Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

IOC Group of Experts on Marine Geology and Geophysics in the Western Pacific

First Session

Townsville, Australia, 4-6 December 1986

Unesco

Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

IOC Group of Experts on Marine Geology and Geophysics in the Western Pacific

First Session

Townsville, Australia, 4-6 December 1986

Unesco

IOC/GEMGGWP-I/3
Paris, 14 May 1987
English only

In this Series

Reports of Meetings of Experts and Equivalent Bodies, which was initiated in 1984, the reports of the following meetings have already been issued:

- Third Meeting of the Central Editorial Board for the Geological/ Geophysical Atlases of the Atlantic and Pacific Oceans
- Fourth Meeting of the Central Editorial Board for the Geological/ Geophysical Atlases of the Atlantic and Pacific Oceans
- Fourth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of «El Niño»
- First Session of the IOC-FAO Guiding Group of Experts on the Programme of Ocean Science in relation to Living Resources
- First Session of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in relation to Non-Living Resources
- First Session of the Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
- First Session of the Joint CCOP (SOPAC)-IOC Working Group on South Pacific Tectonics and Resources
- First Session of the IODE Group of Experts on Marine Information Management
- Tenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies in East Asian Tectonics and Resources
- Sixth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
- First Session of the IOC Consultative Group on Ocean Mapping
- Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ships-of-Opportunity Programmes
- Second Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
- Third Session of the Group of Experts on Format Development of the Working Committee on International Oceanographic Data Exchange
- Eleventh Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of South-East Asian Tectonics and Resources
- Second Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
- Seventh Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
- Second Session of the IOC Group of Experts on Effects of Pollutants
- Primera Reunión del Comité Editorial de la COI para la Carta Batimétrica Internacional del Mar Caribe y Parte del Océano Pacífico frente a Centroamérica
- Third Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
- Twelfth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of South-East Asian Tectonics and Resources
- Second Session of the IODE Group of Experts Marine Information Management

TABLE OF CONTENTS

1. OPENING

The IOC Group of Experts on Marine Geology and Geophysics in the Western Pacific met in Townsville, Queensland, Australia, on 4 and 6 December 1986. The IOC Senior Assistant Secretary, Mr. Ray C. Griffiths, acting as Technical Secretary for the Session, welcomed the participants (List of Participants is in Annex IV, hereto).

2. ADMINISTRATIVE ARRANGEMENTS

The Technical Secretary briefly reviewed the background to the formation of the Group and the Agenda (Document IOC/GEMGGWP-I/1) before it at the present Session.

The Group of Experts proposed a minor restructuring of the Agenda to allow the discussion on OSNLR to be considered independently. The Technical Secretary advised the Group that this presented no difficulty, and the Agenda, with this minor restructuring, is in Annex I. The Technical Secretary referred the experts to the Annotated Agenda as the basis for the work of the Session and recalled certain key documents relevant to the issues before the present Session.

3. ELECTION OF CHAIRMAN

The Group invited Dr. Hideo Kagami to assume the Chairmanship. Dr. Kagami accepted this invitation.

4. REVIEW OF OSNLR

The Chairman invited Dr. Peter Cook, Vice-Chairman of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources (OSNLR), to review the state of development of OSNLR and how the regional activities relate to the global programme.

The Vice-Chairman of the Guiding Group outlined the basis on which it had decided priorities for the OSNLR programme. These included:

- the potential for being global in scope or interests;
- good science relevant to non-living resources;
- not being done or fostered by any other group (i.e., no duplication);
- being feasible, with objectives attainable within a reasonable period of time.

With these constraints in mind, the Guiding Group saw a need for projects that were essentially regional in scope (the WESTPAC proposal on Margins of Active Plates was seen in this light) and one or more that was global. The WESTPAC proposal on Sea-level, Environments and Tectonics (SET) was seen to be one that could be developed into a project that would be highly relevant to the study of non-living resources, regionally and globally. However, there is a need to narrow down the proposal, and the Guiding Group decided to focus on the last million years. This limit is somewhat arbitrary and no doubt there will be a need to go beyond the constraint of a million years; it could even be argued that the last 10 million years might be a better time slice. However, the important point is to focus the efforts of any global programme (e.g., SETMY) sufficiently to ensure that it does not become too broad and consequently fail.

