COMMITTEE FOR CO-ORDINATION OF JOINT PROSPECTING FOR MINERAL RESOURCES IN ASIAN OFFSHORE AREAS (CCOP)

PROCEEDINGS OF THE
TWENTY - FIFTH SESSION
5 - 13 DECEMBER 1988
BAGUIO CITY, THE PHILIPPINES

PART 1

REPORT OF THE COMMITTEE

COMMITTEE FOR CO-ORDINATION OF JOINT PROSPECTING FOR MINERAL RESOURCES IN ASIAN OFFSHORE AREAS (CCOP)

PROCEEDINGS OF THE
TWENTY - FIFTH SESSION
5 - 13 DECEMBER 1988
BAGUIO CITY, THE PHILIPPINES

PART 1

REPORT OF THE COMMITTEE

March 1989
Bangkok, Thailand

CCOP Technical Secretariat, 2nd floor, Offshore Mining Organization Building,
110/2 Sathorn Nua Road, Bangrak, Bangkok 10500, Thailand
Tel: 234-3578 – 9, Telex: 20959 CCOP TH

Surface mail : US$ 3
Airmail : US$ 5 (Asia)
US$ 6 (Europe & Australia)
US$ 7 (North America & Elsewhere)

Explanatory note to the readers:

The Committee for Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas (CCOP) is an Intergovernmental Committee, originally founded in 1966 under the sponsorship of ECAFE (now ESCAP). Member nations of the Committee include People's Republic of China, Indonesia, Japan, Kampuchea, Malaysia, Papua New Guinea, Republic of Korea, Philippines, Singapore, Thailand and Viet Nam.

Principal support is derived from the United Nations Development Programme, from contributions of co-operating countries, and from funds and "in kind" support provided by the member countries.

The Committee meets annually for a ten-day session at which time past progress and future plans are reviewed and developed.

The meeting itself is built around a central theme consisting of a review of technical progress and development of future plans. This key meeting is in fact a joint meeting of Committee members (including alternates) and the Technical Advisory Group (TAG) which consists of Technical and Special Advisers, provided by co-operating and member countries and concerned institutions.

The joint session described above is preceded and followed by plenary sessions at which principally management and administrative problems of the Committee are reviewed and decisions taken.

The Committee Report (Part 1 of the Proceedings) which follows consists of matters reviewed in the two plenary sessions and the TAG session, and includes decisions taken by the Committee in respect to future programming.

The Technical Advisory Group also prepares a report which fully explores the technical aspects of the programme and which is here presented as an annex.

Other reports, prepared by co-operating institutions, by Working Groups or panels, or of special interest to the Committee and/or TAG, are also included as annexes. Among these are reports of the Steering Committee (of CCOP) and the regularly issued financial report prepared by the Project Office/Secretariat.

In the course of the ten-day session many documents are offered for consideration by the participants. Of these, documents dealing with geology and geophysics, and of concern to member countries, are published separately as Part 2 (Technical Reports) of the Proceedings.

Part 1 is usually published and circulated in the first months following a given session, while Part 2 is issued approximately a year later.

ABBREVIATIONS AND ACRONYMS

AGID	Association of Geoscientists for International Development
AIT	Asian Institute of Technology
ASEAN	Association of Southeast Asian Nations
ASCOPE	ASEAN Council on Petroleum
CCOP	Co-ordinating Committee for Offshore Prospecting (full title: Committee for Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas)
CCOP/SOPAC	Committee for Co-ordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas
CGMW	Commission for the Geological Map of the World
CMG	Commission on Marine Geology of IUGS
COGEODATA	IUGS Committee on Storage, Automatic Processing and Retrieval of Geological Data
CPC	Circum-Pacific Council
CPCEMR	Circum-Pacific Council for Energy and Mineral Resources
CPMP	Circum-Pacific Map Project
DMR	Department of Mineral Resources (Thailand)
DTCD	Department of Technical Co-operation and Development (UN)
EAOTC	East Asian Offshore Training Centre
EAPI	Environmental and Policy Institute
ECOR	Engineering Committee on Oceanic Resources (Norway)
ESCAP	Economic and Social Commission for Asia and the Pacific
EWC	East-West Centre
GEOSEA V	Fifth Regional Congress on Geology, Mineral and Energy Resources of Southeast Asia
GSJ	Geological Survey of Japan
GSI	Geological Survey Institute
ICG	Inter-Union Commission on Geodynamics
IDOE	International Decade of Ocean Exploration
IDRC	International Development Research Centre, (Ottawa, Canada)
IGCP	International Geological Correlation Programme
IGS	Institute of Geological Sciences (UK)
INQUA	International Union for Quaternary Research
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IPOD/AODP	International Programme of Ocean Drilling/Advanced Ocean Drilling Programme
ISOT	International School of Offshore Technology (Oslo, Norway)
IUGS	International Union of Geological Sciences
IWGGM	Indonesian Working Group on Gravity and Magnetics
KIER	Korea Institute of Energy and Resources
LDGO	Lamont Doherty Geophysical Observatory (of Columbia University)
LEMIGAS	Oil and Cas Technology Development Centre (of Indonesia), Indonesian Institute of Science

MTDC	Mineral Technology Development Centre (Bandung)
NECOR	Norwegian Engineering Council on Oceanic Resources
NORAD	Norwegian Agency for International Development
OETO	Ocean Economic and Technology Office (UN)
OMO	Offshore Mining Organization (Thailand)
OPMC	Oriental Petroleum and Minerals Corporation
PEDCO	Korea Petroleum Development Corp
PNOC	Philippine National Oil Corporation
RCQ	Regional Centre for Quaternary Geology
RMRDC	Regional Mineral Resources Development Centre (Bandung)
ROPEA	(Technical support to) Regional Offshore Prospecting in East Asia (of UNDP)
SCOT	Standing Co-ordinating Committee on Training
SEATAR	Post-IDOE Studies of East Asia Tectonics and Resources
SEATRAD	Southeast Asian Tin Research and Development Centre
TAG	Technical Advisory Group (of CCOP)
TCDC	Technical Co-operation among Developing Countries
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organization
USGS	United States Geological Survey
USM	Universiti Sains, Malaysia
VEPS	Very Early Production System
WESTPAC	IOC Working Group on the Western Pacific
WGPD	Working Group on Petroleum Data (of CCOP/ASCOPE)
WGPG	Working Group on Petroleum Geology
WGHF	Working Group on Heat Flow
WGRA	Working Group on Resources Assessment

REPORT OF THE TWENTY-FIFTH SESSION OF THE COMMITTEE

Table of Contents

ANNEXES

FOR PARTICIPANTS ONLY

COMMITTEE FOR CO-ORDINATION OF JOINT PROSPECTING
FOR MINERAL RESOURCES IN ASIAN OFFSHORE AREAS (CCOP)

Twenty-fifth Session
5-13 December 1988
Baguio City, the Philippines

REPORT OF THE TWENTY-FIFTH SESSION OF CCOP

I. ATTENDANCE AND ORGANIZATION

Venue

1. The twenty-fifth session of the Committee for Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas (CCOP) and twenty-fourth session of its Technical Advisory Group (TAG) were held in Baguio City, the Philippines, from 5 to 13 December 1988. The twelfth CCOP Steering Committee meeting was held before and during the course of the annual session on the 4th, 7th, 8th and 9th of December.

2. Other meetings held in conjunction with the CCOP annual session were the Tripartite Review of Project RAS/86/138 "Technical Support for Regional Offshore Prospecting in East Asia" by CCOP member governments, ESCAP and UNDP on 10th December, the fourteenth session of the Joint CCOP-IOC Working Group on Post IDOE Studies in East Asian Tectonics and Resources (SEATAR) on 8th, 10th and 11th December and the fourteenth meeting of the Northwest Quadrant Panel of the Circum-Pacific Map Project on the 8th of December.

Attendance

3. The session was attended by representatives of the following member countries: China, Indonesia, Japan, Malaysia, the Philippines, Republic of Korea, Singapore and Thailand.

4. Special Advisers, representatives and experts provided by the co-operating countries of Australia, Belgium, Canada, the Federal Republic of Germany, Japan, The Netherlands, Norway, the United Kingdom, the Union of Soviet Socialist Republics and the United States also attended the session. In addition, Dr. C.Y. Li, founder of CCOP and its first Project Manager/Co-ordinator, also participated in the meeting in his capacity as Honorary Adviser to CCOP.

5. The following international organizations concerned with activities of CCOP were represented: United Nations Development Programme (UNDP), Economic and Social Commission for Asia and the Pacific (ESCAP), Department of Technical Co-operation for Development (DTCD) of the United Nations Headquarters in New York, the Intergovernmental Oceanographic Commission (IOC) of UNESCO, and the Circum-Pacific Map Project.

6. Staff of the CCOP Technical Secretariat and the Mines and Geosciences Bureau of the Philippines provided servicing of the Conference.

7. The list of participants is attached as Annex I to the report.

Welcoming/Opening Addresses

8. In his welcoming speech, the Mayor of Baguio City, Hon. Ramon Labo, extended his greetings to all the CCOP delegates and wished them an enjoyable stay in Baguio. He indicated that this was the first time that the Philippine Government was hosting a CCOP session in this city. He went on to say that Baguio is not only a convention city under whose roof several international conferences have already been held, but continues to be the summer capital of the Philippines and is the gateway to the mineral resources that abound in the surrounding Cordillera.

9. The session was inaugurated by Hon. Celso R. Roque, Undersecretary of the Department of Environment and Natural Resources, on behalf of Hon. Fulgencio S. Factoran, Jr., Secretary of Environment and Natural Resources of the Philippine Government. In his keynote address, Hon. Factoran noted that it had already been more than twenty-two years since the Philippines hosted the first session of CCOP. Throughout these years, CCOP had achieved a standard of excellence in the field of exploration of marine mineral resources. For this remarkable achievement, he congratulated the member and co-operating countries of CCOP and its affiliated organizations for freely

sharing their expertise and resources, as well as UNDP and ESCAP for significant and continuing support. All these have helped strengthen the professional and technical skills of numerous Asian scientists in undertaking offshore prospecting.

He reiterated that the Philippines is very fortunate in having benefited significantly from the undertakings of CCOP. The discovery of the first commercial oilfield in the country offshore northwest Palawan was partly due to the results of the airborne magnetic surveys conducted in the area through CCOP. He added that another vital outcome of CCOP's catalytic role was the acquisition of the Philippine's first geological/geophysical survey vessel, the RPS Explorer, in 1984 thru the grant-in-aid from the Japanese Government. The vessel strengthened and upgraded Philippine capability in offshore mineral resources assessment and marine geological mapping. Up to the present, CCOP has been continuously providing technical assistance to exploration projects involving this vessel. The scientific data that have been gathered to date by the vessel's expeditions have shown exciting potentials for gold, iron sand, chromite and even platinum in various portions of the Philippine offshore territory.

10. Hon. Factoran suggested that the meeting seriously consider the establishment of a training centre for marine mineral exploration and geology, for which the Philippines is willing to offer a site. The exploration vessel obtained from Japan could also be made available to the centre.

11. He concluded by asserting that in addition to exploration and geology, the training centre could also pioneer in the protection of the marine environment. The experience and expertise of CCOP could contribute significantly to the sustainable development of marine mineral resources.

12. In the statement by the Executive Secretary of ESCAP which was delivered by Dr. J. Ringis, Team Leader of the UNDP/ESCAP Technical Support to CCOP Project, he noted that the efforts by CCOP to promote regional co-operation in prospecting for hydrocarbon resources had not slowed down despite depressed oil prices. He also noted that an interesting development in CCOP activities had been the increased concern on the impact of offshore mining activities on the marine environment. This shows the willingness of CCOP to consider ocean space problems as a whole.

13. He hoped that ESCAP and CCOP would be able to co-operate on the development of marine mineral resources, which represent one

of the principal sources of wealth that could be extracted from maritime zones under national jurisdiction. He then expressed his gratitude to UNDP and the co-operating countries for their support of and assistance in the work of the Committee. He concluded by reaffirming that ESCAP would continue to render support to CCOP and that it looked forward to a continuing partnership between ESCAP and CCOP for the mutual benefit of the countries of the region.

14. In the statement by the CCOP Chairman for 1987/1988 delivered on his behalf by Mr. Akanit Suwanasing, representative of Thailand, profound thanks were expressed to the Government of the Philippines for its generosity in inviting the Committee to meet for its 25th session in Baguio City and for providing host facilities for the meeting.

15. According to the Chairman, CCOP is determined to continue its commitment to assist the member nations in accelerating exploration of their natural resource base by providing technical assistance in various fields to augment the technological development and skills of their workforce. It is now in the process of formulating its long-term objectives to reaffirm its resolute commitment mentioned above . Along with that process, it plans to build up its own technical staff to be recruited from the region. He stresses that all the above aims are expected to be realized next year which will also see the Technical Secretariat of CCOP being relocated to permanent premises to be provided by the Royal Government of Thailand.

16. Finally, he expressed, on behalf of the Committee, its heartfelt appreciation for the unstinted support and assistance from the participating Governments, the donor countries and organizations and the United Nations, without which CCOP would not be what it is today.

Election of Officers

17. Hon. Celso R. Roque, Undersecretary of the Department of Environment and Natural Resources of the Philippines, was unanimously elected Chairman for 1988/89. Dr. Chong Su Kim, representative of the Republic of Korea, was elected Vice-Chairman.

18. The Committee appointed Dr. Clive R. Jones, Special Adviser of the United Kingdom to CCOP, as Chairman of the twenty-fourth session of the Technical Advisory Group and appointed Dr. M. J. Keen, Special Adviser of Canada to CCOP, as rapporteur.

Adoption of the Agenda

19. The Committee adopted the following agenda:

Plenary Session I

1. Opening Addresses

2. Election of Chairman and Vice-Chairman for 1988/89

3. Nomination of Chairman and the Rapporteur of the Technical Advisory Group (TAG) for 1988/89

4. Adoption of the Agenda

5. Consideration of report of the Director, CCOP Technical Secretariat

6. Consideration of the long-term objectives of the CCOP

TAG Session

1. Activities relating to offshore hydrocarbon resources

   1.1 Review of activities in member countries

   1.2 Resources Assessment Programme

      1.2.1 Data Management

      1.2.2 East Asia Basin Analysis

      1.2.3 Heat Flow/Geothermometry Studies

      1.2.4 Mineral Commodities

   1.3 Co-operation with ASCOPE

   1.4 Pre-Tertiary hydrocarbon potential

   1.5 Consultancy/advisory services

   1.6 Seismic Stratigraphy and other workshops

   1.7 Proposed future activities

2. Offshore and coastal geophysical surveys

   2.1 Review of activities in member countries

2.2 Report on in-house training of member country personnel at the CCOP Technical Secretariat

2.3 Report on courses and lectures in high resolution marine geophysical techniques.

2.4 Report on correlation studies

2.5 Report on the compilation of atlases of high resolution marine seismic profiles

2.6 Consultancy/advisory services

2.7 Status of Project's equipment and procurement of new equipment

2.8 Planned future activities

3. Quaternary Geology Studies

3.1 Review of activities of the member countries

3.2 Review of assistance given in the field of applied Quaternary geology

3.3 Report on systematic Quaternary geological mapping programmes

3.4 Report on activities to upgrade laboratories in the countries

3.5 Review of co-operation with universities and other institutions

3.6 Report on the workshops/training courses/symposium in 1987 and 1988

3.7 Equipment acquisition

3.8 Establishment of a regional Quaternary Geology Center

3.9 Proposed future activities for the Quaternary progamme within CCOP

4. Aeromagnetic Map Compilation Programme

4.1 Aeromagnetic surveys, including Project MAGNET

4.2 Status of aeromagnetic map compilation

4.3 In-house training

5. Computer applications to data storage, retrieval and interpretation.

5.1 Review of activities in member countries and at the CCOP Technical Secretariat

5.2 Planned activities for 1989

6. Coastal zone resources and management studies

6.1 Review of coastal zone resources and management studies

6.2 Planned activities for 1989

7. Investigation and research relevant to CCOP activities

7.1 Deep sea marine minerals and hydrocarbons

7.2 Isotopic age determinations

7.3 Paleomagnetic studies

7.4 New survey techniques

7.5 Proposed future activities

8. CCOP training programme

8.1 Report on 1988

8.2 Programmes proposed

8.2.1 Fellowships/study tours
8.2.2 Workshop/seminars/symposia
(a) Regional
(b) National
8.2.3 On-the-job and in-house training
8.2.4 Proposed future activities

9. CCOP publication programme

10. Co-operation with national and international bodies

11. Adoption of the TAG report

Plenary Session II

7. Consideration of the Sub-committee and other reports

   7.1 Report of the Steering Committee

   7.2 Report of the 14th session of the CCOP/IOC Working Group on Post IDOE Studies in East Asian Tectonics and Resources (SEATAR)

   7.3 Report of the Circum-Pacific NW Quadrant Panel Map Meeting

   7.4 Report of TAG on its 24th session

   7.5 Report of the Special Advisers

8. Safety programme

9. Review of assistance and co-operation obtained and expected

10. Technical co-operation among developing countries of CCOP

11. Other policy and organizational matters

12. Date and venue of the twenty-sixth CCOP annual session

13. Adoption of report

14. Closing ceremony

II. GENERAL REVIEW OF PROGRESS SINCE THE TWENTY-FOURTH SESSION OF THE COMMITTEE
(Document: CCOP(XXV)/3)

20. The Director reviewed progress of the Committee's work programme and activities, in both administration and technical aspects, carried out by the CCOP Technical Secretariat over the preceding period from 1 November 1987-31 October 1988.

21. On administration, the Technical Secretariat staff now consists of the Director, an Assistant to the Director/Editor of CCOP Newsletter, an Accountant/Office Manager, three secretaries, a driver and a handyman. The UNDP/ESCAP Technical Support to CCOP Project had continued to provide the services of its three experts and three supporting staff who are based at the Technical Secretariat. The Governments of the Federal Republic of Germany, Japan and The Netherlands continued to provide non-reimbursable experts to CCOP. The Royal Norwegian Government has provided from November 1988, the services of a petroleum geologist on a non-reimbursable basis, to serve as the CCOP Resource Assessment Programme Coordinator. The U.S. Geological Survey also made available to CCOP the services of an expert to serve as CCOP interim consultant on SEATAR.

22. One new Special Adviser from Belgium and a new Honorary Adviser from Japan had been added to the Technical Advisory Group of CCOP.

23. Currently housed at the Offshore Mining Organization Building provided by the Royal Thai Government, the CCOP Technical Secretariat anticipated its relocation to new office premises at the Thai Department of Mineral Resources Building in the 4th quarter of 1989.

24. Annual cash contributions continued to be received from the participating member Governments in a timely manner. One member country (Republic of Korea) had increased its contribution from US$10,000 to US$15,000 annually, whereas another member country (Vietnam) indicated that it would settle outstanding contributions to CCOP from 1985 onwards.

25. Assistance and technical support continued to be actively provided by several co-operating countries, namely Japan, The Netherlands, Norway, United Kingdom, Switzerland and U.S.S.R. The United States requested inclusion of the following assistance provided to CCOP by that country in the annual progress report as item "6.2.7 U.S.A." which was agreed by the Committee.

"6.2.7 U.S.A.

- US Geological Survey (USGS) continued compilation by a fulltime cartographer of the 1:2,000,000-scale base maps for CCOP and WGRA thematic maps (basin analysis, aeromagnetic data)

- USGS provided experts to participate in WGRA country visits and workshops

- USGS open-filed the isopach and facies maps of the Circum-Borneo pilot study originally compiled in 1984 by Keith Robinson

- The US Naval Oceanographic Office completed a Project Magnet study of the Bismark Sea at the request of PNG

- USGS completed reports on the "Geology and Offshore Resources of Pacific Island Areas - New Ireland and Manus Region, Papua New Guinea"

26. Additional support continued to be sought from various sources particularly from the co-operating countries and organizations affiliated with CCOP. Requests were made to Australia and Canada for long-term programme assistance of three-year (1989-1991) and five-year (1988-1992) periods respectively. Encouraging signs had been shown by those countries for possible favorable consideration.

27. Concerning the publications programme, results of studies and survey reports in connection with CCOP work programmes continued to be regularly published, particularly the CCOP Newsletter. Publication sales during the reporting period continued to produce satisfactory results.

28. On technical programmes, activities continued to be carried out in the fields of hydrocarbon studies, particularly the Resource Assessment Programme, offshore and coastal geophysical surveys and related activities, Quaternary geology studies, aeromagnetic map compilation programme, safety programme, SEATAR and training programmes. Details of these activities are fully described in Part II of the annual progress report.

29. In connection with the aforesaid activities, fellowships continued to be provided for specialized studies/training abroad and in-service training.

30. The Committee complimented the Director on his well-prepared, informative and comprehensive report.

III. PROPOSED LONG-TERM OBJECTIVES OF CCOP

31. The Director invited attention of the Committee to the paper on the guidelines for the proposed long-term objectives of CCOP. The following comments and/or recommendations were made by the Committee and the Technical Advisory Group.

1. Belgium

Sea level would continue to rise until 2030 even if all measures against an increase in atmospheric CO2 levels are taken. Hence coastal management is a priority since sea level rise will result in more coastal erosion, storms, subsidence and flooding along onshore valleys.

2. Canada

The International Geosphere-Biosphere Programme (IGBP) is concerned with predicting changes in the globe, particularly its biosphere, over the next few decades and centuries. This will certainly involve monitoring changes, modeling changes and mitigating changes.

The above are practical matters. Also, offshore structures, for example, are built with predicted lifetimes of decades, the sorts of times being considered. Furthermore, geological information is needed in many aspects, namely processes which govern changes, and the geological record, which modelers must note.

Since CCOP has competence and interest in many pertinent fields, e.g. Quaternary geology and coastal zone management, would it be appropriate for CCOP to assume a role in the Global Changes programmes in the region?

3. Federal Republic of Germany

CCOP should look at international programmes such as the Ocean Drilling Programme and consider the relevance of such programmes in its activities, particularly for problem identification.

4. Japan

Consideration and discussion on this matter should be focussed on two parts.

4.1 Definition of long-term geological targets/objectives.

4.2 Discussion of organisational mechanism to realise the long-term geological objectives.

5. Republic of Korea

Special Advisers' recommendations could help in the formulation of CCOP long-term objectives and programmes.

The objectives should be oriented towards projects and technology.

6. The Netherlands

It is not possible to focus on offshore features without studying onshore related features. As an example, offshore Quaternary mapping should be related to onshore mapping. So even if CCOP wants to restrict itself to the offshore environment, some onshore activities still have to be undertaken.

In particular development-related offshore activities e.g. mineral dredging especially, sea level rise (may) have some effects on the coastal system, requiring, therefore, coastal zone studies, including the land part.

Besides the proposed long term objectives mentioned by the Secretariat in the related document, attention should be paid to the task of monitoring what is going on outside CCOP which is of geoscientific importance and in promoting the member countries' involvement in such matters (e.g. studies on expected accelerated sea level rise).

Contribution of CCOP to international programmes should not only be in the form of active CCOP participation but CCOP should also preferentially play the part of an interface.

7. Norway

The current work by CCOP to establish strategies and priorities is much appreciated. During a recent review of the CCOP/Norway cooperation, it became apparent that whereas the broad objectives of CCOP are well defined, the strategies through which these objectives may be met are less clear.

In defining the scope and content of longer term cooperation from the supporting countries, such strategies and priorities are necessary as guidelines.

The question of who shall define strategies/priorities is a fundamental one.

The cooperating countries all have ideas about what CCOP may need.

In principle, however, programmes and strategies should be defined by the CCOP member countries with reference to the respective national development needs.

8. Philippines

CCOP needs to identify the gaps in its objectives. While the main task is in offshore prospecting, it should, however, consider broadening its mandate to also cover onshore activities including mineral resources studies, which were previously covered by RMRDC.

9. United Kingdom

Special Advisers' main concern is "Which way is CCOP to go, i.e. from offshore to onland as well?". In such case, CCOP might wish to consider amending the name of its organization to reflect the coverage of onshore activities as well.

10. U.S.A.

In view of the fact that the summary of proposed CCOP objectives for the next decade stresses :

1) Building Infrastructure

2) Structuring capabilities

3) Monitoring breakthroughs

the US delegation therefore suggested that it is critically important to add:

4) Identifying disciplinary interests - - the last annual report lists: hydrocarbon resources (basin analysis project), offshore surveys, Quaternary geology, and safety programmes. It should also consider participating in new international programmes such as global change (IGBP), and hazards analysis and mitigation (IDNDR).

5) Preparing regional products with cooperation and co-ordination between member countries, including maps, digital data, and reports.

11. U.S.S.R.

CCOP should concentrate on investigation of mineral resources and compilation of geological maps of CCOP areas.

Studies on geological setting, volcanic and hydrothermal phenomena in adjacent deep-sea basins, aimed at prospecting for ore occurrences, of practical significance in the near future.

CCOP should have closer co-operation with international geological organizations and programmes such as IUGS, INQUA, and International Geosphere/Biosphere programme.

12. Dr. C.Y. Li

CCOP should pay attention to new technology, i.e. sea-bottom imaging such as SEABEAM, submersibles, GLORIA, etc.

It should also pay attention to programmes on global changes, namely data gathering exercise and the International Decade of Natural Disaster Prevention (1990-2000).

IV. ACTIVITIES RELATING TO HYDROCARBON RESOURCES

32. The Committee was advised of activities in exploration and development of petroleum resources in China, Indonesia, Japan, Republic of Korea, Malaysia, Philippines, and Thailand.

Resource Assessment Programme

33. The Committee was informed of the 1988 activities of the East Asia Sedimentary Basin Analysis Project which forms a major portion of the CCOP Hydrocarbon Programme.

34. Among these activities were WGRA meetings in Bangkok in Feb-March in which both National Co-ordinators and Chief Map Compilers participated and another in Tsukuba, Japan in September where the Chief Map Compilers met and displayed their progress-to-date and worked together to attempt to resolve differences of their maps in areas of overlapping data. The Committee approved of the Technical Secretariat compiling and drafting the consolidated maps for Phase I in Bangkok.

35. Activities in data management related to the Basin Analysis Project were described and the Committee, recognizing the difficulty in obtaining certain specialized computer equipment in the region, approved the re-scheduling of the 3-D Seismic Workshop from January to April 1989 in Kuala Lumpur.

36. The East Asia Basin Analysis Project activities included an Expert Mission on Integrated Play Modeling that introduced that topic to six participating countries in preparation for a major workshop to be held during 1989. The Committee supported the holding of the workshop in Bangkok and the building of a Play Atlas which should be ready in a drafted form before the workshop.

37. The Committee was informed that Heat Flow Workshop III was held in Bangkok during November and the Committee strongly supported a revival of interest in the Heat Flow programme, this included an approval in principle of a proposed research programme to be supported by the British Geological Survey entitled "Thermal History of Petroliferous Basins in the CCOP Region," which Dr. Holliday will revise to take advantage of views expressed by member countries. The revised proposal will be submitted to the next WGRA meeting for final endorsement.

38. The Committee was disappointed at the absence of any report on the progress of the Mineral Resource Project and expressed the hope that progress is continuing even in the absence of a formal report.

Co-operation with ASCOPE

39. The Committee expressed pleasure that co-operation with ASCOPE is continuing with an ASCOPE/CCOP Intersecretariat Meeting held in Bangkok in February 1988 replacing the one that was not convened in October 1987.

40. Co-operation with ASCOPE is continuing in the fields of resource assessment, data management, 3-D seismic workshop, heat flow/geothermometry studies, and stratigraphic correlation. Another major field of co-operation is in the CCOP/ASCOPE/NECOR Marine Safety and Environment Programme which is described elsewhere.

Pre-Tertiary Hydrocarbon Potential

41. The Committee was very pleased to learn that Dr. Henri Fontaine had just returned to the region after an absence of about six months. Since the last Annual Session report, Dr. Fontaine's work carried him on missions to northern Thailan northern Peninsular Malaysia and Indonesia.

42. Dr. Fontaine notified the Committee of the increasing importance of Carboniferous rocks as many new exposures have been encountered lately, and his plans to prepare a volume largely devoted to the Carboniferous of Malaysia and Thailand.

43. The Committee also supported his forthcoming activities in Thailand and Malaysia and was pleased to be informed that two of Dr. Fontaine's volumes are now in press and a special volume is planned to honor his more than 10 years of service to CCOP.

Consultancy/Advisory Services

44. The Committee was informed that with two senior petroleum geologists now with the Technical Secretariat, expanded consultancy/advisory services could be made available upon specific requests of the member countries.

Seismic Stratigraphy and Other Workshops

45. The Committee was advised that in the absence of serious requests for the past two years the topic of seismic stratigraphy workshops will be dropped as an agenda item unless specifically requested by a member country.

46. The Philippines expressed interest in having a seismic stratigraphy workshop held in 1989 in Manila and requested the Secretariat to incorporate this programme into its 1989 Work Plan.

47. Other workshops held during 1988 have been described previously.

Offshore Technology Including Technical/Economic Developments Relevant to CCOP

48. The Committee took note of the two technical papers submitted by the USSR and expressed appreciation for continuing technical support provided by the USSR.

Planned Activities for 1989

49. The tentative plans for WGRA activities in 1989 include:

- A major workshop on "Integrated Play Modeling"
- A mission of experts to visit countries and advise on integration of regional data in play modeling
- Workshop meetings of WGRA National Co-ordinators and Chief Map Compilers
- Pilot implementation of data management activities related to WGRA projects.
- Meetings of the WGRA Co-ordinating Committee
- Continuation of time-slice maps and sections for Phase II as defined at past WGRA meetings.
- Compilation and drafting of the consolidated country maps by the Technical Secretariat

50. All of these activities were reviewed and approved by the Committee.

V. OFFSHORE AND COASTAL GEOPHYSICAL SURVEYS AND RELATED INVESTIGATIONS

Activities in the Member Countries

51. The Committee noted that, as in previous years, a wide range of survey and other programmes had been undertaken related to offshore minerals exploration, engineering investigations and coastal studies. It complimented the member countries on their achievements and the Technical Secretariat on the extensive assistance it had provided in many of those investigations, through on-the-job and in-house training, shipboard operations, advisory services, courses and lectures and in other ways.

