami Commission to arrange a meeting on digital bathymetry within the framework of the IUGG Congress (July 1999, Birmingham, UK) and requested the Chairman and IOC to consider providing support to a few ICG/ITSU experts to take part in this meeting. It is expected that if the ICG/ITSU experts take part in the meeting, it will be considered as a joint IUGG Tsunami Commission/IOC- ICG/ITSU endeavour.

Para. 90:

The Officers strongly supported the participation at the International Decade for Natural Disaster Reduction (IDNDR) Forum (July 1999, Geneva) and recommended that if the presentation on the IOC Tsunami Programme is included in the Forum Programme, the PWTC or ITIC Directors will be considered as speakers.

Para. 94:

The ICG/ITSU Vice-Chairman was requested to keep the ICG/ITSU continuously informed of the progress in developing the European project related to tsunamis and recommended ways for developing future joint projects between ICG/ITSU and the European Union.

Para. 110:

The Technical Secretary was requested to provide the ITIC Director with the questionnaire forms which were used by other programmes of IOC in conducting the evaluation of training efforts.

Para. 122:

The Executive Secretary was requested to continue efforts toward the translation and publication of tsunami-related materials, such as the ITSU poster, *Tsunami Great Waves* brochure, etc. in Russian.

Para. 138:

The Director PTWC, indicated that following ITSU-XVI several Member States had provided useful comments on the draft of the second edition of the Master Plan. Based on those comments, a revised draft was prepared and distributed to participants of the Officers Meeting, and substantive changes were noted. Following a discussion period, it was agreed that the participants would provide additional comments or revisions by the end of the Officers Meeting. A final draft will be prepared and sent to the IOC Secretariat by the end of February 1999 for publication before ITSU-XVII.

Para. 142:

The Technical Secretary was requested to inform the ITIC Director of the address of the IOC Homepage for inclusion in the Tsunami Newsletter and ITSU Homepage.

Para. 147:

The Associate Director ITIC will implement regular (on a monthly basis) updates of the ITSU Homepage, arrange hyperlinks with other tsunami-related Homepages and inform the ITIC Director and Chairman of the progress achieved and problems incurred in the task implementation.

The ITIC Director will provide the Associate Director, Chairman and IOC Executive Secretary with the Terms of Reference and Responsibilities of the Associate Director. It was also agreed that on the basis of new arrangements for the Associate Director's operations (Home Stationed) there may be opportunities for a few Associate Directors to provide assistance to the ITIC Director at the same time in the implementation of his duties.

3. REPORT OF THE THIRTY-FIRST SESSION OF THE IOC EXECUTIVE COUNCIL (17-27 NOVEMBER 1998, PARIS, FRANCE)

The Chairman ICG/ITSU gave a detailed presentation on the content of the report submitted to the IOC Executive Council at the Thirty-first Session. This report included the progress achieved by the Group, the problems the programme is facing and the proposals of the ways to overcome them. He also presented the resolution taken by the IOC Executive Council relevant to the programme. The participants thanked the Chairman for his concise report and comments on the resolution. The Officers acknowledged support provided by the IOC Executive Council and expressed the strong belief that the decision of the IOC Executive Council to provide US\$70,000 from the IOC Regular Fund for the 1999 activities will be implemented.

The Officers requested the Chairman to bring their views promptly to the attention of the IOC Executive Secretary.

4. PREPARATION FOR ITSU-XVII

4.1 DISCUSSION OF THE DRAFTS OF THE PROVISIONAL AGENDA AND LIST OF DOCUMENTS

The participants discussed the drafts, made modifications to the texts and agreed on the documents as they are presented in Annex VI and VII. The Technical Secretary was requested to include the documents in the first dispatch jointly with the ITSU-XVII Annotated Agenda and an invitation letter.

4.2 PREPARATION OF THE ANNOTATED AGENDA

Based on agreed upon Provisional Agenda, the participants prepared an Annotated Agenda to be included in the first dispatch of ITSU-XVII documents.

4.3 TIMETABLE WITH RESPONSIBILITIES FOR ITSU-XVII DOCUMENT PREPARATION

The Timetable was developed and responsibilities assigned for the ITSU-XVII document preparation as they are presented in Annex VII.

It was agreed that there will be three dispatches of documents; first - February 1999, second - June 1999, third - August 1999.

The Chairman urged the Officers and Secretary to keep strictly to the agreed-upon deadlines.

4.4 LOCAL ARRANGEMENTS FOR ITSU-XVII

The Representative of the Local Organizing Committee from the Republic of Korea informed the participants on local arrangements for the Seventeenth Session to be held in Seoul from 4-7 October 1999 and confirmed the readiness of the country to host the joint IUGG/IOC Workshop.

