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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION  
(of UNESCO)

International Co-ordination Group for the  
Tsunami Warning System in the Pacific

Sixth Session

Manila, Philippines, 20-25 February 1978

SUMMARY REPORT

(SC-78/CONF.225/COL.1)

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## 1. Opening of the session

The sixth session of the International Co-ordination Group for the Tsunami Warning System in the Pacific (ICG/ITSU) was convened at the Silahis International Hotel in Manila, Philippines, on Monday, 20 February 1978, at 10:00 a.m. The Unesco National Commission of the Philippines, in co-operation with the National Science Development Board, acted as the host for this meeting, and made arrangements for logistical support.

The session was opened by the Chairman of the Group, Mr. G. Dohler, who welcomed the participants and introduced the speakers.

The inaugural ceremony began with a welcoming address by Dr. Roman L. Kintanar, Director-General, Philippine Atmospheric, Geophysical and Astronomical Services Administration, followed by an address of the guest of honour, Dr. Melecio S. Magno, Chairman, National Science Development Board. (Annex V).

Dr. G. Giermann, Deputy Secretary of the Intergovernmental Oceanographic Commission of Unesco, then welcomed the Group in the name of the Director General of Unesco and the Secretary of IOC, and thanked the government of the Philippines for hosting the meeting and providing such fine facilities. (For list of participants, see Annex IV).

Mr. Dohler closed the inaugural session in giving his report on the activities between the 5th and 6th session (Annex III) and thanking the government of the Philippines for its hospitality in the name of the Group.

## 2. Adoption of the agenda and election of a rapporteur

The Group adopted the provisional agenda (Annex I) without changes. Dr. G. Pararas-Carayannis, Director of ITIC, was elected rapporteur.

## 3. State of implementation of resolution EC-VII.13 and of recommendations 3 to 13, from the 5th session of the ICG/ITSU (Lima, Peru, 23-27 February 1976)

The Secretary, Director of ITIC and Member States reported on the state of implementation of the above-mentioned resolution and recommendations. It was felt that the progress made in the implementation of these recommendations was not always satisfactory, and that in future recommendations should be accompanied by more specific action items.

## 4. Decision of the IOC Assembly at its 10th session, on a new mandate for ITIC (IOC res. X-23)

The Secretary reported that the new mandate and functions for ITIC were adopted by the IOC Assembly during its 10th session in October-November 1977.

Concerning the status of the Director and the Associate Director of ITIC, the Director informed the Group that he is now working full-time for the Centre. The group expressed its concern that funds for the new Associate Director, Mr. Ridgway, were only available for a 9 to maximal 12 months period. The Chairman suggested that countries make contributions to the IOC Trust Fund for this post and asked the representatives of the Member States to express to their appropriate offices the urgency of support.

5. Activity report by the Director, ITIC

The Director of ITIC presented a comprehensive report on the activities of his Centre which was welcomed by the Group. The report also contains proposals for further development including a Draft of a Programme Development Plan which was taken into consideration by the Group in formulating recommendations on budget and programme priorities. Future activity reports should be submitted to the Member States two months prior to the ITSU meetings.

6. National activity reports

The representatives of the Member States reported on developments in their respective countries. Written reports were presented by the representatives from Canada, Chile, Ecuador, Fiji, Indonesia, Japan, Philippines, Thailand, USA, and USSR. The Secretary read New Zealand's activity report. These reports are not annexed to the Summary Report, but will be made available, on request, by the Secretary of IOC, Paris or the Director of ITIC, Honolulu.

7. Consideration of recommendations from the IUGG Tsunami Committee meeting held in Ensenada, Mexico, 23-26 March 1977

The Group regretted that the Chairman of the IUGG Tsunami Committee, Professor S.L. Soloviev, was not able to attend the meeting. On his behalf, the Director of ITIC introduced the above-mentioned recommendations. The Group noted the Committee recommendations and asked the Director of ITIC to take into consideration the first recommendation of the Committee in preparing a Guide for Tsunami Damage and Survey Procedures, to be completed by August 1978. Member States should submit ideas on the subject prior to 1 June 1978.

