

**Intergovernmental Oceanographic Commission**  
*Reports of Governing and Major Subsidiary Bodies*

cdl 63/97  
855 0256

# **IOC Working Committee on Training, Education and Mutual Assistance**

**Fourth Session**  
Lisbon, 4-9 June 1984

**Unesco**

**In this Series**

**"Reports of Governing and Major Subsidiary Bodies", which was initiated at the beginning of 1984, the reports of the following meetings have already been issued:**

- **Eleventh Session of the Working Committee on International Oceanographic Data Exchange**
- **Seventeenth Session of the Executive Council**

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## 1. OPENING

The Fourth Session of the Working Committee for Training, Education and Mutual Assistance (TEMA) in the Marine Sciences was held at the premises of the Laboratorio Nacional de Engenharia Civil (LNEC), Lisbon, Portugal from 4 to 9 June 1984. The Chairman of the Working Committee, Professor Ulf Lie, declared the Session open.

Dr. Victor Sa Machado, President of the Portuguese National Commission for Unesco welcomed the participants\* on his own behalf and on behalf of the local organizing bodies. He extended a special welcome to His Excellency Mr. Mario Soares, the Prime Minister of Portugal for having honoured the occasion by his presence. He said the gathering of eminent specialists in ocean affairs from different parts of the world was a special event for his country which, for the past several centuries, had been associated with the oceans. He wished the participants a great success in their deliberations and in this respect expressed his thanks to the Secretary of IOC for having accepted the invitation to convene the Session in Portugal. In making local arrangements for the Session, he said, a number of organizations were involved and in this respect he expressed particular thanks to the Minister of Foreign Affairs, of Education, of the Sea, and to the Secretary of the State for the Environment, as well as to the National Board for Science and Technological Research and the Director-General of Tourism for their assistance and co-operation.

The Chairman of the Working Committee, in his address, said it was particularly significant to note that the venue of the meeting happened to be in Lisbon, the capital of Portugal, which, in historical terms, was a great sea-faring nation and, thus, provided the appropriate atmosphere for the discussion on problems that need to be resolved to meet marine scientific and technological needs of Member States, particularly the developing nations.

After a detailed review of development of activities and the progress achieved under TEMA since its establishment in 1973, he stated that great impetus to TEMA was provided by important international events that occurred subsequently, such as the Third UN Conference on the Law of the Sea and the UN Conference on Science and Technology for Development, held in Vienna in 1978. He drew attention to the Resolution adopted by the UNCLOS which recommended the appropriate organizations within the UN system to expand programmes in their respective fields of competence for assistance to developing countries in the marine science, technology and ocean services, and to co-ordinate their efforts in the implementation of those programmes with due regard to the special needs of the developing countries. In this respect, he said, TEMA-III undertook an in-depth analysis of the current situation and strongly recommended the establishment of a "Comprehensive Plan for a Major Assistance Programme to Enhance the Marine Science Capabilities of the Developing Countries", which was prepared and later adopted by the Twelfth Session of the Assembly.

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\* A list of participants is given in Annex IV to the present Report.

- 5       The Chairman pointed out that the Comprehensive Plan outlines a strategy to improve national co-ordinating mechanisms, assessment of needs through the preparation of Marine Sciences Country Profiles, formulation at the request of Member States, of technical assistance projects for extrabudgetary assistance and further strengthening of the role of the Commission's subsidiary bodies in the implementation of various elements of the Plan. The Plan addresses itself to the need for co-operation with ICSPRO Agencies in the implementation of the programme of assistance, and calls on the aid-giving agencies to provide the necessary support for it. Finally, he said that the task of the Committee was to renew those developments as well as the progress achieved during the intersessional period and to recommend measures to respond to the new situations confronting Member States of the Commission.
- 6       The Secretary of IOC, Dr. Mario Ruivo, welcomed the participants on behalf of the Chairman of the Commission, Prof. Inocencio Ronquillo, and on his own behalf. He conveyed the deepest appreciation of the Director-General of Unesco and the Chairman of the Commission to the Prime Minister, His Excellency Dr. Mario Soares, and to the Government of Portugal for hosting this Session of the Working Committee for Training, Education and Mutual Assistance in the Marine Sciences (TEMA), as well as the IOC/FAO Workshop on Improved Uses of Research Vessels organized in co-operation with the Norwegian Agency for International Development (NORAD), which was held the previous week. He expressed sincere thanks to the Minister for Foreign Affairs and to the other Ministers concerned, as well as to the two local organizing bodies - the Portuguese National Commission for Unesco and the Portuguese Permanent Oceanological Commission of the National Agency for Scientific and Technological Research - for the excellent arrangements made and for the hospitality extended to the participants.
- 7       The Secretary of IOC drew the attention of the Committee to the increasing interest shown by a number of countries in the multiple uses of the oceans as well as on the need for application of scientific and technological knowledge to exploration, exploitation and management of marine resources as well as the protection of the environment.
- 8       Referring to the great diversity that exists in the level of development, as well as in capabilities for, marine scientific research among countries, especially between the industrialized and developing ones, he said that unless a serious effort was made to reduce the gap, it would be impossible to remedy the situation in the future. He referred to the various provisions of the UN Convention on the Law of the Sea which laid considerable emphasis on the conduct of scientific research and to those which call for action for the competent international organizations so as to respond to the emerging needs of the developing States.
- 9       In this context, the establishment of the Comprehensive Plan for a Major Assistance Programme to enhance Marine Science Capabilities of Developing Countries was a significant step taken by Unesco and IOC in response to the Resolution on Strengthening of Marine Science Infrastructures, Ocean Services and Related Aspects, adopted by the UN Conference on the Law of the Sea. He went on to say that the Working

Committee for TEMA had an important role to play in the promotion and follow-up of the Plan. He then drew the attention of the Committee to the considerable support given by Unesco to the Commission, and the steps taken by its Director-General, with a view to strengthening TEMA and facilitating the implementation of the Comprehensive Plan which was reflected in the proposals submitted to the Unesco General Conference for increasing the budget and strengthening the Secretariat of the Commission. He made particular reference to the address given by the Director-General of Unesco at the Seventeenth Session of the Executive Council, expressing his willingness to appeal, if necessary, for extrabudgetary funds and other sources of assistance for initiation of the preparatory phase of the Comprehensive Plan. 10

Finally, the Secretary of IOC drew the attention of the Committee to the recommendations adopted by the IOC/FAO Workshop on "Improved Uses of Research Vessels" which met the previous week, and suggested that it examine them carefully and advise on appropriate measures to alleviate problems that a number of developing countries are confronted with in the management of this important and expensive facility. He pointed out that the Committee had before it a number of other important tasks which also required careful study in order to take appropriate steps to accomplish them. 11

The Prime Minister of Portugal, His Excellency Dr. Mario Soares, expressed his great satisfaction in addressing this important session of the Working Committee for TEMA, and welcomed the participants to Lisbon. He recalled the efforts of the Commission during the past 25 years in contributing to a better knowledge of the oceans through the concerted action of its Member States, to formation of global programmes with due regard to the diversity of the different levels of development and interests of the Member States and, in particular, to improving the North-South relations. The spirit of co-operation among the States which characterizes the work of IOC justifies the authority it enjoys and, therefore, adds appreciably to the prestige of Unesco, its parent body. He also recalled the important functions the IOC has been discharging as an autonomous body and, in close co-operation with other specialized agencies within the UN system. 12

Referring to the UN Conference on the Law of the Sea, he said, it was not by chance that the regime of scientific research and of transfer of knowledge and marine technology were subjects of intensive debate; it was in fact a key element in the negotiations. The Prime Minister, therefore, laid emphasis on the value of science and technology in development of ocean space. He said, without marine science and technology it is impossible to put the oceans and their resources at the service of mankind. 13

Recalling the centuries-old pioneering role of Portugal in the discovery of the oceans and their natural phenomena through the empirical and audacious approach of its fishermen and navigators, which contributed significantly to the scientific spirit that followed later, the situation today, he said, is in sharp contrast. Progress today not only depends on knowledge and organization but also on national marine science policy and co-ordinated technological innovation. Portugal, with its important geo-strategic position facing the Atlantic and near the entrance of the Mediterranean, with vast economic zone that is 14

relatively rich in living resources, depends for its economic development on its maritime activities. Aware of the important role of science, as an essential factor for development, he re-affirmed the interest of his Government, as shown by the creation of a Ministry of the Sea with the objective of stimulating a coherent policy through complementary action of the administrative and economic sectors and institutions responsible for oceanographic and fisheries research and efficient co-ordination and economic utilization of indispensable means, including research vessels and personnel, to respond to the needs of industry. In this respect, he said, his Government will take appropriate action to strengthen the National Committee of Science and Technology and, within its framework, the Portuguese Permanent Oceanological Commission which will provide the necessary institutional framework for the promotion of active co-operation between the competent national scientific institutions, such as Instituto Nacional de Investigacao das Pescas (INIP) strengthening the role of the university and training of personnel in the conduct of research.

- 15 Referring to the bilateral co-operation from which Portugal has benefited, and to the active participation of the country in activities of international organizations, the Prime Minister affirmed his Government's support for all actions that contribute to making the transfer of knowledge and marine technology possible. He hoped that IOC would support his Government's programme in developing national capabilities in marine science and technology. His Government would also adopt concrete measures in support of IOC activities under TEMA through provision of fellowships, courses and training in national institutions and in promoting other relevant marine scientific activities of scientists and technicians of countries in which Portuguese is an official language. He invited participants to visit the scientific institutions in Portugal, in particular, the INIP and the Hydrographic Service of the Navy.

- 16 He concluded by wishing the participants, on behalf of his Government, success in their deliberations.

## 2. ADMINISTRATIVE ARRANGEMENTS

### 2.1 ADOPTION OF THE AGENDA

- 17 The Chairman presented the Provisional Agenda and invited comments on it. The IOC Assistant Secretary in charge of TEMA and Technical Secretary for the Session, Dr. S.M. Haq, informed the Committee that a request had been made by FAO to include a new sub-item 10.2 on the FAO Programme in Training and Education, and by the Representative of WMO, sub-item 10.3 on the WMO Programme in Training and Education.

- 18 The Committee approved the Agenda, as amended.



## 2.2 DESIGNATION OF THE RAPPOREUR

Professor Dr. Wolf Arntz of the Federal Republic of Germany was elected Rapporteur, following his nomination by the Delegate of France which was seconded by the Delegates of India and Turkey.

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## 2.3 CONDUCT OF THE SESSION

The Technical Secretary, introduced the Provisional Time-Table and the Provisional List of Documents and explained the arrangements for the Session, which were expected to work in Plenary, and to establish ad hoc Sessional Groups, if required.

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## 3. INTERSESSIONAL ACTIVITIES

The Technical Secretary introduced the "Report on Interseasonal Activities" (Document IOC/TEMA-IV/6). Highlighting the achievements during the interseasonal period (1 January 1980 - 30 April 1984), he said that the activities under TEMA were elaborated and progressively implemented on the lines of the new approach recommended by the Third Session of the Working Committee for TEMA held in Buenos Aires, Argentina in 1980, with a view to strengthening the marine scientific capabilities of Member States and especially to enhance their participation in the Commission's on-going and planned programmes. The TEMA components of the IOC programmes were progressively sharpened, particularly to respond to well-defined needs of Member States through training and other activities aimed at increasing their participation in the on-going and planned programmes of the Commission.

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A new dimension was added to the TEMA activities to further the capabilities of Member States in marine scientific research so as to achieve national goals in marine affairs, including participation in international activities, particularly those under the IOC (e.g., global, regional and sub-regional). This was done through the formulation, adoption and initiation of preliminary steps aimed at promotion of the Comprehensive Plan for a Major Assistance Programme to Enhance the Marine Science Capabilities of the Developing Countries which was finally adopted by the Twelfth Session of the IOC Assembly and later endorsed by the Twenty-Second Session of Unesco General Conference. In addition, co-operation among the organizations members of the Inter-secretariat Committee on Scientific Programmes Relating to Oceanography (ICSPRO) on matters relating to TEMA was strengthened. Clarification in the arrangements and procedures for handling TEMA in the Commission was achieved through a better definition of the role to be played by the major technical and regional subsidiary bodies concerned.

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Reporting on the activities undertaken during the interseasonal period, he stated that there had been a progressive expansion of TEMA activities. This trend was particularly influenced by factors internal to the Commission such as the progressive consolidation of regional structures e.g., the Sub-Commission for IOCARIBE, the Programme Groups for WESTPAC, CINCWIO, and the recent establishment of IOCINDIO and IOCEA, which paved the way for gradual expansion of the programmes of

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the Commission in ocean sciences and services in the regions concerned. Also the establishment of new major programmes such as Ocean Science in relation to Living Resources (OSLR), Ocean Science in relation to Non-Living Resources (OSNLR), and those relating to Ocean Processes and Climate had, because of their importance to socio-economic development, generated the growing interest on the part of Member States, particularly in the regional context. Finally, the adoption and signature of the UN Convention on the Law of the Sea by a great number of the States, and the implications of the new ocean regime on the role of the Commission, have influenced the trends and stimulated the progressive strengthening of TEMA.

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One of the most significant achievements of TEMA has been the training, during the intersessional period, of one hundred and eighty-one scientists from about forty-one developing countries which is 6.5 times more per year than the figure in 1977. Out of this, a total of one hundred and thirty-two scientists from twenty-nine countries were trained in fourteen group training courses which relate to the on-going programmes and accounted for 73% of the total training. Among the on-going programmes, about sixty-two scientists from twenty-three countries were trained in programmes related to GIPME and twenty-six scientists from nineteen countries in IOOE. Together, these activities accounted for about 48% of the total training activities. He said much of this progress had been achieved due to increased support provided by a number of donor countries both through contributions to the IOC Trust Fund as well as in kind, such as provision of facilities in their laboratories as well as through availability of experts for running those courses. Countries which made contributions to training activities, either in cash or in kind, included Australia, Costa Rica, the Federal Republic of Germany, France, India, Japan, Spain, U.K., the U.S.A., U.S.S.R. and Venezuela. In addition to this, eighteen scientists were provided shipboard training on Japanese research vessels, R.V. Hakuho Maru and R.V. Takuyo, mostly in the WESTPAC region. Sixteen individual fellowships and forty study grants were provided to enable scientists from developing countries to participate in international workshops and seminars, and support, jointly with Unesco, UNEP, and WMO, was given to about seventy-seven participants to attend the Joint Oceanographic Assembly held in Halifax, Canada. In addition, four international workshops were organized by IOC in co-operation with other agencies on themes relating to TEMA.

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With specific reference to the implementation of the Comprehensive Plan, a number of steps were taken which includes negotiations with aid-giving agencies and the formulation of proposals for five technical assistance projects of which one has already been funded by UNDP and others are at various levels of negotiation with donor agencies. Preliminary steps were taken to develop, on a trial basis, a Marine Science Country Profile for Australia.

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A number of Delegates expressed their appreciation on the extremely efficient work done under TEMA in terms of cost effectiveness and praised the efforts of the Secretariat for the considerable amount of work done despite the limitation of staff during the intersessional period.