52. Reports were presented on activities conducted throughout the past year in China, Indonesia, Japan, Republic of Korea, Malaysia, Papua New Guinea, Philippines and Thailand. These activities had included geophysical and geophysical surveys for detrital heavy minerals including tin, rutile, zircon, ilmenite monazite, xenotime, magnetite, chromite, gold, for construction materials, lacustrine investigations, research on possible hydrothermal activity, surveys related to coastal studies and other investigations.

53. The Committee was particularly pleased to note that follow-up sampling programmes recommended on the basis of results of geophysical surveys conducted with assistance from the CCOP Technical Secretariat in two of the member countries, had found encouraging concentrations of detrital heavy minerals.

54. The Committee was informed that the in-house training programme in processing and interpreting the results of marine geophysical surveys had continued during 1988. Four participants from China had spent a total of seven man months at the Technical Secretariat processing and interpreting the data from the survey off the southwestern coast of Guangdong Province, under the guidance of UNDP/ESCAP Technical Support Project to CCOP experts.

55. The Committee considered the in-house training programme to be a very useful and effective component of CCOP's overall training activities and requested the Secretariat to continue it during the next year.

56. The Committee was informed that a course on high resolution seismic techniques had been presented at the Annual Group

Training Course on Offshore Prospecting in Japan, by the Team Leader of the UNDP/ESCAP Technical Support Project to CCOP. He had also presented papers on offshore marine geophysical techniques at a seminar on the application of geophysics in tin mining at Jakarta, Indonesia and at a workshop on geophysical exploration in tropical terranes in Hanoi, Vietnam.

57. The Committee noted that Japan had requested that the course on high resolution seismic techniques be conducted again at the Group Training Course in 1989, and requested the Secretariat to make the necessary arrangements to do so.

58. The Committee was pleased to note that progress had been made on correlation of onshore and offshore unconsolidated sediment sequences in northwestern Peninsular Malaysia and that the work was to be extended to cover all of Peninsular Malaysia. It requested the Secretariat to provide any assistance it could in this work.

59. The Committee noted that because of unavailability of staff and the higher priority being accorded to other programmes, very little work had been possible on compilation of atlases of high resolution seismic profiler sections. It nevertheless considered this to be a very important and useful programme and requested the Secretariat to allocate whatever resources it could for this work.

60. The Committee was informed in detail of the status of the offshore survey and ancillary equipment, including operational status of equipment already purchased prior to 1988, progress of procurement of equipment included in the UNDP Project budget for 1987-1991 and recommendations for procurement of new equipment items.

61. It noted that requisitions and details for the procurement of most of the equipment included in the 1987-1991 UNDP Project budget had been submitted to ESCAP during 1988 for procurement action and that it was proposed to submit the remaining requisitions in late 1988/early 1989.

62. The Committee further noted that a number of important survey systems including the seismic reflection profiling, navigation, side-scan-sonar, magnetometer and shipboard navigation computer systems were becoming increasingly unreliable and subject to failure of various components. This could result in serious delays in completion of surveys, with attendant loss

of data and effective financial "losses" to the concerned member country. It also noted that new software, and some hardware was needed to upgrade the capability of the computer systems at the Technical Secretariat, to process navigation data and perform a wide range of other mapping and plotting functions.

63. The Committee recognized that there would be a need for the Technical Secretariat to maintain its capability to assist the member countries in their offshore survey programmes through provision of equipment, in the foreseeable future. It therefore requested the Secretariat to complete as soon as possible the purchase of equipment required to maintain the operational status of the existing survey systems and the equipment and software included in the UNDP Project budget for 1987-1991. It considered, however, that no new equipment systems should be purchased at this time.

Future Activities

64. The Committee was informed that during the next year the CCOP Technical Secretariat would be involved in the following activities related to this programme:

(i) Assistance would be provided as requested, to China, Indonesia, Malaysia, Philippines, Papua New Guinea and Singapore in conducting offshore surveys and in processing and interpreting the data from previous surveys, within the resources available to the Secretariat .

(ii) All necessary arrangements would be made for conducting the demonstration survey with a towed gamma ray spectrometer, with participation of an observer from each member country wishing to do so.

(iii) Advisory/consultancy services would continue to be provided as requested, in offshore survey planning, execution and data processing, equipment specifications and performance, survey vessel suitability and modification needs and related topics.

(iv) The in-house-training programme in processing and interpretation of marine geophysical data would be continued.

(v) Workshop courses and lectures on high resolution marine seismic techniques would continue to be conducted, as requested.

(vi) Compilation of atlases of high resolution seismic reflection profiles, and correlation studies (onshore-offshore and regional) would be undertaken within available time and manpower constraints.

65. The Committee endorsed the above programme of activities and requested the Secretariat to arrange the details and timing of individual activities with the organizations concerned.

VI. QUATERNARY GEOLOGY PROGRAMME

66. The Committee was informed of the activities carried out in the member countries during the past year. These activities were mainly related to applied Quaternary geology and mapping programmes. These are reviewed in greater detail, on a member country basis, in the report of TAG.

67. The Committee commended the member countries on their accomplishments and the CCOP Project Office on the field and advisory services provided.

68. Member countries to which the CCOP Project Office rendered such assistance were: Indonesia, Malaysia, Japan and Thailand.

69. The Committee was further informed of the following workshops, training courses and seminars organized by CCOP in cooperation with other agencies:

Course on "Applied Quaternary Geology and Shallow Exploration Methods, 9 - 20 November, 1987, Kuala Lumpur, Malaysia.
Course on "Applied Quaternary Geology and Shallow Exploration Methods, 11 - 22 April, in Quezon City, Philippines.
Course on "Engineering Geology", at the University of the Philippines, April, 1988.
Symposium on "Stratigraphic Correlation of the Quaternary Deposits in Asia and the Pacific Region, Nakhodka, USSR, 9 - 16 October.

70. The Committee noted the proposed future activities of the CCOP Project Office in member countries. These activities, listed in the TAG report, were approved for implementation in 1989.

71. The Committee expressed its gratitude to the Government of The Netherlands for providing the services of the experts involved in the workshops and training course held in Kuala Lumpur and the Philippines.

72. Appreciation was expressed by the Committee to the Federal Republic of Germany for providing as Associate Expert whose tenure ended in October.

VII. AEROMAGNETIC MAP COMPILATION PROGRAMME

73. The Committee was informed that the U.S. Naval Oceanographic Office completed a Project MAGNET survey of the Bismark Sea at the request of PNG. The Naval Oceanographic office would not be able to offer Project MAGNET assistance in the immediate future. Korea reported on its airborne radiometric and magnetic survey in Yangsan and Haenam areas in 1988, and Indonesia informed the meeting of its survey project in Kalimantan.

74. The Committee was informed of the status of the aeromagnetic map compilation programme. Aeromagnetic data of the Office of Energy Affairs, the Philippines is in principle available upon the request of the CCOP Technical Secretariat, and China could provide its aeromagnetic data of South China Sea. The Senior Geophysicist stated that he would like to extend the compilation from Southeast Asia to the area of China, Korea and Japan. Korea reported on its state of the art of airborne geophysical survey and stated its readiness for co-operation in this programme.

75. The Committee was informed of the Senior Geophysicist's efforts on development of computer hardware and software, and of the in-house training on aeromagnetic data compilation and interpretation. Three trainees from GRDC, MGI and Geological Survey of Malaysia participated in this training, and another from LEMIGAS will participate in the near future in 1989. Seven or more trainees from the Philippines, Malaysia, Thailand and China are expected in 1989.

VIII. INVESTIGATIONS AND RESEARCH RELEVANT TO CCOP ACTIVITIES

Deep Sea Minerals

76. The Committee was informed that surveys for deep sea minerals had been conducted in the Pacific by Japan and China.

Isotopic Age Determination

77. The Committee was pleased to note that K-Ar isotopic age determinations had been conducted by the Geological Survey of Malaysia and that, with the completion of their mass spectrometer, the geochronology laboratory was preparing to resume its role as a training centre for K-Ar dating for geoscientists in the region by 1990.

78. In Korea, KIER had continued geochronology studies using the Rb-Sr, K-Ar and Fission Track methods.

79. The Committee also was informed that from August 1987 to August 1988 a geologist from the Philippine Mines and Geosciences Bureau had undergone training at the Isotope Laboratory at the University of Bern, Switzerland, under Professor Jaeger, It noted that a recommendation had been made that he undertake further training of either 2-3 or 3-5 years, after which he could serve as a TCDC expert on age dating.

Palaeomagnetic Studies

80. The Committee was informed that a digital spinner magnetometer and demagnetizing equipment were now operational in the palaeomagnetics laboratory at the Department of Mineral Resources in Thailand. Magnetostratigraphic studies had been carried out on sedimentary strata from northeastern Thailand and work in 1989 would involve a study of continent/continent collisions in Southeast Asia.

81. In China a number of palaeomagnetic/age determination studies had been carried out.

New Survey Techniques

82. The Committee was informed of the capabilities of the GLORIA sea-floor mapping system which had a resolution of 50 x 50 metres

and of the satellite "Thematic Mapper" which was expected to be launched in 1990. It noted that a more detailed presentation on the GLORIA system could be given at CCOP's next meeting.

IX. COMPUTER APPLICATION FOR DATA STORAGE, RETRIEVAL AND INTERPRETATION

83. The Committee was given an update on the computer facilities at the Secretariat and noted that the office presently was operating 5 units and related accessories. The most powerful tool is the Compaq 386/20 Model 60 and related accessories, provided by the Japanese Government.

84. A summary of conclusions from a workshop financed by Norway on "Impact of Computer Technology on the Management and Analysis of Petroleum Exploration Data", held in Bangkok in October/November 1987, was given. The workshop recommended that CCOP should distribute information on petroleum related software and try to obtain group discounts for member countries. The workshop also recommended that the next CCOP/NECOR workshop should focus on the use of computers related to hydrocarbon generation, migration and entrapment with e.g. a title like "Computer Technology for Decision Support in Hydrocarbon Exploration".

85. At the ASCOPE-CCOP Joint Intersecretariat Meeting in Kuala Lumpur in June 1988, it was decided that Data Management activities that CCOP planned to implement in the future should be pursued on a bilateral basis.

86. Mr. Simon Handelsman of the UN/DTCD had made an advisory mission to the CCOP member countries. Four countries were visited in 1987. These were Malaysia, China, Indonesia, and the Republic of Korea. The mission will continue this year (1988), visiting Vietnam and Thailand in December.

87. The preliminary conclusion from the mission was that it is necessary to provide support to CCOP in addition to the short missions to member countries by the UN HQ. The mission identified a need which exists throughout the region for the introduction of modern relational database design techniques to enhance the ability to manage the establishment of geoscience databases. The mission also identified a need for training such as a demonstration of applications for high level staff and training of staff related to day-to-day detailed work.

88. The Secretariat reported on discussions held with the Regional Computer Center (RCC) at the Asian Institute of Technology (AIT), in Bangkok concerning the possibility of AIT aiding CCOP in its development of a computerization strategy.

89. The Committee noted all these activities and urged the Technical Secretariat to move ahead rapidly in its computerization effort.

X. COASTAL ZONE RESOURCES AND MANAGEMENT STUDIES

90. The Committee was pleased to learn that this new element in the CCOP Work Programme is active and appears to be gaining increasing emphasis among the member countries, in that some of them are already undertaking or planning coastal zone management programmes.

91. The Committee felt that such studies are very important to the member countries and hoped that they will continue these efforts and call upon the cooperating countries for their aid in this regard.

92. The committee was pleased to learn that a workshop on coastal management which had been scheduled to be held in Singapore in 1988, will be rescheduled in the last quarter of 1989. Additionally, a workshop on the studies of the EEZ in the the CCOP member countries is also scheduled for 1989, a portion of which will be devoted to coastal zone resources and management.

XI. CCOP TRAINING PROGRAMME

93. The Committee was informed that during 1988 CCOP's training activities had included (i) on-the-job training during offshore surveys and in-house training at the CCOP Technical Secretariat, (ii) workshops and seminars and (iii) fellowships for studies in co-operating and member countries.

94. On-the-job training had been given to participants in offshore surveys in Papua New Guinea, China and the Philippines.

95. In-house training in marine geophysical data processing and interpretation of marine geophysical survey data was provided to four participants from China and in aeromagnetic data compilation and interpretation to two participants from Indonesia and one from Malaysia.

96. Seven workshops and symposia were successfully conducted during the past year, three related to the hydrocarbons programme and four concerned with aspects of Quaternary geology.

97. Four fellowships had been awarded to member country personnel for advanced studies in member and co-operating countries.

98. The Committee noted that a symposium on "Stratigraphy of the Quaternary in Asia and the Pacific Region" would be held in Yakutia, USSR in July 1990.

99. It also noted the strong recommendation made by the Technical Advisory Group that a workshop on Quaternary Stratigraphy and regional correlation should be conducted, if possible in 1989.

100. The Committee considered training to be one of the most important elements of CCOP's work programme, which should be accorded the highest priority. It noted that a large number of workshops and training courses had been recommended for implementation during the next year and beyond and therefore requested the Secretariat to compile a list of all recommended workshops and other training courses, with proposed dates for implementation, for circulation to member countries and to make every effort to implement those activities.

XII. CCOP PUBLICATION PROGRAMME

101. The Committee was informed that during the past year CCOP had issued a number of publications, that several more were in final stages of editing and were expected to be published in early 1989 and that it was planned to prepare and issue up to eight other publications during 1989. In addition, it planned to publish some of the SEATAR transect compilations in 1989. Details of these publications are included in the report of the Technical Advisory Group.

102. The Committee complimented the Secretariat on the number and quality of publications issued during 1988 and urged it to seek all the necessary resources to implement the planned publications programme for 1989.

XIII REPORT OF THE GOVERNING BODY AND SUB-COMMITTEES' REPORTS

103. The Committee considered the following reports of the Sub-Committees: Fourteenth Session of the Joint CCOP/IOC Working Group on Post-IDOE Studies in East Asian Tectonics and Resources (SEATAR) (Annex IV); Fourteenth Session of the Northwest Quadrant Panel of the Circum-Pacific Map Project (Annex V) and the Special Advisers' meeting (Annex VI).

104. The Committee reviewed the report of the 14th session of the Joint CCOP-IOC Working Group on SEATAR held on 8th December and endorsed the recommendations made by that meeting. The Technical Secretariat was requested to implement those recommendations.

105. The Committee endorsed the report of the meeting of the Northwest Quadrant Panel of the Circum-Pacific Map Project held on 8th December and agreed to continue its active co-operation with the programme through its Technical Secretariat.

106. The Committee noted with appreciation the comments and recommendations made by the Special Advisers at its meeting on 9th December.

107. The report of the twelfth meeting of the CCOP Steering Committee (the governing body of CCOP) held on the 4th, 7th, 8th and 9th of December is attached as Annex II to the Committee's Report.

XIV. MARINE ENVIRONMENT AND SAFETY PROGRAMME

108. A change in emphasis was introduced during 1988 in the Norwegian-funded programmes that are administered through CCOP. The Norwegian Government wanted the programmes to be defined by the member countries in order to reflect more fully their needs and desires as expressed by themselves. This change in emphasis was evident in the Marine Environment and Safety Programme where Dr. Mario Berbano was appointed ASCOPE Co-ordinator on Environment and Safety and presented to this meeting his report (Annex VII) on the 1988 activities and plans for the future. The CCOP Technical Secretariat became more involved in meetings, future planning, and budgetary affairs than previously and the roles of ASCOPE and CCOP will expand in the future.

109. As there was no assurance previous to the Annual Session that Dr. Berbano would be presenting his report, Dr. Oystein Berg, who acts as expert adviser to CCOP/ASCOPE on matters relating to offshore safety, prepared two reports dealing with environmental and safety matters that were distributed to the participants, "Annual Report - 1989" and "Perspective 1989-91 and Programme Proposal 1989". Excerpts of Dr. Berbano's report and Dr. Oystein Berg's two reports that give background and details of activities, both past and future, are presented in Annex VII.

110. Activities in 1988 were restricted due to budgetary considerations but included:

- Receipt of individual country reports on progress on Offshore Safety Regulations and their individual country requirements for future planning.

- A course on "Basic Safety and Work Environmental Training" was held in Bangkok from August 29 to September 3, 1988.

- A course on "Safety Management and Work Environment" was held in Kuala Lumpur, Malaysia from 5 to 15 September, 1988.

- Development and implementation of an oildrift model for the South China Sea (Joint Programme with COBSEA/UNEP). Several activities under this project still remain to be completed during 1988 and will be completed.

- NECOR assisted Statoil in arranging a two week Safety Management Programme for three participants from the Petroleum Authority of Thailand and PETRONAS in Malaysia.

- Two Quality Assurance experts from Statoil visited PTT, PETRONAS, PERTAMINA and the CCOP Technical Secretariat during November 1988.

111. All activities scheduled for 1988 have been successfully carried out according to plan and budget. This has been achieved because of the tremendous effort and interest by those involved in the CCOP and ASCOPE countries and the visiting lecturers and instructors.

112. Due to an anticipated increase in budget during 1989 increased activities are planned. Any savings in budgeted costs will be applied to additional activities. The details of the 1989 proposed programme are given in Annex VII.

113. During the meeting on the Marine Environment and Safety Programme a request was made for NECOR assistance in mitigating pollution from offshore disposal of mine tailings. In view of the new emphasis on local definition of the input to the Norwegian programmes a suggestion was made that proper procedure would be for the request to be made to Dr. Mario Berbano, ASCOPE Co-ordinator on Environment and Safety, who would evaluate the request and who might formulate a proposal to ASCOPE and then possibly for an eventual decision at an ASCOPE/CCOP Intersecretariat meeting.

114. The ESCAP delegate informed the meeting of a forthcoming seminar on "Removal of Offshore Production Platforms" to be held in Bangkok 6-10 February 1989 and noted that this is similar to an item presented on page 12 of the report "Perspective 1989-91 and Programme 1989" that had been distributed to the participants at the XXV CCOP Annual Session. The ESCAP delegate proposed that this general field should be covered jointly and invited CCOP member countries, the NECOR group and other interested parties to join the February 1989 seminar.

XV. CCOP Financial Report

115. The audited financial statement which reflects the income and expenditures of CCOP for the period 7 January - 30 September 1988, together with the Status of Sub-Allotments as at 31 October 1988 of the UNDP/ESCAP Project Fund, was presented to the Steering Committee at its meeting on 8th December 1988.

116. The Steering Committee expressed satisfaction with the healthy financial status of CCOP and adopted the report (Annex VIII).

XVI. REVIEW OF ASSISTANCE AND CO-OPERATION OBTAINED AND EXPECTED

United Nations Bodies

117. The Committee expressed its thanks to UNDP for its support to CCOP through UNDP Project RAS/86/138, which covers the period 1987-1991, and requested that favourable consideration be given to extending the appointment of its experts for at least one year to permit a sufficient "overlap" with CCOP's Regional Experts who were expected to commence work with the Secretariat in mid-1989.

118. The Committee also thanked ESCAP, which was responsible for executing the UNDP Project, for its support and assistance to the CCOP Technical Secretariat throughout the past year.

119. It noted that in the area of marine affairs the interests of CCOP and ESCAP frequently overlapped and that during the past year CCOP's technical experts had participated in a workshop on geophysics in Hanoi and a symposium in Quaternary geology in Bangkok, both of which had been co-sponsored by ESCAP.

120. The Committee was pleased to learn that ESCAP would continue to provide assistance to the Secretariat, in facilitating the appointment of non-reimbursable experts to the Secretariat and in assisting to engage the Training Co-ordinator.

121. The representative of the Intergovernmental Oceanographic Commission, Dr. Giermann, conveyed the best wishes of the IOC Secretary, Dr. Ruivo, to CCOP. Dr. Ruivo, who will retire on 31 December, thanked the member countries of CCOP for their always close and friendly co-operation and wished them luck and success in all their future common activities. (the new Secretary will be Dr. Gunnar Kullenberg from Denmark).

122. In its 21st session, the IOC Executive Council "felt that completion of the SEATAR Transect Study and the publication of the results are the most urgent tasks at this stage", it "also instructed the Secretary of IOC, in collaboration with the Vice-Chairman of OSNLR, to pursue negotiations with CCOP on future scientific programmes for SEATAR.

123. The IOC representative expressed his agreement with the special recommendations regarding the transects, adopted at CCOP's 24th session in para. 117. He fully accepted the sugges-

tions made by Professor Hutchison and associated himself to the statement "that the stage we have now reached must be that of finalization and publication; no compilations should be allowed to continue beyond late 1989"; and also that "any extension of transect lines and studies should not be tied up with the present transects; they should be considered as future programmes". The IOC representative expresses the need to publish the additional separate overview volume (separate from the map folios with accompanying text for the individual transects) as soon as possible, and not to regard it as a sort of summary to be published only after all the folios have been published.

124. Due to the still critical financial situation in UNESCO, and therefore in IOC, the IOC Secretary has not yet finished negotiations on funds to be made eventually available by IOC.

125. Concerning the future of SEATAR, the representative of IOC invited member countries to follow a well-established tradition and to hold another joint workshop to present the outcome of the completed transect studies, and to elaborate a new programme and new projects for the further benefit of the member countries of the region. While developing a future programme, recommendations from OSNLR and WESTPAC, as well as from other organizations of the region, should be taken into account.

Other International Organizations

126. The Committee was informed that during the past year close co-operation had been maintained with IUGS and the Circum-Pacific Council, particularly in the implementaion of CCOP's hydrocarbons programme. Details of this were given in the report of the Technical Advisory Group.

Co-operating Countries

127. The co-operating countries provided the following statements on the assistance they had provided to member countries in the past and their planned future assistance. The Committee expressed its thanks to the co-operating countries and the Special Advisers for the extensive support and assistance they had continued to provide to CCOP in the implementation of its work programme.

AUSTRALIA

128. During 1988, Australia continued a number of geoscience research, survey and development assistance programmes in the Asia/Pacific region. In the CCOP area specific, mostly onshore bilateral programmes continued in Indonesia (the Indonesia-Australia Mapping Project); China (various projects covered by the Memorandum of Understanding between the Ministry of Geology and Mineral Resources and the Australian Bureau of Mineral Resources); and Papua New Guinea (various, involving the GSPNG; BMR and CSIRO).

129. There have been a number of recent developments involving Australia's future role in geoscience development assistance. Australia has now formally joined CCOP's sister organization, CCOP/SOPAC, and provides strong support to its programmes. In addition, the Australian International Development Assistance Bureau (AIDAB) has commissioned BMR to produce an overview report outlining the role of geoscience assistance in resource exploration and development. AIDAB are also seeking a specific report on the effectiveness and needs of CCOP, with a view to considering direct support. In this context however, the need for CCOP to strive to further clearly identify corporate objectives and programme strategies and priorities must be stressed.

130. Australia will continue involvement in these bilateral programmes noted above during 1989. In the longer term, an expansion of such programmes into the field of offshore petroleum resource framework studies is foreseen and discussions are underway with several CCOP member countries. In addition, Australia will continue to provide the services of a Special Adviser to future CCOP Annual Sessions.

BELGIUM

131. Proposed support in activities offered by Belgium and IFAQ

1. Counselling on "Quaternary Stratigraphy"

   a) To send initially, a temporary co-worker on Quaternary stratigraphy to the CCOP Technical Secretariat.

   b) To promote the status of the temporary co-worker to a permanent one.

2. Organization of a WORKSHOP ON QUATERNARY STRATIGRAPHY (IFAQ-UNESCO)

3. Offer by IFAQ of long- and short-term scholarships to CCOP (max. 5 years). Deadline is 01.02.89! Member countries are requested to integrate bilateral and CCOP scholarships within CCOP-activities.

4. Organization of short courses on Quaternary Stratigraphy in various institutes and universities of the member countries by IFAQ-UNESCO.

132. Activities in 1987 carried out by Belgium in CCOP countries

1. CHINA

(i) Bilateral Programmes with Ministry of Geology

a) Yangtze-Shanghai Holocene Stratigraphy

b) Marine Stratigraphy around Bohai

c) Coastal geology of Tsientian-bay

(ii) Bilateral Programme with Academia Sinica (IFAQ)

a) Loess stratigraphy in Shaanxi province (PhD)

b) Loess stratigraphy in Tarim basin (PhD)

c) Loess Stratigraphy in NE-China (PhD)

(iii) Four MSc scholarships in loess, and geochronological training. (deadline 1 Feb. 1989)

2). INDONESIA

IFAQ-Bilateral Programme with University of Yogyakarta

a) Study of Lithography of Sangiran region (PhD)

b) Paleo-magnetic and K/Ar geochronological studies in Sangiran region (PhD)

Bilateral Programme with GRDC-IFAQ

Four MSc. scholarships for training in "Coastal Profile Type Mapping"

2. PHILIPPINES

2 MSc scholarships for marine geology training

3. THAILAND

2 MSc scholarships for marine geology training

4. GENERAL CONCLUSION

1. Four Projects

2. Scholarship training (IFAQ-UNESCO)
PhD training : 5 students
MSc training : 12 students

THE FEDERAL REPUBLIC OF GERMANY

133. - The Federal Republic of Germany will continue to provide the service of a Special Adviser

- It will continue with its assistance in the fields of geological and geophysical research, mineral exploration and hydrocarbon assessment, and for training of CCOP member country scientists.

  In 1988 6 geoscientists received training in seismostratigraphic interpretation.

- Geological and geophysical studies in waters of the CCOP region with the German research vessel SONNE are planned for early 1990.

JAPAN

134. As a member and co-operating country, activities carried out by Japan within CCOP's work programme have also been reported elsewhere.

135. Japan's future assistance to CCOP would include the following:

- editing and publishing of the CCOP Technical Bulletin

- continuation of the annual Group Training Course in Offshore Prospecting

- Provision of non-reimbursable experts to the CCOP Technical Secretariat

136. Japan will send one more non-reimbursable expert to the CCOP Technical Secretariat in 1989. That expert, Dr. Hanaoka will be engaged in CCOP's resource assessment and computer programmes.

137. Japan was also considering the possibility of providing assistance in carrying out deep sea cruises in the CCOP region, hopefully starting in 1992. These would be useful for adjustment of isopach map discrepancies between different countries.

THE NETHERLANDS

138. With regard to specific co-operation, after a successful workshop on Urban Geology, held in Shanghai in 1987 and sponsored by China, ESCAP and The Netherlands, a project on this topic between The Netherlands and China is close to implementation as a follow-up.

139. The representative of The Netherlands stated that, as announced last year during the 24th CCOP session, the decision has been made by The Netherlands to no longer provide financial support to the CCOP programme from the Dutch ESCAP allocation. This allocation has been the financial source for The Netherlands's assistance during the last three years. So far, no other financial source has been found. However, certain governmental bodies attach value to a continuation with CCOP in view of the work done to date, and also with respect to ongoing or proposed bilateral projects with CCOP member countries.

140. Therefore, requests to support a specific activity such as the Workshop on Coastal Management, might meet favourable consideration.

141. With regard to the position of the Special Adviser, the Geological Survey attaches value to its representation in this forum and pursues with great effort the continuation of this post.

142. Any activity of IFAQ developed for CCOP may count on participation of the Geologial Survey of The Netherlands, if so required.

NORWAY

143. During 1988 Norwegian assistance has continued in support of the activities on Resources Assessment and on Safety and Environment. The activities have been duly reported to this meeting by the Special Advisers, Prof. Sinding-Larsen and Dr. Berg.

144. Mr. Ivar Miljeteig is new to the Norwegian co-operation programme, having been recently provided on a full time, non-reimbursable basis to the CCOP Technical Secretariat.

145. Since CCOP's new status as an IGO, responsibility for the Norwegian technical assistance programme to CCOP lies with NORAD, the Royal Norwegian Ministry of Development Cooperation.

146. Over the last year, NORAD has assessed the Norwegian co-operation and its validity with respect to CCOP's objectives and priorities and that assessment has resulted in a confirmation of Norway's commitment to CCOP.

147. An agreement with CCOP is being prepared for continued support from 1989 through 1991 . The financial commitment will be in the order of NOK 7 million for the three year period.

148. NORAD will coordinate the co-operation with CCOP in consultation with appropriate Norwegian institutions. More specifically, the Norwegian Petroleum Directorate acts in an advisory capacity to NORAD.

149. Co-operation will continue in the areas of Basin Studies and Data Technology until the end of the present schedule of WGRA activities in 1991.

150. Co-operation will also continue in support of the priority activities in Offshore Safety and Environment. A tentative three year schedule has been established also for this programme.

151. Norway appreciates the whole-hearted participation by CCOP member countries in the activities in which it is involved. It is this contribution which makes these programmes possible.

152. It also expresses appreciation to the Director and staff of the CCOP Technical Secretariat for their unreserved attention and support in facilitating the Norwegian co-operation with CCOP.

153. After careful consideration of its international assistance programmes in the petroleum sector, the Norwegian government has made the Norwegian Petroleum Directorate (NDP) responsible for arranging a training programme based primarily on the fields of expertise residing in NPD. Dr . Berg and Mr. Heiberg have been invited to define and direct this programme, and will aim at developing personnel resources for tasks which have high priorities in the host countries.

154. The Norwegian delegation is impressed by the systematic pattern that lies behind the hydrocarbon programme in particular, as it extends from the pioneering global research studies to the key pre-commercial exploration activity of resource assessment where hydrocarbon play studies are designed to integrate seismic, stratigraphic and heat flow observations.

155. It also noted that the necessary spirit of co-operation that this task requires has caried over into the fields of safety and environmental management, where harmonized practices are bound to reduce costs and improve efficiency in this region as it has in the North Sea.

156. Dr. Berg and Mr. Heiberg will consider the experience of CCOP and the valuable impressions gained from conversations with the distinguished delegates to this conference in the design of the training programme. Dr. Berg's report on it will be presented at the next annual meeting of CCOP.

USSR

157. The USSR will provide the services of Special Advisers at CCOP sessions.

158. At the request of CCOP, scientists from the USSR may assist experts in the implementation of geological/geophysical projects for CCOP member countries. Scientists from the USSR may provide lectures on problems of fundamental and applied Quaternary geology, related to the prospecting for mineral resources in offshore and coastal areas.

159.At the request of CCOP the Ministry of Geology of the USSR could provide research vessels for CCOP, for geophysical/geological studies and prospecting in the areas of oil and gas-bearing basins and offshore placers. The complex equipment could be used for the studies of geological setting of hydrothermal ores in marginal deep sea zones. Specialized vessels are also available for ecological research.