Although, in OSNLR, the nearshore zone and a limited number of commodities within that zone (e.g., placers; the coastal zone as a resource; construction materials; phosphorites) will be emphasized, the deep ocean will not be neglected. The initiative to be taken here is to facilitate the involvement of scientists from developing countries in the Ocean Drilling Project. If this can be achieved, then it would be a very valuable and practical outcome.

The Chairman thanked Dr. Cook for his brief review and invited the Group of Experts to keep this information in mind when considering future activities.

5. FUTURE ACTIVITIES OF THE GROUP OF EXPERTS

The Group of Experts recognized that the initial proposal for a project on Sea-level, Environments and Tectonics (SET) and one on Margins of Active Plates (MAP), drawn up at an expert consultation (Document IOC/WPOSNLR-ad hoc-I/3) immediately prior to the Third Session of the IOC Programme Group for the Western Pacific (Townsville, September 1983), provides a good basis for the future activities of the Group of Experts. However, it agreed that the original proposal on MAP should be updated and include a section on origin and evolution of microplates.

In the context of MAP, the northern mountain system of Papua-New Guinea is widely regarded as being one of the biggest collision zones in the world, occurring between the Australian passive margin and several island arcs. Earthquake data show that convergence is continuing. Though possessing many of the aspects of a "thin-skinned" thrust belt, seismic evidence suggests significant basement involvement in the thrusting. In addition, strike-slip motion is also important.

The Group of Experts identified the following major problems as focusses of marine geological/geophysical research:

(i) Gusap Argillite: a tectonized unit above the Ramu Markham fault zone; age, structure, pressure-temperature conditions (micro-plate concept);

(ii) Quaternary deformation in the Markham Valley-changing facies along the fault trace;

(iii) Relation between volcanism and thrusting in the fold and thrust;

(iv) Developing balanced cross sections for careful reconstruction;

(v) Emplacement of oceanic crust into mountains.

The revised version of MAP is attached hereto as Annex II.

Regarding SET, the Group of Experts considered that the proposal drawn up at the expert consultation just prior to the Third Session of the Programme Group, as mentioned above, was essentially comprehensive enough, and is attached in Annex III.

The Group of Experts proposed two series of field study workshops, one relevant to MAP, the other to SET. Each series would consist of approximately four field study workshops; if possible, one workshop in each series should be convened biennially. The purpose of the workshops would be to catalyse research, provide a mechanism for communication, and for developing standards and uniform nomenclature.

The Group of Experts requested the Secretary of IOC to seek support from interested Member States for the organization, convening and follow-up of the proposed field study workshops.

The Group of Experts anticipated that, with field study workshops every two years, there would be ample scope for significant research between them, that relevant research would be reported at the biennial field study workshops, which would also be used for planning the next phase of research.

The Group of Experts agreed that there was a need to nominate Project Leaders for each of the two projects (SET and MAP) and Local Convenors for each of the workshops. Inevitably, the success of the projects and of invididual field study workshops will depend considerably on the quality of leadership and the enthusiasm of the Project Leaders and the Workshop Convenors.

The Group of Experts specifically recommended to the Secretary of IOC the organization of an IOC Geological and Geophysical Field Study Workshop, and invited him to approach the Geological Survey of Papua New Guinea with a view to holding such a field study workshop in

Papua New Guinea in August 1988. The desirable location for the field work is along a transect across the mountain system, including the Finistere Range, Ramu-Markham fault zone, Mount Hagen, and the fold and thrust belt. The field study workshop should also include an excursion to the south-east end of the Papuan peninsula where incipient rifting is indicated. The purpose of the field study workshop should be to identify major geological problems for further study under external funding and to identify major problems of off-shore geology for further study focussing on aspects that tie together off-shore neotectonics with on-shore geologic investigations.