Commenting upon the substantial amount of work done in the last four years for an expenditure under Regular Programme of approximately US\$ 750,000, one Delegate inquired if the total expenditure including funds provided from extrabudgetary sources might be produced in the future to ascertain whether assistance provided in some fields is more effective than in others. 27

In responding, the Secretary explained that this would be possible but that a complex exercise as the local cost is often hard to assess and the same applies to the contributions made by many donor countries which are mostly in kind. He elaborated further that the IOC training courses are different from the traditional University courses; as in some cases equipment is left in the countries. 28

Several Delegations also suggested that IOC should give more emphasis to training of trainers so that they could in turn train young students and scientists more efficiently. 29

The Working Committee expressed its satisfaction at the progress achieved and the cost effectiveness of the activities undertaken during the intersessional period. It also expressed its appreciation to the Secretariat for the considerable efforts made in accomplishing this task. 30

#### 4. UNESCO/IOC COMPREHENSIVE PLAN FOR A MAJOR ASSISTANCE PROGRAMME TO ENHANCE THE MARINE SCIENCE CAPABILITIES OF DEVELOPING COUNTRIES

##### 4.1 GENERAL GUIDELINES FOR FUTURE IMPLEMENTATION

The Chairman called the attention of the Working Committee to the "Action Paper" (Documents IOC/TEMA-IV/8; IOC/EC-XV/8 Annex 5, Rev.; IOC-XII/8 Annex 10), and gave a brief historical summary of the development of the Comprehensive Plan since the Third Session of the Working Committee in Buenos Aires in 1980. He highlighted the main features of the Comprehensive Plan; and the modalities for its implementation. The Plan in its present state is a strategy for action rather than a list of projects ready for implementation. On some of the elements of the Plan, action had already been taken, such as preparatory work for the Marine Science Country Profiles, and advisory missions to Member States and regions in connection with infrastructure development. The Chairman asked for guidance from the Working Committee on the future actions needed to ensure rapid and efficient implementation of the Comprehensive Plan. 31

A number of Delegates expressed their satisfaction on the course of action taken by the Secretariat to implement the Comprehensive Plan. Looking at the evolution of the Plan since its adoption in 1982, it was thought necessary to bear in mind the fact that this is a long-term exercise. It was pointed out that the scale of the Comprehensive Plan is such that it must have firm foundations for which there is a need to improve increased awareness of the importance on marine scientific research by the developing countries. In this context, it would be necessary to encourage communication between scientists, politicians and other decision-makers. 32

The Working Committee believed that it would be of paramount importance that countries: 33

i) establish a National Oceanographic Commission or equivalent body, as suggested in the Comprehensive Plan and in IOC Resolution XII.8.C, that would enable them to deal effectively not only with IOC matters, but also with national and other international matters in marine affairs;

ii) assign marine science an appropriate priority - which is often not easy when requests for other exigencies outweigh the available but limited budgetary resources;

iii) seek a modest and gradual development of their marine science infrastructure and marine policy, which will eventually allow them to fully develop their own potential, and to participate in regional and international programmes.

34 Some Delegates suggested that if a country can show that it has a national and whole-hearted commitment to marine science, the potential donors, be they individual countries or international funding agencies, are more likely to be willing to support. The role of the IOC in such cases could be that of a catalyst and a broker as was obvious from the work, accomplished during the intersessional period. It was therefore stressed that Member States ought to examine rationally their marine science objectives, resources and requirements. In this context the Marine Science Country Profile was thought to be a useful way of getting countries to identify national goals and to define their requirements for marine science and technology.

35 Specific reference was made to the role of regional and subsidiary bodies in the implementation of the Comprehensive Plan, and it was suggested that co-operation between such bodies and appropriate national bodies responsible for marine science would be very effective in the future.

36 The Representative of Unesco, summing up his agency's activities in the last five years, suggested that emphasis needs to be placed on an international approach in which the role of local UNDP Representatives is important. He said that often when marine science development project ends there is a gap that needs to be filled by continued efforts on the part of country and by continued international input, because of the long-term nature of such development.

37 Some Delegates stressed the need for a regional approach in identifying the TEMA requirements in marine sciences, while others proposed that special efforts would be necessary to develop the Comprehensive Plan in more concrete terms if the IOC is to succeed in its implementation in the next 10-15 years.

38 The Delegate of the Federal Republic of Germany drew the attention of the Working Committee to the establishment of IOC Research Fellowships Scheme, as discussed and decided upon by the Seventeenth Session of the IOC Executive Council in the context of the plans for the commemoration of the Twenty-fifth Anniversary of the Commission. Under this new scheme, Member States are invited to announce IOC Research Fellowships along the following lines:

i) for scientists from a developing country to carry out a research project of his/her own choice in a laboratory of the donor country or of a third country (e.g. during a sabbatical year);

ii) for scientists from the donor country for a research project in a developing country.

In accordance with the guidelines established by the Executive Council, the proposed research fellowships should have a duration of at least nine months and should include all necessary funds and technical means needed for covering the costs of transportation and subsistence and for the implementation of the research project. Donor countries should announce their contributions to the IOC Research Fellowships through the IOC Secretariat, which would make it known to Member States either on a global base or in the region concerned. The IOC Secretariat should also assist in the selection of candidates.

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He continued to say that the Federal Republic of Germany is preparing for the announcement of three IOC Research Fellowships, one of them in oceanographic data handling. These Research Fellowships should be linked with the five year planning of research cruises on board new R/V "Meteor". Right from the beginning, the cruise plans would incorporate TEMA-elements, such as training courses and individual fellowships for researchers and trainees from the developing countries. The cruise plan on board R/V "Meteor" is expected to cover the Mediterranean, Red Sea, Northwestern Indian Ocean and West African and South American parts of the Atlantic, in addition to the marine working areas of the vessel in the North Atlantic. IOC Research Fellowships should enable senior and experienced scientists from the developing countries to join in research projects in phases from the planning of research investigations to the publication of the results.

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The IOC Secretary apologized that, because of workload in the TEMA unit of the Secretariat, it was not possible to provide the required outline of the IOC Research Fellowships Scheme in time for the Fourth Session of TEMA. He stressed the importance of the scheme as an indication of the advanced level of co-operation amongst the Member States, and proposed that the outline would be prepared after the Session in consultation with one or more Delegates and would be circulated in due time to Member States.

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The Working Committee strongly supported the establishment of the IOC Research Fellowships Scheme and it was agreed that the matter would be referred to the ad hoc TEMA ad hoc Group on Co-ordination and Implementation for early preparation of concrete proposals on this subject.

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Commenting on the various suggestions, the Chairman explained that it was clear from the document on the Comprehensive Plan that the IOC would use the regional subsidiary bodies to assist in the formulation of regional/sub-regional technical assistance projects, since these regional structures provide the necessary basis for them to operate and to be involved in the implementation. With regard to identification of specific needs, the initiative must come from the countries themselves,

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and they should reflect local priorities for marine sciences. In this respect, he recalled that Marine Science Country Profiles would be an important tool to assist countries to determine priorities.

44 The Secretary of IOC, in replying to one question raised during the debate, mentioned that a sum of US dollars 1 to 1.5 million for the preparatory phase was estimated for implementation of various elements recommended under the Comprehensive Plan, especially the preparation of Marine Science Country Profiles, and formulation of technical assistance project proposals for submission to the UNDP and other sources of extrabudgetary assistance. He also informed that the IOC is closely co-operating with various units in Unesco in the implementation of the Comprehensive Plan.

45 The Working Committee noted with great satisfaction the progress achieved so far by the Secretariat in the implementation of the Comprehensive Plan. The Working Committee also recognized that since the Comprehensive Plan, being a long-term activity to be implemented in the next ten-fifteen years, there is a need to develop a plan of action for its implementation and, therefore, suggested that the Secretary IOC prepare, in consultation with the TEMA ad hoc Group for Co-ordination and Implementation, the requested Plan and submit it to the IOC Executive Council.

46 The Working Committee was also of the opinion that the initiative for the preparation of technical assistance projects should come from the Member States who would be responsible for implementation of such projects with the assistance of Unesco and IOC.

47 The Working Committee also recommended that IOC should provide, upon request of Governments, guidance for the preparation of proposal for the technical assistance projects through missions, including advice on establishment of scientific bases for the exploration and exploitation of marine resources as well as on the establishment of national co-ordinating mechanisms as recommended under the Comprehensive Plan and IOC Resolution XII.8,C.

48 The Working Committee adopted Recommendation IOC/TEMA-IV.3.

#### 4.2 MARINE SCIENCE COUNTRY PROFILES

49 Dr. G.L. Kesteven, IOC Consultant, introduced the document IOC/TEMA-IV/8 Annex 1 entitled "Scope and Objective of Marine Science Country Profiles 'MSCP'". He said that the Marine Science Country Profile was conceived as a means of helping people to take decisions - decisions in the first place as to the funds to be allocated to marine sciences, as to the programmes to be undertaken, and as to the infrastructure required in support of those programmes, especially with respect to training and education. These decisions are to be taken within a country, in aid agencies (bilateral and multilateral), and in international fora with respect to national, regional and global programmes. Specifically, the decisions are with respect to matters such as:

- What research-obtainable information is required by a country's economic and other policies?
- What proportion of the required information can be obtained from general knowledge and what proportion must be obtained by local research?
- What capability does the country possess, in personnel, ships, laboratories and equipment, to conduct local research?
- What assistance does the country need to enable it to carry out the research it judges necessary?

The kinds of information necessary for taking these decisions are:

- the nature and scope of marine activities for which research-obtainable information might be required;
- the institutional structure in which policy for marine sciences is formulated, funds are provided, and programmes are designed and executed;
- the distribution of research efforts between disciplines and upon different objects;
- the relation of the research efforts to national activities in marine areas in using oceanic resources and protecting the marine environment;
- the infrastructure upon which these sciences rest, especially for training and education.

The MSCP system has been designed to achieve the assembly of information of this kind, in summarized and standardized form. Much of this information is readily available in various publications and from various data bases. Such information is to be reduced to meaningful indications and summary statistics. The MSCP, therefore, will not be a directory, but will rely on directories and it will stimulate the preparation of directories of institutions, personnel, projects, research vessels. MSCP would reveal the status of marine sciences in a country. In this context the expression "status of marine sciences" should be interpreted in a technico-administrative sense as signifying:

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- the fields of marine sciences in which work is being done;
- the particular objects (e.g. species, water masses), phenomena and processes, upon which work is directed;
- the amount of work being done in each project of research, as this may be shown by the number of research workers engaged, the funds available and by similar indicators;
- the importance that Governments attach to the work, as may be shown by policy statements, by budgetary allocations, by support through infrastructural arrangements and by other such indicators;

- the attention paid to this work and the use made of its results by the administration, industry and the general public.

51 Alternatively, the scientific community understands the term to signify:

- the number and quality of scientific publications;
- the reputation of individual research workers of the country;
- the standing of the country's institutions.

However, this alternative will not be contained within an MSCP.

A profile would consist of four sections:

- I. Background - geographic, demographic, economic
- II. Marine Science Policy and Institutional Structure
- III. Marine Science Capability and Needs
- IV. Marine Science Activities

52 The first section will set out evidence with respect to the country's marine affairs - its use of marine resources and protection of the marine environment, and thus will indicate matters of which it is necessary to assemble obtainable research information and to examine the relevance of on-going research to problems encountered within these activities.

53 Dr. Kesteven then provided details on several particular aspects of the MSCP, notably their usefulness as a tool in strengthening marine sciences, resolving some problems in gathering information as to capability and to funds, and problems of developing a standardization of information.

54 A lively discussion followed this presentation. Many Delegates endorsed the principles and approved the methods and arrangements proposed for preparation of profiles. Some expressed doubts about the need for profiles, fearing that the proposed schedule of information was too complex.

55 A number of Delegates recognized that the MSCP could be used for both national and international purposes. It was proposed that internally, it could help make a country aware of the availability of marine resources (e.g. personnel, facilities, etc.) and of existing gaps in the national marine science capabilities so that suitable foreign aid might be solicited. Internationally, it would provide a global view of the situation in a given country and would, therefore, allow donor agencies to direct their assistance in a more efficient way. It was also commented that MSCP developed at the national level could form the basis for the preparation of sub-regional MSCPs.



Some Delegates stressed the need to keep the format flexible, while others recognized the quickly changing nature of the marine science information and thought that there would be a need to update the MSCPs regularly, e.g., every five years. 56

The proposal by some countries to send expert missions to assist in preparing MSCPs, when necessary, was considered rather to be a second or third step. It was stressed that, as a first step, countries should start such a profile by themselves. 57

Since IOC will need MSCPs for implementation of the Comprehensive Plan, some Delegates insisted that countries, both developed and industrialized, should be urged to prepare the draft for the profiles. 58

During the discussion, some Delegates made concrete offers on behalf of their countries to assist in the development of MSCPs. The U.S.A. expressed its willingness to support such efforts from the developing nations of the Caribbean region, while Australia would make the data at the AIMS Institute in Townsville available for MSCP of WESTPAC countries. 59

Suggestions were also made on the following points: 60

- full use should be made of indicators specified in the guide for preparing MSCP (doc. IOC/TEMA-IV/8, Annex 2)
- further study should be made of the problem of ascertaining the funds allocated at national level to marine sciences;
- a means should be found of showing the degree of execution of work and of achievement of results;
- the system should be dynamic and its continuity should be ensured;
- the interest of marine institutions should be given due attention;
- opportunities should be taken to make use of the Commission's regional subsidiary bodies in the compilation of regional profiles.

In connection with the last point, the Secretary of IOC drew the analogy between the proposed MSCP and the FAO Fisheries Country Profiles and assured the Committee that close co-operation between ICSPRO Agencies would avoid duplication of effort. He also outlined the different forms of assistance that could be provided by the IOC to countries wishing to develop a national MSCP and stressed that in all areas an MSCP would only be developed at the request of the component national authorities. 61

Following the discussion, Dr. Kesteven presented Document IOC/TEMA-IV/8 Annex 2 (Guidelines for the preparation of Marine Science Country Profiles) and explained how the preparation of profiles could be affected. He emphasized that the information to be given in Sections I was, in the main if not entirely, stored in data bases of the UN, FAO and other agencies and was readily accessible. 62

63 An ad hoc Sessional Group was set up with Dr. H.N. Siddiquie of India as convenor to study possible amendments in the Guidelines and to make suggestions on the management of the system.

64 On the basis of a proposal submitted by the ad hoc Sessional Group, the Working Committee approved the "Guidelines for the preparation of MSCP" reflected in Document IOC/TEMA-IV/8 Annex 2, with the following amendments there to:

a. To be deleted:

From Chapter 1: items 2, 4, 18 and 19, 14.2., 29;  
The IMO, WMO and UN codes in items 3;  
measurements in miles in items 5 and 6;  
"and year of declaration" in items 10 and 11.

b. To be designated "desirable":

In Chapter 1: items 8, 9, 13, 14.3, 14.4, 14.5, 16, 17, 20, 21.2, 22.1(b), 26;  
in Chapter 3: items 2 and 3 of the Capability questionnaire.

These items will be identified with an asterisk.

c. To be re-phrased

In Chapter 1: items 32 and 33.2, 34, 35 and 36 together;  
in Chapter 2: item 2.

65 The Working Committee recommended that, with regard to the management of the system, Member States of IOC and other such countries whose participation might be thought desirable, be invited by the Secretary of IOC to undertake the preparation of an MSCP, making use of the "guidelines" as a checklist to be followed insofar as the availability of information would permit. The letter of invitation should give a brief account of the origin, objectives and purposes of the Profiles, drawing on material in relevant papers presented at this Session of IEMA. In particular, it should emphasize that the primary purpose of the MSCP is to provide information which will be of value to each country in reaching decisions on its marine sciences, in assessing its needs in respect of those sciences and in developing bilateral and multilateral co-operative programmes. It should also provide IOC with information upon which to base its planning of regional and global programmes, and contribute the option to Member States to prepare their profile themselves or to seek the assistance of the IOC Secretariat in the task.