160. The Geological Institutions of the USSR could assist in the compilation of various geological maps and papers, if so requested.

161. The USSR Academy of Sciences and Ministry of Geology plan to provide the facilities for the organization of the INQUA-CCOP Joint Symposium on Quaternary Stratigraphy of Asia and the Pacific in the USSR (Eastern Siberia) in July 1990. The leading organizers of the Symposium will be the Siberian Branch of the USSR Academy of Sciences and the Geological Survey of Yakutia. The programme of the Symposium includes consideration of problems of long range and regional correlation of Quaternary sediments and events, detailed stratigraphic and genetic subdivisions of the Quaternary and their application to geological mapping and prospecting for detrital heavy minerals, construction materials and ground-water. Specialists from CCOP member countries are invited to prepare papers on these topics and participate in the Symposium.

162. The USSR Academy of Sciences has carried out a wide programme of systematic geological/geophysical studies of the Pacific shelves and deep sea areas. The research vessels, corresponding equipment and scientific personnel could be provided by the USSR Academy of Sciences for the implementation of CCOP programmes. Scientists and specialists of the CCOP member countries taking part in such expeditions would be invited to

take part in the processing or laboratory treatment and the interpretation of the obtained material in scientific centres in the USSR.

163. The USSR Academy of Sciences and the Ministry of Geology will continue to develop bilateral programmes with the Socialist Republic of Vietnam in training and in geological/geophysical studies of geology and mineral resources in the offshore areas in the western parts of the South China Sea.

164. The Geological Institutions of the USSR offer research opportunities for CCOP member countries in micropalaeontological and magnetostratigraphic studies as well as lithostratigraphic and sedimentological treatment of the sediments of key sequences in offshore and coastal areas.

165. The USSR will continue to assist the implementation of the SEATAR Programme and the Circum-Pacific map project in the areas of the activities of the USSR geological and oceanological institutions.

UNITED KINGDOM

166. The United Kingdom will continue to support CCOP and its programme of work in the following areas:

1. The provision of a Special Adviser and Technical Advisers to the annual sessions of the Committee;

2. Consideration of requests to supply experts to participate in technical seminars and workshops and in special missions;

3. Co-operation in regional research and development relevant to CCOP work programmes. This work currently involves a 3-year programme aimed at establishing the thermal history of petroliferous basins in Eastern Asia and in fiscal 1989 will also include an exercise to demonstrate and evaluate the use of a towed seabed gamma-ray spectrometer in East Asian waters;

4. Bilateral programmes with Indonesia in hydrocarbon basin assessment and training in geological, geochemical and geophysical exploration and with Malaysia in operational assistance and regional geophysics will continue. Co-operation with China in geological research funded by the Royal Society will also continue;

5. Research into the tectonic and stratigraphic evolution of eastern Indonesia and the fore-arc basin of Sumatra being carried out by the University of London group will continue.

USA

167. The United States will continue to support CCOP in the following areas of activities.

1. USA will continue to provide Advisers to CCOP, especially from the U.S. Geological Survey (USGS), and the US scientific community insofar as possible.

2. The Circum-Pacific Council and the Circum-Pacific Map Project will continue to work with the Northwest Quadrant Panel, including all CCOP member countries, on the final stages of preparation of the Tectonic, Mineral Resources and Energy Resources Maps at a scale of 1:10,000,000 and on the East Asia Geotectonic Map at a scale of 1:2,000,000.

3. The USGS will continue its compilations of the 8 sheets of the East Asia Geographic Map Series at a scale of 1:2,000,000. Spot data and place names will be added to all sheets by April 1990.

4. Report preparation by USGS marine geologists on the data collected by the research vessel S.P. Lee in 1984 has been completed and a volume has been published on the "Geology and Offshore Resources of Pacific Island Arcs - New Ireland and Manus Region, Papua New Guinea".

5. Project MAGNET completed the co-operative aeromagnetic survey of the Bismark Sea which completes the surveys requested by CCOP member countries. Processing of the data is well underway and a map of the magnetic anomalies will be prepared. Future plans for aeromagnetic survey assistance in the CCOP region are uncertain.

6. Assistance and co-operation from U.S. academic institutions primarily supported by the National Science Foundation, will include surveys in co-operation with Japan and the Philippines for the International Ocean Drilling Programme. These cruises started in 1988.

7. The USGS provided the services of one senior marine scientist to serve as interim co-ordinator for the compilation of SEATAR Transect graphics. Future consultancies could be provided as requested by CCOP.

8. A wide variety of USGS bilateral programmes are underway, including with:

A) China - broad spectrum of scientific exchanges under 4 protocols involving earth sciences, earthquake studies, surface-water hydrology and mapping techniques. This recently has focussed on a comprehensive study of the Bayon Obo rare-earth deposits.

B) Indonesia - USGS residential consultants have been associated with the Volcanological Survey of Indonesia from May 1985 to August 1988, and since March 1986 with the Marine Geological Institute. Additional short-term assignments with MGI will focus on assisting in the final construction and outfitting of their new research vessel, and advising on its initial cruises. USGS is also continuing joint peat research with the Directorate of Mineral Resources, and is discussing other consultancies with the Directorate of Mineral resources and the Directorate of Coal.

C) Japan - A joint Memorandum of Understanding has been renewed, promoting cooperative geoscience research opportunities, mostly in the field of mineral resources.

D) Republic of Korea - USGS is co-operating in a Sedimentary Basin Analysis Project conducted in the Cretaceous Gyoengsang Basin of southeast Korea.

E) Philippines - USGS will continue to assist the Philippine Mines and Geosciences Bureau in its preparations for a workshop on the Exclusive Economic Zones in the CCOP region.

9. The Circum-Pacific Council has scheduled its Fifth Circum-Pacific Conference on Energy and Mineral Resources (CPCEMR) for July 30 - August 3, 1990, in Honolulu, Hawaii. The U.S. proposes that this might be an excellent time and site for a final summary symposium for the SEATAR program. Also the U.S. proposes to investigate the possibility of inviting CCOP to hold its 1990 annual session at the East-West Center immediately preceding the 5th CPCEMR. Concurrent meetings might also be considered for annual meetings of WGRA, WGGM, and the Northwest Quadrant Panel.

XVII. TECHNICAL CO-OPERATION AMONG DEVELOPING MEMBER COUNTRIES OF CCOP(TCDC)

168. The Committee was informed that indications had been recieved from Malaysia, the Republic of Korea and Thailand that they could offer training and use of related facilities in the fields of their expertise to the other members. The Republic of Korea and Thailand had expressed interest in the offer made by Malaysia. Details of those offers appear in document CCOP(XXV)/20 submitted by the Secretariat to the Committee.

169. The Indonesian representative informed the Committee that his Government has been actively implementing TCDC activities in various sectors since 1977, especially in natural resources co-operation. He added that for the 1988/89 fiscal year, Indonesia has been implementing 16 TCDC training programmes in several fields. It is now hosting the Training Centre in Oil and Gas basic drilling at Cepu, Indonesia for a six-week duration starting in October 1988. Living expenses of 15 foreign participants from developing countries attending the course are borne by the Indonesian Government.

170. The Committee was informed that all training activities organized by Indonesia under TCDC are open to all CCOP member countries as well as other developing countries. For 1990, the Indonesian Government plans to offer those training programmes under TCDC, details of which appear in document CCOP(XXV)/40, presented by the Indonesian delegation. The Committee noted that under TCDC arrangements, the UNDP/ESCAP Project financially supported the attendance of an Indonesian expert to lecture at the CCOP Seismic Stratigraphy Workshop II in Shanghai in September 1988.

171. The Philippine representative invited attention of the Committee to document CCOP(XXV)/60 which details the training facilities and expertise that the Philippines could offer for training of nationals of CCOP member countries under TCDC.

172. The Malaysian representative informed the Committee that to allow his country sufficient time for making necessary training arrangements, interested countries should give sufficient advance notification of the proposed time and duration for training of their personnel in any particular fields offered. For training in 1989, Malaysia would appreciate being informed of the member countries interest and schedule by 31 January 1989.

173. The Committee was glad to take note of the importance the member countries have accorded to TCDC and hoped that such an enthusiastic approach among the participating members would be further strengthened in the future.

XVIII. OTHER POLICY AND ORGANIZATIONAL MATTERS

Status of Membership of CCOP

174. The present members are: China, Indonesia, Japan, Democratic Kampuchea, Malaysia, Papua New Guinea, Philippines, Republic of Korea, Singapore, Thailand and Viet Nam.

Permanent Representatives of Member Countries to CCOP for 1988/89

175. The Committee took note that the Permanent Representatives of CCOP in the member countries for the forthcoming year will be as listed below:

China

Chief of Division, Bureau of Foreign Affairs
(Mr. Wang Daxiong)
Ministry of Geology and Mineral Resources

Indonesia

Director of the Marine Geological Institute
(Drs. H.M.S. Hartono)
Directorate General of Geology and Mineral Resources
Ministry of Mines and Energy

Deputy Permanent Representative
(name to be confirmed)

Japan

(to be officially appointed by the Government of Japan)

Malaysia

Director-General of the Geological Survey
of Malaysia
(Mr. Yin Ee Heng)
Ministry of Primary Industries

Papua New Guinea

Secretary
(Mr. W.D. Searson)
Department of Minerals and Energy

Philippines

Undersecretary for Environment and Natural Resources
(Hon. Celso R. Roque)
Department of Environment and Natural Resources

Alternate Permanent Representative
Deputy Executive Director
Bureau of Energy Development
(Mr. Apollo Madrid)
Office of Energy Affairs

Republic of Korea

President of Korea Institute of Energy
and Resources (KIER)
(Dr. Jee Dong Kim)
Ministry of Science and Technology

Singapore

Division Director (Industry)
(Mr. Leong Cheng Chit)
Economic Development Board

Thailand

Director-General
(Mr. Visith Noiphan)
Department of Mineral Resources (DMR)
Ministry of Industry

Viet Nam

Deputy General Director
(Dr. Nguyen Hiep)
Vietnam Oil and Gas General Department

Subject to confirmation by their Governments, the Special and Technical Advisers to CCOP for 1988/89 would be:

Australia

Dr. D.A. Falvey
Chief Scientist
Division of Marine Geoscience and Petroleum Geology
Bureau of Mineral Resources, Geology & Geophysics
P.O. Box 378
Canberra City, ACT 2601

Mr. Chris Johnston
Division Manager/Co-ordinator
Marine Division
Bureau of Mineral Resources,
Geology & Geophysics
GPO Box 378, Canberra 2601

Belgium

Prof. Dr. R. Paepe
Director of the Department for Quaternary
Geology and Marine Geology and Overseas
Mineral Inspection
Belgium Geological Survey
Pleinlaan 2
1050 - Brussel

Canada

Mr. Marcel Morin
Head, Mining Resource Inventories Section
Natural Resources Division
Canadian International Development Agency
2000 Promenade du Portage
Hull, Quebec K1A OG4

Dr. M.J. Keen, Director
Atlantic Geoscience Centre
Geological Survey of Canada
Bedford Institute of Oceanography
Box 1006, Dartmouth
Nova Scotia, B2Y 4A2

France

Mr. Francois G. Callot
Observatoire des Matieres Premieres
120 Rue du Cherche-Midi, 75006 Paris

Mr. Louis Galtier
Bureau de Recherches Geologigues et Minieres (BRGM)
BP 6009, 45060 Orleans Cedex

Mr. Francois Le Lann
Vice-President (Eurasia-America Division)
Bureau de Recherches Geologiques et Minieres (BRGM)
BP 6009, 45060 Orleans Cedex

Germany, Federal Republic of

Professor Dr. Karl Hinz
Director and Professor at the Federal Institute
for Geosciences and Natural Reosurces
P.O. Box 51 01 53, Stille Weg 2
D-3000 Hannover 51

Indonesia

Professor Dr. John A. Katili
Director-General of Geology and Mineral Resources
Ministry of Mines and Energy
Jakarta

Japan

Dr. Tomoyuki Moritani
Director, Marine Geology Department
Geological Survey of Japan
Higashi 1-1-3, Tsukuba-shi
Ibaraki-ken 305

The Netherlands

Dr. E. Oele
Head of Mapping and Applied Geology Department
Geological Survey of The Netherlands
Spaarne 17, Postbus 157
2000 AD Haarlem

Norway

Prof. Richard Sinding-Larsen
Secretary-General of the International Union
of Geological Sciences
Geological Survey of Norway
Leiv Eirikssons vei 39
P.O.Box 3006, N-7001 Trondheim

Dr. Oystein Berg
Expert Adviser on Offshore Safety
Head, Strategy Department
Norwegian Petroleum Directorate
P.O. Box 600, 4001 Stavenger

Switzerland

Professor Emilie Jaeger
Institute of Mineralogy
Isotope Geology
University of Bern
Erlachstrasse Bern CH 3012

Union of Soviet Socialist Republic

Mr. Mikhail N. Alekseev
Chairman, Working Gorup SHELF
Commission of World Ocean Problems
Academy of Sciences of the USSR
Geological Institute
Pyzhevsky Per. 7
Moscow 109017

Dr. Andrey A. Tchistiakov
Vice-Chairman, Working Group SHELF
Institute of Overseas Geology
Dimitrova 7, Moscow

United Kingdom

Dr. Clive R. Jones
Acting Head, Overseas Directorate
British Geological Survey
Keyworth, Nottingham, NG12 5GG

United States of America

Dr. A.T. Ovenshine
Chief, Office of International Geology
U.S. Geological Survey
National Centre, Mail Stop 917
Reston, Virginia 22092

Dr. Maurice J. Terman
Chief, Asian and Pacific Geology
U.S. Geological Survey
National Centre, Mail Stop 917
Reston, Virginia 22092

Dr. George G. Shor
Professor
Scripps Institution of Oceanography
Mail Code A-010
La Jolla, California 92093

Dr. Dennis Hayes, Professor
Lamont-Doherty Geophysical Observatory
Columbia University
Palisades, NY 10964

CPC

Dr. J.A. Reinemund
Executive Director, CPCEMR
P.O. Box 890
Lessburg, VA 22075
U.S.A.

Dr. George Gryc
General Chairman
Circum-Pacific Map Project
U.S. Geological Survey
345 Middlefield Road
Menlo Park, CA 94025

IOC/UNESCO

Dr. M. Ruivo (1988 only)
Secretary
Intergovernment Oceanographic Commission
(IOC)
7 Place de Fontenoy
75700 Paris

Dr. Kazuhiro Kitazawa
Assistant Secretary
Intergovernmental Oceanographic Commission
(IOC)
7 Place de Fontenoy
75700 Paris

IUGS

Professor Richard Sinding-Larsen
Secretary-General of the International Union
of Geological Sciences
Geological Survey of Norway
Leiv Eirikssons vie 39
P.O. Box 3306, N-7001 Trondheim

Dr. John A. Reinemund
Treasurer, IUGS
P.O. Box 890
Leesburg, VA 22075
U.S.A.

Technical Advisers

Mr. Per Laheld
Executive Secretary
Norwegian Engineering Committee
on Oceanic Resources
P.O. Box 350, 1322 Hovik
Oslo, Norway

Ambassador Oddmund Graham
Head, North-South Department
Ministry of Foreign Affairs
P.O. Box 8114 Dept.
0032 Oslo 1, Norway

Prof. Masahiro Miyoshi
Faculty of Law and Economics
Aichi University
1-1 Machihata, Machihata-cho
Toyohashi-shi, Aichi 440
Japan

Dr. John Noakes
Director
Center for Applied Isotope Studies
The University of Georgia
CAIS Building, 120 Riverbend Road
Athens, Georgia 30605

Honorary Advisers

Mr. L.C. Noakes
(Australia)

Dr. C.Y. Li
(Republic of China)

Dr. Gunter K.F. Giermann
(Federal Republic of Germany)

Dr. K.O. Emery
(United States of America)

Mr. Leo W. Stach
(Australia)

Prof. Dr. Masami Hayakawa

Prof. Dr. Shiegeru Oda

Dr. Y. Shimazaki

(Japan)

XIX. DATE AND VENUE OF THE TWENTY-SIXTH SESSION OF CCOP

176. The Committee was informed that the Republic of Korea was unable to host the annual session of CCOP in Seoul in 1989 in view of the planned relocation of the concerned institute from Seoul to another location outside the city in the latter half of 1989. The Steering Committee therefore decided to hold the next session in Bangkok tentatively during the 2nd half of October 1989, to be hosted by CCOP, with co-operation of the Thai Department of Mineral Resources in providing meeting rooms at its new premises and related conference facilities. The Committee expressed its appreciation to Thailand for the proposed provision of such facilities.

XX. ADOPTION OF THE REPORT

177. The report of the Committee was adopted on 11 December 1988.

ANNEX I

LIST OF PARTICIPANTS

CHINA

Representative

Mr. Wang Daxiong
Permanent Representative of China to CCOP
Division Chief
Bureau of Foreign Affairs
Ministry of Geology and Mineral Resources
64 Funei Dajie, Xisi
People's Republic of China

Alternates

Mr. Yang Dengwei
Senior Petroleum Geologist
Research Institute of Petroleum Geology
Jiangling, Hubei Province
People's Republic of China

Mr. Yang Guangtai
Deputy Division Chief
South China Sea Geological Survey Headquarters
No. 477, Huanshi Road East
Guangzhou
People's Republic of China

INDONESIA

Representative

Drs. H.M.S. Hartono
Permanent Representative of Indonesia to CCOP
Director
Marine Geological Institute
Ministry of Mines and Energy
Jalan Dr. Junjunan 236
Bandung 40174, Indonesia

Alternates

Prof. Dr. John A. Katili
Special Adviser of Indonesia to CCOP
Director-General of Geology
and Mineral Resources
Ministry of Mines and Energy
Jalan Jenderal Gatot Subroto Kav. 49
Jakarta, Indonesia

Mr. J. Widartoyo
Head, Division of Multilateral
Co-operation
Ministry of Mines and Energy
Merdeka Selatan 18
Jakarta, Indonesia

Dr. Bona Situmorang
Senior Geologist
LEMIGAS
P.O. Box 89/JKT
Jakarta, Indonesia

Mr. Chairul Bakri
Offshore Exploration Division
P.T. Tambang Timah
Komplek Timah Cilandak No B37
JL.R.S. Fatmawati, Jakarta, Indonesia

JAPAN

Representative

Dr. Jiro Hirayama
Director, International Geology Office
Geological Survey of Japan
1-1-3 Higashi, Tsukuba-shi
Ibaraki-ken, 305 Japan

Mr. S. Ise
First Secretary and Deputy
Permanent Representative
of Japan to ESCAP
Embassy of Japan
1674 New Petchburi Road
Bangkok 10400

Alternates

Mr. Akio Suzuki
Exploration Manager
Nippon Oil Exploration Ltd.
Kuala Lumpur Office
Letter Box No. 74 34th Floor, VBN Tower
No. 10, Jalan P. Ramlee
50250 Kuala Lumpur, Malaysia

Mr. Yoshitaka Hosoi
Resident Representative
Metal Mining Agency of Japan
Manila Office
19th floor, BA-Lepanto Building
8747 Paseo de Roxas
Makati, Metro Manila
Philippines

Mr. Kazuyoshi Hasegawa
Chief Geologist
Singapore Office
Idemitsu Oil Development Co., Ltd.
Singapore Representative Office
16 Raffles Quay 16-03 Hong Leong Bldg.
Singapore

Dr. Masaharu Watanabe
Chief Staff Geologist
Idemitsu Oil Exploration Co., Ltd.
3-1-1 Maruuouchi Chiyodaku
Tokyo 100
Japan

REPUBLIC OF KOREA

Representative

Dr. Kim, Chong-Su
Research Councillor
Korea Institute of Energy and
Resources (KIER)
P.O. Box Guro 98
Seoul
Republic of Korea

Alternates

Dr. Kim, Sahng-Yup
Director
Department of Resources Exploration
Korea Institute of Energy
and Resources (KIER)
P.O. Box Guro 98
Seoul, Republic of Korea

Dr. Lee, Won Young
Head, Marine Exploration Division
Korea Institute of Energy and Resources (KIER)
P.O. Box Guro 98
Seoul
Republic of Korea

MALAYSIA

Representative

Mr. Yin Ee Heng
Permanent Representative of Malaysia to CCOP
Director-General
Geological Survey of Malaysia
Tabung Haji Bldg.
19 & 20 Floor, Jalan Tun Razak
P.O. Box 11110
50736 Kuala Lumpur
Malaysia

Alternates

Mr. T. Suntharalingam
Acting Director of Mapping Division
Geological Survey of Malaysia
P.O. Box 1015
30820 Ipoh
Malaysia

Mr. Oon Kee Hua
Deputy Director of Mines
Department of Mines
Pejabat Pengarah Galian
Bangunan Kerajaan Negari Perak
Ipoh, Perak, Malaysia

Mr. Ho Wang Kim
Senior Geologist
PETRONAS, Menara Dayabumi
Jalan Sultan Hishamuddin
P.O. Box 12444
50778 Kuala Lumpur
Malaysia

PHILIPPINES

Representative

Hon. Celso R. Roque
Permanent Representative of
Philippines to CCOP
Undersecretary
Department of Environment and
Natural Resources
Visayas Avenue, Diliman
Quezon City, Philippines

Dr. Guillermo R. Balce
Director
Mines and Geo-Sciences Bureau
8th Floor, Triumph Building
1610 Quezon Avenue, Quezon City
Philippines

Alternates

Mr. Mario L. de Leon
Director
Office of UNIO
Department of Foreign Affairs
PICC Building, CCP complex
Roxas Boulevard, Manila, Philippines

Mr. Freddy G. Rillera
Chief
Oil and Gas Division
Bureau of Energy Development

Mr. Romeo Luis
Chief Geologist
Mines and Geo-Sciences Bureau

Mr. Salvador Martin
Chief Marine Geologist
Mines and Geo-Sciences Bureau

Mr. Horacio C. Ramos
Regional Executive Director
Dept. of Environment & Natural Resources, Region I
No. 80 Diego Silang St.,
Baguio City, Philippines

Ms. Ellamelides Antonio
Supervising Development Specialist
Trade, Industry and Utilities Staff
National Economic Development Authority

Mr. Dominador Almogela
Regional Technical Director
Mines Sector
DENR Region I

Mr. Ramon Quebral
Senior Geologist
Mines and Geo-Sciences Bureau

Mr. David Baladad
Senior Geologist
Bureau of Energy Development

Mr. Jaciel Benavides
Senior Geologist
Bureau of Energy Development

Mr. Mario C. Berbano
Environmental Management Manager
Philippine National Oil Company Manila
PNOC Complex, Merritt Road
Fort Bonifacio
Makati, Metro Manila
Philippines

Mr. Randolph Avila
Geologist, PNOC
c/o PNOC-EDC, Merritt Rd.,
Fort Bonifacio, Philippines

Mr. Luisito M. Lacson, Jr.
SRS IV
Oil and Gas Division, Office of Energy Affairs
PNPC Complex
1201 Fort Bonifacio, Makati, Metro Manila
Philippines

SINGAPORE

Mr. Gan Chong Cher
Head, Engineering Systems Group
Industry Development Division
Economic Development Board
250 North Bridge Road
#24-00 Raffles City Tower
Singapore 0617

THAILAND

Mr. Akanit Suwanasing
Director
Economic and Information Division
Department of Mineral Resources
Rama VI Road
Bangkok 10400

Dr. Chanin Rasrikriengkrai
Chief, Offshore Exploration Subdivision
Economic Geology Division
Department of Mineral Resources
Rama VI Road
Bangkok 10400

SPECIAL ADVISERS

AUSTRALIA

Dr. David Falvey
Special Adviser of Australia to CCOP
Division of Marine Geosciences
& Petroleum Geology
Bureau of Mineral Resources
P.O. Box 378, Canberra ACT 2601
Australia

BELGIUM

Prof. Dr. R. Paepe
Special Adviser of Belgium to CCOP
Director, Department for Quaternary
Geology, Marine Geology and
Oversea Mineral Inspection
Belgium Geological Survey; and
Director, Earth Technology Institute
Free University of Brussels
Pleinlaan 2, 1050 - Brussel
Belgium

CANADA

Dr. M.J. Keen
Special Adviser of Canada to CCOP
Director
Atlantic Geoscience Centre
Geological Survey of Canada
Bedford Institute of Oceanography
Box 1006, Dartmouth, Nova Scotia
B2Y 4A2, Canada

FEDERAL REPUBLIC OF GERMANY

Prof. Dr. Karl Hinz
Special Adviser of Federal
Republic of Germany to CCOP
Director and Professor at the
Federal Institute for Geosciences
and Natural Resources
P.O. Box 51 01 53, Still-Weg 2
D-3000 Hannover 51
Federal Republic of Germany

JAPAN

Dr. Tomoyuki Moritani
Special Adviser of Japan to CCOP
Director, Marine Geology Department
Geological Survey of Japan
1-1-3 Higashi
Tsukuba-shi, Ibaraki-ken
305 Japan

THE NETHERLANDS

Dr. E. Oele
Special Adviser of The Netherlands to CCOP
Head, Mapping & Applied Geology Dept.
P.O. Box 157
2000 AD Haarlem
The Netherlands

NORWAY

Dr. Oystein Berg
Special Adviser of Norway to CCOP
Norwegian Petroleum Directorate
P.O. Box 600, NPD
4001 Stavanger
Norway

Dr. Richard Sinding-Larsen
Special Adviser of Norway to CCOP
Professor
Norwegian Institute of Technology
Department of Geology
7034-NTH-Trondheim
Norway

Mr. Einar H. Bandlien
Director
NOPEC A.S.
Baarsrudveien 2, P.O. Box 88
3478 Naersnes
Norway

UNION OF SOVIET SOCIALIST REPUBLICS

Dr. M.N. Alekseev
Special Adviser of the USSR to CCOP
Chairman, Working-Group
SHELF
Commission of World Ocean Problems
Academy of Science of the USSR
Geological Institute of the USSR
Academy of Sciences, Pyzhevsky pez. 7
Moscow, 109017 USSR

Dr. Igor M. Mirchink
Deputy chief
Department of Mineral resources
of the World Ocean Ministry of
Geology of the USSR
Bolshaya Gzuzinskaya, 4/6
Moscow, USSR

Mr. M. Tikhonov
Third Secretary, USSR Embassy
Dasmarinas Village, Makati
Manila, Philippines

Mr. V. Kashlatyi
First Secretary (Economy)
USSR Embassy (Trade Section)
Dasmarinas Village, Makati
Manila, Philippines

THE UNITED KINGDOM OF GREAT BRITAIN
AND NORTHERN IRELAND (UK)

Dr. Clive R. Jones
Special Adviser of United Kingdom to CCOP
Acting Head
Overseas Directorate
British Geological Survey
Keyworth, Nottingham NG12 5GG
United Kingdom

Dr. D.W. Holliday
Expert Deep Geology Unit
British Geological Survey
Keyworth, Nottingham NG12 5GG
United Kingdom

THE UNITED STATES OF AMERICA (USA)

Dr. Maurice J. Terman
Special Adviser of USA to CCOP
Asian and Pacific Geology
Office of International Geology
U.S. Geological Survey
National Centre, MS 917
Restion, VA 22092, USA

Dr. George Gryc
Special Adviser of USA to CCOP
General Chairman
Circum-Pacific Map Project
U.S. Geological Survey
345 Middlefield Road, MS 952
Menlo Park, CA 94025, USA

Dr. Charles D. Masters
Chief
World Energy Resource Program
U.S. Geological Survey
National Centre, MS 955
Reston, VA 22092, USA

HONORARY ADVISER

Dr. C.Y. Li
Honorary Adviser to CCOP
5th Floor, 106 Hoping Road E.,
Section 2, Taipei, Taiwan 10636
Republic of China

OTHERS

UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)

Mr. Mohamed Farashuddin
Deputy Resident Representative
UNDP Manila

Mr. Romulo V. Garcia
Regional Programme Officer
Regional Bureau for Asia and Pacific
UNDP, 1 United Nations Plaza
New York 10017, USA

Mr. Dhannan V. Sunoto
Assistant Regional Representative
UNDP Bangkok

Mr. Eduardo Pons
Programme Officer
UNDP, Manila

ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC (ESCAP)

Natural Resources Division (NRD)

Mr. P.J. Bakker
Chief
Mineral Resources Section
Natural Resources Division
ESCAP
United Nations Building
Rajadamnern Avenue
Bangkok 10200

Technical Co-operation Division (TCD)

Ms. Thelma Kay
Programme Management Officer
Technical Co-operation Division
ESCAP
United Nations Building
Rajadamnern Avenue
Bangkok 10200

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(IOC OF UNESCO)

Dr. Gunter Giermann
Alfred Wegener Institute for Polar Research
D-2850 Bremerhaven
Federal Republic of Germany

CIRCUM-PACIFIC MAP PROJECT
(CPMP)

Dr. George Gryc
General Chairman
Circum-Pacific Map Project
U.S. Geological Survey
345 Middlefield Road, MS 952
Menlo Park, CA 94025
USA

UNITED NATIONS HEADQUARTERS

Mr. Simon Handelsman
Interregional Adviser in EDP Methods in
Mineral Exploration/Development
Natural Resources and Energy Division
Department of Technical Co-operation
for Development
United Nations
One U.N. Plaza, DC 1-842
New York, N.Y. 10017
U.S.A.