The participants expressed satisfaction with the proposed local arrangements. The participants recommended that the Local Organizing Committee make efforts in reducing hotel prices, and that the IOC will include the information on local arrangements in the invitation letter. It was noted that to do this there will be a need to have this information before the end of February. At the same time, the Representative of the Local Organizing Committee will also provide a new name of the local contact to the IOC Secretariat. The participants also noted that the participation of a technical assistant from the Secretariat of the IOC, knowledgeable in the tsunami programme will be most desirable for the smooth running of the Session and the timely development of the Summary Report.

The Representative of the Local Organizing Committee expressed his willingness to invite this assistant on a funds-sharing basis with IOC. The Technical Secretary acknowledged with thanks this kind offer and expressed readiness to consider the possibility of providing assistance of the technical assistant.

The participants also discussed the arrangements for the Tsunami Workshop to be held prior to ITSU-XVII. The results of the discussion are presented under the Agenda Item 5.

The participants acknowledged with satisfaction the preparation of the Session and Workshop and encouraged the Local Organizing Committee to continue efforts for the successful implementation of the events.

5. CO-OPERATION WITH THE IUGG TSUNAMI COMMISSION

In his report to the meeting, Dr. V. Gusiakov, Chairman of the IUGG Tsunami Commission, highlighted the efforts jointly undertaken by the IUGG/TC and ICG/TTSU such as:

- i Expert Tsunami Database for the Pacific, its current status and problems;
- ii Seminar on digital bathymetry and coastal land topography held in Seattle in March 1998 and plans to hold the follow-up Workshop in July 1999 in Birmingham, UK, in conjunction with the bi-annual Tsunami Symposium.

Dr. V. Gusiakov outlined his views on the subject and the general scope of the Tsunami Workshop to be held in Seoul in conjunction with the ITSU-XVII. The participants agreed that the problem of effectiveness and reliability of the operational tsunami warning should be put in the focus of the Workshop and be considered in depth. After some discussion, the Officers agreed that the title of the Workshop will be "*Tsunami Warning Beyond 2000 : Theory, Practice and Plan*". The following basic items have been proposed for detailed consideration at the Workshop:

1. seismotectonics of tsunami;
2. tsunami generation mechanism;
3. tsunami modeling techniques;
4. seismic and ocean level data collection and processing;
5. warning criteria and dissemination procedures;
6. public awareness and preparedness.

30 September and 1 October 1999 have been agreed upon as the dates of the Workshop, with the half-day of October 2 as a reserve for the formulation of conclusions. Dr. V. Gusiakov, Chairman of the IUGG/TC and Dr. F. Schindele, Vice-Chairman of the ICG/TTSU, will jointly convene the Workshop, will form its programme and will identify the Key-speakers. They both will be responsible for the development of the Workshop report and its presentation at the ITSU-XVII.

The Officers decided that this Workshop will become the first in a series of workshops which will deal with the plans for the further development of the tsunami programme in the years after 2000. They agreed that the Workshop of 2000 will be dedicated to long-term tsunami risk assessment and of 2001 to tsunami mitigation and countermeasures.

6. ICG/TTSU AND CARIBBEAN AND EUROPEAN COUNTRIES

Prof. G. Maul and Mr. J. Lander presented evidence establishing the tsunami threat to the Intra-Americas Sea (IAS), Gulf of Mexico, Bermuda, Caribbean Sea, Bahamas, and Guyana. It was noted that more lives have been lost in the IAS than in Hawaii, Alaska and the US West Coast combined in the last 150 years. The argument was made that the ITSU warning system was the reason that fewer US lives were lost in the Pacific than the IAS. A call for an Intra-Americas Sea Tsunami Warning System: Education, Warning, Management and Research, was considered by the ICG/TTSU Officers and recommended as a project for consideration at ITSU-XVII.

The Officers decided to ask Prof. Maul to plan and execute a meeting to draft a project proposal for an IAS Tsunami Warning System, which he accepted. The meeting parameters are to include: 1) A clear statement of purpose and outline of the agenda; 2) A list of potential invitees with a balance between technical, NGOs, and governmental expertise; 3) A venue and date so that the final meeting report as

Document IOC/ITSU-XVII/14 is completed in August 1999 or earlier. It is important to secure commitments by attendees to obtain support from their governments for the project proposal implementation on the IAS Tsunami Warning System.

The Officers agreed that the ITSU-XVI proposal for a meeting of key people from the Caribbean, Mediterranean and Pacific should be modified to consider only the Caribbean area and that attendees should include the ITSU Members and others from the Pacific, in addition to the appropriate attendees from the area. The attendance of representatives from ITSU Member States is desirable since their expertise will be helpful in focusing the meeting and keeping it decision-oriented.

The Officers agreed to support Prof. Maul in this effort, and in certain cases, to participate in the IAS Tsunami Warning System Project Proposal meeting. It was recommended to extend a letter of invitation to Prof. Maul to attend IOC/ITSU-XVII in Seoul. The IOC Executive Secretary was requested to consider possibilities for providing support for the travel of Prof. Maul from the funds allocated for regional activities. In the event that Prof. Maul cannot travel to IOC/ITSU-XVII, Mr. M. Blackford and/or Dr. C. McCreery agreed to present the project proposal.