In this context the Working Committee instructed the Secretary :

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- i) to request Member States to make available automatic facilities for maintaining and periodic up-dating of the data;
- ii) to initiate a first pilot effort of MSCP in one or two IOC regional bodies such as IOCARIBE (which will hold its next session in the near future) and WESTPAC.

The Working Committee adopted Recommendation IOC/TEMA-IV.4.

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#### 4.3 FINANCING AND OTHER SOURCES OF INTERNATIONAL ASSISTANCE

The Secretary of IOC introduced this item ('Action Paper' - Document IOC/TEMA-IV/8). He referred to the important changes that have taken place in TEMA from a traditional approach of providing small-scale technical assistance in the past twenty years to the recent decision taken by the IOC Assembly to provide large-scale assistance programmes under the Comprehensive Plan in response to the emerging needs of developing Member States. The new dimension added to TEMA calls for the mobilization of all possible international sources of assistance. As a result of increasing demands for international assistance, access to the funds in recent years have become increasingly competitive. Until recently it was not easy for decision-making bodies in governments to accord priority to projects in marine sciences, perhaps because of insufficient information available to them on the role of marine science, as an essential element in socio-economic development activities in ocean space. Consequently, the level of funding in the past was mainly focussed on the field of fisheries in which UNDP played a major role as well as the World Bank and other international aid-giving Agencies. But lately there has been a change in the attitude. The governments have been giving more attention to marine science and its application. Recent trends triggered by the new ocean regime have brought about change in the attitude of donor countries to augment support for marine scientific projects.

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He then referred to a number of projects that the Unesco Division of Marine Sciences has been executing for many years. He said recent IOC efforts have yielded successful results in the case of a UNDP project on Strengthening of National Aquatic Resources Agency of Sri Lanka which is developed jointly with other agencies (FAO, UN) in the spirit of the ICSPRO agreement and the implementation of which is expected to start soon. He referred to other projects such as the "Training and Education Relating to the Monitoring of 'El Nino'" involving four countries (Chile, Peru, Ecuador and Colombia) which is under consideration for preparatory assistance by UNDP and on which further negotiations with the Italian authorities are underway as a possible alternative sources of funding.

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With particular reference to the Comprehensive Plan, he said that a time frame of fifteen years has been envisaged in which ten to fifteen regional/sub-regional assistance technical projects would be developed and implemented. In this context, a preparatory phase of three to five years has been considered for initiating steps to implement the Plan

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into its full operational phase which would require an initial assistance of 1 to 1.5 million US\$ to cover preparation of MSCP, experts mission and consultation with governments at regional level to prepare proposals for technical assistance projects. He anticipated that a sum of seventy-five to a hundred million US\$ would be required to fully implement the Comprehensive Plan. He said the majority of the projects would be developed in regional/sub-regional areas by IOC in close co-operation with the Unesco Division of Marine Sciences.

71 He reminded the Working Committee of the steps taken by the Director-General of Unesco by providing strong support for the Comprehensive Plan and his intentions to appeal, if necessary, for extrabudgetary fund and other resources for its preparatory stage.

72 He requested the Working Committee to provide guidance on steps to be taken to mobilize international funding and other forms of support required for effective implementation of the Comprehensive Plan, particularly its Preparatory Phase.

73 The Observer of the International Centre for Ocean Development (ICOD) of Canada, Dr. Walton, informed that this new non-governmental organization would support projects and activities focused primarily on to the use of the oceans as a source of food. It would thus seek to help developing countries obtain optimal return from their expanded marine resources arising from jurisdictional gains made at the Third Law of the Sea Conference. The ICOD anticipates developing and sponsoring training programmes, technical assistance, advisory services, the gathering and dissemination of information and a limited amount of necessary research. Projects will be selected which will complement the work of other national and international organizations, thus avoiding duplication and competition. A total sum of \$20 million (Canadian) will be available to the International Centre for Ocean Development for the pursuit of these endeavours over the next five years. He said further information is available from the offices of the Centre in Halifax, Nova Scotia and Ottawa, Ontario, Canada.

74 The Chairman expressed his thanks to the Observer of ICOD for his statement and, in view of the common interest of IOC and ICOD on TEMA-related activities, expressed his hope for a fruitful co-operation between the two organizations in the future.

75 The discussion then concentrated mainly on possible sources of funding for TEMA. Commenting on the Comprehensive Plan, the Representative of Unesco referred to a number of extrabudgetary projects being executed by his organization. He said that bilateral assistance is another important source of development aid. Delegates should discuss their bilateral assistance projects in relation to the international development programme.

76 Some Delegates pointed out that aid-giving agencies have a tendency in some cases to concentrate assistance in a few countries. IOC should bring the needs of other neglected countries to the attention of other potential donor countries. Other Delegates suggested that as a number of bilateral assistance grants are influenced by political considerations IOC could assist in that respect by attracting bilateral agencies to contribute to concentrate major efforts on problem areas

such as the 'El Nino' and by performing a catalytic role in generating major assistance for bilateral aid-giving agencies. It was also suggested that IOC should gather information about developing countries specific requirements and bring to the attention of aid-giving agencies for consideration. Some Delegates proposed that donor countries should channel their activities, not necessarily funding, in consultation with IOC.

The Delegate of Norway suggested that IOC should explore multi-bilateral sources of assistance. Explaining the multi-bilateral concept, an example of NORAD was given. The bilateral assistance provided to a country by the agency could at the same time be combined with a multilateral assistance negotiated by an UN agency through the Foreign Ministry of Norway. In this context, he quoted the example of a training course organized by NORAD in co-operation with Unesco and IOC on oil drilling.

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The Delegate of Australia announced that his country strongly supported TEMA, particularly in the context of WESTPAC. His Government would also be willing to consider multi-bilateral projects for assistance. He also reported that his Government is organizing regional training courses on red tide and would like to provide training to scientists from developing countries.

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The Delegate of Sweden said that his country would be planning to consider backing some projects in marine science.

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Commenting on various suggestions, the Secretary explained that in some cases donors have been giving assistance without adequate attention to all technical aspects involved and conditions required for the success of the projects. Giving the example of research vessel, he explained that donations have sometimes been given without due consideration of the ability of a recipient country to manage and maintain such a costly facility. He said that IOC and Unesco have an overview of the marine scientific problems of a number of countries as a result of information accumulated over the years and thus would be in a favourable position to provide necessary basic information to donor countries on request. With regard to the financing of Comprehensive Plan, he said, the Chairman of IOC has been in close contact with the Director-General of Unesco who was planning to hold a meeting of aid-giving agencies some time before the end of next year. He said the Secretariat would soon be involved in negotiations with donor agencies in various countries.

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The Working Committee noted with appreciation the interest shown by the Director-General of Unesco in exploring extrabudgetary funding and his willingness to approach aid-giving agencies to provide support for the Comprehensive Plan and requests the Secretary of IOC to convey to the Director-General of Unesco its gratitude for the support provided by him in promotion, development and future implementation of the Unesco/IOC Comprehensive Plan.

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The Working Committee taking cognizance of the fact, that a number of developing countries now attach importance to marine science and its technology for development of oceanic areas under national jurisdiction, recognized that IOC could play a useful role in promoting the idea of combining bilateral aid with multilateral assistance available from UNDP and other international sources. In this context the Working Committee recommended that IOC should take the following steps:

i) to identify the potential needs of countries in the context of regional programmes, particularly problem areas which has bearing upon economic development of ocean space such as 'El Nino';

ii) to bring this to the attention of possible donor agencies and;

iii) to provide guidance or suggestions to possible donor countries, upon request, on the scientific and technical information required of those countries for which the donors are interested in giving assistance.

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The Working Committee came to the conclusion that although multilateral assistance through UNDP will be one of the most important sources of assistance for implementing the Comprehensive Plan, various other sources (e.g., bilateral, multi-bilateral) could be explored by the IOC. It further recommended that IOC and Unesco should continue their efforts, upon requests and co-operation of governments, to negotiate with donor agencies on the course of action that is appropriate for funding technical assistance projects.

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The Working Committee urged the donor agencies to give due importance to the technical assistance project to be developed by the IOC under the Comprehensive Plan as well as to use the technical guidance that is available through Unesco and IOC while formulating assistance projects for developing countries in the field of marine science and technology.

##### 5. TEMA COMPONENTS OF GLOBAL AND REGIONAL PROGRAMMES OF THE COMMISSION

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The Technical Secretary introduced the Documents IOC/TEMA-IV/8; IOC/TEMA-IV/10 and IOC/TEMA-IV/10 Corr. He recalled Recommendation TEMA-II.2 which laid emphasis on the IOC subsidiary bodies to develop strong TEMA components of their programmes from their very inception. He drew the attention of the Committee to important trends in the development of TEMA components relating specifically to the on-going programmes of the Commission and the way some of the major programmes, such as GIPME and IODE, have received increasing attention of Member States. This was particularly visible in the active participation of both developed and developing countries in these programmes. He pointed out that the TEMA components of ocean science programmes were

particularly well-defined. As an example, he explained how intercalibration exercises in GEMSI reflected an efficient and objective way of identifying the TEMA components, and the trend in the programme of Ocean Science in Relation to Living Resources which provides an adequate basis for development of TEMA components. With regard to Ocean Services, encouraging results have been obtained in IODC but more efforts are needed to focus the programmes at the regional level so as to develop the related TEMA components in those programmes.

He then drew the attention of the Working Committee to the observations made by the Secretariat on the various Recommendations adopted by the major technical and regional subsidiary bodies of the Commission during the interessional period (Doc. IOC/TEMA-IV/10) and to suggestions reflected therein to improve them in the future. He also requested the Committee to consider other matters such as the future status of the TEMA Co-ordinators as requested by the Twelfth Session of the IOC Assembly, and the Document "IGOSS Training and Education" (IOC/INF-576) prepared by the Working Committee for IGOSS. 86

A number of specific requests and offers of training opportunities were made by several Delegates. The Delegate of Mauritania, while expressing thanks to the donor countries for providing training assistance, requested that, as his country as well as others in Africa have been collecting data on biology of marine species and other hydrographic parameters, IOC should explore with donor countries the possibilities of assistance to those countries. 87

The Delegate of India while expressing his thanks to IOC and donor countries for assistance in the past, stated his Government's willingness to offer training assistance through its newly established Department of Ocean Development to other countries in the region of the Indian Ocean. 88

The Delegate of Bulgaria, referring to a course being organized by his country in the Black Sea in the field of ocean dynamics, welcomed the participation of scientists from developing countries and requested IOC to provide assistance. 89

The Delegate of Japan informed the Working Committee that his country in the framework of IOC has been providing training assistance on board research ships and in oceanographic data handling at the Responsible National Oceanographic Data Centre (RNODE) in Tokyo, to the countries of WESTPAC for the past three years and would continue to provide support in the future. 90

The Working Committee then concentrated the debate on the major issues relating to present trends in the development and implementation of TEMA, the role of regional and major technical subsidiary bodies, the future strategy and support for the development of TEMA components and the future status of TEMA co-ordinators. 91

Many Delegates expressed their appreciation for the preparation of a well structured document (Doc. IOC/TEMA-IV/10) which for the first time described the trends and the recommendations adopted by the IOC subsidiary bodies on TEMA components of the on-going programmes of the 92

Commission and which clearly indicated that, in comparison with the past, considerable improvement has now been made. Commenting on the recommendations adopted by the IOC subsidiary bodies during the intersessional period, it was, however, pointed out that while some recommendations are more specific, the others are rather generic.

- 93        There was a strong feeling that TEMA components should not be an abstract entity within IOC, but should deal with itself on specific elements of the on-going programmes of the Commission. All requirements for assistance, identified at the sessions of major technical and regional subsidiary bodies should be specific. In this respect, it was suggested that regional programmes should be defined as a first step and then TEMA components relative to various elements of the programmes be identified and developed as a 'package', including training requirements, promotion of establishment or development of appropriate facilities, necessary spares for equipment, follow-up support and incentives to scientists to participate in national and international activities. Stimulus for this should come from the Member States concerned and the respective regional bodies. Such a 'package' should also be properly formulated, costed and marketed for support of external aid, since there is considerable competition for the available funds. It was also suggested that with better definition of specific TEMA components of regional programmes, IOC, as a broker, should be in a better position to negotiate with donor countries for necessary support for implementation of such activities, giving due consideration to the fact that a number of donor countries have programmes of assistance restricted to a few selected developing countries.
- 94        Some Delegates, however, stressed that for those countries which, on matter of assistance, tended to remain neglected, the IOC should bring their cases to the attention of donor countries for possible consideration of their needs in marine science and its technology.
- 95        On strengthening TEMA activities in the context of regional co-operative programmes, various suggestions were made. The Delegate of Mexico stated that IOC can facilitate participation of various countries in joint activities. He informed that his country is carrying out joint research activities the Yucatan Channel with the involvement of neighbouring countries such as Colombia, Cuba, Costa Rica, Panama, Mexico, Trinidad & Tobago and the U.S.A., in which the cost of IOC is very small, and which is essentially a programme of mutual assistance, demonstrating that the relation has not always been that of donor-recipient aid.
- 96        The Delegate of Denmark informed that the current programme of assistance offered by DANIDA in the form of training fellowships to scientists from Thailand, under bilateral agreement, has enabled the scientists of that country to participate in a regional project on mangroves, being executed by the Unesco Division of Marine Sciences. He said his Government is considering a rather large aid structure in the tropics with the intention of establishing a marine science training centre to support marine science at a technical level. He proposed that IOC should join the Danish efforts as a "clearing house".



While commending the efforts of the Working Committee for IODE in TEMA, one Delegate suggested that regional TEMA requirements should be linked closely with a regional implementation scheme and, therefore, the Working Committee should work closely with the other subsidiary bodies of the Commission.

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Another Delegate proposed that a sectorial approach covering a wide range of activities in the field of ocean climate, oceanography and many other fields, might allow harmonization of training activities and suggested that the TEMA budget should be allotted on a sectorial basis.

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The Secretary of IOC explained that the TEMA activities relating to various sectors such as climate, fisheries and basic sciences, in the past were handled through the meeting of TEMA Officers of the UN Organizations, Members of ICSPRO. The TEMA activities are presented by programmes as well as at the regional levels with a view to facilitating the participation of scientists from developing countries in those programmes. The Secretary gave examples of the training courses organized in support of CARIPOL, held in Costa Rica in 1980 and the regional training courses in support of OSLR being held in Mombasa (Kenya) in co-operation with the Federal Republic of Germany.

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One Delegate suggested that all TEMA component should be part of the Comprehensive Plan. The key issue involved is the participation of developing countries in the programme of the Commission and, as such, the principle needs of individual countries could not be divorced from the Comprehensive Plan. Another suggestion was that the regular programme funds under TEMA should be devoted to implementing TEMA components of the IOC programme.

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On the role of Subsidiary bodies of the IOC in TEMA there was a general feeling amongst the Delegates that these bodies should play a more decisive role in identifying and developing TEMA components of their programmes. The key actors in the subsidiary bodies are the Member States themselves. In this context it was suggested that it would be desirable if the IOC Assistant Secretaries in charge of regional subsidiary bodies could, for instance, be responsible for TEMA activities and the scientists participating in the regional activities be involved in the identification of TEMA needs.