CCOP TECHNICAL SECRETARIAT

Mr. Sermsakdi Kulvanich
Director
CCOP Technical Secretariat
110/2 Sathorn Nua Road
Bangkok 10500

Dr. Takemi Ishihara
Senior Geophysicist
CCOP Technical Secretariat
110/2 Sathorn Nua Road
Bangkok 10500

Dr. Henri Fontaine
Senior Pre-Tertiary Geologist
CCOP Technical Secretariat
110/2 Sathorn Nua Road
Bangkok 10500

Mr. Ivar Miljeteig
Resources Assessment Programme Co-ordinator
CCOP Technical Secretariat
110/2 Sathorn Nua Road
Bangkok 10500

Dr. Charles Hutchison
Overall SEATAR Co-ordinator
CCOP Technical Secretariat
110/2 Sathorn Nua Road
Bangkok 10500

Dr. Frank Wang
CCOP Consultant
U.S. Geological Survey, MS-999
345 Middlefield Road, Menlo Park, CA 94025
USA

Mr. Sakda Chantanalertvilai
Assistant to Director, and
Editor, CCOP Newsletter
CCOP Technical Secretariat
110/2 Sathorn Nua Road
Bangkok 10500

Ms. Sumalee Songsujarit
Accounts Officer cum Office Manager
CCOP Technical Secretariat
110/2 Sathorn Nua Road
Bangkok 10500

Ms. Chariya Srisuwan
Senior Secretary
CCOP Technical Secretariat
110/2 Sathorn Nua Road
Bangkok 10200

UNDP/ESCAP TECHNICAL SUPPORT TO CCOP PROJECT

Dr. John Ringis
Team Leader
c/o CCOP Technical Secretariat
110/2 Sathorn Nua Road
Bangkok 10500

Mr. B. Elishewitz
Senior Petroleum Geologist
c/o CCOP Technical Secretariat
110/2 Sathorn Nua Road
Bangkok 10500

Dr. James. L. Harding
Senior Quaternary Geologist
c/o CCOP Technical Secretariat
110/2 Sathorn Nua Road
Bangkok 10500

OBSERVERS

Mr. Sigurd Heiberg
Project Manager
Norwegian Petroleum Directorate
P.O. Box 600, N4001
Stavanger, Norway

Dr. Hiroshi Hasegawa
Senior Geophysicist
Geological Survey of Japan
1-1-3 Higashi, Tsukuba-shi,
Ibanaki-ken
305 Japan

Mr. Raymundo Villones, Jr.
Senior Geologist
Mines & Geosciences Bureau
Philippines

Mr. Meliton de los Santos
Senior Geologist
Philippine Overseas Drilling
and Oil Development Corp. (Philodrill)
Quad Alpha Centrum Bldg.
R5 Pioneer St., Mandaluyong,
Metro Manila, Philippines

ANNEX II

REPORT OF THE STEERING COMMITTEE MEETING

The twelfth meeting of the CCOP Steering Committee was held on 4th, 7th, 8th and 9th December 1988 at the Baguio Terraces Hotel in Baguio City, the Philippines. The meeting was attended by representatives from China, Indonesia, Japan, Malaysia, the Philippines, the Republic of Korea, Singapore and Thailand. Staff of the CCOP Technical Secretariat, including technical personnel of the UNDP/ESCAP Technical Support to CCOP Project also participated in the meeting. Representatives from UNDP and ESCAP attended the last day of the meeting. The list of participants is attached as Annex I to the report.

1. Election of chairman and rapporteur

Hon. Celso R. Roque, Undersecretary of the Department of Environment and Natural Resources of the Philippines and new Permanent Representative of the Philippines to CCOP for 1988/89, was elected Chairman of the meeting. Dr. Chong Su Kim, representative of the Republic of Korea, was elected Vice-Chairman. Dr. J. Hirayama, representative of Japan, was elected rapporteur.

2. Adoption of the Agenda

The Agenda (document No. STEERING COMMITTEE (XII)/1) was adopted by the Committee.

3. Review of action taken since the last Steering Committee meeting

The Director reported to the meeting the activities of CCOP, in both administrative and technical aspects, undertaken since the last annual session in Bangkok in November 1987. Details of these activities are fully covered in the annual progress report of the Director, CCOP Technical Secretariat, covering the period 1 November 1987 - 30 October 1988 (document No. CCOP(XXV)/3).

Additional to the information contained in that report, the Director informed the meeting that a cheque for US$5,000 was received from the Singapore representative as his Government's annual cash contribution to CCOP for 1988. The meeting was further informed that the Royal Norwegian Government had indicated its future technical assistance to CCOP in the amount

of 2.3 million Norwegian Kroener annually for three (3) years starting from 1989. Approximately half of this annual support will cover activities in the offshore safety and marine environment programmes and the other half will be allocated to the Resource Assessment Programme.

The meeting was also informed of the Director's plan to have the SEATAR programme successfully concluded at the end of next year with the selection of a full-time overall SEATAR co-ordinator to expedite the work and selection of a publisher to publish the final results of this long-term co-operative undertaking between CCOP and IOC.

The report was accepted by the Steering Committee.

4. Status of the Headquarters Agreement with the Royal Thai Government

The representative from Thailand informed the meeting that the Thai Ministry of Foreign Affairs was in the process of drafting the Headquarters Agreement for submission to Parliament within next year. The Director was requested to work closely with the drafting team. Concerning the Secretariat's request for an interim grant of privileges and immunities pending finalization of that Agreement, the meeting was informed that the Ministry of Foreign Affairs would work out this matter with the Ministry of Interior.

The Thai representative also informed the meeting that the Ministry of Foreign Affairs requested inclusion of the following phrase "taking into consideration prevailing laws and regulations of the host country" at the end of Article 1 in the Terms of Reference of CCOP. The Committee was further informed with respect to the question of privileges and immunities that consideration will be given to grant those to CCOP on the same basis as that given to other international organizations. In other words, CCOP may or may not be granted similar privileges and immunities enjoyed by ESCAP and other U.N. bodies in Thailand. One of the representatives then requested the Secretariat to approach the Thai Government to provide at least fundamental privileges and immunities to CCOP.

The Director was requested to consult the member countries on any amendment proposed to be made to the draft Headquarters Agreement by the Thai authorities. He was also requested to follow up the above matter closely with the concerned authorities in those ministries to ensure that CCOP obtain interim privileges (e.g. work permit for newly-recruited experts) and that the draft Agreement be submitted timely to the next Parliament meeting for its consideration.

5. Consideration of the long-term objectives of CCOP

The Director presented to the meeting a document on the guidelines for long-term objectives of CCOP. The meeting was informed that the Secretariat had received seven recommendations from eight respondent countries, one of which gave no recommendation but only mentioned that the Country agrees on the long-term objectives of CCOP. Three countries have not responded to the request for indication of their long-term needs and objectives.

The following views were expressed by the member countries.

1. The Malaysian representative was of the opinion that CCOP has been established for years and should already have its objectives, both short and long-term. The problem might therefore be on terminology. Also, in defining those objectives, priority should be given to what most of the countries require in common.

2. The Japanese representative suggested that the most imminent task for CCOP now is to recruit the Regional Experts followed by the establishment of a training school equipped with essential training facilities. Japan is prepared to provide assistance in the carrying out of deep-sea seismic cruises, possibly starting in three years. The cruises will be useful for total isopach map adjustment of discrepancies in different countries.

3. The Philippine representative considered that requirements expressed by most of the member countries are not of a long-term objective nature. Review should be made of the existing programmes in the intermediate plan (5-year work programme) first to determine which activities should be accomplished by CCOP in the long term. Also, some proposed activities may not necessarily be considered as long-term, i.e. the setting up of a training center, which could possibly be realized before 1992. He asserted that CCOP, as a body promoting co-operation in mineral resources exploration in the region, should decide on its future direction whether to confine itself to offshore prospecting alone or to expand its scope. In fact, CCOP has already broadened its scope from offshore to some onland activities such as its Quaternary geology, SEATAR and pre-Tertiary geology programmes.

4. The Korean representative recommended that the Secretariat seek the comments and advice of the Special Advisers on the long-term requirements of the countries.

5. The Indonesian representative drew the attention of the meeting to one of the possible long-term objectives of CCOP on deep-sea exploration for joint prospecting that before concentrating on deep-sea, it should study shallow seas first.

The Committee agreed to the suggestion of the Japanese representative that the Secretariat should summarize the opinions and recommendations received on this matter and prepare a summary for its next meeting.

6. Proposed Work Plan for 1989

The Director presented to the Steering Committee document STEERING COMMITTEE (XII)/10 on draft CCOP Work Plan for 1989.

The Secretariat informed the Committee that the 3D Seismic Workshop proposed to be conducted in January next year will be postponed to around April due to problems on availability of computer facilities.

The following requests and/or recommendations were made by the Committee:

1. The Japanese representative requested the Secretariat to include Dr. Hanaoka's programme in the plan.

2. The Chinese representative requested that an activity recommended at the recent 3rd CCOP Heatflow Workshop in Bangkok in November be inserted in the plan for implementation. The activity, entitled "Shallow Water Heat-Flow Experimental Survey", will be the first project to be conducted in the East China Sea around May/June next year for two weeks.

3. The Philippine representative requested the inclusion of the following proposals in the plan.

(i) Demonstration survey with towed gamma-ray spectrometer.

(ii) A workshop on "Management of the EEZ (Exclusive Economic Zones.)

(iii) A feasibility study on the establishment of a CCOP training center.

The 1989 Work Plan was endorsed by the Committee. The Secretariat will incorporate all the above into the plan and issue a final version later on for dispatch to the member countries.

7. CCOP Regional Experts Programmes

The Director presented to the meeting the document No.

STEERING COMMITTEE (XII)/12 on Status of the Regional Experts Programme and Recommendations for Future Action.

The Philippine representative informed the Committee that the view of the Government on this Programme, which was not reflected in the aforesaid document, is that a pool of regional experts stationed in the home countries should be an important component of the Regional Experts Programme.

The Director informed the meeting with respect to the employment conditions that the majority of the member countries had agreed to "Alternative III", of which the essential element is that the home-based organization will continue to pay the experts' salaries and certain basic allowances.

The Chinese representative indicated his country's intention to nominate a candidate for the post of "Marine Geophysicist" and is prepared to cover only basic salary.

The Indonesian representative informed the Committee that a suitable candidate will be located for the "Petroleum Geologist" post and that the employment conditions outlined in Alternative III will be communicated to him.

The Korean representative will recommend to his government for nomination of a candidate for the Marine Geophysicist post.

The remaining countries have no candidates to nominate. However, the Thai representative requested that since his Government could not financially support any of its officials to work for an international organization, consideration may be given by the Committee for inclusion of the following phrase in the relevant documents under the topic on "Funding" to read as follows:

> "(a) the member country providing the nominated regional expert by means of continued payment of their salaries and a few basic employment benefits unless such provision is not allowed under the existing laws and regulations of the member countries."

Also, the Thai representative requested a change of the word "overseas allowance" to "assignment allowance" in Alternative III.

Thailand will consider nominating a candidate if the above proposal is endorsed by the Committee.

Despite the fact that the Secretariat now has non-reimbursible experts from the region (one Japanese expert currently on the staff and another Japanese expert to join soon) and a non-reimbursable petroleum geologist from Norway, the

Malaysian representative suggested that the Secretariat should proceed with implementing the programme for long-term manpower resources development within the region. The Committee unanimously endorsed this suggestion and requested the member countries to follow the schedule outlined in the aforesaid paper.

Concerning funding arrangements for the programme, the Director informed the meeting that the existing CCOP member countries' annual contributions will be sufficient for recruitment of two experts for two years. In fact, provision has already been made for that purpose in the 1989 budget. He further informed the meeting that UNDP has agreed in principle to the Secretariat's request to cover travelling expenses of the Regional Experts' missions from UNDP/ESCAP Project funds. Also, he had approached Norway for support of the Programme and has been given an encouraging response that the Norwegian Government could consider giving support in term of covering programme expenses, i.e. mission costs.

With respect to the possibility of obtaining support under TCDC arrangements, the Committee was informed that such support could be considered only for travelling expenses of member country participants to take part in a training programme under TCDC and not the Regional Experts' travelling expenses.

The Secretariat was requested to plan to explore for additional sources of funding after the programme has started.

8. Consideration of CCOP's draft Administrative/ Financial Code and Rules of Procedure

8.1 Draft Rules of Procedures

In view of a number of differing opinions of the country representatives on the Rules (document No. STEERING COMMITTEE (XII)/3), the Committee suggested that the member countries send in their comments/recommendations to the Secretariat by the end of February 1989 for preparing a second version of the Rules and send it to the member countries for consideration.

8.2 Draft Administrative/Financial Code

Considering the heavy schedule of the meeting agenda and the time allowed for it, the Committee was of the view that it would be hardly possible to review the voluminous document (No. STEERING COMMITTEE (XII)/4) on the above subject within the given time-frame. The Committee therefore recommended that the member countries transmit their comments/suggestions to the

Secretariat by the end of February 1989 for preparation of a second version and send it to the member countries for consideration.

9. Accounting of CCOP funds and UNDP/ESCAP Project fund and financial status of CCOP

The Director presented to the Committee the CCOP Financial Report contained in document No. STEERING COMMITTEE (XXI)/7.

The ESCAP representative invited the attention of the Committee to the statement on the status of sub-allotment of the UNDP/ESCAP Project and informed them of the substantial amount of money left under-spent. These include mainly provisions under the following budget lines: equipment, fellowships, training, sub-contract and consultancy.

In this regard, the Committee was informed that delays in the purchase of equipment were mainly due to delays in ESCAP's administrative procedures. The Committee therefore requested the UNDP/ESCAP Team Leader and ESCAP to expedite the procurement of equipment.

With respect to fellowships, the Committee was requested to accelerate their requests for fellowship requirements as soon as possible.

The financial report was accepted by the Committee.

10. Proposed budgetary allocation for 1989

The Director presented to the Committee a document (No. STEERING COMMITTEE (XII)/13) on the proposed CCOP budgetary requirements for 1989.

On personnel costs, the Japanese representative requested the deletion of a footnote under an item on supporting staff. Thus, the provision for secretary to be covered from the CCOP fund will total US$11,400 for 36 man/months. The Philippine representative requested the Secretariat to consider increasing the salary level of the junior secretary posts.

The Committee considered that only the total budgetary allocation for organizational expenses for the 13th Steering Committee meeting be shown in the paper and that all the details be left out.

The Committee agreed to allocate US$5,000 as the annual hospitality allowance for the Director.

The 1989 budgetary proposal was approved by the Committee after minor amendment.

11. Up-dated status of the member countries' contributions to CCOP

The Director informed the meeting that at the last Steering Committee meeting, the Secretariat was requested to reflect 1985 contributions onwards in its next statement on the countries' annual contributions. He then presented to the Committee document STEERING COMMITTEE (XII)/8 on the subject.

The Philippine representative requested the Secretariat to reconcile the amounts of the Philippines' contributions to correspond with the correct updated information as reflected in the Director's annual report.

12. Consideration of the draft standard loan agreement for the lending of UN equipment to the member countries.

The Director invited attention of the Committee to document No. STEERING COMMITTEE (XII)/11 on conditions for "loan" of survey equipment to CCOP member countries. The meeting was informed by the UNDP/ESCAP Team Leader that the exchange of communication between himself and the concerned U.N. offices reflects some regulations to be followed in connection with the loan. The Director informed the meeting that UNDP had indicated its desire to transfer the technical equipment to CCOP for its execution and responsibility only after the Headquarters' Agreement is concluded. He added that the equipment for administrative purposes had already been transferred to CCOP.

The Committee agreed to the Philippine representative's suggestion that the draft co-operation agreement involving the mobilization of geophysical equipment for use by the member countries in its survey should continue to be used as a generally standard format for that purpose.

13. Consideration of the nominations received for election to the new CCOP directorship

The Committee has decided on the following procedure concerning election of the new CCOP Director.

(1) Selection of a neutral country as a supervising country for the election. In this regard, the Permanent Representative of Malaysia to CCOP was selected to undertake this task.

(2) The member countries will vote by their names and will send their ballots to the Permanent Representative of Malaysia by 16 January 1989 as an ultimate receiving date.

(3) The vote could be cast by any means, i.e. letter, telex, telefax or hand-delivery of such official message.

(4) In the event that the vote from any member country is not received by the 16 January deadline, the Permanent Representative of Malaysia will try by every possible means to communicate with that country to solicit the vote within 2 weeks from 16 January.

(5) If the vote is not received by 30 January (two Mondays after 16 January) despite the utmost efforts of the Permanent Representative of Malaysia to solicit it, the absent country will be considered as having abstained from the voting.

(6) The Permanent Representative of Malaysia will invite the embassy representatives of all the member countries in Kuala Lumpur to witness the vote counting to be conducted at the Malaysian Geological Survey in Kuala Lumpur on 30 January 1989.

(7) In case of a tie, a re-run is to be conducted by the Permanent Representative of Malaysia to solicit the votes for only two leading candidates. The same procedure will be applied in the event of a second tie within a period of 2 weeks.

The CCOP Chairman will communicate the above procedure to the member countries, which have not sent their representatives to this Steering Committee meeting, namely Democratic Kampuchea, Papua New Guinea and Vietnam.

14. Policies and other organizational matters

14.1 Endorsement of the Proposed nomination of TAG chairman and rapporteur

The Committee endorsed the proposal by the Director for nomination of Dr. Clive Jones as Chairman of the Technical Advisory Group of CCOP for 1988/89. The Committee agreed to the Director's proposal that the appointment of the rapporteur for the TAG meeting should be left with the TAG Chairman.

14.2 Role of Special Advisers to CCOP

Since the above subject was supposed to be considered concurrently with the Rules of Procedures of CCOP, the Committee

decided that the member countries should send in their comments/suggestions to the Secretariat by the end of February 1989 for preparation of a second version and send it to the member countries for consideration.

14.3 Proposed change of the auditor of CCOP accounts

For economical reasons, the Committee decided that no change of auditor to an international firm should be made and that the services of the current auditor be retained.

14.4 Report on CCOP's participation in IOMAC meeting

The Director informed the Committee of his attendance at the first Indian Ocean Marine Affairs Co-operation (IOMAC) Technical Group Meeting on Offshore Prospecting for Mineral Resources in the Indian Ocean held in Karachi, Pakistan, from 11 to 14 July 1988. He also informed the Committee that he had presented to that meeting an informative paper entitled "The Experience of CCOP in Offshore Prospecting for Mineral Resources" which was submitted as document STEERING COMMITTEE (XII)/14 to the Committee.

The Committee was further informed that the UNDP/ESCAP Team Leader was also invited to attend the meeting and the report on his participation in that meeting was submitted as document STEERING COMMITTEE (XII)/16 to the Committee.

The above two reports were accepted by the Committee.

14.5 Evaluation of benefits received by the member countries VS their contributions

The Director informed the Committee that, as requested by the 10th CCOP Steering Committee meeting, the Secretariat had prepared a report on evaluation of the assistance provided by CCOP to the member countries during the period 1983-1988, which was submitted as document STEERING COMMITTEE (XII)/6 to the Committee.

The Committee was also informed that a similar paper was prepared once in the past for the period 1977-1982. The information contained in the report was obtained from the data available in CCOP files and reports, as well as input contributed by the co-operating countries at the Secretariat's request.

The Chinese representative suggested that bilateral assistance given by a co-operating country directly to any member country through bilateral negotiation and arrangements may not be included in the report. However, should that bilateral assistance be provided through CCOP, it may then be appropriate

to include that in the evaluation report. The Committee agreed to the Chinese representative's recommendation.

The report was accepted by the Committee.

15. Dates and venues of the thirteenth CCOP Steering Committee meeting and twenty-sixth annual session of CCOP

The Korean representative informed the meeting that in view of the planned relocation of his institute from Seoul to another location outside the city in the latter half of 1989, the Republic of Korea has difficulties to host the next (26th) annual session of CCOP in that country. He therefore proposed that his country host the session after next, i.e. in 1990.

The Japanese representative proposed that for economical reasons, the annual meetings of CCOP should be held in Bangkok, where its headquarters is located. There were extensive discussions about the pros and cons of the practice of hosting the session by the member countries on a rotational basis. The Thai representative indicated to the Committee that his country is prepared to host the session every year.

The meeting finally decided that the decision on the venue of the session should generally be based on the invitation by the member countries and that the rotation should not be compulsory. In other words, the session should be held in Bangkok if no invitation is received by any member countries.

For the next session in 1989, the Committee decided that it will be held in Bangkok and hosted by CCOP, with co-operation of the Thai Department of Mineral Resources in providing meeting rooms and related conference facilities. The Thai representative indicated that if the meeting rooms at the new DMR building are not available, the Thai Government is prepared to cover the costs of holding the session at a hotel.

In deciding on the dates of the meeting, the Committee recommended that the Secretariat should bear in mind the schedule of the meetings of the ESCAP Committee on Natural Resources, which are normally attended by several representatives from the CCOP countries. To avoid overlapping between the above two meetings, the meetings should be held in sequence to enable the CCOP country representatives, particularly the Special Advisers, to make only one trip to Bangkok to attend both meetings. The Committee decided to set the second half of October 1989 as the tentative schedule. The Secretariat will communicate this schedule to ESCAP Natural Resources Division to work out the most appropriate timing based on the above consideration. The duration of CCOP annual session will not be longer than 10 days.

Concerning the Steering Committee meeting, the Committee decided that it should be held only once a year prior to the annual session to enable discussion of its recommendations at the session. In the event that there are important policy and/or administrative matters which should be urgently decided by the Steering Committee, the Director will then consult with the CCOP Chairman who may decide that a mid-year meeting should be held to deal with those urgent important matters. The duration of such meeting will be dependent upon the number of important matters to be discussed. For such ad hoc meetings, the Secretariat was requested to make necessary budgetary allocation to cover expenses related to the attendance of the member country representatives at the meeting.

16. Other business

16.1 Establishment of a Quaternary Geology Centre

The Director informed the Committee that he had informed TAG to postpone consideration of that matter until the long-term objectives of CCOP have been confirmed.

16.2 UNDP Project equipment

The Committee decided that no new equipment should be bought until the long-term objectives of CCOP have been confirmed, but that the purchase of equipment needed to maintain the operational status of the existing systems and already agreed to be purchased under the UNDP Project Document should be expedited.

16.3 Participation of CCOP in the next IGC meeting

The Director informed the Committee that IUGS has provided CCOP an exhibition booth (10 x 10 ft.) for display of CCOP work and publications at the above meeting scheduled for July next year. The cost for such participation to be incurred by CCOP was estimated to be around US$10,000 - 11,000. This includes travelling expenses of the Director (or his representative) and professional preparation of materials for display.

The Committee agreed that CCOP should participate in the above event to publicize its activities, at the minimum cost possible. The Director was also requested to explore external sources of funding for that purpose.

16.4 Consultancy fees for the overall SEATAR co-ordinator

The Committee was informed that Prof.C. Hutchison had already submitted to the Secretariat his requirements for the

above appointment and that the Secretariat would arrange for the necessary funding for his appointment, including negotiating with the IOC Secretariat for its contributions.

16.5 Proposed extension of the UNDP international expert posts

In view of the short time for overlapping between the Regional Experts and the existing UNDP/ESCAP Project experts and considering requirements of the work programmes, the Committee unanimously agreed to request the UNDP representative to make representation to his organization for further extension of the UNDP international experts' services for another year in 1990.

17. Adoption of the Report

The report was adopted by the Steering Committee on 10 December 1988.

ANNEX III

REPORT OF THE TWENTY-FOURTH SESSION OF
THE TECHNICAL ADVISORY GROUP (TAG)

CONTENTS

ORGANIZATION OF THE SESSION

1. The Technical Advisory Group of CCOP (hereafter referred to as the Group, or TAG) met for its twenty-fourth session at the Hyatt Terraces hotel in Baguio City, Philippines, from 5 to 7 December 1988, under the chairmanship of Dr. Clive R. Jones, Acting Head, Overseas Directorate, British Geological Survey.

2. Representatives were present from all the member countries of CCOP except the Democratic Republic of Kampuchea, Papua New Guinea and the Socialist Republic of Vietnam. Representatives of UN HQ, CPMP, IUGS and IOC attended. The meeting included Special and Technical Advisers and observers from all the co-operating countries except France. Dr. C.Y. Li attended as Honorary Adviser.

3. The staff of the CCOP Technical Secretariat and the UNDP/ESCAP Project to Support CCOP acted as secretariat for the session, and supporting services were provided by the Philippine Mines and Geo-Sciences Bureau.

I. ACTIVITIES RELATING TO OFFSHORE HYDROCARBON RESOURCES

A. REVIEW OF ACTIVITIES IN MEMBER COUNTRIES
(Documents: CCOP (XXV)/6,16,21,30,31,32,39,47,61)

CHINA

Gross crude oil production in 1987 was only marginally higher than in 1986 while the first 9 months production in 1988 indicates a significantly large increase in oil production.

Significant discoveries in the Bohai Gulf basin continued with a well on the Jinzhou 9-3 structure testing 184 cubic meters of oil and 6189 cubic meters of gas per day. In the East China Sea basin four wells were drilled of which two tested oil and gas.

Within the Beibu Gulf basin exploration interest has been focused on the Wei Southwest depression where 24 targets have been identified, seven of which have been drilled with five discoveries, one of which obtained production from a buried hill play of Carboniferous limestone. One of the 1988 discoveries in the Beibu Gulf basin was onshore in the northern coastal area of Hainan Island where 80,000 cubic meters of gas was tested in a sandstone interval from 2195-2205 meters depth.

In the Pearl River basin at least 16 oil and gas fields have been discovered to date of which the largest is the Liuhua 11-1 field discovered by Amoco in 1987. It has reserves of more than 100 million tons in place.

Exploration in the Songliao basin has been concentrated on Lower Cretaceous objectives around the giant Daging oil field. Since 1985 five gas fields have been found within place reserves of 50 billion cubic meters.

Other discoveries have been made during the past year in the Yitung, Jiu Quan, and Sichuan basins with the last named having a well producing from an unconventional overpressured gas pool with a maximum well yield of 100,000 cubic meters per day from Jurassic mudstones and sandstones with very low permeabilities. Another well discovered Ordovician gas for the first time at a depth of 3500 m.

In 1988 three additional exploratory wells were completed as discoveries in the Tarim basin, further indicating its great hydrocarbon potential. The resource potential of the Tarim basin is estimated to be 5.5 billion tons of oil and 5.85 trillion cubic meters of gas, accounting for 11% of China's total hydrocarbon resources.

INDONESIA

In Indonesia currently there are 27 foreign oil companies operating within 70 contract areas exploring and/or producing oil and gas.

Production of oil and gas in 1987 was:

Oil: 479.1 million barrels of which 36.8% were produced from offshore areas.

Gas: 1.73 billion cubic feet of which 14.2% were produced from offshore areas.

For the first 9 months of 1988 Indonesian production of oil and gas was:

Oil: 241.6 million barrels of which 33.4% were produced from offshore areas (Status June 1988).

Gas: 0.89 billion cubic feet of which 13.0% were produced from offshore areas (January - June 1988)

Cumulative production of oil and gas through 1 June 1988 has been:

Oil: 12.8 billion barrels

Gas: 15.6 trillion cubic feet

In 1987 total seismic surveying decreased 29.4% from 1986, i.e.: from 39,276 kms in 1986 to 27,730 kms in 1987. During this period, offshore seismic was 15,179 kms or 54.7% of the total. During January 1988 through September 1988 total seismic surveying was 21,237 kms of which 11,435 kms were from the offshore.

JAPAN

Offshore geophysical surveys during 1987 were conducted entirely by the Japan National Oil Corp. and included 4088 kms of seismic, 4010 kms of which were marine seismic and 78 km were shallow marine seismic extending onto land. Gravity and magnetic data were recorded together with the marine seismic and totaled 4092 km and 4057 km respectively.

Offshore exploratory drilling declined from four wells in 1986 to one well in 1987. The MITI Kashiwazaki-oki well was completed on the continental shelf of the Sea of Japan. One of the objectives of the well was to test possible hydrocarbon accumulations in the volcano-pyroclastic complex, the so-called

"Green Tuff" of the lower part of the Miocene sequence, in addition to Miocene-Pliocene normal clastic sediments. The well reached the "Green Tuff" as planned with no production encountered, however, oil and gas were confirmed by DST in Miocene sandstones.

"Green Tuff" exploration is very important in Japan because a large percentage of the oil and gas production of Japan is currently obtained from this type of reservoir.

REPUBLIC OF KOREA

A total of 5,500 line kilometers of a detailed geophysical survey of combined seismic, magnetic and gravity was carried out on Block VI of the Continental Shelf, off the east coast of Korea during March and June, 1988 by PEDCO, to enhance knowledge of basin configuration as well as to develop more information concerning its petroleum potential.

A three well exploratory drilling programme has been started on Block VI-1 on the continental shelf of Korea.

Seismic data interpretation of subzone 7 in the Korea-Japan joint development area is now being processed by the Korea Institute of Energy and Resources.

In addition, paleontological, lithological and geochemical studies were carried out to further knowledge of the source rocks and reservoir rocks in subzone 5.

MALAYSIA

During the period of 1 October 1987 to 30 September 1988 eleven new Production Sharing Contracts and one Letter of Intent were signed with foreign oil companies.

A total of 41,726 km of new seismic data was acquired, 25,322 km of 2D and 16,404 of 3D. Eight exploration wells and 62 development wells were drilled.

Crude oil/condensate and gas production amounted to an average of 550,000 BOPD and 1636 million SCF/D respectively.

Acquisition of seismic data over eight new blocks was started and surveying of the other three new blocks will start in the fourth quarter of 1988.

Offshore Peninsular Malaysia 12,675 km of 2D seismic data were obtained off Terengganu and in the Straits of Melaka.

Offshore Sarawak seismic data acquisition totaled 29,051 km which included 12,647 km of 2D and 16,404 km of 3D.

No seismic was acquired offshore Sabah.

Offshore Peninsular Malaysia 28 development wells were drilled by ESSO Production Malaysia, Inc. in the Guntong field.

All eight exploration wells during this period were drilled offshore Sarawak resulting in two new oil discoveries and some gas shows. Twenty-two new development wells were also drilled.

Off Sabah twelve development wells were drilled in the Erb West, Samarang, and St. Joseph fields.

Daily production of oil and condensate averaged 310,000 BOPD from offshore Peninsular Malaysia, 140,000 BOPD offshore Sarawak, and 90,000 BOPD offshore Sabah. Daily production of gas (associated and non-associated) for Malaysia averaged 1,636 million SCF.

As of 1 January 1988 hydrocarbon reserves in Malaysia were:

- Crude oil 2.92×10^{9} STB
- Non-associated gas 42.23×10^{12} SCF
- Associated gas 9.47×10^{12} SCF

PAPUA NEW GUINEA

No report.

PHILIPPINES

There has been an appreciable increase in exploration drilling, seismic data acquisition and geologic mapping during the period of November 1987 - October 1988. The increased exploration activity has been due to the influx of petroleum companies as a result of a promotional campaign carried out by the Office of Energy Affairs starting in September 1987.

A total of nine wells, six offshore and three onshore were drilled in different parts of the country. Three of these were development wells and are now in production (see accompanying table).

During this same period a total of 3013 line-kilometers of seismic data was acquired by different oil companies.

The complex of oil fields offshore northwest Palawan had a combined production of 2.46 million barrels compared to 2.0 million barrels for the previous comparable period.