The Group of Experts recommended that the Secretary of IOC invite Dr. R. Rogerson (GSPNG), Dr. D. Falvey (BMR, Australia), Prof. E. Silver (UC Santa Cruz), and Dr. B. Taylor (HIG), as leading researchers of this particular tectonic feature, to act as a Steering Committee for the proposed field study workshop. The expected number of participants is 30.

The Group of Experts regarded the SET workshop(s) as being somewhat different in geographic scope in that they related to SETMY, a global programme under OSNLR, and therefore could appropriately be pursued in a number of regions. It called on the Guiding Group of Experts on OSNLR to consider the desirabilty of organizing one field study workshop on sea-level changes, environments and tectonics in the past million years in each of the IOC "regions" (e.g., WESTPAC, IOCARIBE etc). Within the WESTPAC region, field study workshops related to SETMY could be held in PNG (though it should be recalled that a MAP field study workshop was proposed above to be convened there), New Caledonia (or Polynesia) and Australia. Equally well defined long-duration sea-level curves exist in places such as the Caribbean, the southeastern United States, western North America etc.

5.1. CO-ORDINATION WITH THE IOC-UN (OETB) GUIDING GROUP OF EXPERTS ON OSNLR

The Group of Experts recognized the fact that it would, in effect, act as a regional arm of the Guiding Group and promote appropriate studies of general (global) interest as well as those of specific (regional) interest. It recommended to the Secretary IOC that he make arrangements for one or more members of the Group of Experts to attend meetings of the Guiding Group of Experts to promote the required co-ordination. It also suggested that, periodically, the meeting of the Guiding Group of Experts be held in the WESTPAC region, as a way of focussing on WESTPAC activities and enhancing the required co-ordination.

5.2 CO-ORDINATION WITH SEATAR

SEATAR is the Joint CCOP-IOC Working Group on Post-IDOE Studies of East Asia Tectonics and Resources. Through this Joint Working Group the co-sponsors have carried out thirteen geophysical transects, through the relevant national agencies (e.g., Geological Surveys, Bureaus of Mineral Resources etc.) in the CCOP member countries. The infrastructure for such studies therefore exists. The principal objective of CCOP is, as its title indicates, the Co-ordination of Joint Prospecting for Mineral Resources in South-east Asian Offshore Areas. On the other hand, the IOC has a broader interest: promoting co-operative international marine scientific (in this case marine geological/geophysical) research and investigations, as well as the related ocean services, training, education and mutual assistance. CCOP also incorporates a significant training element into its activities.

The Group of Experts recognized that, in the south-east Asian area, any work proposed and undertaken by the IOC through the IOC Programme Group for the Western Pacific should be co-ordinated with the relevant work of SEATAR and carried out in close collaboration with SEATAR. Since the first phase of SEATAR, represented by the completion of the SEATAR Transect Studies, is coming to an end, the co-ordination of future activities is particularly important. This will also involve an increased co-operation between governmental and academic or research geologists and geophysicists. To achieve the required co-ordination, the Group of Experts recommended to the IOC that one or more of the Group's members be designated to represent IOC at sessions of SEATAR.

Pending the implementation of the programmes proposed in section 5, above, the Group of Experts strongly recommended that the co-sponsors of SEATAR take all possible steps to publish the SEATAR Transects as soon as possible and make them widely available to the geoscientific community. The Group of Experts firmly believed that, to do this, an overall Transect Co-ordinator dedicated full time for at least six months, up to one year, should be made available by the co-sponsors of SEATAR, and strongly recommended them to retain the services of an experienced marine geological editor for this purpose.

The Group of Experts recommended to the IOC that it continue to promote the study of south-east Asian tectonics so as to provide a regional framework for the exploration and eventual exploitation of mineral resources.