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The Working Committee having considered various suggestions made by the Delegates came to the conclusion that serious consideration should be given by IOC subsidiary bodies to defining training requirements in more specific terms. The Working Committee, therefore, recommended that whereas the role of major technical bodies (e.g. GIPME, IGOSS, IODE) should be to provide general guidance on methodology, technique, intercalibration exercise and publication, whenever necessary, of pedagogic material relative to their respective programmes, the role of regional subsidiary bodies, because they are responsible for developing, recommending priority co-operative marine science programmes, should be to identify in more specific terms the TEMA components. It also recommended that such TEMA components, as far as possible, should be in the form of a 'package' quantifying the specific needs and follow-up of facilities in order that this be acceptable to possible donor countries.

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103 With regards to the suggestions made in Document IOC/TEMA-IV/10 on strengthening marine scientific research at regional levels, the Delegates expressed positive reactions. The Delegate of Thailand, while strongly supporting the idea of having a scientific seminar/workshop before each session of regional subsidiary body, also suggested that IOC should explore the possibility of assistance to scientists from the WESTPAC countries to enable them to present scientific papers relating to the IOC regional programmes at the Pacific Science Congress, which is held every four years.

104 The Working Committee expressed its satisfaction on the usefulness of the various approaches proposed in the above-mentioned document to strengthen marine research capabilities of developing countries as well as support active development and further expansion of the co-operative programmes of the Commission at regional levels.

105 The Working Committee noted that, in a number of developing countries, there is a lack of scientific fora where results of scientific research could be discussed periodically and recognizing the importance of such fora to the future development and expansion of IOC programmes, particularly in the regional context. The Working Committee, therefore, recommended that all regional subsidiary bodies of the Commission give due attention to holding symposia and/or scientific workshops immediately prior to their sessions, to allow scientists to present the results obtained during the intersessional period, relating to the selected programmes of the Commission, and that the support of Unesco Division of Marine Sciences and organizations concerned be sought.

106 The Working Committee also recognized the need for publication of the results of the scientific research relative to the programmes of the Commission, and their dissemination to all interested countries involved in the programmes, which could considerably encourage the institutions in developing Member States to contribute to marine scientific research activities at the regional level. It therefore recommended that IOC, in consultation with the regional bodies concerned, should assist in the periodic publication of those results, if possible, with the assistance of a donor country or organizations concerned. Such seminars/workshops would also offer an opportunity to evaluate the progress achieved in respect of the programmes on a continuing basis and should assist in their further development and expansion at the regional levels.

107 The question of assessment of training needs through a system of TEMA co-ordinators as requested by the IOC Assembly, at its Twelfth Session, was discussed in detail. The Chairman invited the Vice-Chairman of the Working Committee for IOOE Dr. E. Ridley to present his views.

Dr. Ridley informed the Committee of the decision taken by this subsidiary body to abolish the office of TEMA Co-ordinator. He said the Working Committee for IODE, instead, established an ad hoc Task Team to including members from developing countries would serve as a contact point for identifying training needs, provide a focal point for expertise in training programmes and help other IOC Working Groups and Consultants to be aware of training needs and problems. 108

While a number of Delegates expressed their agreement on the proposal, the others suggested that IOC Training Contacts should be the most appropriate one to be associated in identifying TEMA needs at the national level. On this aspect the Technical Secretary reminded the Working Committee of the previous decision taken by the IOC Assembly, according to which the National Training Contact should be part of the National Oceanographic Commission or equivalent bodies responsible for co-ordination of marine research activities at the national level or to facilitate their tasks. 109

The Australian Delegation, while supporting the idea of the abolition of TEMA co-ordinators, stated that at the regional level WESTPAC Member States are being encouraged to participate in programmes and suggested that IOC should continue to impress upon Member States the value in participation. He also suggested that developed countries should be encouraged to earmark a percentage of funds allocated for marine research programmes specifically to enable developing countries participation. His Government is actively supporting regional developing country participation in Workshop and Seminars and will continue to do so. 110

The Chairman appointed an ad hoc Sessional Group to study the future status of TEMA Co-ordinator and to make appropriate recommendations. 111

The Working Committee concluded that the present system of TEMA Co-ordinators for subsidiary bodies is cumbersome and should be abolished. 112

The Working Committee noted the decision taken by the Working Committee for IODE to abolish TEMA Co-ordinator and, instead, to appoint ad hoc Task Team for carrying out TEMA activities approved by that Working Committee which was later endorsed by the Executive Council at its Seventeenth Session held in February 1984. It further noted that the IODE Task Team for TEMA would provide a focus for assessing, in co-operation with the Secretary and the regional subsidiary bodies, the TEMA needs of developing nations which, if satisfied, would allow full participation in the activities of the Working Committee for IODE. 113

However, while expressing satisfaction over the decision taken by the Working Committee for IODE, it was the consensus of the Working Committee for TEMA that it was not clear that the same approach would be applicable to all other subsidiary bodies of the IOC. 114

- 115      The Working Committee for TEMA, therefore, requested that the Working Committee for IODE maintain complete documentation on the success, or lack of success, in implementation of the programme and report to the Working Committee for TEMA at its Fifth Session. The experience of the Working Committee for IODE in this way might be useful if modifications are required to improve co-ordination for assessment of TEMA needs and their implementation to satisfy Member States' needs.
- 116      In the meantime, the Working Committee for TEMA strongly urged the Member States to establish appropriate bodies such as National Oceanographic Commission or equivalent body so TEMA needs or training opportunities which exist in that country and provide this information in time to the IOC Secretary to be useful in the general meeting of the respective subsidiary body.
- 117      The Vice-Chairman of the Programme Group for WESTPAC, Dr. P. Menasveta, on his behalf and on behalf of the Chairman of the Programme Group, Dr. John Bunt, presented a statement. The statement laid emphasis on TEMA as crucial in promoting co-operation among the Member States in the development of marine science capabilities, particularly in the context of priority programmes of its subsidiary bodies, and called on IOC and the Working Committee for TEMA to take full account of the needs relating to the on-going and developing commitments of WESTPAC.
- 118      Referring to the adoption of the Comprehensive Plan by WESTPAC and its implementation by the preparation of Marine Science Country Profile of Australia, the compilation of MSCP for a small number of countries in the region covered by this subsidiary body was considered an important initiative in which advantage can be taken of the experience gained by Australia and of the Australian Agencies' willingness to assist in this undertaking. The 1986-87 budget should focus attention in identifying priorities such as MSCP's and for adequate funding from Unesco to do so.
- 119      In this context he drew attention of the Working Committee TEMA to the fact that Australian Institute of Marine Science in Townsville is taking steps to establish a computer based Marine Science Information Service to serve as a guide to data bases to facilitate access to sources of information in this field which could be extended to a regional scale and expressed his trust that IOC may feel attracted to help support it with this possibility. Commenting on progress of WESTPAC-III Objectives being encouraging, he noted that an initiative has been taken by the Chairman of WESTPAC to publish a Newsletter with a view to disseminating information on WESTPAC scientific programmes and other relevant activities, and he recalled that a NODC Newsletter for WESTPAC continues to be published by the Japanese Oceanographic Data Centre. The latter is aimed at disseminating news on data and information obtained by the WESTPAC activities.

The Working Committee noted the statement of the Chairman of WESTPAC, Dr. John Bunt, and the measures taken by the Programme Group for WESTPAC to strengthen TEMA activities in the region. The Working Committee also expressed its appreciation to the Australian Institute of Marine Sciences for offering to provide marine science information to the countries of the region. 120

#### 6. OPTIMIZATION OF THE USE OF RESEARCH VESSELS

The Working Committee was informed of the background information provided in the Document IOC/TEMA-IV/8, page 18, on the Workshop on "Improved Uses of Research Vessels" held by the IOC jointly with FAO with the support of NORAD in Lisbon, 28 May - 2 June 1984. 121

The IOC Programme Group for the Co-operative Investigation in the North and Central Western Indian Ocean (CINCWIO), at its First Session, (Nairobi, Kenya, 4-9 October 1982) recognized that most of the available research vessels in the region are not fully operational, for various reasons, such as the lack of sufficient funds for foreign exchange and senior ship personnel for the proper operation of these vessels. Lack of adequate maintenance facilities was likewise deplored. It was recognized that it would be more economical if only one or two of these vessels were used regionally on a co-operative basis, and called upon CINCWIO Member States to identify one or two of these vessels which could suitably be refitted and equipped for the co-operative execution of the adopted projects (Decision CINCWIO-I.9). 122

The IOC Workshop on Regional Co-operation in Marine Science in the Central Eastern Atlantic (Tenerife, Spain, 12-17 December 1983) evoked two main kinds of problems: the high cost of acquiring a specialized oceanographic vessel, and the great cost and difficulty of maintaining and operating such a vessel. The Workshop, among other things, recommended that priority be given to national concertation and co-ordination as a pre-requisite for the operation of a small number of vessels on a regional and sub-regional basis, and noted that a precedent in the use of a small number of ships conducting specialized surveys had already been set by CECAF, the Fishery Committee for the Eastern Central Atlantic. 123

The Chairman invited Dr. H. N. Siddiquie, the Vice-Chairman of the Workshop on "Improved Uses of Research Vessels" to introduce the Summary Report (to be issued later as IOC Workshop Report No. 36). 124

Dr. Siddiquie informed the Working Committee that the Workshop was attended by forty-three participants from twenty-three developing and developed countries who were invited to it solely in their personal capacity as experts responsible for operation and management of research vessels in their respective countries. He recalled that the Workshop was held with the express aim of identifying common problems in the use of research vessels, and to determine ways and means of promoting effective use of these vessels to meet national, sub-regional and 125

regional needs. He then gave a brief overview of the highlights of the discussion which took place, the major conclusions arrived at and the recommendations adopted by the Workshop.

126 For the benefit of the participants of the Workshop four background papers were submitted by the IOC and the FAO Secretariats. The papers on "Basic Requirements (i.e. size, type) for Research Vessels and Shipboard Equipment for Marine Scientific Research" and "Analysis of the Replies Received on the IOC Questionnaire on Improved Use of Research Vessels" were prepared by IOC with the help of consultants. Those on "Interim Results from FAO/IOC Questionnaire on Research Vessels and Requirements" and "UNDP/FAO Fisheries Research Pool" were prepared by FAO. The participants of the Workshop felt that the information contained in these documents was useful. It was agreed that factors presently hampering the effective utilization of research vessels included lack of advanced cruise planning and insufficient institutional arrangements for the financing and adequate utilization of both ship and equipment. As part of management of research vessels several aspects such as manpower requirements, proper definition of duties, and availability of spare parts, were considered essential elements thereof.

127 Several participants to the Workshop provided background papers in which they reviewed planning and decision-making problems related to research vessels acquisition. The Workshop considered the different questions that need to be considered when acquiring a new vessel, and concluded that this decision should be based on a long-term national plan for ocean research. The Workshop furthermore requested countries to undertake significant efforts to assure optimal functioning of their research vessel by ensuring adequate manpower and necessary funding.

128 In addition to the above-mentioned information the participants to the Workshop also described how cruise plans are developed and organized in the respective countries. Having reviewed these examples of cruise planning, the Workshop concluded that the essential elements in cruise planning are: a) timely and phased planning of the annual activities of research vessels is essential to allow for the provision of adequate funding and other support; b) the balance between the needs of the scientific user community and the ships facilities; and c) institutional arrangements on a national basis to ensure the effective utilization of research vessels.

129 The Workshop reviewed the constraints of many developing countries in the effective use of research vessels due to lack of proper equipment or maintenance difficulties of oceanographic equipment and a number of possible ways to overcome the difficulties were identified. In the case of vessels or equipment given as a donation by one country to another it was suggested that careful consideration should be given by donors to electronic and other important navigational power equipment and to consider, jointly with the recipient, how the questions relating to routine maintenance and breakdown can be met. The Workshop also suggested that the recipient country should also make every effort to resolve some of these problems by mobilizing national technical capabilities from organizations not forming part of their own research programme. It was also proposed that pooling of equipment could be introduced on a national basis. In certain cases possibility of pooling such equipment on a regional basis should also be explored. High

priority should be given by owners of research vessels to the use and maintenance of equipment, especially sophisticated scientific equipment.

Participants from both developing and developed countries at the Workshop identified a basic need to monitor and evaluate efficiency of research vessel. Some of the participants illustrated their system, and the model submitted by China was agreed to be worthy of further consideration. While it was generally agreed that it would be difficult to set universal standards to measure the efficiency of research ships, it was recommended that as far as possible standard forms of record/log keeping should be employed, as well as a standard format for cruise reports. 130

The Vice-Chairman of the Workshop went on to explain the difficulties noted by the Workshop in overcoming problems such as increasing the effective sea time of research vessels particularly in countries where fleet management and maintenance and repair of vessels pose basic problems due to lack of adequate support facilities. The Workshop noted from the various information papers presented and from the discussions that some developing countries are in need of setting up ship management systems for ship operations and maintenance. For this, training of ship personnel would be required as well as, in some cases, allocations of additional funding for operation of research vessels. 131

The Workshop, he said, also recognized that improvement of sea going conditions for both personnel and equipment could contribute significantly to the willingness of both crew and the scientists to go to the sea. In this regard, special attention was given to the problems of remuneration for both crew and scientists, including sea-going allowance; the insurance of minimal comfort on-board in living and working areas through the application of appropriate design considerations; and the quality and presentation of food, especially on research cruises of extended duration. 132

The Vice-Chairman of the Workshop informed the Working Committee that the item on international co-operation was introduced during the Workshop by the Secretary of the IOC who referred to the highly successful large-scale co-operative marine science programme of the IOC such as IIOE, CICAR, CSK etc. He also mentioned the programme for shipboard training organized by the IOC has been increasing over the years. He said that for a number of practical reasons and, as the New Ocean Regime takes effect, it is to be expected that co-operation in the study of many ocean phenomena will increase with time. Several participants provided examples of on-going bilateral programmes. The Workshop recognized that notwithstanding the diversity of international co-operation under bilateral and multilateral managements, such co-operation, especially in the optimization of the use of research vessels, will constitute an important element in the development of oceanography in a national, regional and global context. 133

The Vice-Chairman of the Workshop concluded his presentation with the introduction of the five Recommendations resulting from the Workshop. These dealt with: i) the formulation of a guide on operation and management of research vessels; ii) the organization of regional and sub-regional training courses on research fleet management and cruise planning; iii) the improvement of cruise planning and ship time 134

co-ordination; the establishment of an international pool of equipment and personnel; and iv) the possibilities for international co-operation for the improved use of research vessels.

135 A number of Delegates commented upon the usefulness of the study accomplished by the Workshop. In the general discussion, it was pointed out that in certain cases the budget needed to operate a vessel to its full capacity was significantly higher than the total budget of the home institute.

136 Some Delegates reiterating that there is a tendency to acquire bigger vessels, suggested that the size of a research vessel should be appropriate for the objective means of a country which is not reflected in the report.

137 One Delegate suggested that bigger vessels can be more efficient, but this depends on a number of factors such as the purpose of the vessel, the size of the users community, the coverage in terms of area to be investigated and the duration of the cruises. While others thought that more information would be required on relationship between increase in efficiency and the size of research vessels.