The Officers noted that there was no response to the IOC Circular Letter 1579 of 20 July 1998 (copy of the letter is given as Annex VIII) and requested Prof. Maul and the IOC Executive Secretary to continue their efforts in pursuing Member States of IOCARIBE to nominate tsunami national contacts.

It was decided that the reminder will be sent to the IOC National Contacts in the region and Prof. Maul will provide the names of experts from the region interested in the tsunami problems to the IOC Secretariat. Prof. Maul was invited to recommend the experts to approach relevant governmental agencies in order to explain to them the need to nominate contacts and develop this project.

The Vice-Chairman informed the participants that the Second European Tsunami Project (GITEC-TWO) was completed at the end of 1998. In May 1998, Laboratoire de Geophysique, France (LDG), organized a joint IOC-EC Conference on tsunamis in Paris where more than 40 scientists and persons in charge of warning centers gave presentations. The proceedings will be published in March 1999.

The experimental tsunami warning centre built by France and Portugal is in operation since August 1998 and will be maintained continuously. New projects on tsunami research and warning will probably be presented to the European Commission in 1999.

The participants requested the Vice-Chairman to continue keeping the ICG/ITSU informed of the progress in the development of the European tsunami-related projects.

7. CONSIDERATION OF THE ICG/ITSU OFFICERS ELECTION

The Technical Secretary reminded the Officers of the fact that the terms of service of the Chairman and Vice-Chairman of the ICG/ITSU expires at ITSU-XVII and of the procedures for the election of the ICG/ITSU Officers. He informed the Officers of an informal contact with France and the plan of France to recommend the present Vice-Chairman for the Chairman's position.

8. PLACE AND DATES FOR ITSU-XVIII

The Officers were informed of the interest of New Zealand and Colombia to host ITSU-XVIII in 2001. The Chairman was requested to approach these countries and seek official letters of proposition.

9. OTHER BUSINESS

The Director PTWC, reported on his participation in the Annual Meeting of the South Pacific Applied Geoscience Commission (SOPAC) held in Fiji in September 1998. SOPAC is an intergovernmental body representing 17 Member States in the South Pacific region, and it has certain hazard assessment and disaster reduction responsibilities. Due to the recent tsunami in Papua New Guinea there was a heightened interest in this hazard at the SOPAC meeting and in taking actions to evaluate the tsunami risk and mitigate future tsunamis. The desirability of increased co-operation and co-ordination of tsunami-related activities between SOPAC and ITSU was recognized, and it was agreed that the ITSU Chairman would write a letter to SOPAC inviting them to send a representative to the ITSU-XVII Meeting and Workshop.

10. ADOPTION OF THE SUMMARY REPORT

The Summary Report was adopted. The Chairman and the Technical Secretary were requested to publish it and distribute it to the participants in February.

11. CLOSURE

The Chairman closed the meeting at 12:00 on 29 January 1999. He expressed thanks to the participants for their contributions to the discussion and to the local organizer for providing excellent facilities.

ANNEX I

AGENDA

- 1. OPENING/ADOPTION OF THE AGENDA**
- 2. REVIEW OF THE IMPLEMENTATION OF THE ITSU-XVI DECISIONS**
- 3. RESULTS OF THE THIRTY-FIRST SESSION OF THE EXECUTIVE COUNCIL (17-27 NOVEMBER 1998, PARIS, FRANCE)**
- 4. PREPARATION FOR ITSU-XVII**
 - 4.1 DISCUSSION OF THE DRAFTS OF THE PROVISIONAL AGENDA AND LIST OF DOCUMENTS
 - 4.2 PREPARATION OF THE ANNOTATED AGENDA
 - 4.3 TIMETABLE WITH RESPONSIBILITIES FOR ITSU-XVII DOCUMENT PREPARATION
 - 4.4 LOCAL ARRANGEMENTS FOR ITSU-XVII
- 5. CO-OPERATION WITH THE IUGG TSUNAMI COMMISSION**
- 6. ICG/ITSU AND CARIBBEAN AND EUROPEAN COUNTRIES**
- 7. CONSIDERATION OF THE ICG/ITSU OFFICERS ELECTION.**
- 8. PLACE AND DATES FOR ITSU-XVIII (PRELIMINARY CONSIDERATION)**
- 9. OTHER BUSINESS**
- 10. CLOSURE**