5.3 CO-ORDINATION WITH STAR

The Group of Experts noted that STAR had adopted some of the programmes endorsed by the IOC Programme Group for the Western Pacific at its Third Session (Jakarta, 1983). It recognized that here too, as for SEATAR, any WESTPAC activities in the field of marine geology and geophysics would have to be co-ordinated with STAR, and implemented in

close collaboration with STAR as an effective mechanism in this field in the South Pacific.

The Group of Experts similarly recommended to the Secretary of IOC, as for co-operation with SEATAR, that one or more of its members be invited to attend sessions of STAR, or that, if appropriate, joint sessions be organized.

6. ADOPTION OF THE SUMMARY REPORT

The Chairman reconvened the session on Saturday 6 December 1986 at 0900 hr. to review and adopt the draft Summary Report. In discussing section 5, the Group of Experts decided that it would be sensible to approach Dr. Rogerson of the Geological Survey of Papua New Guinea to obtain his views on the convenience and content of the proposed field study workshop and, if necessary, to adjust the proposed plan of the field workshop in Papua-New Guinea accordingly. Professor Eli Silver agreed to arrange this consultation through Dr. Robert McCaffrey, of the MIT, who was due to undertake a mission to PNG shortly, and to inform the Chairman of the Group of Experts and the Technical Secretary of the outcome of such consultations.

The Group of Experts adopted the Summary Report of its First Session.

7. CLOSURE

The Chairman closed the First Session at about 1100 on 6 December 1987.

ANNEX I

AGENDA

1. OPENING

2. ADMINISTRATIVE ARRANGEMENTS

3. ELECTION OF CHAIRMAN

4. REVIEW OF OSNLR

5. FUTURE ACTIVITIES OF THE GROUP OF EXPERTS

   5.1 Co-ordination with the IOC-UN(OETB)Guiding Group of Experts on OSNLR

   5.2 Co-ordination with SEATAR

   5.3 Co-ordination with STAR

6. ADOPTION OF THE SUMMARY REPORT

7. CLOSURE

ANNEX II

OUTLINE OF THE PROGRAMME ON MARGINS OF ACTIVE PLATES (MAP)

Scope

This programme will focus on aspects of the geological evolution of the complex active plate boundaries of the western Pacific. In this region, defined by the zone of intense earthquake activity, oceanic lithosphere is created at marginal basin spreading ridges and is destroyed by underthrusting "subduction" at islands and volcanic arcs. Large-scale horizontal displacement of crustal accretion leads to arc-arc and arc-continent collisions and crustal accretion resulting in the formation of fold mountain belts. All active plate boundaries are to some extent in a state of evolution - the fundamental driving mechanisms of such evolution are only sketchily understood. As part of programmes aimed at resolving these driving mechanisms, projects leading to terrane identification and tectonic process labelling will be necessary.

Objectives

(i) To define the Tertiary history and kinematic framework of the western Pacific plate boundaries as a prerequisite to quantifying back-arc and collision tectonic processes.

(ii) To identify the structural, thermal, magmatic, volcanic, tectonic and eustatic processes involved in arc rifting and back-arc sea-floor spreading.

(iii) To identify processes of arc collision and terrane accretion through the identification of styles of structural deformation, including ophiolite emplacement, displaced terranes in collision complexes, mechanism and causes of plate boundary relocation/ reactivation mechanisms for associated sedimentary basin evolution, and factors affecting vertical tectonics.

Significance

(i) Most of the world's modern island arcs and active back-arc basins occur in the WESTPAC region. However, they are also incorporated in ancient fold belts where they contain major ore bodies. An understanding of modern processes provides a key to exploration in older terranes.

(ii) This programme has immediate application to exploration for petroleum and minerals in the present-day island arcs and foldbelts of the western Pacific.

(iii) The programme also provides a tectonic framework for geological hazards: major earthquake, volcanic eruptions, tsunamis and landslips.