138 With regard to the number of sea days tallied annually by a research vessel, one Delegate pointed out that factors not related to ship management may also constitute a significant problem in the optional use of a vessel. As an example, it was mentioned that about twice the time spent at sea was needed on land to treat all data accumulated during a research cruise. Serious delays with resulting loss in valuable ship-time may therefore result from those cases where the shore-based capacity is insufficient to keep up with the timely treatment of data generated by oceanographic cruises. It was therefore suggested that it would be useful if the models of optimization of operational costs, include size of vessels for certain purposes and information on manpower required on land.

139 In connection with the establishment of EEZ by a considerable number of States, one Delegate referred to the increasing difficulties encountered by research vessels of one country in having access to the waters under the jurisdiction of other nations. In this connection, he cited the example of a six month lead time among the ICES countries. He suggested that IOC should assist in improvement of the present arrangements.

140 A question was raised as to how the IOC could assist with implementation of Recommendation 3 of the Workshop on "Mechanisms for Cruise Planning and Co-ordination of Ship-time". The Secretary of IOC replied that the implementation of the Recommendation depends on each individual country and its infrastructure. He, however, pointed out that the Recommendation in some respects relates to other IOC Resolutions which calls for Member States to establish a National Oceanographic Commission so as to provide effective co-ordination of marine research activities at a national level, including such matters as the use of research vessels, and increased participation of scientists in IOC programmes.



The Working Committee welcomed the preparation of a catalogue of research vessels jointly by FAO and IOC. 141

Some Delegates emphasized that regional co-operation in the use of research vessels is an important aspect of economic utilization of this expensive facility and that IOC could offer an appropriate ground for promoting such a co-operation. 142

The Working Committee, having recognized the growing interest of many countries to undertake scientific studies with a view to having a better understanding of and to exploring and making rational use of the resources of the ocean, considered that the IOC/FAO Workshop on "Improved Uses of Research Vessels", in co-operation with the Norwegian Agency for International Development (NORAD), was timely and acknowledged with appreciation its outcome. 143

The Working Committee expressed its deep appreciation to NORAD for its valuable support to the Workshop, and invite it to give favourable consideration to the proposals and in the follow-up of the appropriate approved Recommendations. 144

Having studied in depth the problems facing a number of Member States, especially developing countries, in the effective utilization of research vessel which is an expensive tool for carrying out marine scientific investigations, the Working Committee stressed the need by the Member States to take appropriate steps to ensure rational and optimal use of this facility at the national and regional levels. It further stressed the importance of international co-operation in this field so as to facilitate sharing experience among the countries and of the institutions involved in the use of research vessels. In this context the Working Committee was of the opinion that the mutual assistance among countries in the acquisition, chartering, operation and maintenance of research vessels and sea-going equipment, could considerably resolve some of these problems confronting the developing countries. 145

The Working Committee also felt that the Recommendations of the Workshop should be harmonized with the general TEMA Recommendations which deal with the establishment or strengthening of the existing National Oceanographic Commission, as called for in the Resolution XII-8 of the IOC Assembly to ensure, inter alia, the effective co-ordination and economic utilization of research vessels, its proper maintenance and required funding and to encourage participation of interested institutions in the planning and organization of research cruises. 146

Recognizing that a number of developing countries are in dire need of appropriate guidance in the effective use of research vessels, the Working Committee strongly recommended that IOC in close collaboration with FAO and with the assistance of extra-budgetary funding sources take the following actions: 147

i) to prepare with the assistance of consultants a guide on the operation and management of research vessels, preferably on the basis of selected case studies;

ii) to organize regional training courses on operation and management of research vessels, and,

iii) to organize training courses on planning of research cruises to be assisted or co-sponsored by donor agencies.

148        On the aspect of pooling of research vessels and rotation of capital equipment, spare parts and personnel, including engineers and technicians reflected in the Recommendations of the Workshop, the Working Committee recommended that FAO jointly with IOC undertake a study on the possibilities of international assistance and on the expansion of the scheme presently being executed by FAO through extrabudgetary sources of funding.

149        The Working Committee adopted Recommendation IOC/TEMA-IV.2

7. TRANSFER OF KNOWLEDGE AND TECHNOLOGY IN THE CONTEXT OF THE NEW OCEAN REGIME

150        The Secretary of IOC introduced this Item. He drew the attention of the Working Committee to the steps taken by the Commission in the past to study the implications of the Third UN Conference on the Law of the Sea (UNCLOS) on the work of the Commission. Referring to the new ocean regime defined by the Convention, he said, considerable emphasis is laid on the marine scientific research as an essential activity for understanding and providing scientific basis for development and management of marine resources and protection of the marine environment. He then recalled the action taken by the Commission to establish an ad hoc Task Team to "Study the Draft Convention on the Law of the Sea and Any Future Text by UNCLOS, and the Implications to the Commission" (LOSI). Two Sessions of this ad hoc Task Team were held, one in Tenerife (Spain), 18-20 June 1981, and the second in United Nations (New York), 26-30 July 1982. The ad hoc Task Team, among other things, identified provisions and fields covered by various articles in which IOC is already active or would need to further its efforts as well as those in which IOC is not active, but would need to play its role. In this context, particular reference was made to: development of favourable conditions for the conduct of marine scientific research; promotion and co-ordination of marine scientific research; scientific bases of exploitation of marine living and non-living resources; dissemination of marine information and oceanographic data on ocean mapping; enhancement of marine scientific capabilities of developing countries; and scientific and technical advisor services to other

organizations and Member States. Among other areas, he stressed the need for improving international co-operation with a view to fostering effective transfer of marine science and technology.

He informed the Working Committee that the Workshop on International Co-operation in the Development of Marine Science and the Transfer of Technology in the Context of the New Ocean Regime (Paris, 27 September - 1 October 1982) was organized by IOC jointly with the Unesco Division of Marine Sciences at the initiative of the United Nations University. It was attended by eight invited distinguished scientists and experts and twelve participants from different parts of the world. The Workshop provided an informal forum for a free and concentrated debate with the express aim and objective to identify and elaborate the ways to improve co-operation at international levels and particularly on how to foster effective transfer of marine science and technology in the context of the New Ocean Regime. He said, the results of the Workshop were published as "UNU/IOC/UNESCO Workshop on International Co-operation in the Development of Marine Science and the Transfer of Technology in the Context of the New Ocean Regime" (Document IOC Workshop Report No. 32), which is distributed to all Delegates. He also added that the papers presented at the Workshop are now being published as a Supplement to the Workshop Report. 151

Summarizing the highlights of the Report of the Workshop, he made particular reference to the following: the implications of the New Ocean Regime for co-operation in marine science and technology, triggered by a number of inter-related developments in the ocean; the analysis of the problem confronting the countries, especially the need for the development of a scientific and technological sector and improving conditions for the scientific community to contribute to marine research; the implementation of requirements for international co-operation with particular reference to the acquisition of competence, creation of favourable conditions for research; international co-operation in marine science, education and training; and international transfer of information, planning and conduct of research and the development and creation of institutions. 152

The Workshop as a result of indepth study of these aspects offered a number of suggestions and made a number of recommendations. It recommended exploring various forms of agreement for co-operation in scientific activities at a more 'operational' level than has hitherto been a common practice, in particular the method of establishing consortia and joint ventures and their effective use, particularly with regard to making available research vessels and other facilities to groups of developing states for establishing regional institutions of various kinds. On the role of international organizations, the Workshop recommended assistance to developing countries to establish the awareness of the importance of sound scientific basis for fulfilling national responsibilities laid down by the New Ocean Regime through provision of relevant information on ocean affairs and international co-operation so as to help activate endogenous capabilities and intellectual creativeness regarding marine science and technology. This would lead to partnership in oceanography between the developing and other states on equal footing by replacing one way export of technology by the exchange of culture and knowledge and through building mutual trust among them. 153

- 154 The Secretary of IOC also informed the Committee that as a follow-up of this Workshop, another workshop on the Concept and Development of Regional Centres and Networks will be organized by the IOC jointly with the United Nations University.
- 155 The Observer of the United Nations University, Professor Walter Manshard, requested the Chairman to place the following statement on records.
- 156 The programme activities related to marine sciences were initiated by the UNU in 1978, with a number of coastal management courses for graduate students in Indonesia (1978-82). Under the UNU-Fellowship Programme a number of post graduate fellowships were awarded in the field of marine sciences (mostly to US Japanese institutions). A number of international workshops and task force meetings to enhance the coastal management capabilities in developing countries was held between 1978- 1984 (e.g. Fiji, Kenya, Saudi Arabia, the Gulf Area, Japan). Some of the results of this work were published in the UNU Natural Resources Series. The UNU jointly with IOC and Unesco organized a IOC/UNESCO workshop on "International Cooperation in the Development of Marine Sciences and the Transfer of Marine Technology in the context of the New Ocean Regime", which was held in Unesco Headquarters, 27 September - 1 October 1982, and published as IOC Workshop Report NO. 32. At present a research project on the traditional uses and the socio-economic effects of eco-system changes in Mangrove Resources is under way in Thailand, Tanzania and Sri Lanka.
- 157 One Delegate commending the initiative taken by the United Nations University in this respect, suggested that IOC to pursue collaboration with the UNU in the implementation of some of the projects directed to assist the developing countries to acquire the necessary competence to deal with marine affairs.
- 158 The Working Committee expressed its great appreciation to the UNU for the initiative taken in providing necessary support for this Workshop. It further encouraged the future collaboration between IOC and the UNU on matters of common interest.

8. IMPROVING UNIVERSITY EDUCATION IN MARINE SCIENCE AND OCEAN ENGINEERING

- 159 The Representative of Unesco, Director of the Division of Marine Sciences, Dr. Dale Krause, introduced this Agenda Item. He emphasized the importance of the Working Committee for TEMA as a policy body, not only for IOC but for Unesco as well in its field of competence. He drew attention particularly to three background documents in the series Unesco Reports in Marine Science: No. 15 - Fishery Science Teaching at the University level; No. 25 - Ocean Engineering Teaching at the University level, and No. 26 - Global Survey and Analysis of Post-graduate Curricula in Ocean Engineering.

The Representative of Unesco covered five topics:

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i) Ocean Engineering at the University Level. This activity was carried out by Unesco, in co-operation with IOC and the Engineering Committee on Oceanic Resources, in response to Recommendation TEMA-II.14 on ocean engineering and marine technology adopted at the Second Session of the Working Committee for TEMA (New York, 18-23 July 1977). The activity consisted of two phases: (a) the carrying out of a global survey of post-graduate curricula in ocean engineering, and (b) the organization of a workshop which prepared guidelines for designing advanced university curricula in ocean engineering and related fields.

ii) Fishery Science Teaching at the University Level. A Unesco/FAO Workshop (Paris, 5-8 May 1980) reviewed curricula in this field and adopted recommendations for universities to use in the new development of such curricula.

iii) Open University/Unesco Course in Oceanography. This self study/tutorial course with its materials has been furnished to universities in seven developing countries, an activity which will continue. The Open University of the United Kingdom and the Unesco Division of Marine Sciences are co-operating on the development of a new teaching unit, specifically designed to deal with tropical and sub-tropical marine environments.

iv) Evaluation of Undergraduate Marine Science Teaching. Unesco and the Open University are undertaking a global survey of undergraduate marine science teaching through a questionnaire, in order to evaluate the role of such undergraduate programmes in relation to existing Unesco recommendations concerning graduate (post-Bachelor's Degree) marine science teaching programmes.

v) Advanced Technology in Teaching. Unesco is investigating the feasibility of using laser video discs in conjunction with computers to teach topics such as remote sensing of the oceans and marine taxonomy.

The Representative of Unesco invited the Working Committee to comment on the programme and to identify high priority problems that Unesco should consider for its future programme.

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In the discussion in which twelve speakers took part, all Delegates expressed their satisfaction with the content and direction of the programme. Many Delegates had concrete proposals for new actions or for updating or improving existing curricula. Several Delegates indicated that the curricula and teaching materials were being used in their own countries.

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Concerning ocean engineering curricula development, the Delegates considered the approach and documents to be very useful to their countries and institutions. One Delegate advised that it would be very helpful to bring in other Unesco units, such as the Education Sector, to help in introducing ocean engineering into the university system. Another Delegate regretted the absence of the strong coastal ocean engineering programme of the Asian Institute of Technology from the

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global survey of ocean engineering curricula. Concerning the priority to be given to ocean engineering in the Unesco programme, some Delegates urged a strong promotion of ocean engineering teaching as part of marine sciences while maintaining the vigorous promotion of marine science (biological, geological, physical and chemical oceanography teaching).

164        The Working Committee, considering the increasing needs of developing countries in this field, as well as in related activities concerning marine technology, encouraged Unesco and IOC to develop progressively their involvement in these fields.

165        Concerning fishery science teaching at the university level, the Working Committee proposed that the study be taken further in a second advanced workshop jointly with FAO. Such a workshop would examine thoroughly the modern approaches to fishery science teaching and up-date the recommendations for the design of appropriate advanced curricula.

166        A special problem in African universities was discussed in introducing new marine teaching programmes, citing fishery science curricula as an example. The Director of the Unesco Division of Marine Sciences proposed the organization by Unesco of a short workshop to bring awareness to university deans, teachers and administrators in Africa on the need of introducing curricula on various high-priority aspects of marine science and technology.

167        The new curricula for training hydrographers developed by the International Hydrographic Organization, were brought to the attention of the Working Committee and might serve as a useful model for further development of marine science and technology curricula by Unesco. The Representative of IHB informed that his organization will send copies of their curricula to the Secretary of IOC and the Director of the Unesco Division of Marine Sciences, as well as to all interested IOC Member States.

168        Concerning new specialized curricula, the Working Committee recommended that a workshop on teaching in marine geosciences be organized to fill an important gap. The teaching in developing countries of physical oceanography should also be encouraged.

169        With respect to the use of advanced technology in teaching, one Delegate urged fast action because of the rapid advances now occurring. He laid particular emphasis on taxonomy where the world capability is rapidly deteriorating.

170        The IOC Secretary pointed out that the university teaching programme of the Division of Marine Sciences is an important contribution to the overall objectives of the IOC and TEMA.

171        The Representative of Unesco thanked the Delegates for their constructive comments and proposals for future activities. He said the Division of Marine Sciences would carefully consider these proposals in developing its programme and budgets for 1985 and 1986-1987, and would keep the IOC informed of progress.

## 9. IOC'S VOLUNTARY ASSISTANCE PROGRAMME

The Technical Secretary gave a brief account of the Voluntary Assistance Programme of the Commission (IOC-VAP) since its establishment by the IOC Assembly at its Tenth Session in 1977 by referring to the background information given in the "Action Paper" (Document IOC/TEMA-IV/8). He stated that the IOC-VAP was inspired by the WMO-VAP (now known as Voluntary Co-operative Programme (WMO-VCP)). The scheme consists essentially of two components: the Voluntary contribution to the IOC Trust Fund earmarked for implementation of this scheme; and the other equipment and services donated by the Member States. He also introduced the "Revised Rules for the Utilization of IOC-VAP", as approved by the Eleventh Session of the IOC Assembly.

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The IOC-VAP is based on the principle of mutual assistance between the developed and developing Member States of the Commission and serves as a supplementary source of assistance to strengthen the marine science of developing Member States of IOC so as to enable them to participate fully in all programmes of the Commission. He recalled the Resolutions and Recommendations adopted by the IOC governing bodies and the Working Committee for TEMA to implement this scheme, which, despite all the efforts made by the Secretariat, received very little support from the donor countries. This led the IOC Assembly at its Twelfth Session to refer the matter to be considered by the Working Committee to advise whether the scheme should be followed and if so to provide necessary guidance for its efficient working.