8. Proposals for further expansion of the Tsunami Warning System in the Pacific

The Director of ITIC presented to the Group proposals for future expansion of the Tsunami Warning System. Proposals included the addition of tidal and seismic sensors and communications to the System in Member States of ICG/ITSU presently not actively involved in the System, as well as the addition of stations in countries which may be joining the Group at some future time.

The Group considered these proposals, and particularly the need for regional tsunami warning systems, as expressed specifically by the delegate of Ecuador and the observers of Fiji and Indonesia. The Group agreed that the Director of ITIC and interested Member States should examine the feasibility of establishing such regional tsunami

warning systems, should co-ordinate their efforts with the Office of the United Nations Disaster Relief Co-ordinator (UNDRO) and the United Nations Development Programme (UNDP), and should explore the possibility of international funding for that purpose.

At the suggestion of the Chairman, an ad hoc group was organized which subsequently formulated recommendations on budget and programme priorities for 1981/1982 (Annex VI). Recommendation ITSU-VI.1 was adopted (Annex II).

9. Proposals for further technical improvements of the Tsunami Warning System in the Pacific (TWS)

The Director of ITIC summarized the progress made to date and presented plans for further technical improvements for the Tsunami Warning System. The Chairman established an ad hoc group on technical improvements which developed the following action plan which was adopted by the Group:

The Group requests Canada and the USA to investigate the use of satellites in the TWS and to prepare a report for publication in the ITIC newsletter by 1 January 1979. The USSR and Japan are requested to provide information on their satellite programmes by 1 June 1978 for inclusion in this report.

The Group requests each Member State to review the communication facilities between its TWS gauges and the Pacific Tsunami Warning Center (PTWC) and submit a report to ITIC recommending the most expedient means of communication. This report should be submitted to ITIC by 1 June 1978.

ITIC will review these recommendations and suggest improvements in the TWS communication plan. Implementation of these recommended improvements will be the responsibility of the Member States.

The Group is of the opinion that the goal of the TWS should be to verify the existence of a tsunami within one hour after the time of generation. As a first step, ITIC and PTWC will prepare a report defining the system of TWS gauges needed to achieve the goal. The recommended network of gauges, based on historical data and communication links, will be published in the ITIC newsletter by September 1978. Member States are requested to consider establishment of the recommended gauges as appropriate and to report to ITSU-VII on their progress.

The Group requests each Member State to provide ITIC with a description of existing gauging equipment utilized at each tsunami gauge site, as well as any planned improvements. This information should be submitted by 1 June 1978.

10. Proposals for research on tsunamis

The Director of ITIC and delegates of Member States reported and commented on overall objectives of research that may be of value to the understanding of the tsunami phenomenon and to improvements of tsunami warning systems. The Group emphasized the need for continuous research on tsunami. The delegate from the United States emphasized the need for each

Member State to delineate tsunami hazards in their coastal areas, and brought to the attention of the Group a report by Dr. D.C. Cox of the University of Hawaii as an example of such studies. Copies of this report will be provided to all ITSU members by the United States.

11. Proposals for a tsunami educational programme

The session, with the assistance of an ad hoc group set up by the Chairman, identified three groups with whom an educational programme on tsunamis must be concerned. One group is the scientific community, i.e. those researchers concerned with the technical aspects of tsunamis. Many in this group may never be directly involved in an actual tsunami event but all are necessary for the development of appropriate input to the Tsunami Warning System. Their needs for educational material are fairly well defined - catalogues of historical events, observed data, bibliographies of current research, etc.

The next group has as its membership the co-ordinators and operators of the actual Tsunami Warning System. These may be civil and/or military authorities who have the responsibility for carrying out those actions required to save lives in the event of an actual tsunami. The needs for educational material here are less well defined and on a broader level than that for the scientific community. These may include internal training programmes on effective evacuation procedures, relief centres, etc., as well as the need to distribute educational materials in the form of brochures, slide presentations, films, etc. to the last group, the general public - or at least that portion at risk in an actual tsunami event.