Origin and Evolution of Microplates (OEM)

The western Pacific is composed entirely of a large number of microplates that are completely or partly surrounded by seismic zones and/or active faults. The origins of these microplates are variable, and are as follows, together with examples: (i) orthogonal arc-arc collision (Izu peninsula); (ii) highly oblique arc-continent collision (New Guinea); (iii) back-arc spreading (Mariana-Bonin Trough); (iv) fore-arc sliver by oblique subduction (southern Kurile arc); (v) ridge jump (Ontong Java plateau); (vi) trapped oceanic plate (Banda and Sulu Basins ; (vii) opening along suture zone (Woodlark Basin); and there are presumably more.

So-called terranes proposed by Coney et al. (1979) may directly correspond to microplates herein (Silver et al., 1984), and their stratigraphies are highly different from those in adjacent microplates. Along the three kinds of boundaries of microplates (divergent, convergent and transform) are observed distinct orogenic phenomena such as mountain building, magmatism, sedimentation, deformation and formation of continental crust through regional metamorphism. However, it is also undoubtedly true that these features are dissimilar to those along major plate boundaries in the order of magnitude, and physico-chemical characters. Following this philosophy, the following characteristics should be investigated; (i) age, petrography, chemistry and physics of magnatism; (ii) stratigraphic record within each microplate; (iii) tectonic deformation along plate boundary specifically along convergent zone; (iv) uplifting of regional metamorphic rocks; and (v) sedimentation.

Systematic analysis of these microplates in the western Pacific would greatly contribute to the modelling of the evolution of microplates, and help the understanding of terrane mosaics in circum-Pacific orogens.

Back-arc Tectonics (BAT)

There are numerous regions in the western Pacific where the objectives outlined above may be pursued. Actively spreading marginal basins in the region occur in the mariana Trough, Okinawa Trough, Bismarck Sea, Andaman Sea, Woodlark Basin, North Fiji Basin and the Lau Basin. However, two areas stand out as regions where the processes of arc rifting and back-arc spreading can best be investigated in relation to the full suite of objectives. These are:

(i) the Mariana - Bonin region, and

(ii) the Woodlark - East Papua region.

Both of these areas allow an investigation of the spatial and temporal development of back-arc basins, from their initial rift stage to mature development. Understanding the processes involved in this development will particularly require detailed sea-floor geological mapping, requiring bathymetric/side-scan swath mapping and submersible sampling/observations. A comparative study of both areas would be particularly beneficial. Particular attention will also need to be placed on the determination of microplate/plate kinematics and their relationship to magmatic/hydrothermal activity, structural evolution and consequent crustal structure.

Collision Tectonics (COT)

Several different types of collision zones are well developed in the WESTPAC region. Arc-continent collision is occurring in Taiwan, Timor, Mindanao-Molucca and northern New Guinea. A mosaic of "displaced" terranes has been assembled by strike-slip and collision tectonics in the Philippines, Borneo and central New Guinea. Microcontinental fragments, oceanic plateaus, aseismic ridges and seamounts are colliding with trenches along the entire western Pacific boundary from Japan to New Zealand. There are several equally important areas where the three different types of collision may be studied. Several of these are being studied under other regional programmes. However, two areas in particular could be usefully adopted by the Programme Group for WESTPAC. These are:

(a) the Louisville Ridge collision with the Tonga Trench

(b) the late Tertiary arc-continent collisions in northern New Guinea

The latter could be compared very profitably to the SEATAR studies in the Philippines and the Indonesian-Australian mapping programme in Kalimantan. It represents a particularly complex problem involving a series of accretion and collision events. Besides offshore programmes, a transect is suggested from the Bismarck/Caroline Basins across the foldbelt involving palaeomagnetic and deep crustal seismic studies.

ANNEX III

OUTLINE OF THE PROGRAMME ON SEA LEVEL, ENVIRONMENTS AND TECTONICS (SET)

Scope

This programme is concerned with the interaction between changes in sea level, vertical tectonic movement, and the depositional environments of sediments.