ANNEX II

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ANNEX III
TIMETABLE

Time	26 Jan. (Tues)	27 Jan. (Wed)	28 Jan. (Thurs)	29 Jan. (Fri)
09:30 10:00	Registration & last minute administrative arrangements	Agenda Item 2, cont.	Agenda Item 4, cont.	Consideration of the ICG/ITSU Officers election (Agenda Item 4)
10:00 10:20	Opening, Welcome, Adoption of the Agenda (Agenda Item 1)	<i>Morning break</i>	<i>Morning break</i>	<i>Morning break</i>
10:20 12:15	Review of the implementation of the ITSU-XVI decisions (Agenda Item 2)	Agenda Item 2, concluded	Agenda Item 4, concluded	Preliminary consideration of places & dates for ITSU-XVIII (Agenda Item 8); Other business, Adoption of the Summary Report (Agenda Item 9)
12:15 13:30	<i>Lunch break</i>	<i>Lunch break</i>	<i>Lunch break</i>	<i>Lunch break</i>
13:30 15:00	Agenda Item 2, cont.	Results of the 31 st Session of the IOC Exec. Council, 17-27 Nov.'98, Paris, France (Agenda Item 3); Preparation for ITSU-XVII (Agenda Item 4)	Co-operation with the IUGG Tsunami Commission (Agenda Item 5)	Agenda Item 9, concluded
15:00 15:15	<i>Afternoon break</i>	<i>Afternoon break</i>	<i>Afternoon break</i>	<i>Afternoon break</i>
15:15 17:00	Agenda Item 2, cont.	Agenda Item 4, cont.	ICG/ITSU Co-operation with other regions (Agenda Item 6)	Closure

ANNEX IV

LIST OF DOCUMENTS

WORKING DOCUMENTS Document Code	Title
IOC/ITSU Officers/1 prov.	Provisional Agenda
IOC/ITSU Officers/1 add. prov.	Provisional Timetable (prepared during the Meeting)
IOC/ITSU Officers/2	Annotated Provisional Agenda
IOC/ITSU Officers/3	Provisional Summary Report (prepared during the Meeting)
IOC/ITSU Officers/4	Provisional List of Documents (this document)
IOC/ITSU Officers/5	Provisional List of Participants
IOC/ITSU Officers/6	Draft of the Tsunami Glossary
IOC/ITSU Officers/7	Final draft of the ITSU Master Plan
IOC/ITSU Officers/8	Summary Report of the Thirty-first Session of the IOC Executive Council (extracts related to the ICG/ITSU activities)
IOC/ITSU Officers/9	Drafts of the basic documents for ITSU-XVII • Provisional Agenda • Preliminary List of Documents
IOC/ITSU Officers/10	Action Sheet based on the decisions of ITSU-XVI
IOC/ITSU Officers/11	Summary Report of ITSU-XVI
IOC/ITSU Officers/12	Oceans Hazards Poster
IOC/ITSU Officers/13	Local arrangements for ITSU-XVII
IOC/ITSU Officers/14	Proposals for the Workshop planned to be held in Seoul prior to ITSU-XVII
IOC/ITSU Officers/15	Proposal for the Conference in memory of Prof. S. Soloviev
IOC/ITSU Officers/16	Tsunami Programme in the Caribbean

ANNEX V

ACTION SHEET BASED ON THE DECISIONS OF ITSU-XVI

Agenda Item	Major Subject	Paras., Res/Rec	Actions	Responsible	Status of Implementation
2.2	National Tsunami Activities	22	To send letter of thanks to Member States (M.S.) who submitted reports but were not able to participate at session.	Chairman ICG/ITSU	Done 15 Nov.'97
		22	Provide abbreviated texts of national reports to ITIC for publication by 1 Dec.'97.	ICG/ITSU Nat. Contacts	Not implemented
		22	Publish texts in ITIC Newsletter (1 st half '98).	Director ITIC	Not implemented
2.4	TIME Project - Present & Future	29 Rec.ITSU-XVI.1	Continue support to Training Component of TIME by allocating funds for 1998-99.	Chairman; Tech. Sec.	Done Training Course in Chile, Apr.'98
		31-32 Rec.ITSU-XVI.1	Provide support to 2 nd phase of TIME through Trust Fund arrangements.	ICG/ITSU M.S.; Chairman; Tech. Sec.	Letter from Chairman to provide TF support (10.12.98/08.02.99)
2.5	ETDB	37 Rec.ITSU-XVI.3	Further development of ETDB Project (Transfer from MS-DOS to Windows 95, new version of mapping subsystem, extension of dataset to entire Pacific, etc).	Novosibirsk Computing Centre (contact: V. Gusiakov)	Done, partly
		37 Rec.ITSU-XVI.3	Sign contract with Novosibirsk Computing Centre for the development of ETDB.	Tech. Sec.	Done
		38	Provide ETDB development team with regional tsunami data.	ICG/ITSU Nat. Contacts; Director ITIC	Done. Nomination of regional contacts