The educational requirements for the general public are of a completely different character than those for the first two groups. Reduced to bare essentials, the first group must know WHEN (based on WHY) something is happening, the second group must know WHAT must be done and the third group must know HOW to carry out these actions. This implies more of a sociological and psychological problem than a technological one, and this area of education appears relatively open for further development. The needs of this group are also most heavily oriented towards individual Member States and even localities. The response of the general community to risk will be most divergent, depending on local custom, religious practices, relationship to a central authority from whom an evacuation order may come, etc.

To summarize this view, these three identifiable groups have markedly different educational needs, some of which may not have been adequately dealt with in the past.

Based on an analysis of recommendation ITSU-V.13, it appears that the educational needs of the scientific community may be reasonably well met. The needs of the administrative community are being met to some extent, but there does not appear to be any co-ordinated effort to systematically exchange information and experiences between the appropriate authorities of the Member States. Finally, the educational needs of the general public have not been addressed adequately.

In view of the weakness of the general public educational programme, the group emphasized that this element of the Commission's tsunami programme should receive special attention immediately. The public education programme

should be directed towards : coastal residents, their local officials, school teachers, mass media people, policy makers and should include : straight lectures, group dynamics, live-in seminars, audio-visual aids, (slides with tape recordings, movies, stills - cartoons) drawings, pictures to be displayed in public places and on television, radio announcements, brochures and pamphlets.

Funding of these activities are primarily the responsibility of each Member State. Support should also be provided by the IOC through its regular funds, Trust Fund and its new Voluntary Assistance Programme (IOC/VAP). The Group therefore decided that the Programme and Budget Forecast for 1981-1982 (see Annex VI), should include as a high priority item the preparation and publication of educational material. It was noted that the 1979-1980 Regular Budget does not have adequate funds for tsunami education for the general public. Thus, other funds should be sought for this purpose, perhaps through the Trust Fund.

The impact that a public education programme will have is not fully understood. One method to address this problem would be to undertake one pilot educational programme within each country and Member States are urged to do so. A report of these activities should be disseminated to other Member States via the ITIC and an evaluation presented at the next session of ITSU.

In response to the request of the Commission (res. X-19), the group invited Mr. W. Miñoza (Philippines) to be the TEMA Co-ordinator for ITSU to the Working Committee for Training, Education and Mutual Assistance in the marine sciences (TEMA). Mr. Miñoza accepted this responsibility.

The Group adopted recommendation ITSU-VI.2 (Annex II).

The Group further requests the Director of ITIC to arrange the preparation and distribution of :

1. A catalogue of emergency evacuation plans prepared by each Member States, and
2. An inventory of public educational material.

The delegate of the USSR made a tsunami film, produced in the USSR, available to ITIC for copying and provision to Member States, on request.

12. Other matters

13. Date and place of the seventh session of the ICG/ITSU

The delegate of Chile invited the Group to hold its seventh session in his country. The delegate of the USSR stated that the USSR will not send a delegation to Chile.

After due consideration, the delegate of Canada invited the Group to accept the invitation made by the delegate of Chile. The matter was moved by Canada and seconded by the Philippines.

The Group, excluding the USSR, accepted the invitation.

14. Adoption of the Summary Report and recommendations

The Group adopted the Summary Report and its Annexes I, II and VI.

15. Closure of the session

The session closed at 17.00, on Friday, 24 February 1978. It was followed by a cruise aboard RV "Atyimba" to Corregidor Island, on Saturday, 25 February 1978.



ANNEX I

A G E N D A

1. Opening of the session
2. Adoption of the agenda and election of a rapporteur

REVIEW

3. State of implementation of resolutions EC-VII.13 and of recommendations 3 to 13, from the fifth session of the International Co-ordinating Group for the Tsunami Warning System in the Pacific (Lima, Peru, 23-27 February 1976).
4. Decision of the IOC Assembly at its 10th session on a new mandate for ITIC (Resolution X-23)
5. Activity report by the Director, International Tsunami Information Center (ITIC)
6. National activity reports
7. Consideration of recommendations from the IUGG Tsunami Committee meeting, held in Ensenada, Mexico, 23-26 March 1977