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To have a thorough re-examination of all aspects of IOC-VAP, the Secretariat requested Professor H.U. Roll to undertake an in-depth study of the IOC-VAP and to advise on how to effectively implement this scheme for consideration by the Working Committee for TEMA. He then introduced the Document entitled "IOC Voluntary Assistance Programme: Review and Perspectives" prepared by Professor H.U. Roll (Doc. IOC/TEMA-IV/9).

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The document provided an exhaustive review and analysis of a number of aspects having direct bearing upon the functioning of IOC-VAP, a very candid account of the factors contributing to the success of the WMO-VCP, and finally the guiding principles on which Voluntary Cooperation Programme within the IOC could be developed and reactivated.

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The evaluation of IOC-VAP indicated that out of sixty-nine requests partial support for seven fellowships was offered by two Member States and, for journals and documentation by eleven Member States. These highly unsatisfactory results called for detailed investigations of the scheme and its modus operandi. It was pointed out that the major causes of this were: the oceanographic community in Member States is not properly organized and centralized; the dependence of IOC on willingness of its Member States to establish and to maintain national bodies prepared and capable to act as focal point for all IOC matters, in particular for IOC-VAP; the procedure of processing IOC-VAP request is cumbersome and time consuming; the fields in which assistance is solicited are generally broad; and finally the inadequate Secretariat support for management of the scheme.

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- 177 In the case of the WMO-VCP it was explained that the scheme benefited from an organized national counterpart structure in each Member State, and from a strong technical assistance or co-operation programme of WMO which plays a crucial role in attracting support for UNDP (over 50%), VCP (over 25%), Trust Fund (about 15%) against about 2 percent of regular fund and in which the WMO World Weather Watch (WWW) Programme stood as the First Priority in the technical assistance programme, and which attracted support for requests under WMO-VCP. It was added that to this scheme, other fields of co-operation have been added later. It was also stated that apart from the Revolving Fund established by WMO to ensure appropriate facilities for operation of WWW on continuing basis, contributions made by Member States to WMO-VCP Fund provides the organization with means to respond to actual needs with great flexibility.
- 178 A noteworthy feature of assistance under WMO-VCP has been a pronounced preference of donor countries to provide support in the form of equipment and/or services including fellowships as compared with payment in cash. The success may also be attributed to the management of the WMO-VCP by three professional staff at the WMO Secretariat, exclusively devoted to this programme, as well as to close personal contact of Secretariat with relevant authorities such as the WMO Permanent Representatives in both the donor and recipient Member States, and with Resident Representatives of UNDP for additional support from the UNDP. Further, it was stated that a concept of co-ordinated programmes to improve the effectiveness of the WWW through an integrated approach on a regional basis and proper review and appropriate documentation of WMO-VCP projects rendered the WMO-VCP attractive to donor Member States which resulted in efficient co-operation among all Member States concerned.
- 179 It was suggested that, although the targets for assistance in the example of WMO for its VCP may not be applicable to IOC, the national structures for meteorology and oceanography seem to differ considerably, the "Unesco/IOC Comprehensive Plan for a Major Assistance Programme to Enhance Marine Science Capabilities of Developing Countries" offers itself most readily as appropriate framework for a suitable target of assistance within a reactivated IOC-VAP. The Centre of gravity of the demands for assistance under IOC-VAP mostly lies in the field of TEMA and is concerned with strengthening marine science infrastructures and building up required capabilities. This should set a general movement towards achieving real partnership among all Member States, particularly in regard to global programmes of IOC such as the GIPME, IGOSS, IODE, Ocean Processes and Climate, OSLR and OSNLR and their regional components which could well serve as alternative fields for motivating potential donor countries to support IOC-VAP.
- 180 In the discussion that followed there was some controversy on the success or failure of VAP and as to how it should be continued. The Representative of WMO in his statement, based on the experience of his organization in dealing with WMO-VCP, mentioned that apparently owing to its short existence the IOC-VAP could not yet be expected to be a full success. He commented that IOC-VAP was established at a time when there was an economic recession all over the world, and, because of that, many countries were not in a position to contribute to IOC-VAP. He said the scheme had received requests and donations, so in some cases a start had



been made, and therefore it should be given a fair chance to grow. Explaining the working of WMO/VCP, he pointed out that there were three bodies responsible for the operation of the scheme; the Executive Committee (EC) of WMO, the EC Panel of Experts on the WMO VCP, which has advisory functions and does the related work, and an informal meeting of donor Member States which does the job of acting as a clearing house for these requests, to facilitate the utilization of VCP resources. These bodies are composed of the representatives of Member States which therefore make the necessary decisions, rather than the WMO Secretariat which undertake the processing arrangements. Some countries that did not wish to contribute to WMO/VCP were associated with bilateral programmes of assistance. Noting that the World Weather Watch Programme is considered a priority programme for such assistance, he suggested that some parallel ought to be found in the IOC-VAP. In the context of multicountry benefits, if donor countries have interests in projects, projects of this kind are more likely to be picked up and could set the IOC-VAP scheme rolling. He also suggested that regional or sub-regional projects rather than global ones might prove to be more successful in the early stages of the scheme.

Several Delegates agreed with the WMO Representative that it was too early to consider the scheme as a failure. A particularly strong point in favour of VAP was made by the Delegates of Portugal and Spain, referring to the recent planned activities under the Voluntary Assistance Programme to assist African Portuguese-speaking and other western African countries respectively.

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Several Delegates stated that the comparison between WMO-VCP and IOC-VAP needs to be made with certain reservations. Apparently, meteorological approaches have a greater worldwide coverage than marine research, and the requirements are simpler, the time scale is shorter, the people are more aware of the necessity of weather research and prediction, and the Secretariat supporting activities of WMO are much larger than those available to IOC-VAP. It was also thought that, in comparison to global aid through other multilateral programmes, the number of requests handled through the VAP was very small.

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One Delegate stated that his country has been giving assistance with hundreds of fellowships to developing countries upon requests and did not understand why there should be so much difficulties with small requests such as those under IOC-VAP. Others pointed out that a number of donor countries have been making large contributions in cash to multinational programmes. It has also been suggested that the role of a scheme like VAP might be rather to connect donors and recipient countries in a more efficient way which might lead to a better distribution of the funds and actions. Some Delegates also suggested that activities related to some of the IOC programmes, such as ocean processes and climate, IGOSS, IODE, GIPME, OSLR, and OSNLR and the emerging needs of countries in the use of research vessels could prove successful candidates for supporting VAP.

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In general, there was a good will on the side of the donor countries but apparently there was also some mismatch of donor interests and recipient interests. It was also proposed that the donor countries should announce clearly to the recipient countries what their possibilities for aid were, and the recipient countries should explain

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their needs and their requirements more precisely, so that IOC, under VAP, could act more effectively as a broker.

185        The Working Committee unanimously paid high tribute to Professor H.U. Roll for his review of the IOC-VAP which gave a clear analysis of the functioning of this scheme and relevant background information, including WMO-VCP, thus providing an excellent basis for re-examination of the future of IOC-VAP. It also considered that the suggestions made by Professor Roll to improve this scheme are very useful and should be pursued.

186        The Working Committee, having examined various views and constructive suggestions made during the discussion, decided that the scheme should be continued.

187        The Working Committee, however, recognized that there is a need to reactivate the present scheme so as to promote and strengthen the concept of partnership between the donor and recipient countries in the implementation of global programmes of IOC as well as their regional components. As long as the full partnership on equal footing has not yet been achieved among Member States, the programme of assistance offered in the Comprehensive Plan should be used as basis for building-up the required partnership. The Working Committee further considered that the reactivated scheme should not be seen as a one way flow of assistance from a donor to recipient, but as an act of co-operation between two or more countries in which the recipient countries should also provide a substantial counterpart support thus documenting its interest and engagement in the scheme as well as in the development of endogenous capabilities.

188        Having considered the above points, the Working Committee recommended that the scheme should be renamed as IOC Voluntary Co-operative Programme (IOC-VCP) commensurate with its new approach to promote partnership among its Member States.

189        The Working Committee also recognized the need for improving all aspects of procedure in processing requests for assistance under this scheme, including compilation, review, distribution and responses to such requests. In this context the Working Committee recommended that:

i) priority should be given to such requests which have bearing upon major global programmes and their regional components;

ii) In order for requests under IOC-VCP to be considered favourably by a donor Member State, there is a need to identify an appropriate national body with an adequate mandate, having access to, or being in the position for mobilizing funds, as well as to give particular

attention to IOC programmes and requests received under the IOC-VCP, while considering assistance under bilateral and multilateral arrangements. In this respect, Member States should as far as possible provide or distribute informal summaries of their national activities and opportunities relevant to TEMA objectives;

iii) The Member States requesting for assistance under IOC-VCP should give due attention to their requirements and provide information on matching contributions from national sources in support of those programmes and against which assistance is solicited;

iv) The Secretariat of IOC should make all possible efforts to contact potential donor countries to respond favourably to requests for assistance and for co-operation from other Member States.

The Working Committee also recommended that the rules for the utilization of IOC-VAP should be simplified so as to allow delegation of authority for consideration of all applications to IOC-VCP by an ad hoc panel, consisting of the IOC Secretary, the IOC Vice-Chairman in charge of TEMA, the Chairman of the Working Committee for TEMA and the Chairman of the appropriate IOC subsidiary bodies for approval of these requests. 190

The Working Committee adopted Recommendation IOC/TEMA-IV.1. 191

#### 10. THE ROLE OF ICSPRO AGENCIES IN TEMA RELATED ACTIVITIES.

The Item was introduced by the IOC Secretary who recalled that the Inter-Secretariat Committee on Scientific Programmes Related to Oceanography (ICSPRO) has been created in 1969 and that it was composed of the Executive Heads of several UN organizations (specifically UN, Unesco, FAO, WMO and IMO, having interests in marine science and related subjects. The objective of the Committee is to contribute to the development of effective forms of co-operation between organizations of the United Nations system substantially concerned with ocean programmes, and thus to avoid duplication in the planning and implementation of a programme of international co-operation in marine science, as decided by the international community. He then drew the attention of the Working Committee to its Terms of Reference (IOC Manual - Part II) according to which the Committee should review the needs in TEMA, as identified by Member States as well as the programmes of the international organizations concerned, especially those which are members of ICSPRO, as guidance for co-ordinated action to contribute to solve such needs. The Committee should also recommend TEMA activities relating to IOC Programmes which call for concerted action by Member States and other participating international organizations. In this context he informed the Delegates of the increased co-operation of IOC with Organizations Members of ICSPRO by referring to the examples of IOC co-operation with: WMO under IGOS and the Oceanographic Component of WCP, with FAO on Ocean Science and in relation to Living Resources (OSLR) and jointly with UN(OETB) in ASFIS, and with the letter on Ocean Science in Relation to Non-Living Resources (OSNLR). He made specific reference to the 192

close co-operation that exists between the IOC and the Unesco Division of Marine Sciences.

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The Secretary of the IOC then recalled that the ICSPRO at its Twenty-Second Session held in Rome, FAO, 1983 was of unanimous view that the current needs of Member States to improve their marine science capabilities, including aspects related to the programmes of the organizations, Members of ICSPRO, was a critical issue which requires that the Members of ICSPRO use available funds as effectively as possible, taking advantage of any opportunity to consolidate their efforts and avoid duplication. The ICSPRO had also recognized the desirability of improving the flow of information between Members, particularly on projects having a bearing on research and ocean use, and the need to concentrate efforts to identify activities of common interest to Member organizations and to implement them jointly for the benefit of developing Member States.

#### 10.1 PROGRAMME OF THE DIVISION OF MARINE SCIENCES

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The Chairman invited the Unesco Representative, Dr. D. Krause, Director of the Unesco Division of Marine Sciences to present a review of the Unesco programme in marine sciences. Dr. Krause referred to the programmes that had been briefly discussed under Agenda Item 4 (Unesco/IOC Comprehensive Plan) and under Agenda Item 8 (Improvement of University Education). The research programme of the Division had until now not been discussed by the Working Committee, but is included in the publications and documents produced by the Division. He outlined the main functions of the Division concerning the promotion of marine science at the global level and in developing countries including the three-fold strategy for marine science development based on the establishment of scientific infrastructures, manpower and research programmes. Concerning the programme, he highlighted the marine science fellowships of Unesco, the Division's Major Inter-regional Project on Research and Training leading to the Integrated Management of Coastal Systems (COMAR), and the extrabudgetary marine science development programmes (during 1979-1983, twenty-six national and five regional projects totalling US\$ 14 million). He discussed the development of the Unesco Programme and Budget for 1984-1985 and its interdisciplinary emphasis and indicated areas of co-operation with IOC.

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Several Delegates expressed their appreciation to the Director of the Unesco Division of Marine Sciences and congratulated him on the work accomplished by his Division. The Working Committee noted that the activities carried out under IOC/TEMA and the Division of Marine Sciences are of a complementary nature. In this context, one Delegate discussed a marine science project at his institution being carried out in co-operation with Unesco and the UN Funding System for Science and Technology for Development. The Representative of France proposed that the Division help in the formation of specialists needed for the global and regional programmes of the Commission. Other Delegates indicated continuing emphasis should be placed by the Division on training activities related to the basic oceanographic sciences, and attention should also be paid to recognized areas of critical importance such as marine geology, as well as to newly emerging areas such as ocean engineering.

Some Delegates stated that the report of Unesco could serve as a good example of detailed breakdown of figures and activities, which might be useful as an approach for TEMA.

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#### 10.2 PROGRAMME OF TRAINING AND EDUCATION OF FAO

The Representative of FAO, Mr. E. Akyuz, Chief, Fishery Information, Data and Statistics Service, introduced his organizations training programme relating to marine sciences. He stated that this programme is adapted and aimed at the promotion of fishery resources in Member States. The direct services offered are: the scientific and technical courses in fishery science and fishery management; workshops held in conjunction with meetings of FAO Regional Bodies; fellowships to scientists and technicians and, exceptionally, internships in FAO headquarters. FAO supports these activities by producing and disseminating to users, training and education material such as identification sheets.

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He briefly described the objectives of the forthcoming FAO World Conference on the Management and Development of Fisheries. He reiterated the emphasis given to training at all levels in the FAO's Director-General's Programme of Work and Budget and the need for close collaboration amongst ICSPRO Agencies.

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The Secretary of IOC drew the attention of the Working Committee to the fact that the FAO World Conference on Fisheries is expected to consider training of scientists and technicians. He stated that this offered a new area for possible fruitful collaboration between FAO and the IOC, and noted that other areas for co-operation existed in the execution of the OSLR programmes. Recalling the discussion under Item 6, he also mentioned the co-operative action aimed at promoting a better use of research vessels as a promising area for co-operation between IOC and FAO.

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The Delegate of Denmark congratulated FAO for organizing training courses in stock assessment and other areas including preparation of Identification Sheets in selected subjects which his country, through DANIDA, also participated. He then outlined the training programme implemented by his country on a continuous basis in the area of food processing technology, and explained that these programmes are sponsored by the EEC. He invited the Secretary IOC to explore possibilities for funding from the EEC for training activities under the Commission's auspices.