		39	Develop CD-ROM version of Historical Tsunami Database & provide for demonstration at ITSU-XVII, Fall '99.	Novosibirsk Computing Centre (V. Gusiakov)	Done
2.6	New Technologies	40	Develop formal project with detailed budget of international tsunami mitigation plan for submission to ITSU-XVII, Fall '99.	US Nat. Contact; Directors ITIC & PTWC; Chairman & Vice-Chairman ICG/ITSU	
		42	Continue routine communication tests	Director PTWC; US Nat. Contact; ICG/ITSU M.S.	Continuously. Once a month
		43	Explore reasons & improve communications between PTWC & SOA of China for delivery of tsunami watches & warnings.	Tech. Sec.; Chairman ICG/ITSU	Done, partly
		45	Prepare national reports on experience in new communication technology development & utilization for submission to ITSU-XVII.	ICG/ITSU Nat. Contacts; Director PTWC	Include in invitation letter
		45	Provide available technical data on EMWIN system to ITSU-XVI participants.	US Nat. Contact	Done
		47	Inform all institutions concerned with change in warning threshold & modify communication plan accordingly.	Director PTWC	
		51	Request national oceanographic & hydrographic authorities to check mareograms for minor recordings after each earthquake equal to or greater than magnitude of 6 degrees.	ICG/ITSU Nat. Contacts	Include in invitation letter. Request to include results of the implementation
		54	Inform regional & local observatories on four criteria approach for issuing watch & warnings.	Director PTWC; Vice-Chairman ICG/ITSU	
		54	Identify procedure for implementation of Recommendation of transmitting to PTWC arrival time of pP or the focal depth determined by regional network.	Director PTWC; Vice-Chairman ICG/ITSU	

3	ITIC Activities	58	Identify areas of common interest with the Pacific Tsunami Museum for facilitating co-operation.	Director ITIC	Done
		58	Contribute to activities of Museum.	ICG/ITSU M.S.	In progress
		62	Continue efforts in increasing membership of ICG/ITSU	Chairman; Director ITIC; Tech. Sec.	In progress
		65	- Standardize & improve content of Tsunami Newsletter; - Establish ITSU/ITIC website; (Spanish version may be available) - Improve collection & accessibility to ITIC library materials.	Director ITIC	In progress. Done In progress
		65	Establish & carry out strategies to better collect information & water level records of all tsunami events.	Director ITIC; WDC-A for SEG	
		65	Assist in development & support of virtual centres for tsunami & tsunami-related data needed by scientific community.	Director ITIC; Chairman IUGG Tsunami Commission	In progress
		67	Send corrections & additions to Field Guide for Post-Tsunami Surveys by 15 Nov.'97	ICG/ITSU Nat. Contacts	Done
		67	Incorporate additions & modifications to Guide & make it ready for publication in English & Spanish.	Mr. S. Farreras; Director ITIC; Nat. Contact Chile	Done
		67	Implement publication of Guide in 4 languages: (E,F,S,R).	Tech. Sec. IOC	Done
		69	Arrange visit of Associate Director to ITIC for briefing & formulation of working plans.	Tech. Sec. IOC; Nat. Contacts: USA & Chile; Director ITIC	Done
4	Regional TWS in Pacific	75	Keep Chairman & Secretariat informed of efforts in establishment or improvement of national & regional tsunami warning systems.	ICG/ITSU Nat. Contacts	Include in invitation letter

		77	Implement questionnaire survey within countries interested in establishment of Far East Tsunami Centre, to identify problems, needs & requirements for regional centre.	Nat. Co-ord. Japan; Director ITIC; Chairman ICG/ITSU	In progress
		81	Arrange meeting of parties involved in implementation of K/K Project before end of '97.	Tech. Sec.; Nat. Contacts Russia, Japan, USA	Done, Dec.'97, Moscow
		81	Arrange training of experts within K/K Project objectives.	Director ITIC; Tech. Sec.; Nat. Contacts: Russia, USA	Planned for Apr.'99
		81	Finalize K/K Project implementation by autumn '98	All partners concerned	
5.1	Co-operation with IUGG Tsunami Commission	87 Rec.ITSU-XVI.2	Organize set of regional seminars on digital bathymetry as identified in Recommendation.	Chairman ICG/ITSU; Chairman IUGG Tsunami Commission; Tech. Sec.	Mar.'98, Wash., Seattle Jul.'99, Birmingham
5.2	ICG/ITSU & IDNDR	90	Extend links of co-operation with IDNDR & identify actions which will contribute to final stage of IDNDR.	Chairman & Vice- Chairman ICG/ITSU	Done
		90	Take steps to improve co-operation with IDNDR Secretariat.	Tech. Sec.	Done
		91	Contribute to international days for Natural Disaster Reduction & inform Exec. Sec. IOC of actions taken.	ICG/ITSU M.S.	Include in national reports
5.3	Tsunami Programme in Europe	94	Identify actions for co-operative activities of ICG/ITSU & European group & bring them to attention of ITSU Officers Mtg.	Vice-Chairman; Co-ord. GITEC, Prof. Tinti	'98 Tsunami Conference, May, Paris
5.4	IOCARIBE	102	Organize meeting of key people in development of tsunami warning programmes from Pacific, Mediterranean & Caribbean regions.	Chairman, Vice- Chairman ICG/ITSU; Tech. Sec.	