NEW ACTIVITIES

8. Proposals for further expansion of the Tsunami Warning System in the Pacific (TWS)
9. Proposals for further technical improvements of the Tsunami Warning System in the Pacific (TWS)
10. Proposals for research on tsunamis
11. Proposals for a tsunami educational programme
12. Other matters
13. Date and Place of the seventh session of the International Co-ordinating Group for the Tsunami Warning System in the Pacific
14. Adoption of the Summary Report and recommendations
15. Closure of the session

ANNEX II

RECOMMENDATIONS ADOPTED BY THE INTERNATIONAL CO-ORDINATION  
GROUP FOR THE TSUNAMI WARNING SYSTEM IN THE PACIFIC  
AT ITS SIXTH SESSION

RECOMMENDATION ITSU-VI.1

PROPOSED PROGRAMME AND BUDGET FORECAST 1981/82

The International Co-ordination Group for ITSU,

Recommends that the IOC, when preparing its Programme and Budget Forecast for 1981/82, take into account the budget proposals made by the Group, and the priorities the Group established within those proposals (Annex VI of the Summary Report)

RECOMMENDATION ITSU-VI.2

EDUCATIONAL MATERIAL

The International Co-ordination Group for ITSU,

Having reviewed the Tsunami educational programme being conducted within the Commission, particularly under the auspices of ITIC,

Considers the present public education element of this programme to be inadequate for the prevention of life and property;

Invites Member States to undertake the preparation and dissemination of tsunami educational material for the general public and to provide copies of such materials to ITIC;

Requests the Secretariat to investigate means of obtaining additional financial support for the preparation of tsunami educational material during the period 1978 through 1980.

ANNEX III

REPORT OF THE CHAIRMAN TO THE SIXTH  
SESSION OF THE IOC/ITSU

When it was decided in 1965 to establish the International Co-ordinating Group for the Tsunami Warning System in the Pacific (ICG/ITSU), great enthusiasm was expressed and programmes to achieve the goals as set at that time were drawn up. Although not all of them are in place as yet, much work to save the loss of life and to prevent damage to property has been carried out.

The membership of the Co-ordinating Group consists presently of 15 States, all belonging to the family of the Intergovernmental Oceanographic Commission (IOC) and we hope this meeting ends that other Member States will be added. We must keep in mind that just expanding our membership will not necessarily make a better Tsunami Warning System for the Pacific. Nationals subscribing to the system should be prepared to utilize their IOC trust funds for the Tsunami purposes and should maintain and promote certain gauging and seismic stations for an effective and efficient warning system which will be beneficial to all nations bordering the Pacific Ocean. Some education and training has been carried out but much more is needed if we are to reach all communities and people in remote areas, explain to them the danger of tsunamis and in particular on how to recognize them and what should be done whenever a tsunami wave is generated.

The International Tsunami Information Center (ITIC) as the focal point must work with, and provide liaison to any nation within our Co-ordinating Group or with other interested agencies. With the assignment of a full-time Director, and the Associate Director position now filled again by an officer from one of our Member States, the nucleus for this important centre is now in place. I hope that within the next few months participating nations will submit names to fill the post of the Associate Director before it is vacated by the present incumbent. This will ensure that the international character for the Centre is maintained at Honolulu.

It was a pleasure to participate as your Chairman in the tenth session of the IOC Assembly in Paris. I pointed out that Chairmen of all subsidiary bodies must play an important part in the decision-making process of IOC and that budget and programme forecasts should be done in consultation with the Secretariat and all subsidiary bodies, particularly during the present period of constraints on IOC finances.

What have we done since the last meeting and in particular with respect to the recommendations made at that time?

The recommendations ITSU-V.1 to V.13, as prepared during the Lima session, were consolidated during the seventh session of the Executive Council meeting into resolution EC-VII.13.