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#### 10.3 PROGRAMME OF TRAINING AND EDUCATION OF WMO

The Representative of WMO, Mr. G. Rudder, Chief, Training Activities Division gave a description of the training programmes undertaken by the Organization. The training and education activities of WMO fall into four basic categories: fellowships, publications, training facilities and training events. Under fellowship activities, emphasis is laid on careful planning to ensure that the training corresponds to the actual needs of Member States. Emphasis is also placed on the training of trainers. WMO also organizes a series of regional seminars on the provision of marine meteorological service to various interests and monitors the quality of training provided in

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fifteen Regional Meteorological Training Centres, fourteen of which are located in developing countries. The WMO Representative also mentioned his organizations role and activities in TEMA-related matters and stated that the training of personnel in marine meteorology would be a component of the WMO manpower development programme.

202 The Delegates expressed their appreciation on the close collaboration that had been realized between IOC and WMO in the framework of the ICSPRO Agreement, especially in training activities in support of the Integrated Global Ocean Services System (IGOSS). The Secretary of IOC informed the Working Committee that further joint training courses between the two organizations are being envisaged.

203 The Working Committee expressed its appreciation to the Representatives of Unesco, FAO and WMO for their valuable presentation. It recognized that the information provided by them was useful in seeking further collaboration in areas of common interest and requested their organizations to continue to provide such information to the Sessions of the Working Committee and urged other organization Members of ICSPRO (e.g. IMO) or those co-operating with the Commission (e.g. Unesco, IAEA) to do so in the future.

204 In this context, the Working Committee recommended that IOC, in view of the expansion of some of its major programmes and of their components in different regions, should explore co-operation of Member Organizations in organizing joint training activities and on related aspects to enhance marine science capabilities of developing Member States, especially in those areas which have relevance to the activities being carried out at present by those organizations in their respective areas of competence. The Working Committee is also encouraged to note the increasing attention being given by ICSPRO to TEMA matters of common interest to its Members States.

#### 11. GUIDANCE ON PROGRAMME AND BUDGET FOR 1986-1987

205 The Technical Secretary introduced the Document on Programme of Work and Financial Requirements (Document IOC/EC-XVII/7). He informed the Working Committee that as a result of the Resolution of the Twelfth Session of the IOC Assembly (Resolution XII.11), the General Conference of Unesco at its Twenty-second Session approved supplementary funding for IOC activities. He then summarized the "Guidelines for Preparation of the IOC Component of the Unesco Programme and Budget for 1986-1987 (Annex to Resolution EC-XVII.1) approved by the Seventeenth Session of the Executive Council held in February 1984.

206 The overall strategy set out in those guidelines is to develop a balanced, closely-knit set of programmes in which the main scientific objectives are supported by the adequate ocean services, and related training and mutual assistance. To build on the progress already achieved in the planning and implementation of the ocean science programmes, ocean services, and training, education and mutual

assistance (TEMA), the 1986-87 biennium will be a period of consolidation of the work of the Commission, during which its structures and operations, particularly at the regional level, should be strengthened. Special emphasis will continue to be given to the implementation of the programmes and activities through the active involvement of Member States.

With specific reference to TEMA he pointed out that the above guidelines provided for 1986-1987 laid emphasis on the fundamental policy of IOC to develop TEMA, in conjunction with the Unesco Division of Marine Sciences, by incorporating the component of this activity in all marine sciences and services activities of the Commission with the primary objective of assisting developing countries to strengthen their own marine science capabilities.

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The Unesco/IOC Comprehensive Plan for a Major Assistance to enhance Marine Science Capabilities of Developing Countries is to be accelerated by formulating more regional and sub-regional technical assistance projects with their national components; increasing the promotion of bilateral and multilateral co-operation in oceanography; providing technical advice and organizing training courses or workshops in key areas of marine science and ocean services development; and by the improved uses of research vessels and the strengthening of IOC-VAP to enable more Member States to participate in the regional and global programmes of the Commission. Increased attention will be paid to forms of international co-operation transcending the regional level, with a view to exploring the establishment of appropriate mechanisms of co-operation taking into consideration similarity of problems facing the countries as well as having the bio-geographic characteristics.

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He requested the Working Committee, while providing general guidelines on the formulation of proposals relevant to be included in the Draft Programme and Budget (Draft 23C/5) for the biennium 1986-1987, to bear in mind the discussions that had already taken place on other substantive Items of the Agenda, particularly Items 4 and 5.

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Having discussed various aspects of TEMA and recalling views expressed on previous Agenda Items, the Delegates in general agreed that the development and expansion of TEMA in the biennium 1986-87 should follow the priorities set up in the guidelines approved by the Executive Council. It was suggested that to implement programmes under the Comprehensive Plan extrabudgetary funds will have to be reinforced. The proportion of 30 percent of the regular funds earmarked for TEMA was considered to be the most appropriate sum and that this amount should be utilized as a catalyst to generate additional sources of funding from extrabudgetary sources.

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Some Delegates, however, expressed concern as to whether the IOC Secretariat would have sufficient staff to deal with the enormous load of work foreseen in the biennium. It was suggested that the Secretariat should have one professional staff and one Associate Expert to assist in the implementation of the expanded work under TEMA. The Delegate of Australia said that, although it was not the business of the meeting to recommend the appointment of extra staff, given the apparent increase in TEMA activities in recent years the staffing of TEMA should be reviewed.

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In addition, Member States should be asked to consider making available, associate experts to work at the Secretariat of the IOC for six to twelve months at a time. He said that Australia is considering such an arrangement.

212        The Working Committee having considered the various suggestions made during the debate, endorsed fully the priorities suggested in the "Guidelines for Preparation of the IOC Component of the Unesco Programme and Budget for 1986-87" approved by the Executive Council, and, in this context; instructed the Secretary to develop the programmes of activities in accordance with the afore-mentioned guidelines.

213        The Working Committee also recognized the increasing load of work on the Secretariat that will result particularly from the implementation of Comprehensive Plan, the development and expansion of TEMA components of major programmes of the Commission and their regional components and the implementation of IOC-VCP which call for additional staff to dispense with the responsibilities satisfactorily in the interest of its Member States.

214        The Working Committee, therefore, instructed the Secretary IOC to submit the requirement of additional staff, giving full justification, to the IOC Assembly at its next session for consideration.

## 12. ELECTION OF CHAIRMAN AND VICE-CHAIRMAN

215        The Delegate of Mexico proposed the name of Prof. U. Lie as Chairman for the next intersessional period. This proposal was seconded by the Delegates from the Federal Republic of Germany, Cuba, Spain, Turkey, India, Portugal, the U.K. and Madagascar, and adopted unanimously.

216        The Delegate of Turkey proposed the name of Dr. H.N. Siddiquie (India) as Vice-Chairman which was seconded by the Delegates from Madagascar, Japan, Thailand, Brazil, Bulgaria, Spain and adopted unanimously.

## 13. DATES AND PLACE OF THE FIFTH SESSION

217        The Working Committee agreed to reconvene in about three years time at the IOC Headquarters in Paris, France.



14. ADOPTION OF THE SUMMARY REPORT

The Working Committee adopted the recommendations (see Annex II) and part of the Summary Report. Because of certain technical difficulties and the shortage of time, it was agreed that the Draft Summary Report be circulated to all Delegates, Representatives and Observers for approval. 218

15. CLOSURE

The Delegate of the Federal Republic of Germany, on behalf of the Working Committee paid tribute to the Chairman of the Working Committee, Prof. Ulf Lie, for the excellent leadership and the manner in which he conducted the Session and for his devotion to TEMA. He expressed appreciation for the work done by the Secretariat staff, in particular the Technical Secretary of the Session, Dr. S.M. Haq, in preparing the documents and the Report and to the Consultants who assisted him in this task, particularly Mr. Roger Aertgeerts. He thanked the Rapporteur, Professor Dr. Wolf Arntz for the excellent job done in the preparation of the discussion notes during the Session. He also expressed his thanks to the Secretariat staff for typing and providing services to the Session, to the interpreters for undertaking the debate in the professional way, to the local organizing Committee for the excellent administrative arrangement and to the technical staff and the ladies who provided excellent administrative arrangements and services during the conduct of the Session. Finally, he expressed his most sincere thanks to Dr. Mario Ruivo, Secretary of IOC, for having arranged the Session of the Working Committee in Portugal, his home country, and for the valuable guidance provided by him during discussion on various Items. 219

He said that it is needless to mention how much all the Delegates to the Session enjoyed their sojourn in Lisbon and its surroundings and the usual Portuguese hospitality. He said many of us certainly will take back the pleasant memories of visiting this part of beautiful old Europe and meeting the very kind people of Portugal who are known for their maritime traditions and are now working for a future which is closely linked to the sea and for co-operation with developing countries overseas. 220

The Chairman of the Working Committee expressed his thanks to all the participants for their co-operation and the kind words expressed. In fact, he said, the task of the Committee was greatly facilitated by the rich contribution made by the Delegates themselves. 221

The Secretary of IOC followed by the Technical Secretary, expressed their thanks to the Working Committee for their co-operation and for providing valuable guidance to the future work of TEMA. 222

Finally, the Vice-Admiral Jose A. Barahona-Fernandes, Chairman of the Portuguese Standing Commission for Oceanology, winding up the Session expressed on behalf of the Portuguese Government, the pleasure of having hosted the Fourth Session of the Working Committee for TEMA in Lisbon. He was happy to learn of the achievement of the Committee which 223

was able to clarify many points for providing a new impetus for closer co-operation among the Member States and the scientific community in the world. Referring to the statement given at the opening of this Session by his Excellency the Prime Minister of Portugal, in which he defined the main elements of marine policy of his Government, he reiterated that Portugal would continue to accord full support to IOC and its programme of activities. He expressed the hope that IOC would continue to offer common platform for countries to solve complex ocean problems through concerted action and in which his country would continue to play its share through co-operation with other countries in joint exercises. He said the task of TEMA is gigantic and to which a new field has now been added as a result of deliberations that went on last week, i.e., to assist the developing states to improve their capacity to use research vessels efficiently.

224 He congratulated the Working Committee for their success in the deliberation and in arriving at the conclusions which would lead to further advances in the work of TEMA and conveyed to them the best wishes of the people and the Government of Portugal.

225 The Chairman declared the Session closed.

ANNEX I

AGENDA

1. OPENING
2. ADMINISTRATIVE ARRANGEMENTS
  - 2.1 ADOPTION OF THE AGENDA
  - 2.2 DESIGNATION OF THE RAPPORTEUR
  - 2.3 CONDUCT OF THE SESSION, TIME TABLE AND DOCUMENTATION
3. INTERSESSIONAL ACTIVITIES
4. UNESCO/IOC COMPREHENSIVE PLAN FOR A MAJOR ASSISTANCE PROGRAMME TO ENHANCE THE MARINE SCIENCE CAPABILITIES OF DEVELOPING COUNTRIES
  - 4.1 GENERAL GUIDELINES FOR FUTURE IMPLEMENTATION
  - 4.2 MARINE SCIENCE COUNTRY PROFILES
  - 4.3 FINANCING AND OTHER SOURCES OF INTERNATIONAL ASSISTANCE
5. TEMA COMPONENTS OF GLOBAL AND REGIONAL PROGRAMMES OF THE COMMISSION
6. OPTIMIZATION OF THE USES OF RESEARCH VESSELS
7. TRANSFER OF KNOWLEDGE AND TECHNOLOGY IN THE CONTEXT OF THE NEW OCEAN REGIME
8. IMPROVING UNIVERSITY EDUCATION IN MARINE SCIENCE AND OCEAN ENGINEERING
9. IOC VOLUNTARY ASSISTANCE PROGRAMME
10. ROLE OF ICSPRO AGENCIES IN TEMA RELATED ACTIVITIES
  - 10.1 PROGRAMME OF THE DIVISION OF MARINE SCIENCES
  - 10.2 PROGRAMME OF TRAINING AND EDUCATION OF FAO
  - 10.3 PROGRAMME OF TRAINING AND EDUCATION OF WMO

11. GUIDANCE ON PROGRAMME AND BUDGET FOR 1986-1987
12. ELECTION OF THE CHAIRMAN AND VICE-CHAIRMAN
13. DATES AND PLACE OF THE FIFTH SESSION
14. ADOPTION OF THE SUMMARY REPORT
15. CLOSURE

ANNEX II

ADOPTED RESOLUTIONS

<u>Recommendation number</u>	<u>Title</u>
TEMA-IV.1	IOC's Voluntary Assistance Programme (IOC-VAP)
TEMA-IV.2	Recommendation on International Co-operation for the Improved Uses of Research Vessels
TEMA-IV.3	Recommendation on the IOC/Unesco Comprehensive Plan For a Major Assistance Programme to Enhance the Marine Science Capabilities of Developing Countries
TEMA-IV.4	Marine Science Country Profiles

Recommendation TEMA-IV.1

IOC'S VOLUNTARY ASSISTANCE PROGRAMME (IOC-VAP)

The Working Committee for TEMA,

Recognizing that IOC-VAP could be an important supplementary source of support to strengthen Member State marine science capabilities, enabling them to participate more fully in programmes of the Commission;

Considering the need to improve all aspects of the IOC-VAP process, including compilation, review, distribution, and response to IOC-VAP requests;

Taking into consideration the advice given to the Working Committee for TEMA by the Twelfth Session of the IOC Assembly to have an in-depth analysis of IOC-VAP;

Having reviewed document IOC/TEMA-IV/9 entitled "IOC Voluntary Assistance Programme: Review and Perspectives";

Continues its support for the principles upon which IOC-VAP is based;

Calls upon potential donor States of the Commission:

- i) to identify an appropriate national body (with adequate mandate, having access to, or being in the position for mobilizing funds and with experience in technical assistance), to act as national focal point for matters relating to IOC-VAP or to make alternative arrangements;
- ii) to give particular attention to IOC programmes and IOC-VAP requests when developing bilateral and multilateral marine technical assistance programmes;

Calls upon requesting States of the Commission:

- i) to consider major global IOC programmes and their regional components as the priority areas for IOC-VAP assistance requests;
- ii) to assist donor States with their contribution by offering the maximum available matching resources;

Invites Member States to produce and distribute informal written summaries of their national activities and opportunities relevant to TEMA objectives;

Requests the IOC Secretary to provide a summary progress report of the IOC-VAP programme to IOC Executive Council and regional subsidiary bodies upon request and regularly to the IOC Assembly;

Recommends simplification of the rules 15 and 24 for utilization of IOC-VAP, wherein the delegation of authority for approving applications to IOC-VAP shall be an ad hoc panel constituted by the IOC Secretary, the IOC Vice-Chairman in charge of TEMA, and the Chairman of the Working Committee for TEMA, in consultation with the Chairmen of the appropriate IOC subsidiary bodies representing the requesting State's regional and programmatic interests.