WELLS DRILLED

NOV. 1987 - NOV. 1988

Well Name	Location	Total Depth (feet)	Remarks
Tara South - 1	NW Palawan	TVD 4,535 MD 7,876	Development Well/Offshore/P&A
Victoria - 2/2A	Central Luzon	14,529/18,360	Dry Hole/Onshore/P&A
North Matinloc - 1	NW Palawan	7,370	Producing Well/Offshore
Verde - 1	NW Palawan	12,009	Dry Hole/Offshore/P&A
North Matinloc - 2	NW Palawan	11,890	Producing Well/Offshore
Jubitnil - 1	Cebu	8,519	Dry Hole/Onshore/P&A
Saddle Rock - 1	NW Palawan	3,250	Dry Hole/Offshore/P&A
Esperanza - 1	NW Palawan	3,642	Drilling/Testing

THAILAND

During the period of October 1987 - September 1988 the following activities took place in Thailand:

- Due to a special resolution of the government PTTEP, the national oil company, bought back four offshore blocks from Texas Pacific Thailand. Two gas fields had already been discovered and appraised in these blocks, the "B" and "E" fields with proven reserves of 1.8 and 0.12 TCF of gas and 10.6 and 2.4 MMBBL of condensate respectively.

- Petroleum exploration and production activities are summarized in the accompanying table.

Area	Geophysical Survey		Drilling			Production		
	Seismic (km)	Crew-Month	EXP.	APP.	DEV.	GAS (MMSCFD)	CONDY (BOPD)	CRUDE (BOPD)
Onshore	2D, 2060.85	8.9	5	8	8	32.90	-	17,631
	3D, 79.8 km^2	2.5						
Offshore	2D, 2526.1	5.0	5	17	35	532.45	19,757.5	3,674
	3D, 16666.875							

B. RESOURCE ASSESSMENT PROGRAMME
(Documents: CCOP (XXV)/3,4,5,17,19,22, ROPEA - R. 150, ROPEA - R. 151)
: CPMP (XIV)/4

The TAG was informed of the year's activities in the portions of the Resource Assessment Programme being co-ordinated by CCOP. The Resource Assessment Programme consists of three major components, the East Asia Geotectonic Map Project which is being co-ordinated by the Geological Survey of Japan, the second component, the East Asia Mineral Assessment Project, is being co-ordinated by the Mineral Resources Section of ESCAP. The third component, the East Asia Sedimentary Basin Analysis Project, forms a major portion of the CCOP Hydrocarbon Programme. The main purpose of the Project is to provide training in the methodologies, techniques and tools required for hydrocarbon assessments to be carried out by each country.

The Resource Assessment Programme is carried out by the CCOP Working Group on Resource Assessment (WGRA) with the recently constituted WGRA Co-ordinating Committee co-ordinating activities between the periodic WGRA meetings. IUGS provides much of the technical support and guidance and advice to the WGRA. This scientific input to CCOP has benefited from financial support from NECOR through grants from the Norwegian Government that have covered expert visits, workshops, and project meetings on data management and computer related activities.

Based on the recommendations of the first WGRA meeting in Kuala Lumpur during 1986, a Project Document had been drafted and circulated to all concerned parties. This Project Document was reviewed in detail at the 2nd WGRA meeting and approved. The Project Document outlines the goals of the Resource Assessment Programme and the procedures for completing Phase I of the East Asia Sedimentary Basin Analysis Project, which basically consists of the production of maps, cross sections and columnar sections of the sedimentary basins in the countries participating in the Programme. The main purpose of the 2nd WGRA meeting was to review the progress made to date towards the goals of Phase I. The review indicated that sufficient progress had been made to justify the implementation of Phase II.

Phase II activities comprise the remainder of the East Asia Sedimentary Basin Analysis Project, which is expected to be completed in 1991. Activities that have been completed and those that are scheduled for the future are shown on the next page.

Recommended Schedule of WGRA Activities
(Revised December 1988)

Activities	1986	1987	1988	1989	1990	1991
Map Compilation - Phase I Total isopach maps, basin outline maps, cross sections, columnar sections	preliminary country by country compilations		regional syntheses			FINAL SUBMITTALS
Map Compilations - Phase II			time-slice paleoenvironmental and lithofacies maps, time-slice isopach maps, paleoenvironmental and lithofacies cross sections			
Play Modeling			manual compilations of typical plays before expert visits	integrated play modeling (WGRA 1, March)	data integration, regional data and models	
Data Management Activities			definition of formats	pilot implementation on microcomputers	establishment of ASCOPE/CCOP data bank prototype	
Expert Visits		June'87 (China, Thailand, Malaysia, Indonesia)	Integrated play modeling	Regional Data and Play Model Integration (June-Aug)	to be defined later	
Workshops	Resources Assessment April'86 (K.L.)	Computer Technology Oct'87 (Thailand)	Heat Flow (BKK) 3-D Seismic (Kuala Lumpur) April 89	Integrated Play Modeling (WGRA 2, November)	Regional Data and Play Model Integration	
Meetings of Co-ordinating Committee			K.L. June' 88 Manila Oct' 88	Thailand (March) Singapore (Oct)	location to be selected later	
Meetings of National Co-ordinators	Apil' 86 (K. L.) 1'st meeting	July' 87 (Jakarta) 2nd meeting	Map Compliers' Workshop Tsukusa, Japan Sept' 88 4th meeting			
Working Meetings of National Co-ordinators and Map Compilers			Feb-March 1988 Bangkok 3nd meeting	(See WGRA 1&2)	location to be selected later	

I. DATA MANAGEMENT

With respect to the Data Management Programme, the TAG was informed that a report had been received from the expert mission which visited China, Thailand, Malaysia and Indonesia last year. The purpose of the mission was to lay the groundwork for the Workshop on "Impact of Computer Technology on the Management and Analysis of Petroleum Exploration Data" which was held in Bangkok in 1987. The workshop focused on the retrieval and interpretation of digitally recorded data. Numerous computer programmes were distributed to the participants. The report is contained in ROPEA R.151.

The WGRA programme in 1988 included in the data management sub-program an activity "Definition of Formats". This was largely accomplished by the recently completed NECOR/IUGS Mission to six of the CCOP member countries. The mission introduced standardized input formats that will be utilized in the 1989 workshop on "Integrated Play Modeling" where the countries will be introduced to usage of software on micro-computers for resource assessment. An abbreviated report of the mission was distributed as document CCOP XXV/19. Two countries, Vietnam and China requested the IUGS/NECOR mission to visit them, but could not be accommodated within the time-frame that the members of the Mission had established. These countries will be visited during the first half of 1989 by the Senior Petroleum Geologist and the WGRA Co-ordinator at the CCOP Technical Secretariat.

At an ASCOPE/CCOP Joint Intersecretariat Meeting it was agreed that a project should be implemented with CCOP establishing a prototype data management system at the Technical Secretariat. Bilateral arrangements should be established with the member countries for demonstration and training in storage, retrieval and interpretation of data.

A programme developed at the Technical Secretariat designed to transform data points from Mercator projection to Lambert Azimutal Equal Area Maps, being used as base maps in the Resource Assessment Programme, has been distributed to member countries after being rewritten by the national map compiler from Indonesia.

A workshop on "3D Seismic" will be held in April 1989 in Kuala Lumpur, Malaysia. The workshop will demonstrate software developed for micro-computers as a work station. One participant from each country will be funded to the workshop.

Dr. R. Sinding-Larsen of NECOR/IUGS pointed out that the Integrated Play Modeling workshop in Bangkok in '89 will be a follow-up of the workshop in Kuala Lumpur in '86. Software will be installed at the Technical Secretariat. Software will be

distributed according to interest expressed by the member countries. The software will be run on Compaq/386 with 130 Mb hard disk or compatible IBM or Toshiba. He also pointed out that the 3D workshop in Kuala Lumpur in April '89 will introduce software, run on Compaq/386 with 130 Mb hard disc, which will be a useful tool in helping to define plays by seismic. The system will, however, not replace larger mainframe systems when it comes to processing large volumes of data.

East Asia Basin Analysis Project

The CCOP Working Group on Resource Assessment (WGRA) met in Bangkok from 29 February - 3 March 1988. This was the third meeting of the WGRA and was chaired by Dr. Richard Sinding-Larsen of IUGS/NECOR. This was the first time that both National Co-ordinators and Chief Map Compilers from all countries participating in the programme met together in what turned out to be a most interesting and successful workshop. The report of the workshop is contained in document ROPEA-R. 150.

A Status Document adopted by the workshop established a Project Co-ordinating Committee to carry on the day-by-day activities between the periodic WGRA meetings. The Co-ordinating Committee met in Kuala Lumpur in June and again in Manila in October 1988 where it reviewed and endorsed the Recommended Schedule of WGRA Activities for 1989 and the budget required to carry them out. It is composed of Dr. Sinding-Larsen, Mr. Sermsakdi Kulvanich and ex-officio the Senior Petroleum Geologist, the WGRA Project Co-ordinator, the ASCOPE Secretary, and the Chairman of the ASCOPE Technical Committee.

The major remaining work to be done to complete the maps for Phase I is to cover the areas of overlapping data. At the suggestion of the third meeting of the WGRA another workshop of map compilers was convened in Tsukuba, Japan from 27-29 September 1988 with the sedimentary thickness maps displayed on plastic overlays so the areas could be worked out one-by-one. The report of this fourth WGRA meeting is being distributed as document number CCOP (XXV/4).

During the workshop each country presented its compiled data and in most cases the total sedimentary thickness maps of Phase I were completed by each country. Then the participants broke into small groups to work on areas of overlapping data. In many cases conflicting interpretations could be worked out easily, in other cases data reviews would have to be conducted in the home offices. In some cases it was found that a neutral observer might have to be called upon to resolve differences. However, it could be seen that sufficient progress had been made so that after a short final review in the home offices the total sedimentary thickness maps should be integrated in a centralized drafting office at CCOP in Bangkok. As the mapping progresses at the Technical Secretariat offices, any unresolved differences could be sent back to the WGRA compilers or presented to them at future meetings for resolution.

During the workshop the USGS presented to the Technical Secretariat a copy of the isopach and facies maps of the Circum-Borneo pilot study originally compiled in 1984 by Dr.Keith Robinson. Also, they presented a set of the most recent version of the eight sheet stable base maps, which include topography.

The Expert Mission on Integrated Play Modeling, which was mentioned in the part on data management, consisted of Dr. Richard Sinding-Larsen of IUGS/NECOR, Dr. Rolf Magne Larsen of Statoil and the IUGS, and Dr. Richard Mast of the USGS. In standardizing the formats for inputs to the USGS and Geological Survey of Canada computer programmes it was necessary to first define plays, explain how they fit into a regional geologic framework, and could be conceptually based on the regional geology, and how they should be risked. Next year's workshop on "Integrated Play Modeling" will help clarify the concepts introduced by the mission. A preliminary report on the expert mission has been distributed as document number CCOP(XXV)/19.

Dr. R. Sinding-Larsen of NECOR/IUGS pointed out that he was pleased to learn that the workshop in Tsukuba in September showed that Phase I of the Resource Assessment Program was on schedule. He told the Committee that the workshop had agreed on making a Play Atlas which should be available in a drafted form before the workshop on Integrated Play Modeling in November 1989. The Atlas will serve as a reference for the definition of plays within the various basins. It was also pointed out that although the main objective for the Resource Assessment Programme is training and transfer of technology , a series of maps, profiles, charts, software programmes and manuals will be available by the end of the program in 1991.

Dr. C. Masters of USGS/IUGS pointed out that the CCOP-WGRA programme was far ahead of any other mapping programme in the area. He pointed to the fact that the Tsukuba workshop was a great experience and showed that the various countries were collaborating very well on solving mapping problems in areas of overlapping data. The Play Atlas which was decided on in the meeting would become a very important reference which will represent a very good basis for discussions as has been the case in the U.S.

Dr. Masters also strongly encouraged CCOP to be represented at the IGC in July 1989 as the conference will be the place for meeting the geological community and generating ideas. The delegation from Thailand expressed its great interest in the WGRA Programme and the great importance for the activity in Thailand. Due to its importance, they asked that it be held in early 1989 with more participants. The Secretariat will attempt to meet their requests as far as possible.

The delegation of Japan requested to be informed what the status was with respect to finalizing Phase I of the WGRA and was informed by the Technical Secretariat that most of the countries would be able to deliver their contribution to the Secretariat by December 1988/January 1989.

NECOR has provided to the CCOP Technical Secretariat, on a non-reimbursable basis, a senior geologist, Mr. Ivar Miljeteig, to act as a WGRA Programme Co-ordinator. His main tasks are to co-ordinate on-going WGRA activities, establish and maintain co-ordination with other programmes and, if requested, assist national co-ordinators and national map compilers in fulfilling their functions for the WGRA. He will also be active in establishing data bases in the CCOP offices to be utilized in resource assessment work.

Heat Flow/Geothermometry Project

During 1988 a mission of heat flow experts from Japan visited Indonesia, Philippines, Malaysia, Thailand and China on three different trips. The composition of the mission changed between trips, with the members shifting between Drs. S. Uyeda, O. Matsubayashi and M. Yamano.

The primary aim of the mission was to prepare the groundwork for the 'Heat Flow Workshop III', which was held from 17-19 November in Bangkok after a change in the venue from Japan.

The workshop itself had three main themes:

- Heat flow data acquisition, onland and offshore
- Application of heat flow data to tectonic problems
- Resource assessments utilizing heat flow data

There were 21 participants and observers including seven invited speakers. With some excellent country papers and interesting lectures it is felt worthwhile to publish the Proceedings as a CCOP Technical Publication. The Technical Secretariat will endeavor to do so during 1989.

There has not been time to prepare a report on the workshop but one item that was brought before the meeting for discussion and possible endorsement is the document CCOP XXV/17 'Summary of Proposals for Project Entitled Thermal History of Petroliferous Basins in the CCOP Region', presented by Dr. D.W. Holliday of the British Geological Survey. The proposals were reported to the TAG which discussed his proposals (Document CCOP (XXV)/17). Dr. Holliday told the TAG the proposals had been written before visiting the area and they would be amplified on in subsequent correspondence. TAG agreed that the suggestions would form a potentially very valuable contribution to regional geologic knowledge and resource assessment and urged the member countries to cooperate as far as possible. It was also agreed that Dr. Holliday should revise his proposal and submit it for final endorsement by member countries at the next WGRA meeting.

Indonesia responded that there are large quantities of data in many countries that would be made available if the work was carried out in the countries and not in the CCOP office and under those conditions Indonesia would support the programme.

Malaysia pointed out that the oil companies in that country were not releasing vitrinite or other maturation data and therefore it would be very difficult to establish calibration points.

Dr. Holliday confirmed that in establishing TTI indices it had not yet decided on whether the Lopatin method is going to be used or not.

Korea mentioned that there are not enough data available in the offshore around the Korean Peninsula to study the geothermometry of the area and asked for outside assistance to make heat flow measurements in its offshore.

Most of the published data in the CCOP region has already been incorporated in a data base established by the Geological Survey of Japan.

Dr. Uyeda's mission also contacted the various countries concerning the possibilities of conducting joint experimental shallow water heat flow measurements. China responded favorably and a two week project is planned for May or June of 1989 on the continental shelf of the East China Sea with the support and assistance of CCOP and Japanese experts.

China presented a paper (CCOP (XXV)/22) on Heat Flow measurements in China Seas in which they suggested that measurements be made on samples from the northern part of the South China Sea by borrowing CCOP's Quick Thermal Conductivity Meter (QTM). This will be subject to future discussions and especially subject to the condition of the QTM.

Mineral Assessment Project

Due to the absence of the ESCAP representative, no report nor paper was delivered on this project. However, the USGS representative reminded TAG that recent progress in mineral deposit modeling would greatly assist the Mineral Assessment Project, the application of genetic models to specific tectonic environments might permit more accurate assessment of the potential for undiscovered mineral resources.

Co-operation with ASCOPE

Many of the hydrocarbon activities of CCOP are conducted in close co-operation with ASCOPE and this co-operation will continue. The workshop on "Impact of Communication Technology on the Management of Petroleum Exploration Data" was jointly sponsored by CCOP and ASCOPE with the support of NECOR and IUGS. A report on this workshop (ROPEA - R. 151) has been distributed.

The forthcoming workshop on 3-D Seismic is also a joint CCOP/ASCOPE endeavor with the IUGS/NECOR supplying the technical and much of the financial input.

Mr. Amnuaychai Thienprasert of Thailand has been appointed Co-ordinator of the ASCOPE Geothermometry/Heat Flow Project to replace Mr. Thamrin of Indonesia who has retired. Dr. Suhaimi Nurusman of Indonesia has been appointed that country's co-ordinator. The next major project is the compilation of data and preparation of a report and map on "Conductivity Map of the ASEAN Region". To some extent the progress of this project depends on the operation of the CCOP Thermal Conductivity Meter (QTM) which right now is in questionable condition.

In the CCOP offices drafting will soon begin on the revised maps of Part I of the ASCOPE/CCOP Stratigraphic Correlation series: "Tertiary Sedimentary Basins of the Gulf of Thailand and South China Sea".

Dr. Mario Berbano, ASCOPE Co-ordinator on Environment and Safety, then presented an interesting and informative report (Annex VII) on the Joint CCOP/ASCOPE/NECOR Marine Environment and Safety Programme for 1988 and plans for the future. The full report has been presented as document CCOP(XXV)/49.

Dr. Oystein Berg will present the programme proposal for 1989 and perspective for the period 1989-91 during the plenary meeting.

I. Pre-Tertiary Hydrocarbon Potential

Dr. Henri Fontaine, the non-reimbursable expert provided by the Government of France, has been carrying out field work in the region for about 6 months since the last Annual Session. In Thailand work was carried out near Chiangmai and Mae Hong Son in the North. First results of this work appear in an article on "Spectacular Karstic Region of Thailand" in CCOP Newsletter Vol. 12, No. 4. Studies were also carried out on selected samples from other provinces. Work was also carried out in Malaysia to assist the Geological Survey in assessment of paleontological results so far obtained. Details of this appear in an article on Paleontological Research in Terengganu State, Peninsular Malaysia", CCOP Newsletter Vol. 13, Nov. 1). On the same mission field work was also carried out in the Kinta Valley. Assistance has also been given to the Indonesian Geological Development and Research Center with problems in Mesozoic stratigraphy in Indonesia.

Dr. Fontaine notified the Group of the increasing importance of the Carboniferous plays where numerous new exposures have recently been found. The TAG was pleased to hear that a separate volume called "The Carboniferous of Malaysia and Thailand, with some notes extending to the Permian", would be published using funds provided by the French Government. A special paper on the Carboniferous of Malaysia is also being planned. In Thailand, special attention was drawn to a well-exposed limestone outcrop at Amphoe Noen Maprang. It may become an international type section for the boundary between Lower Carboniferous and Middle Carboniferous. Two major works of Dr. Fontaine are now in press: "Upper Paleozoic and Mesozoic Fossils of West Thailand and Their Environments" and "Pre-Tertiary Fossils of Sumatra and their Environments".

The delegation from Thailand reviewed Dr. Fontaine's work in the country, and considered it of great value. The services of Dr. Fontaine were requested for one month during 1989 in southern Thailand.

The delegation from Malaysia complimented Dr. Fontaine for his work and requested his services for 3 months during 1989, from Feb. 15-May 15.

Consultancy/advisory services

Due to a prolonged illness of the Senior Petroleum Geologist, the hydrocarbon consultancy and advisory services were sharply curtailed during 1988. They are expected to return to normal in 1989 and probably be considerably expanded due to the presence of the new WGRA Programme Co-ordinator in Bangkok.

Seismic Stratigraphy and other workshops

At the last Annual Session it was reported that the request by Thailand for a workshop on the "Seismic Stratigraphy of Extensional Basins" had been cancelled. Another request was later made by another government agency for a workshop on the same topic and this request has also been indefinitely postponed.

The other 1988 Hydrocarbon Programme workshops and group meetings have been reported in other paragraphs but a summary is given below:

- Third WGRA Meeting - February-March 1988, Bangkok, Thailand
- Fourth WGRA Meeting (Map Compilers) - September 1988, Tsukuba, Japan
- Heatflow Workshop III - November 1988, Bangkok, Thailand
- 3-D Seismic Workshop - January 1989, Kuala Lumpur, Malaysia
- Heat Flow Mission to Indonesia, Philippines, Malaysia, Thailand
- Mission on Integrated Play Modeling to Philippines, Thailand, Indonesia, Malaysia, Republic of Korea, and Japan.

Offshore Technology Including Technical Economic Developments Relevant to CCOP

Two papers were presented by the representatives of the USSR and are to be considered for publication in Part II of the Proceedings.

- CCOP (XXV)/45 - Oil and Natural Gas Reservoirs within the Northwestern part of the Pacific and the Adjacent Territories.
- CCOP (XXV)/41 - Oil and Gas Bearing Potential of Riftogenic Structures within the Western Pacific Mobile Belt.

The US delegation announced that the USGS has completed reports on the "Geology and Offshore Resources of Pacific Island Areas - New Ireland and Manus Region, Papua, New Guinea".

Proposed future activities

The tentative plans for WGRA activities in 1989 are outlined in Appendix V of ROPEA-R. 150 "Recommended Schedule of WGRA Activities". These major proposed activites consist of:

- A major workshop on "Integrated Play Modeling"
- A mission of experts to visit countries and advise on integration of regional data in play modeling
- Working meetings of WGRA National Co-ordinators and Chief Map Compilers
- Pilot implementation of data management activities related to WGRA projects
- Meetings of the WGRA Co-ordinating Committee
- Continuation of compilation of time-slice maps and sections defined at past WGRA meetings for Phase II.

This schedule of WGRA activities have been defined for the TAG and received its endorsement.

- The director of the CCOP Technical Secretariat has informed the TAG that a workshop on Deep Sea Exploration could be organized if requested by member countries.

II. OFFSHORE AND COASTAL GEOPHYSICAL SURVEYS AND RELATED INVESTIGATIONS

A. Activities in Member Countries

The Group was informed of the activities carried out in this field in the member countries during the past year, as detailed below. It noted that, as in previous years, a wide range of survey and other programmes had been undertaken related to offshore minerals exploration, engineering investigations, and coastal studies. It commended the member countries on the work done during the past year and the CCOP Technical Secretariat on the level of assistance it had continued to provide in those activities.

CHINA

(Document: CCOP (XXV)/23)

A Survey for placers along the coast of Yangjiang-Dianbai in southwestern Guangdong Province of China had been carried out by the second Marine Geological Investigation Brigade of the Ministry of Geology and Mineral Resources of the People's Republic of China, with the assistance of the CCOP Technical Secretariat.

The survey was conducted in three stages: (i) offshore geophysical survey, (ii) sea bottom sampling, and (iii) offshore drilling.

The objectives of the survey were:

(i) to obtain a detailed knowledge of the stratigraphy of the unconsolidated sediments in the survey area so as to delineate areas with the best potential for the occurence of economic concentrations of the heavy minerals monazite, xenotime, zircon, ilmenite and rutile and (ii) to provide the opportunity for South China Sea Geological Investigation Headquarters personnel to obtain additional experience in conducting high resolution marine geophysical surveys for detrital heavy minerals.

The South China Sea Geological Investigation Headquarters used its survey vessel the "Hai Bin No. 3" for the work and also provided all backup support, establishment and manning of navigation control stations and local transport.

Equipment for the survey provided by UNDP/CCOP included (i) a high resolution seismic reflection profiling system with sparkarray sound sources, (ii) a side-scan sonar system, (iii) an echo sounder, (iv) a sonobuoy marine refraction system, (v) a Motorola Miniranger III navigation system with automatic computer/plotter and (vi) all necessary recorder paper, spares, etc.

Also provided were the services of the Team Leader of the UNDP/ESCAP Technical Support Project to CCOP for survey planning and implementation and the services of a consultant Marine Geophysicist for five weeks and an Electronics Engineer, for five weeks, during the survey.

The survey was conducted between 17 April and 8 June and obtained 1307.7 Km of single channel seismic and echo sounder data and 415.5 Km of side-scan sonar data. Data quality was good, with seismic penetration in excess of 100 metres to bed-rock in the south-western part of the survey area.

A preliminary interpretation of the results of the survey was undertaken by the South Sea Headquarters Team during the course of the survey and immediately after it, with advice and assistance from the Team Leader and the consultant Marine Geophysicist.

On the basis of that interpretation, five types of sediment deposits immediately underlying the sea floor, which may contain heavy minerals, were recognised in the area. A programme of sampling and drilling was therefore recommended to fully check this interpretation and to determine the heavy mineral content of those sediments.

Subsequently a programme of bottom sampling was carried out from 6-31 August 1988, involving 55 surface samples and 20 core samples. Analysis of the samples has shown that many contain encouraging quantities of the heavy minerals being sought.

Drilling with a total penetration of 110.5 metres in 70 holes is planned for March 1989 and it is also planned to conduct a detailed geophysical/geological survey over an area of 300 to 400 Km^2 which is considered to have high potential for economic deposits of heavy minerals.

The assistance of the CCOP Technical Secretariat was requested to conduct the detailed survey.

INDONESIA

(Documents: CCOP (XXV)/38, 42, 43)

During the period mid-1987 to mid-1988 the Indonesian State Tin Enterprise (P.T. Tambang Timah) had carried out drilling activities in the waters around the islands of Bangka, Belitung, Singkep, Karimun, and Kundur. In September and October, 1988 geological and geophysical surveys had been conducted off northern Bintan island.

The drilling activities had included prospecting to find new deposits or new indications, further exploration of known indications or deposits, exploration to find extensions of known deposits and further evaluation or re-evaluation of known deposits.

The drilling equipment used had included manual waterjet drills, mechanised waterjet and counterflush drills, Bangka drills mounted on steel pontoons and self-propelled drilling barges equipped with counterflush drills.

During the above period 5925 holes had been drilled with a total penetration of 87,838 metres.

The geological/geophysical survey off Bintan island was conducted to investigate the geological conditions and mineral potential of the area and consisted of 292 Km of seismic traverses at 200 to 400 metre spacings, covering an area of 108 Km2.

The Marine Geological Institute (MGI) carried out two geological and geophysical survey during the past year.

The first survey in Karawang waters, west Java consisted of 39 bottom samples and 178 Km of seismic profiling, to study the bottom sediments, sub-bottom structures, bathymetry and depositional environments, as a part of MGI's programme to compile a bottom sediment distribution map of the marine areas of Indonesia.

Interpretation of the geophysical survey data and laboratory work on the samples has been completed. These elucidated the stratigraphy of the unconsolidated sediments and showed that erosion is occurring along some parts of the coast and accretion in other parts.

The second survey was conducted in Tangerang waters and consisted of 50 bottom samples and 175 Km of seismic profiling, to study bathymetry, bottom sediments, sub-bottom structures and depositional environments.

Tidal measurements, wave parameter measurements and shore line mapping were also carried out.

Interpretation of the seismic results indicated that the sediments in the area investigated can be divided into four sequences.

Coastal erosion in the area was considered to be caused by seasonal waves and human activities and it was considered that sand excavation in the area should be stopped to protect the coast from serious erosion.

JAPAN

(Document: CCOP (XXV)/8)

A five year programme (1984-1988) of marine geological studies of continental shelves around southwestern Japan was continued with surveys off Wakasa Bay. The results have been published as a preliminary cruise report and maps are under preparation.

The offshore areas around Noto Peninsula were also surveyed and the next phase of this series of surveys, for 1989-1991 is now being planned.

A series of environmental studies had been continued to establish the patterns of sedimentation in lacustrine to marine environments, to provide basic data on the sedimentation of polluted bottom sediments and to produce sedimentology, geochemical and biological maps to provide a comprehensive guide for the management of the coastal environment.

In 1987-1988, under the project, "Study on Anthropogenic Influence of Sedimentary Regime of Some Open Type Bays", Akita Bay was investigated, and under the project, "Study on Sedimentation of Polluted Lake Sediments", Lake Biwa was studied, in which interesting subbottom landslide deposits were revealed.

In 1988, a new project, "Study on Long Range Prediction Model for the Change of Shallow Water Environment for Optimum Industrial Development" was started in Tokyo Bay, jointly with the National Research Institute for Pollution and Resources. This aims at establishing prediction methods for the environment for industrial constructions in the coastal areas.

Studies of marine sand resources on the continental shelves around Japan have been conducted since 1975 preliminary to evaluating their potential as fine aggregates. Though earlier

studies until 1979 were done by sampling surveys using a chartered vessel, since 1981 the style of study was changed to reanalyze the stored samples obtained through the surveys of the Continental Margin Mapping Program, for aggregate quality.

In 1987, the offshore areas of Oki-Kaikyo between Oki-islands and central Chugoku were studied.

REPUBLIC OF KOREA

(Documents: CCOP (XXV)/28, 29)

A marine geological and geophysical survey of the continental shelf between Ulsan and Tsusima island was conducted by KIER in 1988 over a 4000 Km2 area, as part of the continuing programme of compiling marine geological maps of Korea. A total of 670 line Km of seismic and magnetic profiles, 76 grab samples and 12 piston cores were obtained during the survey.

A marine geological and geophysical survey had also been conducted off the southern coast between Pusan and Ulsan in 1987. A total of 1150 line Km of seismic and magnetic profiles, 59 grab samples and 22 piston cores were obtained during that survey. Interpretation of the geophysical data and laboratory work on the samples have been completed and a series of maps of the areas has been produced.

The sediments overlying acoustic basement could be divided into four mappable depositional sequences and it appeared that a series of right-lateral wrench fault systems had played an important part in the formation of the Quaternary sedimentary sequences.

MALAYSIA

(Document: CCOP (XXV)/7)

A complete reinterpretation of all data from the survey between east and west Malaysia, along a proposed high voltage power cable route, was completed by the Team Leader of the UNDP/ESCAP Technical Support Project to CCOP. This included reinterpretation of the seismic data, detailed correlation of that with side-scan and bathymetric data and especially with the results of bottom sampling previously carried out along the route. The reinterpretation indicates that along the majority of the route the bottom sediments may be overconsolidated, having

been subjected to one or more periods of subaerial weathering during low sea level stands.

Advisory/consultancy services were provided to the Geological Survey of Malaysia in the preparation of a project document to carry out geological/geophysical surveys for detrital minerals in the Darvel Bay area, Sabah, sometime between July to September, 1989.