Recommendations ITSU-V.1 invited the Secretary of IOC to submit in writing, prior to February 1978, a new mandate and function to the Member States of ITSU. This must be approved at the sixth session of the International Co-ordination Group and submitted for adoption by the IOC Executive Council. According to Resolution EC-VII.13, however, the

instructions were to prepare the necessary correspondence and to submit the mandate and functions to the 10th session of the Assembly which was held in Paris in October 1977. The Director of ITIC, after submitting a draft, met with the Chairman and members of the U.S. National Weather Service. An appropriate document was prepared and submitted to all Member States of ITSU for comments early in 1977. I am happy to report that the final draft was approved at the 10th Assembly with only minor changes. ITIC now has the green light to act within the framework of its mandate and functions. In addition, the document now provides a good understanding of the collection and dissemination of gauge records for research and operational requirements in the field of tsunamis as referred to in recommendation ITSU-V.2.

The Government of Canada did extend the services of Mr. Wigen as Associate Director until the end of November 1977. On behalf of ITSU, I would like to thank Mr. Wigen for a job well done. The generous offer made by the Government of Canada to use a large portion of its IOC trust fund contribution for ITSU provided the base to make ITIC a truly international centre.

It is noted with great satisfaction that the Director of ITIC is now assigned full time to this important post. This announcement, made by the U.S. Government during the 10th Assembly, shows the importance the USA assigns to the aspect of international co-operation within the Tsunami Warning System for the Pacific. Dr. Pararas-Carayannis and his small staff are highly commended for the work carried out since the last meeting of our group.

IOC trust fund monies have been made available to cover the living expenses of the new Associate Director, Mr. N. Ridgway. The programme and budget forecast contained in doc. IOC-X/20 could be used as a guide during this meeting's deliberations. It is noted that \$ 206,000 would be required if we were to carry out the work as laid out during ITSU-V. For the benefit of our group and for a proper allocation of the funds available to IOC, prioritizing of all programmes is essential. You may wish to assess the priorities as assigned in the budget document.

It is assumed the ITIC did receive the requested annual reports covering tsunami research and the book written by Dr. T. Murty covering many facets in the field of tsunamis is now available through the Canadian Government, Department of Services and Supplies, in Ottawa.

In reference to recommendations ITSU-V.8 and V.11, ways and means are still being explored by the Secretariat to find the appropriate funds to carry out the pilot computer study on Tsunami Hazard Evaluation as well as the Tsunami Preparedness Project.

It would be extremely beneficial to establish a group of experts very knowledgeable in the field of satellites, communication facilities, measuring equipment, and with a good understanding of the area and countries for which the Tsunami Warning System is applicable.

Training of scientists and technical personnel was again provided at ITIC and the Director no doubt will report in more detail on this matter.

While some educational material is now available, much more work is required to carry out the programme as outlined under rec. ITSU-V.13. It is my strong belief that educational material for the benefit of communities bordering coastlines threatened by tsunamis, should be very high on our priority list.

I hope that our deliberations during this meeting will substantially contribute to understand better the reason why a co-ordinated effort is needed to establish and to operate a Tsunami Warning System within the Pacific.

G.C. Dohler  
Chairman, ICG/ITSU

ANNEX IV

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ANNEX V

ADDRESS DELIVERED BY DR. MELBOIO S. MAGNO  
CHAIRMAN, NATIONAL SCIENCE DEVELOPMENT BOARD OF THE PHILIPPINES

I am greatly honoured to give these remarks in this sixth session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, of the Intergovernmental Oceanographic Commission. This privilege allows me to welcome the members of IOC and other distinguished participants of this momentous meeting. We consider this event very significant. As one of the nations in the gringes of the great Pacific, our country welcomes this opportunity to host this session - dedicated to the improvement of the warning system to minimize the effects of tsunamis.

As far as is recorded, the Philippines has a long history of tsunamis. Since 1627, our coastal shores have been affected by no less than 70 tsunamis. Some of our coastal areas are repeatedly visited by tsunamis, which means that some areas are more risk prone. You can readily see, therefore, the importance of improving the tsunami warning system on our country to reduce the effects of potentially calamitous tsunamis among our countrymen.

Sometime in 1970, we welcomed the invitation to join the International Co-ordination Group for the Tsunami Warning System in the Pacific. We felt then and still do feel now that the Philippines should take an active role in the Tsunami Warning System in the Pacific under the aegis of the United Nations Educational, Scientific and Cultural Organization. The System has gone a long way since then and I am glad to note the many lives saved and enormous amounts of damage to property averted due to the early notices of impending tsunamis issued by the System.