Recommendation TEMA-IV.2

INTERNATIONAL CO-OPERATION FOR THE  
IMPROVED USES OF RESEARCH VESSELS

The Working Committee for TEMA,

Noting the report of the IOC/FAO Workshop on Improved Uses of Research Vessels;

Appreciating also the contribution of NORAD to the Workshop;

Recalling the vital importance of operations at sea in particular by means of research vessels at a time of growing interest of many countries to study, explore and make rational use of the resources of the oceans;

Stressing, therefore, the need to rationalize and to optimize the use of research vessels at national and regional levels and to promote international co-operation in this field by sharing of experience among countries and institutions and by mutual assistance in the purchase, chartering, operation and maintenance of vessels and sea-going equipment;

Recommends that IOC and FAO take due note of the recommendations of the Workshop, in particular:

- that IOC and FAO prepare, with the assistance of consultants, a guide on the Operation and Management of Research Vessels to be complemented by selected case studies and models;
- that IOC and FAO organize regional training courses on operation and management of research vessels and on planning of cruises, such courses to be assisted and co-sponsored by national donor agencies; that IOC and FAO study the possibilities for international assistance to expand the schemes for the pooling and rotation of capital, equipment, spares and personnel, including engineers and technicians, provided by FAO with the assistance of UNDP and various donor agencies;
- that IOC should explore the possibility for the provision of equipment, spare parts and other forms of ad hoc assistance under the IOC Voluntary Assistance Programme.

Recommendation TEMA-IV/3

COMPREHENSIVE PLAN FOR A MAJOR ASSISTANCE PROGRAMME TO ENHANCE  
THE MARINE SCIENCE CAPABILITIES OF DEVELOPING COUNTRIES

The Working Committee for TEMA,

Recalling Resolution XII-8 of the Twelfth Session of the IOC Assembly which, inter alia, invited the Director-General of Unesco to enhance the promotion and implementation of the Comprehensive Plan and urged Member States to improve or establish National Oceanographic Commissions or equivalent bodies, and to give adequate priority to marine sciences as an essential element in their socio-economic development;

Recalling further the strong support for the Comprehensive Plan at the Eleventh Session of the Executive Board of Unesco, as well as at the meetings of the Programme Group for CINCWIO in Nairobi in 1982 and the Programme Group for WESTPAC in Townsville in 1983;

Noting with appreciation the Director-General of Unesco's plans to hold a meeting with the leading individuals and heads of bilateral and multilateral funding agencies with a view to mustering support to developing Member States to enhance their capacities in marine sciences;



Expresses its appreciation to Unesco for strengthening the IOC budget for 1984-1985 with particular reference to the preparatory stage of the implementation of the Comprehensive Plan;

Requests that the Director-General and the Governing Bodies of Unesco continue to give due attention to the staff situation in the IOC Secretariat in order to ensure efficient implementation of the TEMA activities;

Urges national and international funding sources to give increased support to projects under the Comprehensive Plan in bilateral and multilateral assistance programmes;

Invites Member States of the IOC to accelerate the implementation of the Comprehensive Plan by seconding personnel to the IOC Secretariat at the Headquarters and in the regions;

Advises the Chairman of TEMA and the Secretary of IOC to structure the agenda of future sessions of the Working Committee for TEMA with a focus of the Comprehensive Plan;

Encourages the Secretariats of IOC and of Unesco's Division of Marine Sciences to co-operate closely in the planning of both national and regional activities to be implemented under the Comprehensive Plan;

Invites the ICSPRO agencies to continue to exchange information regarding programmes related to TEMA activities and to strengthen their co-operation with IOC in order to co-ordinate as appropriate their programmes with the Comprehensive Plan;

Encourages the regional subsidiary bodies of the Commission to play an active role in the formulation and implementation of regional and subregional projects, under the Comprehensive Plan.

Recommendation TEMA-IV.4

MARINE SCIENCE COUNTRY PROFILES

The Working Committee for TEMA,

Recalling the Recommendation IOC/TEMA-III.1 instructing the Secretary IOC to continue his efforts in close co-operation with the Unesco Division of Marine Sciences, in the preparation of marine science country profiles (MSCP);

further recalling the instructions given by the Twelfth Session of the IOC Assembly to the Secretary of IOC to undertake preliminary trials with a limited number of countries and to present an evaluation of results of this exercise to the Fourth Session of the Working Committee for TEMA and then to the Governing Bodies of the Commission for advice on further action;

Having reviewed the documents IOC/TEMA-IV/8 Annex 1; IOC/TEMA-IV/8 Annex 2 and IOC/INF-573 entitled "Marine Science Country Profile of Australia - A Case Study";

Requests the IOC Secretary to distribute to all Member States revised guidelines for the preparation of Marine Science Country Profiles (MSCP) with an attached Circular Letter emphasizing the importance of the MSCP to assisting Member State participation in the IOC programmes, to bilateral and multilateral co-operation, and to assessing national needs;

Requests further the IOC Secretary to establish a reasonable time frame for the first compilation of MSCPs;

Requests IOC Member States to provide the IOC Secretariat, in its appropriate time frame, the essential information requested in the revised MSCP format;

Encourages further IOC Member States to provide the information marked as "desirable" in the revised MSCP format as well as any additional information deemed appropriate by the Member State concerned;

Requests the IOC Secretariat to provide assistance, if requested by a Member State, in the preparation of its MSCP;

Encourages Member States to assist the IOC Secretariat as required in the preparation of the MSCPs, including the maintenance of these profiles on their automated facilities where possible;

Requests Member States to provide up-dates of MSCP information to the IOC Secretariat as appropriate;

Requests the TEMA ad hoc group for Co-ordination and Implementation to keep under review progress in the preparation of MSCPs and to report to the next session of the Working Committee for TEMA.

ANNEX III

ADDRESS BY HIS EXCELLENCY DR. MARIO SOARES,  
PRIME MINISTER OF PORTUGAL

Mr. President,  
Mr. Secretary of the Intergovernmental Oceanographic Commission and  
Representative of the Director-General of Unesco,  
Delegates and Representatives of International Organizations,  
Ladies and Gentlemen,

It is for me a matter of great satisfaction to be with you at the inaugural meeting of this important session of the TEMA Working Group of the Intergovernmental Oceanographic Commission and to welcome you, in the name of the Portuguese Government.

It is also a special pleasure for me to greet here my old friend Mario Ruivo, a fellow countryman and a companion in many a struggle, who is the Secretary of the Intergovernmental Oceanographic Commission.

I know that the Commission has, in nearly 25 years of activity, contributed, through the concerted action of its Member States and of the respective scientific communities, to a better knowledge of the oceans. The programme, which was developed on a worldwide scale, aided by the support of regional collaboration involving the greater part of the large ocean regions, has also contributed in a positive way, within the Commission's field of action, to a constructive dialogue between the States, with their different levels of development and interests and, in particular, towards the North-South relations. This is a dialogue in which Portugal, situated on the frontier between the two worlds, is vitally interested, as was clearly seen at the Conference on this subject, held recently in Lisbon by the Council of Europe.

The high technical and scientific standards, as well as the spirit of co-operation, which have characterized the activity of the Intergovernmental Oceanographic Commission are enough in themselves to justify its position of authority and bring prestige to Unesco, within whose scope the Commission functions as an autonomous body, with important duties at the service of other agencies of the United Nations which make use of it, by agreement, as a specialized organ.

It was not by chance that, at the United Nations Conference on the Law of the Sea, the regulations governing scientific research and exchange of information and marine technology were debated intensely, and were, in fact, major points in the negotiations, and the object of important articles in the resulting Convention.

This can be understood if we bear in mind the value of science, in general, as a factor of power and a condition essential to development particularly in a vast, hostile and largely unknown world, such as that of the oceans. It is not possible today to place the oceans and their riches at the service of mankind, nor ensure the required management and

conservation of resources and the protection of the marine world without an adequate scientific and technical basis.

We are all fully aware of this, particularly we Portuguese, who have lived for centuries with the sea and have tried to unveil its mysteries. The time is past when the Discoveries were made empirically and with audacity. Progress today depends on knowledge and organization. Without a co-ordinated scientific and innovative technological policy, neither progress nor modernization of the structures of society and the State is possible. Portugal can be proud of having played, in the history of humanity, a pioneer role in the discovery of the oceans and the natural phenomena contained therein, when, at the time of the 15th and 16th century navigations, it developed an experimentalism (based on the great accumulated experience of its fishermen and navigators, and also including knowledge of other people), which contributed considerably to the surprising progress of the scientific spirit which followed.

Portugal's interest in oceans today, is justified by the vast maritime zones over which it has jurisdiction, of the Continent, the Azores and Madeira, areas which are relatively rich in live resources, and in the important geostrategic position it occupies, facing the Atlantic and at the mouth of the Mediterranean. The Portuguese economy still depends, to a great extent, on seafaring activities, some of which, such as shipbuilding and the merchant navy, are undergoing difficulties, forcing us to restructure to improve quality. Apart from the fisheries and the potential of aquaculture, the beauty of our beaches is an important tourist attraction. The importance of the sea for the development of the Autonomous Regions, which our young democracy is interested in promoting, cannot be forgotten. All this requires effective action in the conservation of resources and in the protection of the marine environment.

We are fully aware of the role of Science as an essential factor in development and of how it depends on the existence of infrastructures, of stimulating intersectorial co-ordination with appropriate means, as well as the improved use of and increase in specialized personnel with a critical and innovative spirit. I would like to take this opportunity to reaffirm my Government's interest in the sea, for the wellbeing of the Portuguese people, of present and future generations. This interest has led the Government to create the Ministry of the Sea whose objective is to stimulate a coherent policy in this field, and to integrate the administration of the various economic sectors involved, assuring them of the necessary scientific and technical support. Thus the strong political wish to promote the development of the national scientific and technical capacities. This task will demand the increase in and rationalization of the existing institutions of oceanographic and fisheries research, and an efficient co-ordination of the essential personnel and means, including research ships, to respond to the needs of industry, optimizing the investments in the area of research, which are essential in a field which is particularly expensive.

This is an activity in which the National Scientific and Technological Research Agency, through its Permanent Oceanology Commission, will have an important role to play, as an institutional framework for more active co-operation between the relevant national

scientific institutions such as the National Institute of Fishery Research. The function of the Universities in educating and training personnel and in the area of research must be mentioned here.

In the efforts already made in order to develop the national capacities in marine science and technology we have benefited from bilateral co-operation and aid from friendly countries - such as Norway - as well as from participating in the activities of international organizations to which Portugal belongs. I take this opportunity to affirm the Portuguese Government's intention to favour all actions contributing towards helping the exchange of information and technology, in accordance with the clauses of the United Nations Convention on Law of the Sea, to which Portugal has subscribed, and also that it supports the Intergovernmental Oceanographic Commission in all programmes and activities intended to develop national capacities in science and technology and in oceanic services by means of mutual assistance which will serve to reduce the gap between highly developed and underdeveloped countries, and to stimulate an ever increasing spirit of co-operation.

Therefore, as a European country, we consider the increasing efforts of the Council of Europe towards developing co-operation in the field of marine science and its applications to be most opportune. Portugal is also willing to share what means it has available with other countries in activities of mutual interest, and in particular with those countries with which, for historic, cultural and linguistic reasons, we have great affinities. With that end in view and within the framework of co-operation, Portugal is studying the possibility of adopting concrete measures in support of the TEMA activities of the IOC, by providing grants, courses and training programmes in national institutions, and other relevant activities for scientists and technical personnel of Portuguese speaking countries.

Although Portugal has been a member of the IOC for many years, it has only recently been following the work of the Commission in a more systematic fashion, and we plan to strengthen this co-operation in matters which are of special interest to our country. The Session of the Working Committee in Lisbon, together with the presence of so many distinguished specialists in marine science, also provides an opportunity of contracting our national scientific institutions and, in particular, the INIP and the Navy's Hydrographic Office, including a visit to their respective ships, the "Noruega" and the "Almeida Carvalho". This visit will certainly contribute to the strengthening of the existing ties of co-operation.

At a time when a new ocean regime is emerging (and here I must say that I hope the United Nations Convention on the Law of the Sea can be ratified by the States, as soon as possible - including Portugal - so that it can come into force) the IOC has the important task of promoting and facilitating the implementation of the regime for scientific research and the transfer of knowledge and marine technology.

I do not wish to end without reminding you that the Portuguese Government suggested, at the time, Lisbon as a possible headquarters for the International Tribunal for the Law of the Sea. The Portuguese Government, bearing in mind the maritime and cultural traditions of its country and the close ties with all countries of the world, is still

willing to be the host country for an international maritime organization, if any such opportunity should arise, and the world community is favourable.

Mr. President, Ladies and Gentlemen,

The subjects on the Agenda of this Session seems to me to be extremely interesting, and therefore, in the name of my Government, I wish every success in the work you are undertaking here in Lisbon.

ANNEX IV

LIST OF PARTICIPANTS/LISTE DES PARTICIPANTS/LISTA DE PARTICIPANTES

I. PARTICIPANTS FROM MEMBER STATES

ALGERIA

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ANNEX V

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ASFIS (FAO-IOC-UN (DETB) Unesco))	Aquatic Sciences and Fisheries Information System
CCCC	Joint SCOR-IOC Committee on Climate Changes and the Ocean
CCOP (SOPAC)	Committee for the Co-ordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas
CPPS	Comision Permanente del Pacifico Sur
ECOR	Engineering Committee on Oceanic Resources
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization of the United Nations
GEMSI (IOC)	GIPME Group on Experts on Methods, Standards and Intercalibration
GIPME (IOC)	Global Investigation of Pollution in the Marine Environment; Working Committee for GIPME
IAEA	International Atomic Energy Agency
ICES	International Commission for the Scientific Exploration of the Mediterranean Sea
ICSPRO (UN-FAO-Unesco- WMO-IMO)	Inter-secretariat Committee on Scientific Programmes Relating to Oceanography
ICSU	International Council of Scientific Unions
IDRC (Canada)	International Development Research Centre
IGOSS (IOC-WMO)	Integrated Global Ocean Services System
IHO	International Hydrographic Organization
IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission
IOCARIBE	IOC Association (or Sub-Commission) for the Caribbean and Adjacent Regions

IOCINCWIO	IOC Programme Group for the Co-operative Investigation in the North and Central Western Indian Ocean
IOCINDIO	IOC Programme Group for the Central Indian Ocean
IODE (IOC)	International Oceanographic Data Exchange
IOCEA	IOC Programme Group for the Eastern Central Atlantic
IREP	International Recruitment Experiment
LEPOR (IOC)	Long-term and Expanded Programme of Oceanic Exploration and Research
LOSI (IOC)	Ad hoc Task Team to Study the Implication, to the Commission, of the UN Convention on the Law of the Sea and the New Ocean Regime
APMOPP (IOC-WMO)	Joint IOC-WMO Marine Pollution (Petroleum) Monitoring Pilot Project
MARPOLMON (IOC)	Marine Pollution Monitoring Programme
MEDI (IOC)	Marine Environmental Data Information Referral System
MEDPOL (UNEP)	UNEP Co-ordinated Mediterranean Pollution Monitoring and Research Programme
MSL	Mean Sea Level
NODC	National Oceanographic Data Centre
OETB (UN)	Ocean Economics and Technology Branch
OSLR (IOC-FAO)	Ocean Science in Relation to Living Resources
OSNLR (IOC-UN(OETB))	Ocean Science in Relation to Non-Living Resources
TEMA (IOC)	Training, Education and Mutual Assistance in the Marine Science
UN	United Nations
UNCLOS	United Nations Conference (or Convention) on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme

UNU	United Nations University
VAP (IOC)	IOC Voluntary Assistance Programme
VCP (WMO)	WMO Voluntary Co-operation Programme
WCRP (ICSU-WMO)	World Climate Research Programme
WCRP-O	The Oceanographic Component of the WCRP
WDC	World Data Centre
WESTPAC	IOC Programme Group for the Western Pacific
WHO	World Health Organization
WOCE	World Ocean Circulation Experiment