In the western Pacific, the unravelling of the processes that form sedimentary sequences on continental margins is unusually complex.

Recognized frameworks for analysis based on oscillations of sea level are complicated in many places by rapid tectonism, in some places by changes in ocean currents and in other places by high carbonate growth. The limited understanding has inhibited analysis of the structural and sedimentological evolution of the region and the interpretation of that evolution in terms of mineral and energy potential.

There appears to be a clear need to document and understand the evolution of sedimentary environments in terms of changes in the overlying water and underlying crust and lithosphere.

Objectives

(i) To differentiate between eustatic and tectonic sea-level changes and other environmental changes in the evolution of key sedimentary sequences, and to study mechanisms, rates and products.

(ii) To identify criteria that consistently provide indices of particular interrelationships that can be used for the interpretation of sequences.

Significance

(i) The WESTPAC region uniquely allows the study of juxtaposed sediment sequences on tectonically active and passive margins. The scientific solution to many global problems resides within

the region. The understanding of, for example, the evolution of carbonate sequences under different tectonic regimes will provide comprehensively applicable analogues for the interpretation of ancient sequences elsewhere.

(ii) This programme will have direct application to studies of hydrocarbon evaluation, and exploration for offshore heavy minerals.

Sedimentary Evolution in Active Margins (SEAM)

The resolution of factors that affect the evolution of major sedimentary bodies and the correlation of seismic sequences is particularly complex along the rapidly changing plate boundaries of the western Pacific.

The objective is to define the general principles for the evolution of sedimentary sequences in several key areas that are of major importance or unique to the western Pacific.

(i) Trench-slope and fore-arc basins, particularly adjacent to major land masses.

(ii) Intra-arc basins, an element of reversed arcs in the Solomon Islands, Vanuatu, Fiji and Papua New Guinea.

(iii) The unique hierarchy of young and old marginal basins of the Pacific.

(iv) Slope-toe areas affected by western boundary undercurrents which may have oscillated in time and space.

Understanding of these primary processes could be a significant contribution to understanding hydrocarbon generation in some basins and polymetallic nodules in slope-toe areas and adjacent ocean floors.

Cenozoic Reef Evolution in Space and Time (CREST)

In the western Pacific, more than in other parts of the earth, coral reefs have thrived in a wide variety of tectonic environments now and throughout the Cenozoic. The main objectives are:

(i) To define and compare the geometric growth, the history and factors affecting evolution of reefs and their associated fore-reef and back-reef deposits along passive continental margins, offshore marginal plateaus, collision-overprinted passive margins and active margins.

(ii) To define the interrelationships between carbonate and terrigenous sedimentation with changes of sea level and tectonic setting.

(iii) To use the foregoing objectives for the precise analysis of older reef sequences, particularly as they are expressed in seismic reflection record sections.

(iv) To consider reefs and their associated deposits as source rocks and reservoirs for hydrocarbons.

Outstanding areas for study are around the Coral and South China Seas, although useful research is possible throughout the western Pacific. With respect to the South China Sea, various shelf and slope basins in the region are, or have been, the focus of intense petroleum exploration, providing a still unpublished and largely unintegrated body of scientific data.

ANNEX IV

LIST OF PARTICIPANTS

I. MEMBERS OF THE GROUP

S.K. CHONG **
Korea Institute of Energy and Resources (KIER)
219-5, Garibong-Dong
Guro-Gu
Seoul
KOREA 150-6

Tel. : 856-0041-7/854-5081-6
Telex : K 24337

J. DANIEL
ORSTOM
B.P. A5
Noumea
NOUVELLE-CALEDONIE

Telex : ORSTOM 193NM

D.A. FALVEY
Bureau of Mineral Resources
P.O. Box 378
Canberra ACT 2601
AUSTRALIA

Tel. : (61) (62) 644 064
Telex : AA 62484

---

* Although expected, they did not appear

** Accepted invitation to be members of the Group but were unable to attend since they were on sabbatical leave in the USA