PAPUA NEW GUINEA

The CCOP Technical Secretariat provided the Miniranger III navigation system for positioning of survey vessels during two research cruises in the West Woodlark Basin, in early 1988.

The Team Leader of the UNDP/ESCAP Technical Support Project to CCOP also advised and assisted in mobilising the system and instructed participants from the Geological Survey of Papua New Guinea in its operation. He also participated in the second cruise and made a preliminary interpretation of the seismic profiles obtained during that cruise.

The research cruises were conducted to investigate the possible occurrence of seafloor hydrothermal activity in the area, where sea-floor spreading is propagating into continental crust and to study the petrological and tectonic characteristics of this transition. The surveys included multibeam echo sounder and magnetometer profiling, bottom video-camera tows, some seismic reflection profiling and dredging.

PHILIPPINES

(Document: CCOP (XXV)/50)

The Philippine Mines and Geosciences Bureau continued interpretation of the shallow marine seismic data gathered during the 1987 geophysical survey off the northwest coast of Luzon, which had been conducted with the assistance of the CCOP Technical Secretariat. Following the in-house training of three technical personnel at the CCOP Technical Secretariat in Bangkok in 1987, further assistance in the interpretation of the data was provided in 1988 by the Team Leader of the UNDP/ESCAP Technical Support Project to CCOP. Priority in the interpretation was given to the Lingayen Gulf area as it was considered to have the best promise for mineral deposits. This was based on the interpretation of the seismic data from the area which delineated

possible older shoreline sediments in the central part of the Gulf.

From 22 October to 8 November 1988, a follow-up piston coring survey was carried out in the Gulf, with assistance from the CCOP Technical Secretariat, which provided the navigation system for the work and the services of the Team Leader of the UNDP/ESCAP Technical Support Project to CCOP to assist in it.

Initial examination of samples from the south-central part of the Gulf confirmed the presence of inferred prograded shoreline sediments at a depth of 60 to 70 metres below present sea-level. Some of the cores also appeared to contain significant percentages of opaque heavy minerals.

During the middle part of the year a joint marine research expedition was conducted off the Kalayaan islands. This survey was conducted together with various members of the National Committee on Marine Sciences and the data obtained would be utilised in the assessment and inventory of marine resources in the Kalayaan group of islands.

THAILAND

(Document: CCOP (XXV)/26)

In the period October 1987 to September 1988, geophysical and geological surveys were undertaken offshore Rayong and Chantaburi Provinces in the eastern part of the Gulf of Thailand. The surveys were carried out under the "Training in Offshore Mineral Exploration in the Gulf of Thailand Project", being conducted by the Department of Mineral Resources (DMR), with technical assistance from the UNDP.

The surveys involved 310, 763, 797 and 706 line-kms of geophysical profiling (seismic and magnetic) in four tracts, respectively, as well as 106 gravity core samples. An additional 467 beach sediment samples were also collected by suction cores. These were processed in the laboratory to produce grain-size and heavy mineral analyses.

All survey data have been interpretated and a number of interesting geological and geophysical features have been delineated. Heavy minerals occurring in the tracts include zircon, leucoxene, ilmenite, tourmaline, rutile, monazite, garnet, pyrite, anatase, Fe-oxide, green spinel, xenotime and cassiterite.

Reports Relating to Offshore Surveys

The Group was informed that the following reports, notes and agreements relating to the offshore survey programme were prepared during the past year by the CCOP Technical Secretariat.

(i) Marine Seismic Survey in Hall Sound, Papua New Guinea - Preliminary Review of Data - by John Ringis. (November 1987)

(ii) Preliminary interpretation of seismic reflection data from research cruise in the Woodlark Basin, Papua New Guinea - by John Ringis. (For inclusion in the cruise report - February 1988)

(iii) Agreement between South China Sea Geological Investigation Headquarters and CCOP for co-operation to conduct an offshore geophysical survey along the western coast of Guangdong province, China. (March 1988)

(iv) Recommendations for Sampling and Drilling in 1988 Survey Area Off Western Guangdong Province, China - by John Ringis and John Lean. (June 1988)

(v) Geophysical Survey for Offshore Mineral Deposits, Western Guangdong Province, China - by John Lean. (June 1988)

(vi) Reconnaissance Marine Geophysical Survey of a Proposed High Voltage Cable Route from Teluk Mahkota, Johore to Tanjung Datu, Sarawak, Malaysia - by John Ringis. (June 1988)

(vii) Report on First Meeting of the IOMAC Technical Group on Offshore Prospecting for Mineral Resources in the Indian Ocean - John Ringis. (Prepared for UNDP, New York)

(viii) Interpretation of Reconnaissance Seismic Reflection Profiler Results and Recommended Sampling Locations, Lingayen Gulf, Northwestern Luzon, Philippines - John Ringis. (October 1988)

(ix) Agreement between the Philippine Mines and Geosciences Bureau and CCOP on Co-operation to undertake geological sampling in Lingayen Gulf. (October 1988)

B. In-house Training of Member Country Personnel at the CCOP Technical Secretariat

Four of the participants in the offshore survey conducted in China from April to June 1988, also participated in processing and interpretation of the data at the CCOP Technical Secretariat, under the guidance of UNDP/ESCAP Technical Support to CCOP Project experts. One of the participants was at the Technical Secretariat for one month (October) and three for two months (October and November, 1988).

The work accomplished during this period included, (i) plotting of bathymetric contours (2 m intervals), (ii) interpretation of the seismic profiles in terms of stratigraphic units/sediment types and tabulation of depths (for correction for sound source - hydrophone array offset), (iii) interpretation of side-scan sonar records, (iv) correlation of preliminary sampling results with seismic and side-scan sonar results, (v) formulation of stratigraphic "models" for the area surveyed and (vi) preparation of outline for final report on the investigations.

C. Courses and Lectures on High Resolution Marine Geophysical Techniques

The Team Leader, UNDP/ESCAP Technical Support to CCOP, presented the following courses and lectures during the past year

(i) A lecture/practical course on "High Resolution Seismic Techniques", on 5 and 6 September 1988, at the Annual Group Training Course on Offshore Prospecting conducted by the Geological Survey of Japan. Of the 11 participants, 4 were from CCOP member countries.

The main topics covered were, equipment, survey methods, the basic physics involved and interpretation of seismic reflection profiles using seismic stratigraphic concepts.

(ii) A paper on "Geophysical Techniques on Offshore Tin Exploration", at a Seminar on "Application of Geophysics in the Tin Mining Industry" held at Jakarta, Indonesia on 30-31 May, 1988. The seminar was organised by the Southeast Asia Tin Research and Development Centre (SEATRAD), in co-operation with P.T. Tambang Timah (PERSERO) of Indonesia and the Indonesian Association of Geophysicists (HAGI).

(iii) A paper on "Geophysical Methods in the Offshore Exploration for Tin and Other Detrital Heavy Minerals in Southeast Asia", at a Workshop on "Geophysical

Exploration in Tropical Terrances" held at Hanoi, Vietnam, from 19-24 November, 1988.

D. Correlation Studies

Work done to date had shown that the unconsolidated sediment sequences in the onshore and offshore areas of northwestern Peninsular Malaysia can be correlated by adopting a scheme of six major stratigraphic subdivisions, based on drilling data onshore and drilling and seismic data offshore (in the Lumut area).

The key to making that correlation had been the seismic stratigraphic interpretation of the offshore seismic reflection profiles.

Further detailed work was planned in early 1989 with the aim of completing this project in the first half of 1989.

The Geological Survey of Malaysia had made a literature survey and available data were being collected to extend the correlation studies to all of Peninsular Malaysia.

E. Atlases of High Resolution Seismic Profiles

The Geological Survey of Malaysia had been compiling some high resolution seismic sections in conjunction with the offshore-onshore correlation studies.

F. Consultancy/Advisory Services

The Group was informed that advisory services were provided to member countries during the past year, as follows:

In Papua New Guinea: (i) to advise and assist Rabaul Volcanological Observatory in interpretation of marine seismic survey data from Rabaul harbour - Blanche Bay and correlation with SEAMARK side-scan data, (ii) in reviewing seismic data from offshore surveys in Lae and (iii) on requirements for setting up and operating navigation control stations for research cruises in the Woodlark Basin.

In China, on requirements for planned offshore surveys in western Guangdong Province and in data interpretation and recommended followup work.

In the Philippines, on interpretion of marine geophysical data from the survey in Lingayen Gulf.

In Thailand, on interpretation of marine seismic profiler data from surveys in the eastern Gulf of Thailand.

G. Report on Geophysical Survey and Other Equipment

The Group was informed of the status of geophysical and other equipment for offshore and coastal surveys as follows:

(i) Echo Sounder - fully operational

(ii) Seismic Reflection Profiling System

- operational, but with following possible problems/shortcomings.
- EPC 4800 recorder fully operational but two EPC 3200 recorders unreliable and subject to frequent malfunction
- Power supply and Triggered Capacitor Bank Units likely to malfunction increasingly more frequently.
- at least one new hydrophone array will be required within the next one to two years.
- instrumentation tape recorder not fully repaired due to difficulty (and therefore time required and cost) to locate basic fault

(iii) Side-Scan Sonar System - operational but recorder subject to constant overheating and malfunctioning. Two towfish in good order.

(iv) Marine Magnetometer - operational but needs new cable.

(v) Base Station Magnetometer - subject to frequent malfunctions. Printer very unreliable.

(vi) ORE Transducer System - requires minor repair work to make fully operational.

(vii) Motorola Miniranger System with Computer/Plotter

- operational but shipboard R/T unit unreliable and subject to malfunction. A new unit has been requisitioned at a cost of US$12,000.

  The shipboard computer is very unreliable and in need of urgent replacement.

The shipboard plotter requires overhaul and this will be arranged under the existing maintenance contract when equipment is returned to Singapore.

(viii) Navigation Post-Processing Computer/Plotter at CCOP Technical Secretariat

- operational but slow and incompatible with IBM and Compaq systems forming basis of Secretariat's computer facilities. Upgrading (mainly through new software) required.

(ix) Sonobuoy Refraction System - operational

(x) Satellite/Omega Navigator - operational

(xi) 24 Channel Seismic Refraction System - delivered in early 1988. One of recorder units damaged during delivery. Supplier has been requested to repair or supply new unit. Awaiting response.

The Group was informed that the status of procurement of items, recommended for purchase by the committee and therefore included in the UNDP Project budget for 1987-1991, was as follows:

1. Replacement of items for marine seismic system
(Budget:- US$55,000)

To date no major items needed. Funds to be kept in reserve for replacement of any items which may break down in the next two to three years.

2. Replacement items for navigation systems
(Budget:- US$30,000)

New shipboard R/T unit requisitioned (US$12,000). The rest of the budget to be kept "in reserve" for replacement of items as needed in the next two to three years.

3. Marine and Base Station Magnetometers
(Budget:- US$60,000)

The following systems have been requisitioned through ESCAP in February 1988.

(i) Recording/marine proton magnetomter - US$30,000

(ii) Portable proton magnetometer/gradiometer - US$15,000

(iii) New cable for existing marine magnetometer - US$ 4,500

Total - US$ 49,500

4. Portable "radar" set
(Budget:- US$6,000)

Requisition submitted to ESCAP. Estimated cost:- US$4,000.

5. Bottom Samplers:
(Budget:- US$40,000)

Requisition for piston/gravity corer submitted to ESCAP. Estimated cost:- US$ 8,000.

Details of bottom grabs and rock dredges submitted to ESCAP for location of supplier. Estimated cost:- US$7,000.

6. Underwater Camera System
(Budget:- US$10,000)

Purchase of camera not considered warranted. Instead purchase of ROV recommended (see below).

7. Recording Oceanographic Current Meters
(Budget:- US$30,000)

Purchase of recording current meters not considered warranted. Instead "flowmeter" type meters recommended and details supplied to ESCAP for location of suppliers. Estimated cost:- US$4,000.

8. Seismic Refraction System
(Budget:- US$75,000)

Delivered, at a cost of US$60,000.

9. Resistivity System
(Budget:- US$10,000)

Requisition to be submitted in late 1988/early 1989.

10. Borehole Logging System
(Budget:- US$30,000)

Requisition submitted to ESCAP in February 1988.

11. Computer/Plotter, etc
(Budget:- US$50,000)

Requisitions for AO size plotter and dot matrix colour printer submitted to ESCAP. Estimated cost: US$11,000 and US$1,700, respectively.

Replacement of shipboard navigation computer urgently required. Requisition to be submitted to ESCAP late 1988/early 1989. Estimated cost:- US$15,000.

12. Computer Software
(Budget: US$58,700)

Cost of the software procured in 1988 was about US$8500.

New software required for processing and plotting of navigation data at CCOP Technical Secretariats as well as for comprehensive capability for manipulating data, plotting maps, sections, making volume calculations, etc. Purchase is therefore strongly recommended. Estimated cost of package, including system design, customization, commisioning and training is US$32,000.

Software for proposed new shipboard navigation computer also required, to be compatible with office systems. Estimated cost US$13,000.

Requisitions for the above software packages to be submitted to ESCAP in late 1988/early 1989.

The Group was informed that the CCOP Technical Secretariat was considering the purchase of the following equipment, which had not been included in the budget for 1987-1991, to be financed largely from savings made in equipment purchase.

(i) A remote operated underwater vehicle (ROV) in place of the underwater camera. Estimated cost - US$60,000.

(ii) A replacement Side-Scan Sonar recorder. Estimated cost - US$36,000.

The Group noted that purchase of the above equipment and software packages would maintain the capability of the CCOP Secretariat to provide assistance to member countries in a wide range of offshore survey activities for at least the next five years.

It considered that it was important that such a capability should be maintained for that period and beyond and that the acquisition programme was well thought out and would meet this need.

H. Proposed Future Activities

The Group was informed that requests for assistance in conducting offshore surveys and in processing and interpreting data from previous surveys had been made by China, Indonesia, Malaysia, Philippines, Papua New Guinea and Singapore. It recommended that the CCOP Technical Secretariat should provide whatever assistance it could in this work.

The Group was also informed of the status of plans made to date to conduct a demonstration survey with the British Geological Survey's towed seabed gamma spectrometer. It noted that the demonstration could be conducted during 1989 and that, in order to make it a comprehensive one, the CCOP Technical Secretariat could provide additional geophysical equipment if needed (and available). It was also informed that the "host" country would need to provide a suitable survey vessel and meet the cost of its operation during the survey, while the CCOP Technical Secretariat would finance participation of other member country observers on the demonstration.

The Group considered this to be a very useful exercise and recommended that the CCOP Technical Secretariat should make all necessary arrangements to implement it in 1989 if possible.

The Group was informed that the Secretariat would continue to provide advisory services as requested by member countries in offshore survey planning, execution and data processing, equipment specifications and performance, survey vessel suitability and modification needs and related topics.

It would also continue to conduct courses and give lectures on marine geophysical survey techniques and results as requested and subject to availability of staff.

The Group recommended strongly that preparation of atlases of high resolution seismic profiles and regional and onshore-offshore correlation studies be accorded a high priority in next year's work programme.

It also considered the in-house training programme in survey data processing and interpretation to be a very successful one and recommended its continuation.

III. QUATERNARY GEOLOGY PROGRAMME

A. Review of Activities in Member Countries

The Group was informed about the activities conducted by the organizations within the member countries coincident to Applied Quaternary Geology. The investigations included projects and research activities formulated to assist in resources exploration, engineering geology, environmental geology, shallow ground water and other aspects of Quaternary Geology in the coastal areas.

CHINA

(Document CCOP (XXV)/25)

During 1988, more attention was paid in China to applied Quaternary Geology with regards to needs of economic construction, as well as the environmental consequences of large construction projects. However, in order to adequately define these processes, basic Quaternary geology projects were also conducted.

I. Basic Studies in Quaternary Geology

1. Quaternary Processes & Events - The Lower Boundary of the marine Pleistocene was identified as 1.90 Ma. in the East China Sea, the Xisha Islands and the Zhujiang River basins according to index forminifera. A Special Publication: "Quaternary Processes & Events in China Onshore and Offshore Areas" will be published soon. The lower boundary of the terrestrial Quaternary was found to be 2.40 Ma in the Nihewan Bed formation. Nine Quaternary transgressive beds were identified from a core in the Huanghai Sea and correlated with other China coastal areas. The O_{18} curves have been used to identify palaeoclimatic events in the Late Pleistocene.

2. Holocene Palaeoclimate and Sea Level Changes - A symposium on "Sea Level Changes in China in the Past 10,000 years" was held in December 1987. Discussions focused on the high sea level in Middle Holocene and its sedimentary and geomorphological records.

3. Studies on Integrated Harnessing of Rivers and their drainage basins - The Chinese government has paid great attention to the harnessing of the Yangtze River and the Huanghe (Yellow) River for 30 years. New programs will be conducted in the next few years. Damming the waters alone is not considered to be a proper way for long term management.

4. Studies on Depositional Models and Evolution of River Deltas

   - Depositional models on the Zhujiang and Yangtze river deltas have been published. A three volume set, "Deltas of China" is under preparation.

5. New Achievements and New Programs - The volume "Geology of the Huanghai Sea" will be published next year. A new project on offshore tidal sand ridges of northern Jiangsu province will be conducted next year. Two important publications "the Geology of the East China Sea" and "The Late Quaternary Geology of Huanghai Sea" were published at the end of last year.

II. Quaternary Geology Studies in the Sea & Coastal Areas

1. A five year programme has been started in the Nansha and Zengones Basins of the South China Sea. A scientific cruise was conducted in the Nansha Islands and adjacent areas. A mapping Project on the scale of 1:100,000 was started in the Huanghai Sea and Behai Sea. Research in the Taiwan Straits was finished in early 1988.

2. Publications on Quaternary geology

   A series of 13 maps on "Geophysical and Geological Maps of the South China Sea (1:2,000,000) were published last December. The "Regional Geological Records of Yunnan Ningeia and Inner Mongolia" were approved last year. Also, the "Quaternary Geology of Shandong" is completed.

III. Applied Quaternary Geology

1. Survey and Management of the Coastal Zone, consisted of many projects on management of coastal lowlands and utilization

of natural resources. A series of symposia were held for this purpose.

2. Engineering Geology & Hazard Geoloy

New breakthroughs have been reached by statistical analysis and modeling in the prediction of landslides. Regional studies have been started, including some offshore. Geophysics and remote sensing have been widely applied to engineering geology in China. A three-year project on the engineering geology of the Chinese continental shelves is underway.

3. Hydrogeology

Water shortage problems are increasing in China, and are being studied.

4. Urban Geology

Studies are underway regarding sea level rise, land subsidence, neotectonic changes, storm effects, port construction, cultivation of lowlands, etc.

5. Quaternary Mineral Resources

The project "the Study of Coastal Placer Minerals in China" ended last year. Data from 170 placer deposits were collected. Prospecting and exploitation of placer gold is ongoing in Shandong and other provinces.

6. Environmental Geology

Important research in engineering geology is being carried out in China, regarding studies on loess, agriculture, and changes to be expected in the next century.

7. Agrogeology

Many benefits have been gained in the field of agrogeology with regards to irrigation and plant selection practices.

INDONESIA

(Document CCOP (XXV)/46)

Quaternary Geological Activities

1. Quaternary Geological Mapping of Cliamaya - Three hundred hand-drills were used to map the Cliamaya area in the extensive coastal lowland belt of northern Java. Cone penetration and geoelectric measurements were also made. The following sedimentary units were recognized: flood plain deposits, channel deposits, beach and beachridge deposits, mangrove swamp and nearshore and shallow marine deposits.

2. Quaternary Geological Mapping of the Pamanukan Quadrangle, West Jawa.

   This area is east of the Cliamaya, and 215 hand drill sites, penetrating between 6 and 14 m, defined 4 sedimentary units: flood plain deposits, channel deposits, beach & beach ridge deposits and nearshore & shallow deposits of Holocene age, underlain by pre-Holocene Strata.

3. Status of Quaternary Geological Mapping

   Two field surveys are in progress, six have been completed. Three quadrangle maps have been published and one is in progress.

4. Other Studies

   The Technical Co-operation Project on Quaternary Geology in Java, carried out with the assistance of the government of Japan, is continuing, A new project "Geology of Quaternary Environments" is an extension and will interface with the International Geosphere-Biosphere Program (IGBP) under the auspices of the ICSU.

   Seismotectonic studies on the Island of Bali are also underway.

JAPAN

(Document: CCOP XXV/53)

Quaternary Geological Activities

Detailed surface land subsurface geological mapping was conducted around Tsukuba Science City in 1988. A geological map (1:25,000) was published with 11 profiles and an explanatory text based on data from 5,111 bore holes. This is a model for urban geology planning, land-use and development.

Detailed studies in other areas were conducted on core samples for lithology, sedimentary structures, palaeontology, chemistry of pore water, magnetic polarity and 14C dating.

Other activities in Quaternary Geology involved the prediction and mitigation of earthquakes and volcanic eruptions.

KOREA

(Document: CCOP XXV/33)

Quaternary Geological Programme (1988)

The topography of the Korean Peninsula changes from a hilly area with a large alluvial plain in the west to very mountainous in the east. In the western coastal area, alluvial plains of Holocene age are widely developed in shallow, but broad channel valleys.

The Pleistocene deposits seldom outcrop along the foothills of the mountains just above the upper margin of the alluvial plains. The eastern coastal area of the Peninsula has gravelly deposits filling the deeply-incised valleys. Lithological and palaeomagnetic studies, combined with palaeoenvironmental data are being used to compile a comprehensive stratigraphy of the Quaternary deposits of the Korean Peninsula.

MALAYSIA

(Document: CCOP (XXV/7)

Quaternary Geology Studies

1. Peninsular Malaysia

The systematic mapping continued, and to date about 23% of Peninsular Malaysia has been mapped on a scale of 1 inch to 1 mile. A report on the "Quaternary Deposits in the Coastal Plains of Peninsular Malaysia" was published during the year. Palynological studies were continued, and at present there are 1770 reference slides in the collection.

2. Sarawak

Systematic (urban) mapping of the Kuching area was carried out by the staff of the MGS Sarawak office.

A. Applied Quaternary Geology

Fieldwork is being carried out in Seberang Perai and Penang to obtain data for the compilation of engineering geological thematic maps. In Sarawak, assistance was provided in hydrogeology, in-situ testing and setting up a geotechnical laboratory by The Netherlands Geological Survey. Also, Urban geological mapping was carried out in the Kuching area.

B. Proposed Future Activities for Quaternary Geology

The Malaysian delegation submitted the following activities which would involve input from CCOP:

1. Services of the Senior Expert for coastal area correlation, sea-level studies, coastal management studies and editing;

2. Continuation of technical assistance in applied Quaternary Geology;

3. Advisory services on peat deposits in Sarawak;

4. Continuation of assistance in data computerization;

5. Geophysical-geological mapping of urban Kuching;

6. Exploration for mineral water in Sarawak.

PHILIPPINES

(Document: CCOP XXX/55)

A. Quaternary Geological Mapping

The Hydrogeology, Engineering and Quaternary Geology section (HEQGS), the working group for Quaternary Geology studies in the Mines and Geosciences Bureau (MGB), carried out the following activities:

1. Quaternary geology and Heavy Mineral Exploration of Jose Panganiban-Paracale-Daet-Vinzon Plain area, Camarines Norte, Southern Luzon.

2. Environmental Impact Assessment of Proposed Mining Activities in Northern Palawan, Calamian Islands.

3. Adverse Environmental Effects of Extraction of Washed-out shells in Boracay Islands, Aklan, central Philippines.

4. Hydrogeological and Environmental Study on Seclusion of a Portion of the Biak-na-Bato National Park.

5. Investigation of National Irrigation Administration proposed Borrow Areas in connection with the Balog-Balog Multipurpose Dam Project in Tarlac, Central Luzon.

6. Surface manifestations and possible effects of mass movements threatening the area of Mines View Park, Baguio City.

7. Evolutionary Development of the Coastal Plain of Infanta, Quezon, Luzon, Philippines.

B. Proposed Future Activities in Quaternary Geology

The Philippines will undertake geological mapping in relation to Projects 218 and 274, in the lowlands, under a 5-year project entitled "In-depth Environmental Geological Studies of Quaternary Lowlands". Other activities will be related to salt water intrusion problems in Negros Occidental.

THAILAND

(Document CCOP (XXX)/27)

A. Quaternary Geology Activities of Thailand

The Quaternary geology of the coastal plain and alluvial Central plain were mapped on a scale of 1:50,000 in 1988. Altogether, six map sheets, two in the western coast near Satun Province, another two in the east coast of Pattani area and the area of alluvial deposits, to the west of Lower Central Plain, and two other map sheets have been surveyed by the Department of Mineral Resources.

Field work consisted of bore hole investigations on marine and on-marine environment within the deposits, supplemented by X-ray diffraction, radiometric dating of shoreline indicators, electric conductivity and pH values and other chemical analyses for classification and correlation of Quaternary stratigraphic map units. Investigations on economic aspects for construction and industrial sand and clay minerals, as well as shallow groundwater deposits were also undertaken.

Hydrogeological Investigation of Mae Ing Basin

Mae Ing Basin is elongate in shape, with a width of about 15 km. It is situated in the northernmost part of the country, about 800 km north of Bangkok. The results of resistivity and drilling surveys indicate that the basin is underlain by unconsolidated and semi-consolidated sediments of Holocene, Upper Pleistocene, and Lower Pleistocene age formations. The Holocene formation yields considerable amounts of ground water. However, it exists only in the western portion of the basin.

B. Future activities in Quaternary Geology

The activities in Quaternary Geology planned by Thailand in 1989 include the following:

1. Quaternary geology mapping in the central alluvial plain and along the coastal plain.

2. Investigation on applied Quaternary Geology in specific areas.

3. Age dating and correlations of deposits onshore and offshore.

In regards to the above, Thailand will require support and cooperation from CCOP in 1989.

B. Remarks and Recommendations

The Special Adviser of The Netherlands made several recommendations concerning the Quaternary Geology Programme of CCOP.

He commented on the references to coastal erosion in the reports from the member countries, and noted that several reports made mention of coastal instability, especially as a result of human activity. He therefore suggested that a workshop be organized by the CCOP Secretariat on the general subject of coastal stability, which might possibly be held in conjunction with the meeting of IGCP Project 274, which will convene in Malaysia in September, 1989.

Noting the good progress being made in the field of Quaternary mapping, he suggested that it may be timely to organize a workshop on Quaternary Stratigraphy which forms the basis for such mapping. He further noted that the progress in Quaternary geology, overall, might call for coordination in data base management.

The Group concurred with these suggestions, and urged the CCOP Secretariat to implement such activities as soon as possible within the constraints of time and manpower.

C. Status of Regional Centre for Quaternary Geology

Due to his familiarity with the background of attempts to establish a Regional Center for Quaternary Geology (RCQ), the Chairman requested the Special Adviser of The Netherlands to summarize those efforts for the Group. The Group was informed that the first mission in 1980, visited the member countries to define the need for such a Centre after China had offered a site in Guangzhou. This offer was accepted by the Committee in 1980.

In September 1982, the CCOP Project Office was informed that the Chinese government had decided to change the locality of the RCQ to Qingdao, which had been selected as China's National Centre for Quaternary Research. In November, 1982, a technical mission visited China in order to formulate the programme and evaluate the facilities in Qingdao. Immediately following this mission, the Committee accepted the programme as well as Qingdao for the location of the RCQ, during the 19th Annual Session of CCOP, held in Tokyo in December, 1982. The Committee recommended that the establishment of the RCQ should be a tripartite undertaking between the host country, CCOP and ESCAP. To date, no funding for the establishment of the RCQ has been identified.

The Group recommended that the CCOP Secretariat work with China to continue efforts to find funding for the proposed centre.

IV. AEROMAGNETIC MAP COMPILATION PROGRAMME

The meeting was informed that the U.S. Naval Oceanographic Office completed a Project MAGNET survey of the Bismark Sea at the request of PNG. That Office will not be able to offer Project MAGNET assistance in the immediate future. Korea reported on its airborne radiometric and magnetic survey in Yangsan and Haenam areas, which is a part of a long-term aerosurvey project. Indonesia informed the meeting that it has a survey project in Kalimantan funded by an ADB loan.

The meeting was informed of the status of aeromagnetic map compilation, in which data gaps, such as Sumatra, and the South China Sea exist. The Philippines stated that aeromagnetic data of the Office of Energy Affairs is in principle available for this compilation programme upon formal request of the CCOP Technical Secretariat. China stated that it could co-operate in this programme by providing its aeromagnetic data of the South China Sea, which were already published. The Senior Geophysicist attached to the CCOP Technical Secretariat stated that he would like to extend the compilation from Southeast Asia to the areas of China, Korea and Japan if the co-operation of these countries would be available. Korea reported on its state of the art of airborne geophysical survey and stated its readiness to co-operate in this programme.

The meeting was informed of the Senior Geophysicist's efforts on development of computer hardware and software for the in-house training on aeromagnetic data compilation and interpretation and the activity of the in-house training, in which three trainees from GRDC, MGI and the Geological Survey of Malaysia participated. A trainee from LEMIGAS will participate in the near future in 1989. Two trainees from the Philippines, one from PETRONAS, two from Thailand and two from China are expected in 1989. The Malaysian delegation expressed its interest in the workshop on interpretation and application of aeromagnetic data for prospecting for hydrocarbon resources.

V. COMPUTER APPLICATION FOR DATA STORAGE, RETRIEVAL AND INTERPRETATION

1. The Committee was given an update on the computer facilities at the Secretariat and noted that the office presently was operating 5 units and related accessories. The most powerful tool is the Compaq 386/20 Model 60 and related accessories provided by the Japanese Government.

   The Committe was notified that the integrated play modeling would require a Compaq 386 with 130 mb disc capacity which hopefully could be provided by one of the co-operating countries.

2. Reference was given to the agreement in the CCOP Steering Committee in March 1987 in Bangkok where the Committee agreed in principle to the CCOP programme in computer application to geology and geophysics.

3. A summary of conclusions from a workshop financed by NORAD on Impact of Computer Technology on the Management and Analysis of Petroleum Exploration Data, held in Bangkok in October/November 1987, was given. The workshop concluded that CCOP should distribute information on petroleum-related software and try to obtain group discounts for member countries. The workshop also concluded that the next CCOP/NECOR workshop should focus on the use of computers, related to hydrocarbon generation, migration and entrapment with a title e.g. "Computer Technology for Decision Support in Hydrocarbon Exploration".