The System, however, has still to be improved, a consideration which make this continuing consultation imperative. If you may recall, only recently, an earthquake-generated tsunami started in the Celebes Sea that caused havoc and destruction along the coastal areas of Southern Mindanao, making this the most severe earthquake and tsunami disaster in Philippines history. We feel that this unnecessary loss of lives and property could have been minimized, had we been able to provide a timely warning on the approach of that dangerous tsunami. This only shows the inadequacy of our local warning system, and we hope that, through this regular session of the ICG for the Tsunami Warning System in the Pacific, better techniques of predicting tsunamis through improved communication systems and standardisation of information exchanges could be developed for adoption by the member nations.

So far the TWSP has done remarkably well, considering that it was formally started only in 1965. Previous to 1965, it may be

mentioned, there was already an existing system loosely linking some countries in the Pacific. The linkages were made on a country-to-country basis. The formal organization by UNESCO-IOC of the present system was, therefore, very timely.

I note that Mexico, Fiji, Malaysia, and Indonesia are not yet member states of the International Co-ordination Group for the Tsunami Warning System in the Pacific. I feel that the formal affiliation of these countries is important for the more efficient functioning of the System. These four countries are important listening posts, and their observations, when transmitted immediately to the System facility in Honolulu, will enrich the data base from which early warning signals on impending tsunamis could be formulated.

From the annotated provisional agenda of this meeting, I notice that you will have a very busy schedule during the next five days. The technical sessions are particularly of much interest to us, especially those on the proposals to further improve the Tsunami Warning System in the Pacific.

I hope that this session will be fruitful for all the distinguished participants.

ANNEX VI

PROGRAMME AND BUDGET FORECAST 1981/82

<u>Priority :</u>	<u>A. ITSU Programme Support :</u>	<u>Regular Fund</u> \$	<u>Trust Fund</u> \$
1st :	1. ICG/ITSU session	13,000	-
4th :	2. Run-up survey field assignments	12,000	-
	To provide a contingency fund in IOC, to be utilized if participating nations request the assistance of ITIC to carry out surveys immediately after the occurrence of a major tsunami.		
	3. ITIC Travel	8,000	-
	To provide 50% of the travel costs of the Director and Associate Director of ITIC, for all travel approved by IOC.		
	4. ITIC Contractual Services	7,000	6,000
	Contractual services for programming, key punching, bibliographical updating, PEACESAT, within ITIC. This item is intended to supplement the support services normally provided to ITIC by the U.S.		
	5. Publications	5,000	7,000
	Publication of tsunami catalogues, bibliographies, and related informal material.		
	6. Programme oriented workshop	-	20,000
	To conduct workshops for participating states in matters relating to mitigating the effects of tsunamis; e.g., methods and procedures for conducting run-up surveys, tsunami warning assessment, and civil defense procedures.		

Priority :	B. <u>ITSU Training Support</u>	Regular Fund	Trust Fund
		\$	\$
2nd :	7. Educational materials	20,000	-
	Preparation and publication of educational materials, to serve as guide, for the protection of life and property in tsunami threatened areas. Those educational materials are to be made available, as required in the languages necessary to communicate with people of threatened areas.		
3rd :	8. Workshop to assess training needs	20,000	-
	Workshop of Member State representatives to review the existing capability of States to operate and participate in regional and national tsunami warning systems, and to assess the additional training needed to develop and standardize the capabilities among Member States.		
	9. Training course	-	20,000
	To conduct training courses in the technology necessary for effective tsunami warning systems, such as : communications, including satellite data transmission; installation, operation and maintenance of automated tidal and seismic stations and networks.		
	10. Visiting scientists programme	12,000	-
	Four scientists to be sent to ITIC, each for a 6-week period, for research and training, and exchange of views. This is a continuation of the regular programme.		
	<u>T O T A L :</u>	<u>\$ 77,000</u> =====	<u>\$ 53,000</u> =====