		104	(i) Send letter to IOC contacts in region with request to inform officials of high possibility of regional tsunami hazard; (ii) Provide them with information about ICG/ITSU; (iii) Request to name Nat. Contacts to deal with tsunami warning issue.	Chairman ICG/ITSU; Head, IOC Regional Office for IOCARIBE; Tech. Sec.	Done 20.07.98 CL N° 1579
6.1	Tsunami Glossary	107	Send lists of definitions to all M.S. & selected IUGG experts in order to get comments & prepare final draft for adoption during ITSU-XVII.	Vice-Chairman ICG/ITSU; Nat. Contact Japan; Tech. Sec.	Done
		108	Follow progress of IASPEI in developing reference books & report views to ITSU-XVII.	Vice-Chairman ICG/ITSU	In progress
6.2	Training & Education	110	Conduct survey of former ITIC Visiting Experts Programme participants regarding their recent activities to evaluate effectiveness of Visiting Experts Programme.	Director ITIC	
		110	Provide ITIC Director with questionnaires which were used by IOC in conducting the same type of survey within other programmes.	Tech. Sec.	
		116	Finalize arrangements for translation & publication of earthquake & tsunami textbooks in Russian.	Nat. Contact Russia; Tech. Sec.	Done
6.3	Publication of advertising materials	119-120	Finalize preparation of new version of "Tsunami - Great Waves" booklet as contribution to IYO in accordance with timetable presented in para.120	Vice-Chairman ICG/ITSU; Director ITIC	Done, in French
		121	Organize publication of booklet in E, S,F.	Nat. Contacts: USA, France, Chile	F: published S: translated, publication by ITSU-XVII
		122	Explore possibility of translation & publication of booklet in Russian.	Tech. Sec; Nat. Contact Russia	

		123	Implement adjustment of graphical content of children's cartoon book " <i>Tsunami Warning</i> ", make portable graphics/text separation, apply Spanish text.	Nat. Contact USA	
		123	Make master copies of artwork & text of cartoon book available to M.S. upon request.	Director ITIC	
		124	Consider ways of publishing Spanish version of cartoon book.	Chairman ICG/ITSU; Tech. Sec.	
		124	Inform M.S. of availability of portable form of publication by end of '97.	Director ITIC	
		127	Finalize tsunami text & cutout of oceans & coastal zone hazards poster & send comments to producers by Nov.'97.	Tech. Sec.	Done
		129	Provide sponsorship for printing copies of poster in English & other languages.	ICG/ITSU M.S.	Done
		130	Implement production of at least 1,000 copies of poster in Spanish.	Nat. Contact Chile; Chairman ICG/ITSU	Under development
		131	Look for commitments of other countries in contributing to translation of poster into other than English languages & to ensure its wide distribution.	Tech. Sec.	Partly. Distribution done.
7.	ICG/ITSU & 1998 IYO	135	Organize presence of the tsunami programme in national pavilions & UN pavilion of Expo '98.	ICG/ITSU Nat. Contacts; Tech. Sec.	Done
		136	Formulate proposals for presenting tsunami programme at Expo '98 pavilion by 1 Dec.'97.	ICG/ITSU Vice-Chairman; Tech. Sec.	Done
		136	Provide Vice-Chairman with information on space available in UN Pavilion for tsunami programme demonstration by 15 Nov.'97.	Tech. Sec.	Done

8.	ITSU Master Plan	138	Provide comments, corrections & additional input to Plan by 1 Dec. '97	ICG/ITSU Nat. Contacts	Done
		138	Incorporate comments into final form by 1 Apr.'98.	Director ITIC	Done
		138	Forward Master Plan to IOC for publication & distribution.	Director ITIC; Tech. Sec.	Mar.'99
9.	National proposals for future projects	141	(i) See para. 39; (ii) Develop preliminary tsunami bulletin version, test it during 1998-99 & report results to ITSU-XVII.	Nat. Contact France; Vice-Chairman ICG/ITSU	
		142	(i) Use modern communication facilities for despatch of documents, e.g., IOC ICG/ITSU WWW Homepage; (ii) Remind national contacts with Internet access to check site regularly.	Tech. Sec.	
10.	Elections	145	Send official IOC letter of acknowledgment to Dr. C. McCreery for his input to ITIC activities.	Tech. Sec.	Done
11.	Programme & Budget 1998-99	146	Continue & extend M.S. efforts in support of programme.	ICG/ITSU Nat. Contacts	Continuous
		146	Send letter to M.S. requesting to support programme in funds through Trust Fund arrangements & in-kind.	Tech Sec.	Done. See comments to para. 31-32
		147	Consider ways of providing additional funds to support IDNDR-related activities, other than tsunami programme.	Exec. Sec. IOC	Done
		147 Rec.ITSU-XVI.4	Implement activities identified in workplan presented in Recommendation ITSU-XVI.4 in accordance with established priorities.	Chairman, Vice-Chairman ICG/ITSU; Tech. Sec.; ICG/ITSU M.S.	