4. At the ASCOPE-CCOP Joint Intersecretariat Meeting in Kuala Lumpur, June 1988, it was decided that further use of the Data Management Programme that CCOP planned to establish should be pursued by ASCOPE countries on a bilateral basis with CCOP.

5. Mr. Simon Handelsman of the UN/DTCD has made an advisory mission to the CCOP member countries. Four countries were visited in 1987. These were Malaysia, China, Indonesia, and Korea. The mission will continue this year (1988) visiting Viet Nam and Thailand in December.

   The preliminary conclusion from the mission was that it is necessary to provide support to CCOP in addition to the short missions by the UN HQ. The mission identified a need which exists throughout the region for the introduction of

modern relational database design techniques to enhance the ability to manage the establishment of geoscience databases. The mission also identified a need for training such as demonstration of applications for high level staff and training of staff related to the day to day detailed work.

6. The Secretariat reported on discussions held with the Regional Computer Center (RCC) at the Asian Institute of Technology (AIT), in Bangkok concerning the possibility of AIT aiding CCOP in its development of a computerization strategy. The preliminary conclusion was that AIT can provide CCOP with assistance in the development of a computerization policy. AIT can also provide the necessary facilities and back up for CCOP for workshops using both mainframe and PC systems.

VI. COASTAL ZONE RESOURCES AND MANAGEMENT

Review of Activities in Member Countries

The Group was informed about the activities conducted by the member countries coincident to Coastal Zone Resources and Management. Although this is a new field of endeavor for CCOP, and such activities were minimal, the subject has invoked a great deal of interest within the member nations, and activities in this regard can be expected to undergo a sharp increase in future years.

INDONESIA

(Document:CCOP(XXV)/41)

Bali Coastal Erosion and Nearshore Sedimentation Processes

The Marine Geological Institute (MGI) in Bandung, conducted research into the basic causes of the erosion problems on the island of Bali. There were two main areas which exhibited unstable shoreline conditions: a) the southern end of Kuda Beach, between the runway of the Ngurah Rai Airport and the northern end of the beach front at the Pertamina Cottages, and b) the beach zone at Tanah Lot Shrine.

Kuta Beach is located on the northern portion of the western side of a tombolo which connects the southernmost extension of Bali to the larger part of the island. In the area between the runway and Rama Beach the sediment budget has been severely impacted by the emplacement of man-made structures, combined with the natural interference of wave and swell action on a fringing reef, offshore the area.

The deficiency of the natural sand supply is the basic cause of the erosion in this zone.

At Tanah Lot, the situation is different. The beach zone is one of extremely high energy, and the problem involves undercutting of the cliff face, followed by subsequent collapse, the latter endangering the shrine atop the cliff. Tetrapods had been placed in front of the shrine at the base of the cliff by helicopters, but since their implacement, the tetrapod units have been moved by wave action, thereby increasing the chance of cliff-base erosion. The displacement of the units could be due to scour and collapse, or, to engineering miscalculation. In either case, the situation warrants further study.

MALAYSIA

(Document : CCOP XXV/7)

Coastal zone resources and management studies

The Geological Survey of Malaysia is represented in the national Steering Committee of the ASEAN-USAID Co-operation Programme of the Coastal Resources Management Programme that is being carried out in South Johore from 1986 - 1989. The staff of the Quaternary section has been involved in this study and has provided various reports and maps on the geology and mineral resources. Since this project will end in 1989 and similar projects will be planned for other areas it is hoped that CCOP will assist in training Malaysians in this field.

PHILIPPINES

(Document : CCOP (XXV)/57)

Workshop/Seminar on Surveys and Management of the EEZ in the CCOP Region

The Philippine delegation suggested the formulation of a workshop/seminar on Surveys and Management of the EEZ (Exclusive Economic Zones) in the CCOP Region. In this proposed seminar, which would be multi-disciplinary, representatives of member countries and experts from developed countries possessing the technology could concieve a forum to formulate plans and transfer of knowledge. June 1989 was suggested as an optimum date for the seminar.

The US delegation endorsed the Philippine proposal for a Seminar/Workshop on the EEZ in the CCOP region and suggested two modifications:

1) Possible addition of one day to focus on coastal and resources and management studies, and

2) That each CCOP member suggest a priority listing of EEZ surveys of resources that could constitute a work/research program that could be conducted with co-operating countries when funding is secured.

Planned activities for 1989

Thailand

Thailand has a shoreline extending for about 2,614 kilometers along the Gulf of Thailand and the Andaman Sea. The coastal zone is therefore extremely important to the society and economy of the country. It brings together a unique collection of natural resources, such as gas, water, minerals, food, beaches and high quality landscape and plays a major role in the country's transportation network.

However, the coastal zone is ecologically complex and sensitive and may thus be more susceptible to natural hazards. Great care must be taken to manage and develop its potential. Therefore, the advisory services from any cooperating country are requested to assist in formulating a systematic work programme relating to the Economic Geological Aspects of Coastal Zone Management.

In particular, Phuket, a famous province on the west coast of the country is both a main tin mining area and coastal tourist resort. However, the Tourism Authority of Thailand has claimed that offshore tin dredging has destroyed some beaches. Thailand requests the advisory services of the Senior Quaternary Geologist from the CCOP Secretariat in 1989 to aid in addressing this problem.

The Special Adviser of The Netherlands continued that care should be exercised in using the term "Coastal Zone", and that some sort of water depth demarcation (i.e. 70m) should be employed to separate it from other terminology, such as the EEZ, which usually includes deeper waters. He felt that from the viewpoint of resources, a workshop on the EEZ as proposed by the Philippines was timely. The Special Adviser also re-emphasized the usefulness of including a one-day session on coastal stability in the workshop on Coastal Evolution planned for Malaysia in September 1989.

It was suggested that the workshop on "Geological Aspects of Coastal Zone Management", which had been scheduled for 1988, and is rescheduled for 1989-90, be separate from the others, as engineers and planners will be among the targeted audience.

VII. INVESTIGATION AND RESEARCH RELEVANT TO CCOP ACTIVITIES

A. Deep Sea Marine Minerals
(Documents : CCOP(XXV/8,24)

The group was informed that Japan had continued to conduct surveys of deep sea minerals with three important types of targets. These were; (i) manganese nodules, (ii) cobalt rich manganese crusts and (iii) hydrothermal metalliferous deposits.

(i) Manganese nodules in the southwest Pacific area have been investigated on R/V Hakurei-Maru No. 2 cruises, jointly by the Geological Survey of Japan with the co-operation of the Metal Mining Agency of Japan and CCOP/SOPAC, with good results. However, it is considered that the CCOP region is not promising for manganese nodules.

(ii) Cobalt-rich manganese crusts are often located in the Exclusive Economic Zones (EEZ) of the Pacific island countries and more work will be planned in the west and southwest Pacific areas. The Geological Survey of Japan has a plan to study the seamounts and associated crusts in the West Pacific in a programme starting in 1990.

(iii) A hydrothermal metalliferous deposit rich in gold and silver had been found in the Okinawa trough during a joint Japanese/German cruise on the R/V SONNE in June 1988 and further studied by submersible "Shinkai 2000" in September 1988. The ore found was similar to the Miocene age Kuroko type deposits distributed in northern Japan. This finding gave a possibility of the existence of such deposits in the back arc basins on the continental crust in the CCOP region. The Geological Survey of Japan will carry out two R/V Hakurei-Maru cruises both for the Okinawa Trough and the northern Mariana Trough.

The Group was also informed of deep sea investigations which had been conducted in the Pacific region by the Ministry of Geology and Mineral Resources of China. Geological and geophysical investigations had been conducted since 1960 in the Bohai Sea, Yellow Sea, East China Sea and South China Sea aimed at searching for marine minerals (hydrocarbons and placers) and geoscientific research.

In 1986 ocean-going investigations commenced using the R/V Haiyang IV, with the first cruise from November 1986 to June 1987 in the central and eastern Pacific region. Investigations had included gravimetry, seismic reflection, magnetics, bathymetry, multi-frequency prospecting, sub-bottom profiling, sonobouy, and a variety of geological sampling.

A variety of laboratory and other studies and interpretations of the data obtained had been completed.

At present the R/V Haiyang IV was conducting a second cruise in the same region.

B. Isotopic Age Determination
(Document: CCOP(XXV)/7, 36, 56)

The Group was informed that the activities of the geochronological laboratory at the Geological Survey of Malaysia had included K-Ar dating of granitoids from Peninsular Malaysia and of volcanics from Peninsular Malaysia and Sarawak.

The maintenance and general upkeep of the K-Ar dating facilities continued to improve with the assistance of the University of Bern, Switzerland. With the completion of the VG 1200 MM mass spectrometer, the geochronology laboratory was now preparing to resume its role as a training centre for K-Ar dating for geo-scientists in the region and such training facilities were expected to be available by 1990.

In Korea, geochronology had been carried out at KIER by the Rb-Sr, K-Ar and Fission Track methods.

The determinations have included ages of Precambrian metamorphic rocks in the Gyeonggi and Ryeongnam Massifs by Rb-Sr methods and Cretaceous to Tertiary volcanic and igneous rocks by the K-Ar and Fission Track methods. In addition, mineralization ages of metallic and non-metallic ore deposits have been determined by the K-Ar method and proved useful in classifying periods of mineralization in the Korean Peninsula.

The Group was informed that from August 1987 to August 1988 a geologist from the Philippine Mines and Geosciences Bureau had undergone training at the Isotope Geology Laboratory of the University of Bern, Switzerland, under Professor Jaeger. It had been suggested that he undertake further training of either 2-3 or 3-5 years, after which he could serve as a TCDC expert on age dating.

C. Palaeomagnetic Studies

The Group was informed that a digital spinner magnetometer and demagnetizing equipment had been installed in the palaeomagnetics laboratory at the Department of Mineral Resources in Thailand. After a programme of equipment testing, magnetostratigraphic studies have been carried out on fossil-poor sedimentary strata from northeastern Thailand.

Work involving a study of continent/continent collisions in Southeast Asia will be carried out in 1989.

The Group was also informed that a number of palaeomagnetic/age determination studies had been carried out in China.

D. New Survey Techniques

The group was informed of the capability of the GLORIA sea-floor imaging system, which has a resolution of 50 x 50 metres and of the satellite "Thematic Mapper" which was expected to be launched in 1990. This would enable the application of "Spectral Stratigraphy" in onshore areas, with a resolution comparable to that obtainable by the GLORIA system.

The Group was also informed that a more detailed presentation on the GLORIA System could be given at CCOP's next meeting.

VIII. CCOP TRAINING PROGRAMME

The Group was informed that during 1988, CCOP's training programme had included (i) on-the-job training during offshore surveys and in-house training at the CCOP Technical Secretariat, (ii) workshops and seminars and (iii) fellowships for studies in co-operating and other member countries.

(i) On-the-job training in offshore survey techniques had been given to participants on two research cruises in Papua New Guinea, an offshore survey for heavy minerals in western Guangdong Province, China and in navigation procedures for an offshore sampling survey in the Philippines.

In-house training in processing and interpretation of marine geophysical data from the survey offshore China was provided to four participants from the South China Sea Geological Investigation Headquaters in October and November, 1988.

In-house training in aeromagnetic data compilation and interpretation using the computer systems at the CCOP Technical Secretariat was provided to three participants; two from Indonesia for 7 weeks each and one from Malaysia, for 9 weeks.

(ii) The following workshops, training courses, etc. had been conducted during the past year.

(a) Workshop on "Impact of Computer Technology on the Management and Analysis of Petroleum Exploration Data" held in Bangkok, Thailand, from 31 October to 3 November 1987, with 11 participants.

(b) The third meeting of the Working Group on Resources Assessment (WGRA), held at Bangkok, Thailand, from 29 February to 3 March, 1988, with 15 participants.

(c) A meeting of the WGRA Map Compilers at Tsukuba, Japan, from 27 to 29 September, 1988, with 25 participants.

(d) A symposium on "Quaternary Stratigraphy and Correlation of Asia and the Pacific" at Nakhodka, USSR, from 9 to 16 October 1988, with 9 participants from CCOP countries funded by the UNDP Project Office.

(e) A workshop on "Applied Quaternary Geology and Shallow Exploration Methods" in Kuala Lumpur, Malaysia, from 9 to 20 November 1987 with 26 participants.

(f) A workshop on "Applied Quaternary Geology and Shallow Exploration Methods" at Quezon City, Philippines, from 11 to 22 April, 1988 with 31 participants.

Concurrently with the above workshop a short course on "Engineering Geology" was held at the University of Manila. There were 31 participants.

(g) A course on "Basic Safety and Work Environmental Training" in Bangkok, Thailand, from August 29 - September 3, 1988 with 16 participants.

(h) A course on "Safety Management and Work Environment" at Kuala Lumpur, Malaysia, from 5-15 September 1988 with 29 participants.

(i) A workshop entitled "Heat Flow Workshop III" was held in Bangkok from 17-19 November 1988 with 22 participants.

(iii) Four fellowships were awarded to member country personnel for advanced studies in member and co-operating countries.

The Group considered CCOP's training programme to be one of the most important elements of its work programme and therefore strongly recommended that high priority should continue to be given to it.

The Group was informed that the Academy of Sciences and the Ministry of Geology of the U.S.S.R. is organizing a symposium on "Stratigraphy of the Quaternary in Asia and the Pacific Region" in Yakutia, U.S.S.R. in July 1990, in conjunction with INQUA and CCOP.

The Group recommended that consideration should be given to conducting a workshop on Quaternary Stratigraphy and regional correlation in the CCOP region.

It also noted that a large number of workshops and training courses had been recommended for implementation during the next year, and beyond. It recommended that the Secretariat therefore compile a list of the recommended workshops and other training courses, with proposed dates for implementation and to make every effort to implement these activities.

IX. CCOP PUBLICATION PROGRAMME

The Group was informed that during the past year CCOP had issued the following publications:

(i) Part I, of the Proceedings of CCOP's 24th Annual Session

(ii) CCOP Technical Bulletin Vol. 19, on joint Indonesian/Japanese investigations on the Java Trench.

(iii) Regular issues of the CCOP Newsletter

Currently undergoing final editing and expected to be published in early 1989 are the following:

(iv) A volume on "The Pre-Tertiary Fossils of Sumatra and their Environments" by Fr. H. Fontaine.

(v) Proceedings, Part II of the 24th Session of CCOP (Technical Papers)

(vi) A volume on "The Palaeozoic and Mesozoic Fossils of West Thailand" - by Fr. H. Fontaine.

Other publications expected to be prepared and issued during 1989, include the following:

- Proceedings (Parts I and II) of the 25th Session of CCOP.
- Classified index of CCOP publications issued during 1983-1988 (as CCOP/TP Ref. 3)

- Special technical volume on Dr. Fontaine's work to mark his over 10 years of services to CCOP (as CCOP/TP 20).

- Proceedings of the international symposium on "Stratigraphic Correlation of Asia and the Pacific Region", Nakhodka, USSR, October 1988.

- Proceedings of the 3rd Heat Flow Workshop in Bangkok, November 1988.

- Updating of a CCOP technical publication on "Prospecting Offshore Placers: Drilling Ships, Equipment and Positioning Techniques (1980)" (CCOP/TP 9).

The Group was informed that following a publicity campaign in 1988, publication sales had brought an income of approximately US$4300. A further sales drive will be mounted in 1989.

The Group was also informed that some of the SEATAR transect compilations were expected to be published in 1989.

X. CO-OPERATION WITH NATIONAL AND INTERNATIONAL BODIES

The Group was informed that co-operation with various national and international bodies concerned with mineral resources of the sea and marine science and technology continued during the past year, as follows:

(i) IOC/UNESCO in connection with the joint CCOP/IOC post-IDOE SEATAR programme. In this connection IOC had financed the attendance of Professor Charles Hutchison at the 14th CCOP-IOC Joint Working Group Meeting on SEATAR.

(ii) The Circum-Pacific Council on Energy and Mineral Resources (CPC), particularly in the East Asia Resource Assessment Programme. The Group was informed of the organization and objectives of the Circum-Pacific Council and of the Circum-Pacific Map Project, and that the next Circum-Pacific Conference, which will be held in 1990 would emphasize deep sea minerals.

(iii) IUGS, which had also been heavily involved in the Resource Assessment Programme.

(iv) IGCP, which is jointly supported and operated by the IUGS and UNESCO, is operating several projects of relevance to the region, including an extension of Project 218 and Project 274, which involve Quaternary studies.

(v) ESCAP Natural Resources Division in several programmes, including the Quaternary programme and the Resource Assessment Programme.

(vi) ASEAN Council on Petroleum (ASCOPE) in several activities under the Hydrocarbons Programme and the Offshore Safety and Environment Programme.

(vii) The Asian Institute of Technology (AIT), in CCOP's computer and training programmes.

(viii) The USSR Academy of Sciences and INQUA in conducting a symposium on Quaternary Stratigraphy in the U.S.S.R.

The Group was also informed that a symposium on tectonics and resources in the northwest Pacific would be held in September 1989 in Khabarovsk, USSR, under the sponsorship of the USSR Academy of Sciences and the Circum-Pacific Council.

The Secretary-General of IUGS expressed his satisfaction with its co-operation with CCOP and urged CCOP to exhibit its achievements at the forthcoming International Geological Congress to be held in Washington in July 1989.

He also urged CCOP to consider becoming involved in the new programme of the International Council of Scientific Unions (ICSU), involving global biosphere/geosphere interactions (including global change and hazards) which is also part of UNESCO's IGBP and IGCP programmes.

The Group was informed that the CCOP Technical Secretariat had provided the services of two experts to give lecture courses at the Group Training Course on Offshore Prospecting conducted by the Geological Survey of Japan in Tsukuba, Japan.

The Group was also informed that IFAQ/UNESCO would be prepared to co-operate with CCOP to develop further the Quaternary and Coastal Zone programmes and the establishment of a Regional Centre for Quaternary Geology.

ANNEX IV

Joint CCOP-IOC Working Group on
Post-IDOE Studies in East Asian Tectonics
and Resources (SEATAR)

Fourteenth Session
Baguio City, Philippines, 8, 10 and 11 December 1988

TABLE OF CONTENTS

SUMMARY REPORT

Joint CCOP-IOC Working Group on Post-IDOE Studies in East Asian Tectonics and Resources (SEATAR)

Fourteenth Session, Baguio City, Philippines
8, 10 and 11 December 1988

SUMMARY REPORT

1. OPENING OF SESSION

The fourteenth session of the Joint CCOP-IOC Working Group on Post-IDOE Studies in East Asian Tectonics and Resources (SEATAR) was opened in Baguio City, Philippines on 8 December, 1988 by the Chairman and CCOP's Principal Co-ordinator for SEATAR, Professor Dr. John Katili. The Chairman welcomed the participants and stressed the need to publish the results of the SEATAR transect studies as soon as possible.

The session was attended by representatives from the following countries: Australia, Canada, China, Federal Republic of Germany, Indonesia, Japan, Republic of Korea, Malaysia, Norway, Philippines, U.S.S.R., UK, U.S.A., and Thailand. Representatives of ESCAP, IOC, the CCOP Secretariat and the UNDP/ESCAP Technical Support Team to CCOP also attended the session. The List of Participants is given in Annex II.

2. ELECTION OF RAPPORTEUR

Professor C.S. Hutchison was elected rapporteur for the session.

3. ADOPTION OF THE AGENDA

The Joint Working Group adopted the Agenda for the Session as it appears in Annex I.

4. REVIEW OF CCOP AND IOC INTERSESSIONAL ACTIVITIES

The Chairman called on Dr. J. Ringis to present a review of CCOP and IOC intersessional activities and recommendations of the 13th SEATAR meeting held at Bangkok on 31 October 1987.

a. The CCOP Secretariat had maintained correspondence with IOC during the year and Dr. Kitazawa of IOC twice visited the Secretariat for discussions on SEATAR matters.

b. Dr. Frank Wang was interim overall SEATAR transect co-ordinator until 15th August 1988 when Dr. C.S. Hutchison, who was on a 6-month UNDP/ESCAP consultancy to the CCOP Secretariat in Bangkok from April to October 1988, was officially appointed overall co-ordinator of SEATAR transects.

c. During the year Dr. Wang made a visit to Indonesia, Singapore and the Philippines to assist the individual co-ordinators in obtaining data for incorporation in their transects, and also to make arrangements for possible funding for publication of the transects.

During the year Prof. Hutchison made visits to Sarawak (Miri and Kuching), and Ipoh (Peninsular Malaysia) and two visits to Indonesia (Bandung and Jakarta) and Kuala Lumpur (Peninsular Malaysia) to assist the coordinators of transects III, VII and VIII and to plan the future publication of these transects.

d. Prof. C. Hutchison also reviewed the progress on all transects and sent specific lay-out plans to Japan (Transect VI) and the Philippines (Transect VIII).

e. It had been agreed at the last session that:

i. Each transect should be published separately and with minimum delay

ii. There should be a later overview volume prepared and published, and

iii. A SEATAR bibliography should also be compiled.

The Secretariat had concentrated on item i above, and ii and iii would follow only after completion of item i.

f. IOC has financially supported the attendance of Prof. C. Hutchison at the present meeting.

5. CONSIDERATION OF THE REPORT AND RECOMMENDATIONS OF THE 13TH SEATAR MEETING HELD IN BANGKOK, THAILAND ON 31 OCTOBER 1987

No separate discussion on this item took place as the topic was fully covered in discussions under agenda item 6.

6. CONSIDERATION OF PROGRESS ON SEATAR TRANSECT COMPILATIONS AND PLANS FOR THEIR EDITING, DRAFTING AND PUBLICATION AND SOURCES OF FUNDING

(Detailed report prepared by Professor C.S. Hutchison)

The Chairman called on Prof. Hutchison to present the following report as overall co-ordinator of SEATAR transects.

a. Preamble

Delegates reading this and comparing it with the report of the 13th session will wonder what has gone wrong with SEATAR, the contrast between the two being so dramatic. The simple answer is that in retrospect, the report of the 13th session was misleadingly over-optimistic. During Dr. Hutchison's short term as overall co-ordinator, he tried to instill an element of realism into the programme.

In his tenure as overall co-ordinator, he will plan and guide the programme through to successful completion, which means compilation, editing and publication.

The scientific value of the transects may have been diminished by unfortunate delays caused by a variety of reasons. Had they been completed and published 3 or more years ago, they would have had considerably greater impact.

Several of the transects may also never mature to a stage suitable for publication, and they may have to be abandoned. Others may have to be drastically pruned.

The stage now reached must be that of finalization, and publication. No compilations should be allowed to continue beyond late 1989. A pragmatic approach is necessary, leading to a closing-down process. If extensions are to be considered, they must belong to completely new programmes of the future.

This report may possibly be at considerable variance with previous ones and with the generally over-optimistic view of the state of progress accepted by many people involved.

b. Overall Co-ordinator

The 13th session report clearly stated the great need for an overall co-ordinator, ie., "There were grounds for optimism that a full-time Co-ordinator/Editor would be appointed to bring the project to a speedy and successful conclusion", and again "The appointment of a co-ordinator should proceed as quickly as possible".

On April 14th 1988 Dr. Hutchison arrived in Bangkok on a six-month consultancy. Initially he was engaged in general editing of CCOP publications and then he and Dr. Wang, were requested to go to Indonesia and Malaysia to assist the co-ordinators of transects III, IV, and VII to "begin completing them for publication".

On 15th August 1988, Dr. Wang was advised by the CCOP Secretariat that his services as Interim Co-ordinator would now be taken on by Dr. Hutchison as Overall SEATAR Transect Co-ordinator. Copies of the letter were also sent to all SEATAR transect co-ordinators and CCOP permanent representatives. Thus, Prof. Hutchison was put in charge 3 months after the start of his six-month consultancy, and in the remaining three months of his consultancy, he achieved much progress in SEATAR transect co-ordination, as shown below.

c. Future of the Overall Co-ordinator

Dr. Hutchison has offered his continuing services as Overall Co-ordinator on the following basis:

As from mid-January 1989, he is taking up a three-year contract as Professor of Applied Geology at the following address:

Department of Geology
University of Malaya
59100 Kuala Lumpur
Malaysia

Telephone: (03) 755-5466 ext. 203
Telex: 39845 UNIMAL MA

The Vice Chancellor of the university has agreed that he could continue to be a consultant for CCOP.

The university in Kuala Lumpur is a very suitable central location for him to continue co-ordinating and editing the SEATAR transects and getting them finally into publication. Indeed the university has advantages over the CCOP Secretariat because there is access to a considerably more complete library of SE Asian geology. Dr. Hutchison has already ascertained that a cartographer/draughtsman would be available to him on an ad-hoc basis in Kuala Lumpur, if CCOP can obtain the necessary funding. This is not an additional expense, for such a cartographer would also need to be made available in Bangkok, were he to be based there.

Dr. Hutchison will have an office in the Institute of Higher Learning at the University of Malaya especially designated for SEATAR work, at no expense to CCOP.

Being Overall SEATAR Co-ordinator is not a full-time job, but the work needs to be carried out continuously and can be efficiently combined with his academic position.

Dr. Hutchison would allocate time weekly, or even daily at some periods, to SEATAR work and would continuously monitor the transects progress. His involvement would be more intense once manuscripts and drawings are submitted.

By arrangement with CCOP, Prof. Hutchison could travel to Bangkok and other regional centres as necessary at no additional expense compared to any possible domicile in Bangkok.

Prof. Hutchison would need to be offered a consultancy, in the first instance from February 1989 to January 1990, to be renegotiated as progress is monitored. Funding would also be needed for travel, postage and telexes etc.

The Chairman put the above proposal to the meeting and it was agreed that Professor C.S. Hutchison should be offered an appointment as outlined above.

It was further agreed that all correspondence on SEATAR matters by transect co-ordinators and all others, should be made through the CCOP Secretariat to Professor Hutchison in Kuala Lumpur, and also to the Secretariat in Bangkok.

d. Assessment of the SEATAR Transect Compilations

A questionnaire and follow-up correspondence was sent to all co-ordinators, asking for a realistic assessment of their progress. The results are given in Annex 3. As a general comment, it is obvious that the whole situation is far less optimistic than given in the report of the 13th session.

For example, it was therein stated that "It was entirely feasible to have several of the transects, including the accompanying notes, finalized for publication by the time of the next SEATAR meeting in 1988". It was also therein suggested that Transect VI: Japan-Korea, would be the first to be completed. Reality has fallen short of the optimism of the report of the 13th session (See Annex 3).

i. General

Progress in the transect compilations has been hampered by the absence of a formalized time schedule and publication plan. The network system by which CCOP operates has also been of little help to the individual co-ordinators, for in general the Permanent Representatives of the countries have been unable to offer much assistance to the transect co-ordinators. Their isolation has become more complete through the lack of an Overall Co-ordinator domiciled in the region to whom they could refer for solving problems.

ii. Individual Transect Comments

Transect I Burma - N. Thailand - Viet Nam

Chongpan Chonglakmani has only begun the text compilation and estimates a completion date of December 1989. It is essential that the final submission be completed by the end of 1989 so that this transect can be published in 1990. No new data should be sought and writing up with the present data should now proceed.

It was recommended that Dietrich Helmcke and Andrew Mitchell be invited to be involved in the write-up. The Permanent Representative and Co-ordinator from Thailand would need to agree to this. However, their involvement is recommended because of their strong background in Burma and Thailand geology. Father Henri Fontaine should also be asked to contribute to the text, for he will be available at the Secretariat in early 1989.

Dr. Le Thac Xinh had submitted a compilation and write-up for the Viet Nam part of the transect in October 1987, and Dr. Joseph Curray had submitted a data package on the Andaman Sea which should also be incorporated.

The USSR delegate informed the meeting that data from the South China Sea had been made available to Viet Nam and could also be incorporated.

Transect II Andaman Sea-Gulf of Thailand

Chamrat Mahawat estimates December 1989 for the submission deadline, and it was recommended that he keeps to this date with the publication planned for 1990. Dr. Joseph Curray had already provided data and had promised some further Andaman Sea compilation for Chamrat in the near future. However, he has indicated that he would definitely not be involved in the writing up as he has no facilities nor time for such as endeavour. Chamrat must therefore

write up his own or find a collaborator. Multi-authors have been suggested as the normal format, and Chamrat is encouraged to find helpers. Mr. Songpoh Polachan has written a thesis on the Andaman Sea, and he should be asked to be one of the co-authors. Again, it is recommended that Father Henri Fontaine be asked to help on stratigraphy and/or palaeontology in Thailand.

Transect III Sumatra-Peninsular Malaysia-Natuna

The Malaysian part of the transect is well advanced, and a firm deadline for submission of 31st March 1989 has been formalized. The transect has been moved to the north through Peninsular Malaysia so that PETRONAS can be given the welcome opportunity to provide maximum Malay Basin data and interpretation (see attached sketch). Staff of the Geological Survey of Malaysia and PETRONAS have already been assigned to the write-up in this excellent collaborative effort.

A major problem for this transect rests with the Indonesian part (Sumatra and Natuna regions). Fred Hehuwat has agreed to the shift of the transect to the north, but his progress has been slow. He has indicated that he may change his employment before mid 1989 but would try to complete his part of transect III by the end of March 1989.

He has asked Prof. S. Nishimura of Kyoto University to write on the volcanics and will ask Dr. Pulunggono to write on the oil basins. Dr. Pulunggono needs to also be formally approached by Dr. Hehuwat to do so.

At the request of Fred Hehuwat, the former members of the British Geological Survey team to Sumatra were requested to help. However, they are all now dispersed and will not be able to contribute. Likewise Dan Karig has informed that he would not be able to contribute any further since his work was in the past and his present research and time - commitments lie elsewhere.

The Malaysian team have formally agreed that their deadline is March 31st 1989. If there is no submission from Indonesia by that date, Malaysia will submit its own compilation to a journal of its own choice. However, the partial transect could still be included in the CCOP-IOC publications.

Should the Indonesian contribution mature by 31st March 1989, Malaysia would allocate a cartographer in Kuala Lumpur (Geological Survey and PETRONAS jointly) and with Prof. Hutchison's personal and regular help, the cartography would

be completed by early May. Prof. Hutchison would edit the text and write the introduction. The submission to a publisher is projected for June 1989. This is conditional on the presence of Prof. Hutchison in Kuala Lumpur as Overall Co-ordinator.