*** Accepted invitation to be member of the Group but could not attend

H. KAGAMI
Ocean Research Institute
University of Tokyo
Nakano, Tokyo 164
JAPON

Telex : 256 07 J ORIUT

S. POOBRASERT
Department of Geology, Faculty of Sciences
Chulalongkorn University
Bangkok 10500
THAILAND

Telex : 20217 UNICHUL TH

***
B. TAYLOR
Hawaii Institute of Geophysics
2525 Correa Road
Honolulu
Hawaii 96822
USA

Telex : UNIHAW

*
B.I. VASILIEV
Pacific Institute of Geography
7 Radio St. 690032
Vladivostok
USSR

*
Y. YE
Second Institute of Oceanography
State Oceanic Administration
P.O. Box 507
Hangzhou, Zhejiang
PEOPLE'S REPUBLIC OF CHINA

Telex : 35035 NBOHZ CN
Cable : 3152

S. WIRASANTOSA **
Indonesian Institute of Sciences
Center for Oceanological Research and Development
Jl.Pasir Putih I
Ancol Timur
P.O. Box 580
Dak
JAKARTA 11001

Tel. : 683850
Telex : 45875 PDIN-IA
Cable : LONAS

II NON-MEMBER EXPERTS INVITED TO THE FIRST SESSION

J.S. BUNT
(As Chairman of WESTPAC Programme Group)
P.O. Box 422
MALANDA
Queensland
AUSTRALIA 4885

Tel. : (070) 965757
Telex : AA47 165

P. COOK
(As Vice-Chairman of IOC-UN(OETB)
Guiding Group of Experts on OSNLR)
Bureau of Mineral Resources
P.O. Box 378
Canberra ACT 2601
AUSTRALIA

Telex : BUROMIN

B. PREOBRAZHENSKY
Pacific Institute of Geography
7 Radio St. 690032
Vladivostok
USSR

E. SILVER
Earth Sciences, University of California
Santa Cruz, California 95064
USA

III OBSERVER FROM IOC MEMBER STATE

V. LLICHEV
Pacific Institute of Geography
7 Radio St. 690032
Vladivostok
USSR

IV SECRETARIAT

R.C. GRIFFITHS
Technical Secretary for the Session
Intergovernmental Oceanographic Commission
Unesco
7, Place de Fontenoy
75700 PARIS

Tel. : (1) 45 68 39 79

ANNEX V

LIST OF ACRONYMS

BAT	Back-arc Tectonics
BMR	Bureau of Mineral Resources of Australia
CCOP	Committee for Co-ordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas
CCOP(SOPAC)	Committee for the Co-ordination of Joint Prospectinf for Mineral Resources in South Pacific Offshore Areas
COT	Collision Tectonics
CREST	Cenozoic Reef Evolution in Space and Time
GSPNG	Geological Survey of Papua-New Guinea
HIG	Hawaii Institute of Geophysics
IOC	Intergovernmental Oceanographic Commission
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
KIER	Korea Institute of Energy and Resources
MAP	Margins of Active Plates
MIT	Massachusetts Institute of Technology
OEM	Origin and Evolution of Microplates
OETB (UN)	Ocean Economics and Technology Branch

ORSTOM	Institut Français de Recherche Scientifique pour le Développement en Coopération (previously, Office de la Recherche Scientifique et Technique Outre-Mer)
OSNLR	IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources
PNG	Papua-New Guinea
SEAM	Sedimentary Evolution in Active Margins
SEATAR	Joint CCOP-IOC Working Group on Post-IDOE Studies on East Asia Tectonics and Resources
SET	Sea-level, Environments and Tectonics
SETMY	Sea-level Changes, Environments and Tectonics during the Past Million Years
STAR	Joint CCOP(SOPAC)-IOC Working Group on South Pacific Tectonics and Resources
UC	University of California
UN	United Nations
WESTPAC	IOC Regional Committee (formerly Programme Group) for the Western Pacific