12.	ITSU-XVII	148	Take necessary actions for organization of session & concluding required formalities not later than beginning of '99.	Tech. Sec.; Chairman ICG/ITSU	Done
		150	Explore possibility before end 1998 of having joint ICG/ITSU Workshop on Tsunami Mitigation in conjunction with ITSU-XVII.	Chairman ICG/ITSU; Chairman IUGG Tsunami Commission; Nat. Contact Rep. of Korea; Tech. Sec.	Done
		151	Organize & implement ITSU Officers Meeting in Jan. '99 under auspices of ITIC.	Chairman ICG/ITSU; Director ITIC; Tech. Sec.	Done
		151	Identify date & place of ITSU-XVIII prior to ITSU Officers Meeting planned for Jan.'99.	Chairman ICG/ITSU; Tech. Sec.	Done
13.	Adoption of Summary Report	152	Bring findings of ITSU-XVI to attention of 31 st Session of IOC-EC, Nov.'98.	Chairman ICG/ITSU.	Done

ANNEX VI

PROVISIONAL AGENDA FOR ITSU-XVII

- 1. OPENING AND ARRANGEMENTS FOR THE SESSION**
- 2. PROGRESS IN THE PROGRAMME IMPLEMENTATION**
 - 2.1 REPORT OF THE CHAIRMAN
 - 2.2 NATIONAL REPORTS
 - 2.3 ITIC DIRECTOR'S REPORT
- 3. IMPLEMENTATION OF ITSU-XVI RECOMMENDATIONS**
 - 3.1 *TIME* PROJECT
 - 3.2 REGIONAL SEMINARS ON DIGITAL BATHYMETRY DATABASE
 - 3.3 PROGRESS IN THE DEVOLVEMENT OF THE CD-ROM "*TSUNAMIS IN THE PACIFIC, 47 B.C. - 2000 A.D.*"
- 4. PROGRAMME MATTERS IN LIGHT OF THE INTERSESSIONAL ACTIVITIES**
 - 4.1 COMMUNICATION PLAN
 - 4.2 WARNING AND WATCHES
 - 4.3 IMPLEMENTATION OF NEW TECHNOLOGIES
- 5. PROGRESS IN THE ESTABLISHMENT OF THE REGIONAL TSUNAMI WARNING SYSTEMS IN THE PACIFIC REGIONS AND OTHER AREAS**
- 6. WAYS TO INCREASE PREPAREDNESS FOR AWARENESS OF THE TSUNAMI DANGER**
 - 6.1 IYO AND EXPO '98
 - 6.2 TSUNAMI GLOSSARY
 - 6.3 TRAINING AND EDUCATION
 - 6.4 TSUNAMI NEWSLETTER
- 7. EXISTING PARTNERSHIPS AND OPPORTUNITIES FOR NEW ONES**
 - 7.1 CO-OPERATION WITH THE IUGG TSUNAMI COMMISSION AND CONCLUSIONS OF THE JOINT TSUNAMI WORKSHOP, SEOUL, 30 SEPTEMBER-1 OCTOBER 1999
 - 7.2 ICG/ITSU AND IDNDR
 - 7.3 WDC-A, SOLID EARTH GEOPHYSICS (SEG) DEVELOPMENT RELATED TO TSUNAMIS
 - 7.4 NEW OPPORTUNITIES WITH SOPAC
- 8. NATIONAL PROPOSALS FOR FUTURE PROJECTS AND OTHER BUSINESS**
- 9. ELECTIONS OF THE CHAIRMAN AND VICE-CHAIRMAN OF THE ICG/ITSU**
- 10. PROGRAMME AND BUDGET FOR 2000 - 2001**
- 11. DATE AND PLACE FOR ITSU-XVIII**
- 12. ADOPTION OF THE SUMMARY REPORT**
- 13. CLOSURE**

ANNEX VII

ITSU-XVII PROVISIONAL LIST OF DOCUMENTS
RESPONSIBILITIES AND DESPATCH DEADLINES

Document Code	Title	Responsible person(s) for preparation	Deadline for preparation
WORKING DOCUMENTS			
IOC/ITSU-XVII/1 prov.	Provisional Agenda	HG +IO	Feb. (II)
IOC/ITSU-XVII/1 add.	Timetable	HG + IO	VIII
IOC/ITSU-XVII/2	Annotated Prov. Agenda	HG + IO	II
IOC/ITSU-XVII/3	Summary Report (prepared during the Session)		
IOC/ITSU-XVII/4	List of Documents (this document)	HG + IO	II
IOC/ITSU-XVII/5	List of Participants (prepared during the Session)		
IOC/ITSU-XVII/6	Report of the Chairman of ICG/ITSU on Intersessional Activities	HG	VIII
IOC/ITSU-XVII/7	National reports on Tsunami-Related Activities	IO	VIII
IOC/ITSU-XVII/8	Report of the ITIC Director	MB	VIII
IOC/ITSU-XVII/9	Digital Bathymetry for Tsunami Modeling	SG	VIII
IOC/ITSU-XVII/10	" <i>Tsunami in the Pacific, 47 B.C. - 2000 A.D.</i> " Project - Present & Future	SG	VI
IOC/ITSU-XVII/11	Summary of Results of Monthly Communication Tests	CMcC	VI
IOC/ITSU-XVII/12	Warnings & Watches Problems	MB	VI
IOC/ITSU-XVII/13	New Technologies in Support of the Warning System	DH	VIII

IOC/ITSU-XVII/14	Call for an Intra-Americas Sea Tsunami System: Education, Management, Engineering & Science	JM	VIII
IOC/ITSU-XVII/15	Results of the Far East Tsunami Warning Centre Survey	Japan	VIII
IOC/ITSU-XVII/16	Tsunami Glossary	FS	VI
IOC/ITSU-XVII/17	Restructuring of the ITIC Periodical Publications & Tsunamigenic Event Information Dissemination	MB	VI
IOC/ITSU-XVII/18	Summary of Results & Recommendations of Seoul Workshop (prepared during the Session)	SG + FS	
IOC/ITSU-XVII/19	National Proposals for Future Projects	IO	VII

ANNEX VIII

IOC CIRCULAR LETTER N^o. 1579 OF 20 JULY 1998
(English only)

To: IOC Member States (Action Addresses) in the Caribbean.

cc: Chairman, Vice-Chairman ICG/ITSU, Chairman, Vice-Chairman, Acting Secretary IOCARIBE.

Subject: **Letter informing authorities of the regional tsunami hazard, providing information about ICG/ITSU, and requesting the nomination of a National Contact to deal with the tsunami warning issue.**

Dear Sir/Madame,

There is historical information, evidence and data on over 80 Caribbean tsunamis including the tele-tsunami from the 1755 Lisbon, Portugal earthquake which created a 7 meter tsunami in the Caribbean 7-8 hours later. Tectonic tsunamis such as the 1867 Virgin Islands tsunami which produced 3 meter waves as far as Grenada, and landslide tsunamis such as the 1688 event which destroyed Port Royal, Jamaica, killing 2,000 people are also reported. In addition, other fatalities due to tsunamis, including 459 in the last 150 years in the Caribbean are well documented. This exceeds the number reported from Hawaii, Alaska, and the West Coast of the USA combined for the same period. Nevertheless, these last mentioned areas are protected by regional warning systems.

Destructive tsunamis in the Caribbean are relatively rare, averaging about one per 20 years and none have occurred since the 1946 event in Hispanola. A repeat of any of these events however, would be disastrous, given the great increases in population and tourism in the coastal areas and the coastal development in general. Concern is increasing in relation to the possibility of a volcanic tsunami due to the activity of the Soufriere Volcano on Montserrat and the submarine volcano Kick'em Jenny near Grenada.

Under the auspices of IOC, the International Co-ordination Group for the Tsunami Warning System in the Pacific (ICG/ITSU) was established in 1968. The ICG/ITSU membership is presently comprised of 26 Member States. The representatives of these countries meet every 2 years to: review progress; co-ordinate activities; monitor the efficiency of the Warning System detection, analysis and dissemination procedures; enhance the participation of new Member States in developing of their own regional warning systems; recommend policies and develop programmes on data collection and exchange; discuss tsunami prevention and public education.

IOC also maintains the International Tsunami Information Center (ITIC) and the Pacific Tsunami Warning Center (PTWC), working closely together. The tsunami programme is one of the most successful of the IOC programmes. Some of its more recent achievements are: the Tsunami Inundation Modeling Exchange (TIME) project; the Earthquake Tsunami Data Base (ETDB) project; the bi-annual Visiting Experts Programme; the development of Standards for Tsunami Post-Disaster Survey; and the Electronic Tsunami Bulletin Board/HomePage.

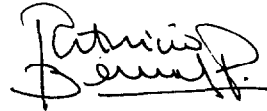
During its Sixteenth Session, held in Lima, Peru, 23-26 September 1997, the ICG/ITSU was of the general opinion that there is a significant tsunami risk in the Caribbean. At the same time, little local expertise is available in tsunami mitigation and warning. The Group agreed that the expertise of the IOC ICG/ITSU in promoting tsunami preparedness actions may be most helpful. The Group also recommended that a meeting of key people in the development of tsunami warning programmes from

different tsunami prone areas be organized in order to explore the possibility of bringing knowledge and expertise together, and identify ways and means for effective co-operation.

In order to start organizing this meeting, I would appreciate your prompt action in providing me with the name of a National Contact who will deal with the tsunami warning issue.

Thank you in advance for your co-operation and early response to this letter.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Patricio Bernal', with a horizontal line underneath the name.

Patricio Bernal
Executive Secretary IOC