The Chairman requested Drs. Hartono to ensure that the Indonesian part of this transect should be completed without delay. It was agreed that the Indonesian delegation would arrange that the Geological Research and Development Centre (GRDC) in Bandung be asked to finalise the Sumatra and Natuna sectors and that all work already compiled by Dr. Fred Hehuwat should be incorporated. It was agreed that Rab Sukamto should be appointed co-ordinator to ensure the completion of the Indonesian part of the transect.

Drs. Hartono informed the meeting that he would request for a transfer of the data from Fred Hehuwat to Rab Sukamto.

Transect IV Banda Sea, Indonesia

The corridor format proved unsuitable for this almost equi-dimensional area, and rectangular maps will be presented and data combined as much as possible. Final compilation of the map sheets may prove difficult because of space constraints.

So much has been published on the Banda Sea in various journals that only a small amount of new data will be made available by this transect publication. It is therefore essential that it be delayed no further than the given deadline of March 31st 1989. Several authors have been assigned by H.M.S. Hartono, including Prof. Hutchison, for the volcanic arc.

Transect V Philippines - Marianas

G.R. Balce has confirmed a final completion date of June 1989. The transect will not be continued west across the South China Sea to the coast of China, and the completion will not be delayed for possible incorporation of new uncompiled data. The scale will be 1:2,000,000 as for all transects.

Transect VI Japan - Korea

In the thirteenth session report it was stated "Transect VI is now virtually complete and is likely to be

the first to be published". However, the text is only 10% complete, with a promised deadline of December 1989. The final map compilation on two sheets has not been done because the Geological Survey of Japan has no cartographers/draftsmen on its staff as it usually sub-contracts all cartography out to private companies, for which funding needs to be planned.

The Korean delegation agreed to carry out the final cartography on the transect and may begin in February 1989, after Japan has finished the compilation. The final draft should first be reviewed by the overall co-ordinator, Prof. Hutchison.

Transect VII Java-Kalimantan-Sarawak-South China Sea

This is the most advanced transect and is the one that is projected to be the pilot publication for the series. The revised corridor is shown on an attached sketch (Annex 6).

Indonesia has promised their final submission (drawings plus text) by March 1989. Malaysia (Geological Survey and PETRONAS) also will meet the March deadline. Initially it was thought that the transect would have to stop at the offshore Brunei border, but PETRONAS data and compilations extend far to the north and will be included.

Recently Dr. Dennis Hayes has promised a compilation and text for an extension into the South China Sea.

The deadline for all contributors is March 31st 1989, and they should be sent to Prof. Hutchison, through the CCOP Technical Secretariat. Malaysia has already assigned a cartographer and with Prof. Hutchison's day-to-day help as Overall Co-ordinator, the final drawings will be compiled and the text edited. The projected date for submission to a publisher of the whole transect is June 1st 1989. However, this is conditional on Prof. Hutchison's presence in Kuala Lumpur as Overall Co-ordinator.

Shell (Sarawak) has agreed to constructively criticize the joint compilation, and a visit to Miri (Sarawak) by Prof. Hutchison, with the involved Malaysian staff of the Geological Survey and PETRONAS, has been planned. Funding will be required for such a visit.

Since this transect will turn out to be the pilot publication, it should be given priority, and Prof. Hutchison's active involvement will be necessary since the Indonesian and Malaysian co-ordinators have both extended their work only to the International borders, and across

border correlation and continuity will need to be solved by him.

Transect VIII Sulu, Celebes and Molucca Seas

Draft maps and the preliminary text have been prepared by Apollo Madrid, and a recommended layout for the corridor compilations has been forwarded to him. The proposed corridor is shown in an attached sketch (Annex 7), and advanced artwork of very high quality was displayed at the meeting.

Apollo Madrid has indicated that, "the multi-author format will not be convenient.....because of the complexity of the area of study". This appears to indicate that the Philippines wishes to complete the whole transect by itself. However, Rab Sukamto is also compiling the maps for Indonesia and already has several authors beginning on the text. It is therefore suggested that each country compile to the border and then submit to Prof. Hutchison for amalgamation and editing.

Furthermore Malaysia has decided that this transect remains outside of Sabah, as was initially agreed.

It is hoped that the contributions of both countries can be received by the overall co-ordinator in the first quarter of 1989, and after compilation and editing, the transect may go to the publishers late in 1989.

The meeting agreed that the final cartography was to be done in the Philippines.

Transect IX Papua New Guinea

No progress had been made in the last 12 months due to other Geological Survey duties with higher priorities.

The Co-ordinator hopes to make a push early in 1989, but completion dates are uncertain because of a difficult staffing situation.

Transect X Bismark Sea - Solomon Sea

No work has been done for the past 18 months because of other more pressing duties and under-staffing. The transect will be necessarily shortened because it is behind schedule. The geology will also be re-assessed.

Hopefully a map sheet and text may be produced by late 1989.

e. Publishers

The format of a text with a back pocket containing two or more folded enclosures, partly in colour, of necessity limits the options for publishers. Because of space constraints, the final strip maps will be compiled on a 1:2,000,000 scale for publication.

Several potential publishers have been approached.

i. The American Association of Petroleum Geologists (AAPG) has put in writing its total lack of interest.

ii. The Circum-Pacific Council for Energy and Mineral Resources has expressed interest in financial help and even publication. John Reinemund has stated, "preferably in a synthesis volume along with the transects and related descriptive texts". This format is, however, clearly not one that is possible at this time. Uncertainties with some transects make it imperative to consider each one independently, and a synthesis volume is definitely out of consideration at this time, but may be considered after all the transects are individually published.

iii. An attractive offer was received from the Bundesanstalt fur Geowissenschaften und Rohstoffe, Hannover. Dr. Pfeiffer has indicated that they would consider publishing the transects individually in Geologisches Jahrbuch, which is perhaps the world's highest quality journal combining the format of text and coloured maps/sheets in a back pocket.

Copyright would be no problem if CCOP-IOC gave a written guarantee that the texts submitted to Geologisches Jahrbuch would not be published elsewhere. This would normally be expected by every publisher.

They would give 25 free copies, and further copies could be purchased by CCOP and IOC at a greatly reduced price. It would be unreasonable of CCOP-IOC to expect more than this since most of the publication costs would be covered, and it would be a small outlay to buy copies when publication costs are avoided.

iv. The most attractive format for transect publication has been offered by the Geological Society of America, and it is the one recommended.

It is important to note that the Society claims copyright to prevent other organizations from copying the material in identical format. However, immediately upon publication, the copyright reverts to CCOP/IOC.

Prof. Karl Hinz recommended that the Geological Society of America map and Chart Series would be a better format for publication, preferable to Geologisches Jahrbuch

Dr. Frank Wang indicated that financial contributions from several U.S. oil companies and also from SEAPEX, Singapore (Southeast Asia Petroleum Exploration Society), may be available. However, some of the donors had specified that the pilot project should be of high scientific value. Such funds could be used to pay the publisher for the required number of free copies which CCOP and IOC would need for complimentary distribution.

Some of the collected funds may be made available to individual countries if needed for the cartography.

The meeting agreed that the distribution of such funds should be through the CCOP Secretariat.

A list of 10 specific proposals was tabled by the Indonesian delegation and fully discussed. The accepted proposals from this list are incorporated in the Recommendations given below.

f. Recommendations

The following were agreed by the meeting:

(1) That the scientific contribution value of the forthcoming transect publications are primarily the maps and sections which will be accompanied by explanatory texts. The G.S.A. map and chart format fits this need very well.

(2) That the overall coordinator should arrange with the publisher that Professor K. Hinz and Dr. D. Hayes could be selected as suitable reviewers for the scientific content of the submitted transect materials.

(3) That the CCOP Technical Secretariat and IOC make arrangements to obtain appropriate funds to assist the overall coordinator and the individual transect coordinators in the final cartographic/colour separation work, wherever needed. These funds would also be needed for CCOP and IOC to purchase copies of the publications for complimentary distribution.

(4) That as many completed pilot transect drawings as possible, in their final draft form, be exhibited at the I.G.C. to be held in Washington D.C. in July 1989.

(5) That Professor C.S. Hutchison be retained as Overall Coordinator of the SEATAR transects beginning from February 1989, initially for a period of one year with the possibility of extension for one further year by mutual arrangement.

(6) That travel and DSA funds be made available to him for travel from Kuala Lumpur to Bangkok and other SEATAR centres, as necessary, by the CCOP Technical Secretariat and IOC.

(7) That funds be made available to him for telex, final manuscript typing and postage or courier delivery of the manuscripts and drawings to the publishers.

(8) That all SEATAR compilations should be completed according to the time table (Annex 3) with no further extensions, except where specifically later agreed between the transect co-ordinator, the overall coordinator and the CCOP Technical Secretariat. Further data collection should not continue for all transects beyond 1st March 1989.

The meeting agreed that Dr. Wang could continue to assist co-ordinators until 1st March 1989, and provide unpublished data to fill in the gaps, thus enhancing the scientific quality of the final product.

(9) That all cartography will be finally carried out under the guidance of the overall coordinator and the text compiled and edited by him to suit the format of the publisher, and submitted by him to the publisher with minimum delay. The final format, contents and authors to be mutually agreed by the individual transect coordinators and the overall SEATAR co-ordinator to meet the needs of the publisher. Each transect will be done separately and sequentially, but not in numerical order.

(10) That the method of publication of the transects (G.S.A. map and chart series or other means), and the number of free or purchased copies to be provided to CCOP and IOC, should be agreed on by consultation between the overall-coordinator, the CCOP Technical Secretariat and IOC.

(11) That any extension of transect lines and studies should not be tied up with the present transects. They should be considered as future programmes. In this respect the delegation from China made an offer of future cooperation.

(12) That individual countries agree wherever possible to provide their own colour separation, cartography and drafting. The following listing was agreed upon for the final cartography/colour separation:

Transect	I:	Thailand
	II:	Thailand
	III:	Malaysia
	IV:	Indonesia
	V:	Philippines
	VI:	Korea
	VII:	Indonesia
	VIII:	Philippines
	IX:	Papua New Guinea*
	X:	Papua New Guinea*

* Discussions still under way because Papua New Guinea was not present.

(13) That the detailed final format will be obtained from the publisher as soon as possible by the overall coordinator, and discussed individually with the coordinators before the final drafting proceeds.

(14) That the Preface of the transect publications should properly acknowledge those people and organizations that contributed to the transect and that maps and sections should identify the coordinator and the compiler and should refer to all sources, as commonly practiced in publications.

(15) That the cover of the transect publications should maintain the identity of SEATAR, CCOP and IOC, similar to the previous SEATAR publications.

7. FUTURE OPTIONS

There were no discussions on future options.

The representative of IOC, however, made a statement to the 25th Session of CCOP, held at Baguio City, Philippines, from 3 to 13 December, 1988 (Agenda Item 9 of the Plenary Session), which refers to this subject.

8. OTHER BUSINESS

There was no other business.

9. CLOSURE OF SESSION

This report was adopted on Saturday 10 and Sunday 11 December, 1988, under the chairmanship of Dr. G. Gierman, the representative of IOC.

The meeting was closed on 11 December, 1988 at 1840 hours.

APPENDIX 1

AGENDA

1. Opening of session
2. Election of chairman and rapporteur
3. Adoption of agenda
4. Review of CCOP and IOC intersessional activities
5. Consideration of the report and recommendations of the 13th SEATAR meeting held in Bangkok, Thailand on 31 October, 1987
6. Consideration of progress on SEATAR transect compilations and plans for their editing, drafting and publication and sources of funding (detailed report prepared by Prof. C.S. Hutchison)
7. Future options
8. Other business
9. Closure of session

APPENDIX 2

LIST OF PARTICIPANTS

I. MEMBERS OF THE JOINT WORKING GROUP

AUSTRALIA

David A. Falvey
Special Adviser of Australia to CCOP
Chief
Division of Marine Geosciences and
Petroleum Geology
Bureau of Mineral Resources
P.O. Box 378
Canberra ACT 2601

CANADA

M.J. Keen
Special Adviser of Canada to CCOP
Director
Atlantic Geoscience Centre
Geological Survey of Canada
Bedford Institute of Oceanography
Box 1006, Dartmouth, Nova Scotia
B2Y 4A2

CHINA

Wang Daxiong
Permanent Representative of China
to CCOP
Chief of Division
Bureau of Foreign Affairs
Ministry of Geology and Mineral Resources
64 Funei Dajie, Xishi, Beijing

Yang Dengwei
Comprehensive Institute of
Petroleum Geology
P.O. Box 12, Jiangling
Hubei Province

Yang Guangtai
Deputy Division Chief
South China Sea Geological Survey
Headquarters
No. 477, Huanshi Road East
Guangzhou

FEDERAL REPUBLIC OF GERMANY

Karl Hinz
Special Adviser of Federal Republic
of Germany to CCOP
Director and Professor
Federal Institute of Geosciences
and Natural Resources
P.O. Box 51 01 53, Still-Weg 2
D-3000 Hannover 51

INDONESIA

John A.Katili
Director General
Geology and Mineral Resources
Dept. of Mines and Energy
Jalan Jenderal Gatot Subroto
Kaveling 49, Jakarta

H.M.S. Hartono
Permanent Representative of
Indonesia to CCOP
Director
Marine Geological Institute (MGI)
Ministry of Mines and Energy
Jalan Dr. Junjunan 236
Bandung 40174

J. Widartoyo
Head
Division of Multilateral Co-operation
Ministry of Mines and Energy
Merdeka Selatan 18, Jakarta

JAPAN

Jiro Hirayama
Director, International Geology Office
Geological Survey of Japan
Higashi 1-1-3
Tsukuba City, Ibaraki 305

Yoshitaka Hosoi
Resident Representative
Metal Mining Agency of Japan
Manila Office
19th Floor, BA-Lepanto Building
8747 Paseo de Roxas
Makati, Metro Manila

Tomoyuki Moritani
Director
Marine Geology Department
Geological Survey of Japan
Higashi 1-1-3
Tsukuba City, Ibaraki 305

Masaharu Watanabe
Chief Staff Geologist
Idemitsu Oil Exploration Co.,Ltd.
3-1-1 Maruuouchi Chiyodaku
Tokyo 100

REPUBLIC OF KOREA

Kim, Chong Su
Research Councillor
Korea Institute of Energy
and Resources (KIER)
P.O. Box Guro 98, Seoul

Kim, Sahng Yup
Director
Department of Resources Exploration
Korea Institute of Energy
and Resources (KIER)
P.O. Box Guro 98, Seoul

Lee, Won Young
Head, Marine Exploration Division
Korea Institute of Energy
and Resources (KIER)
P.O. Box Guro 98, Seoul

MALAYSIA

Yin Ee Heng
Permanent Representative of
Malaysia to CCOP
Director-General
Geological Survey of Malaysia
Tabung Haji Bldg.
19 & 20 Floor, Jalan Tun Razak

T. Suntharalingam
Acting Director of Mapping Division
Geological Survey of Malaysia
P.O. Box 1015, 30820 Ipoh

NORWAY

E.H. Bandlien
Director
NOPEC A.S.
Baarsrudveien 2, P.O. Box 88
3478 Naersnes

Sigurd Heiberg
Project Manager
Norwegian Petroleum directorate
P.O. Box 600, N 4001
Stavanger

PHILIPPINES

Guillermo R. Balce
Director
Mines and Geo-Sciences Bureau
8th Floor, Triumph Building
1610 Quezon Avenue, Quezon City

R.A. Avila
Geologist, PNOC
c/o PNOC-EDC, Merritt Road
Fort Bonafacio

David Baladad
Senior Geologist
Bureau of Energy Development
Visayas Avenue, Quezon City

Jaciel J. Benavidez
Senior Geologist
Bureau of Energy Development
Visayas Avenue, Quezon City

Ramon D. Quebral
Senior Geologist
Mines and Geo-Sciences Bureau
8th Floor, Triumph Building
1610 Quezon Avenue, Quezon City

Freddie Riclera
Chief
Oil and Gas Division
Bureau of Energy Development
Visayas Avenue
Quezon City

THAILAND

Chanin Rasrikriengkrai
Chief, Offshore Exploration Subdivision
Economic Geology Division
Department of Mineral Resources
Rama VI Road, Bangkok 10500

Akanit Suwanasing
Director
Economic and Information Division
Department of Mineral Resources
Rama VI Road, Bangkok 10500

UNION OF SOVIET SOCIALIST REPUBLICS

M.N. Alekseev
Special Adviser of the USSR to CCOP
Academy of Sciences of the USSR
Geological Institute
Pyzhevsky poz 7
109917 Moscow

I.M. Mirtchink
Deputy Chief
Department of Mineral Resources
Ministry of Geology
Moscow

UNITED KINGDOM

C.R. Jones
Special Adviser of United Kingdom
to CCOP
Director
Overseas Directorate
British Geological Survey
Keyworth, Nottingham NG12 5GG

UNITED STATE OF AMERICA

G. Gryc
Special Adviser of U.S.A. to CCOP
General Chairman
Circum-Pacific Map Project
U.S. Geological Survey
345 Middlefield Road, MS 952
Menlo Park, CA 94025

Maurice J. Terman
Special Adviser of U.S.A. to CCOP
Asian and Pacific Geology
Office of International Geology
U.S. Geological Survey
National Centre, MS 917
Reston, VA 22092

II. REPRESENTATIVES OF ORGANIZATIONS

ESCAP

P.J. Bakker
Chief
Mineral Resources Section
Natural Resources Division
ESCAP, UN Building
Rajadamnern Avenue
Bangkok 10200

III. SECRETARIAT

CCOP TECHNICAL SECRETARIAT

Henri Fontaine
Senior Pre-Tertiary Geologist
CCOP Technical Secretariat
110/2 Offshore Mining Organization Bldg.
Sathorn Nua Road
Bangruk, Bangkok 10500

C.S. Hutchison*
Overall SEATAR Co-ordinator
c/o CCOP Technical Secretariat
110/2 Offshore Mining Organization Bldg.
Sathorn Nua Road
Bangruk, Bangkok 10500

Takemi Ishihara
Senior Geophysicist
CCOP Technical Secretariat
110/2 Offshore Mining Organization Bldg.
Sathorn Nua Road
Bangruk, Bangkok 10500

* attending with IOC support

Sermsakdi Kulvanich
Director
CCOP Technical Secretariat
110/2 Offshore Mining Organization Bldg.
Sathorn Nua Road
Bangruk, Bangkok 10500

Frank F.H. Wang
CCOP consultant
U.S. Geological Survey, MS-999
345 Middlefield Road, Menlo Park
CA 94025

UNDP/ESCAP TECHNICAL SUPPORT PROJECT TO CCOP

B. Elishewitz
Senior Petroleum Geologist
c/o CCOP Technical Secretariat
110/2 Offshore Mining Organization Bldg.
Sathorn Nua Road
Bangruk, Bangkok 10500

J. Harding
Senior Quaternary Geologist
c/o CCOP Techncial Secretariat
110/2 Offshore Mining Organization Bldg.
Sathorn Nua Road
Bangruk, Bangkok 10500

John Ringis
Team Leader
c/o CCOP Technical Secretariat
110/2 Offshore Mining Organization Bldg.
Sathorn Nua Road
Bangruk, Bangkok 10500

IOC

Gunter Giermann
Alfred Wegener Institute of
Polar Research
D-2850 Bremerhaven
Federal Republic of Germany

IV. HONARARY ADVISER TO CCOP

C.Y. Li
Honorary Adviser to CCOP
5th Floor, 106 Hoping Road E.
Section 2, Taipei, Taiwan 10636
Republic of China

ASSESSMENT OF STATUS OF SEATAR TRANSECT COMPILATIONS

Transect		Map Sheets-legend		Accompanying Text		Co-ordinators
No.	Name	% completed	Completion date (end)	% completed	Completion date (end)	
1.	Burma, North Thailand, Viet Nam	90%	May 1989	10%	December 1989	Chongpan Chonglakmani
2.	Andaman Sea - Gulf of Thailand	50%	December 1989	50%	December 1989	Chamrat Mahawat
3.	Sumatra, Peninsular Malaysia, Natuna	20%	? March 1989	5%	? March 1989	Fred Hehuwat (Indonesia)
		80%	November 1988	10%	January 1989	Foo Khong Yee (Malaysia)
4.	Banda Sea, Indonesia	90%	March 1989	25%	March 1989	H.M.S. Hartono
5.	Philippines - Marianas	80%	February 1989	30%	June 1989	G.R. Balce
6.	Japan - Korea	90%	May 1989	10%	December 1989	Eiji Inoue (Japan) Won Young Lee (Korea)
7.	Java, Kalimantan, Sarawak, South China Sea	80% 95% 10%	January 1989 October 1988 February 1989	80% 15% 10%	January 1989 January 1989 February 1989	M. Untung (Indonesia) Foo Khong Yee (Malaysia) D. Hayes (South China Sea)
8.	Sulu, Celebes, Molucca Seas	90%	December 1988	60%	February 1989	Apollo Madrid (Philippines)
		50%	March 1989	20%	March 1989	Rab Sukamto (Indonesia)
9.	Papua New Guinea	80%	? March 1989	0%	? March 1989	R. Rogerson
10.	Bismark Sea - Solomon Sea	70%	? August 1989	0%	? August 1989	G. Francis

APPENDIX 4

LETTER TO DR. HUTCHISON FROM

GEOLOGICAL SOCIETY OF AMERICA

October 28, 1988

Dear Dr. Hutchison:

Thank you for your letter concerning the publishing of your crustal transects. GSA Special Papers might be a good place to publish them but our Map and Chart Series might be even better. Let me describe both for you.

Special Papers are considered state-of-the-art reports on on-going research. They are considered to be of a more temporary nature where additional research will perhaps outdate any particular publication in three or four years. They may carry oversized items such as maps, with or without color, in a pocket in the inside back cover. Such items, however, are usually considered supplemental to the text material. There is no limitation to the number of pages in a Special Paper. The number of pocket pieces must be limited to the amount of paper than can be folded and put in a pocket without disfiguring the book. We can print oversized pocket pieces up to 60 x 40 inches (152 x 100 cm). That size is too large for a reader to use conveniently, so we prefer not to exceed 30 x 40 inches (76 x 100 cm). These books are printed with an 8.5 x 11 inch (21.5 x 28 cm) format and are paper bound.

The Map and Chart Series is intended to feature maps or charts with a supplemental text. Maps and charts are printed with the same dimensions as noted for oversized pocket pieces above. The supplemental text is limited to about 64 printed pages (approximately 200 manuscript pages). The number of colors on the maps is limited only by the author's ability to provide camera-ready color separation negatives. The text, in an 8.5 x 11 inch format, is usually saddle stitched without a cover-stock cover. The map, with accompanying text, is enclosed in an illustrated 9 x 12 inch (22 x 30 cm) envelope. Maps can be out dated by later efforts portraying the same area, but several of the items in our Map and Chart Series are more than 10 years old and still selling well.

To answer the questions in your letter more specifically:

1. The Society is interested in publishing any material that will further the science of geology. We can make no commitment until we have had a chance to examine the material, but we would be happy to consider your transects.

Dr. Hutchison - page 2.

2. The maximum size of folded enclosures is noted above.

3. We can print any number of colors, either line color or four-color process, but we do need camera-ready negatives. A hand-colored version of the transects would be handy for review purposes, but for printing, we do need the color separations.

4. We do ask the authors of Special Papers for page charges—$125.00 per printed page—but these charges are strictly voluntary and payment or not is not considered when evaluating a manuscript for publication. The authors of maps and charts are not asked for page charges. I might mention, Dr. Hutchinson, that as a not-for-profit, private organization, the Society establishes selling prices of publications on actual production costs and not on production plus profit margin. Our selling prices are usually about half what a commercial publisher would need to charge.

5. The Society claims copyright on all our publications in the form we publish them, but upon publication all rights revert to the authors. Our copyright is restrictive only in the sense of not permitting a commercial publisher to duplicate our efforts and dilute our market to a point where we cannot recoup our production costs. Our copyright imprint includes the statement, "All materials subject to this copyright and included in this volume may be photocopied for the noncommercial purpose of scientific or educational advancement." Our copyright is not restrictive nor profit motivated, but we do need to copyright our publications.

6. We act as the direct sales agent for all our publications. If the CCOP and IOC organizations were interested in placing quantity orders prior to publication, we could probably arrange for a special pre-publication discount.

I am enclosing a copy of our latest publication catalog. Please note the variety of subjects listed in both the Special Papers and in the Map and Chart Series, as well as their selling prices.

I hope we can be of service to you, Dr. Hutchison, and please feel free to write if you have any additional questions.

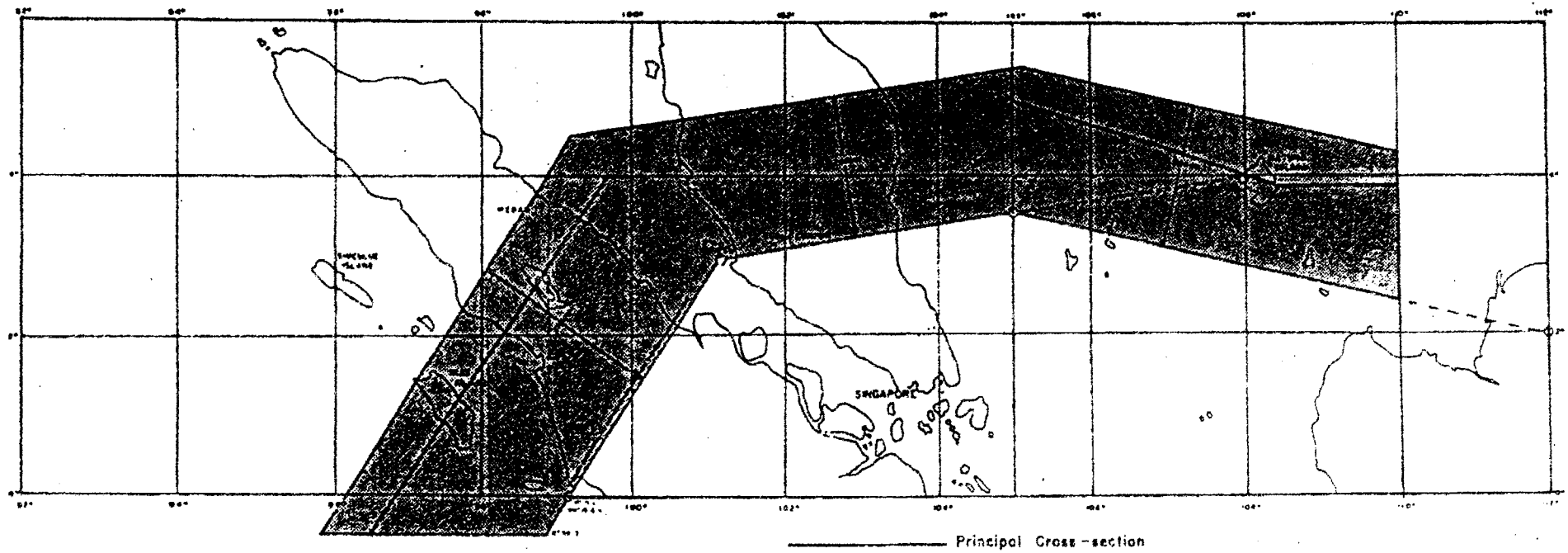
Sincerely,

Lee E. Gladish

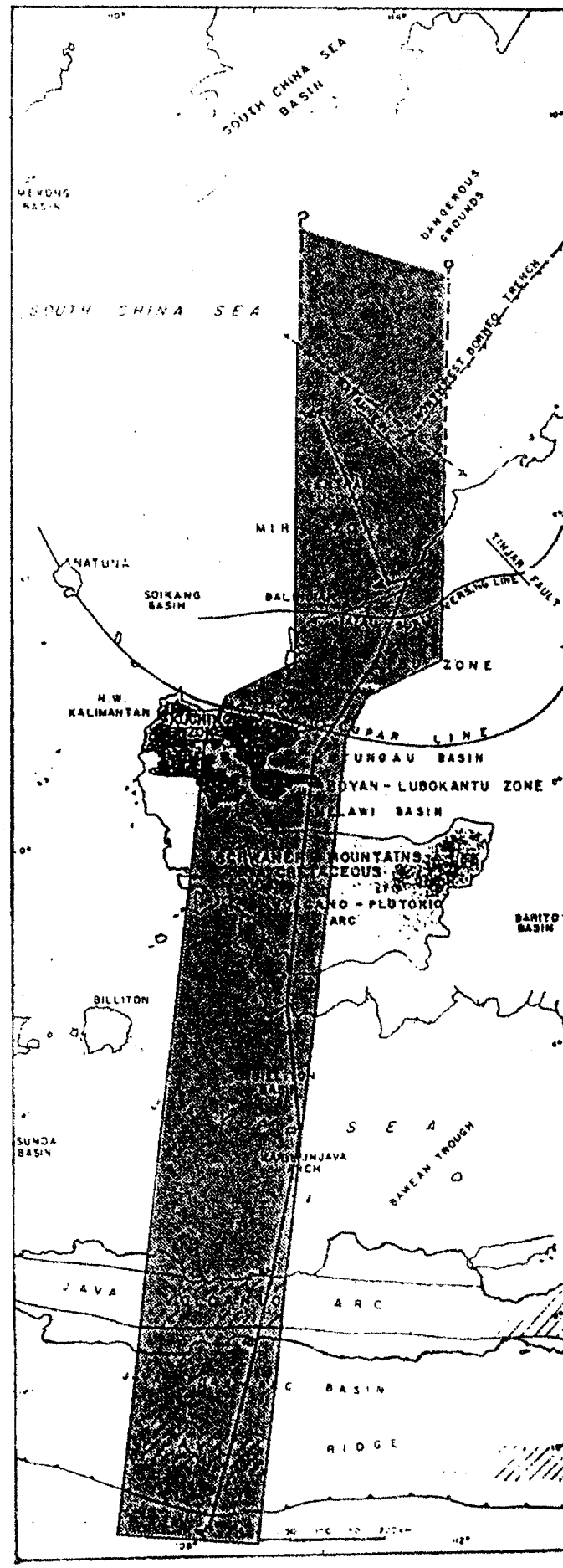
Lee E. Gladish
Books Coordinator

APPENDIX 5

TRANSECT III: NEW CORRIDOR SUMATRA - PENINSULAR MALAYSIA - NATUNA

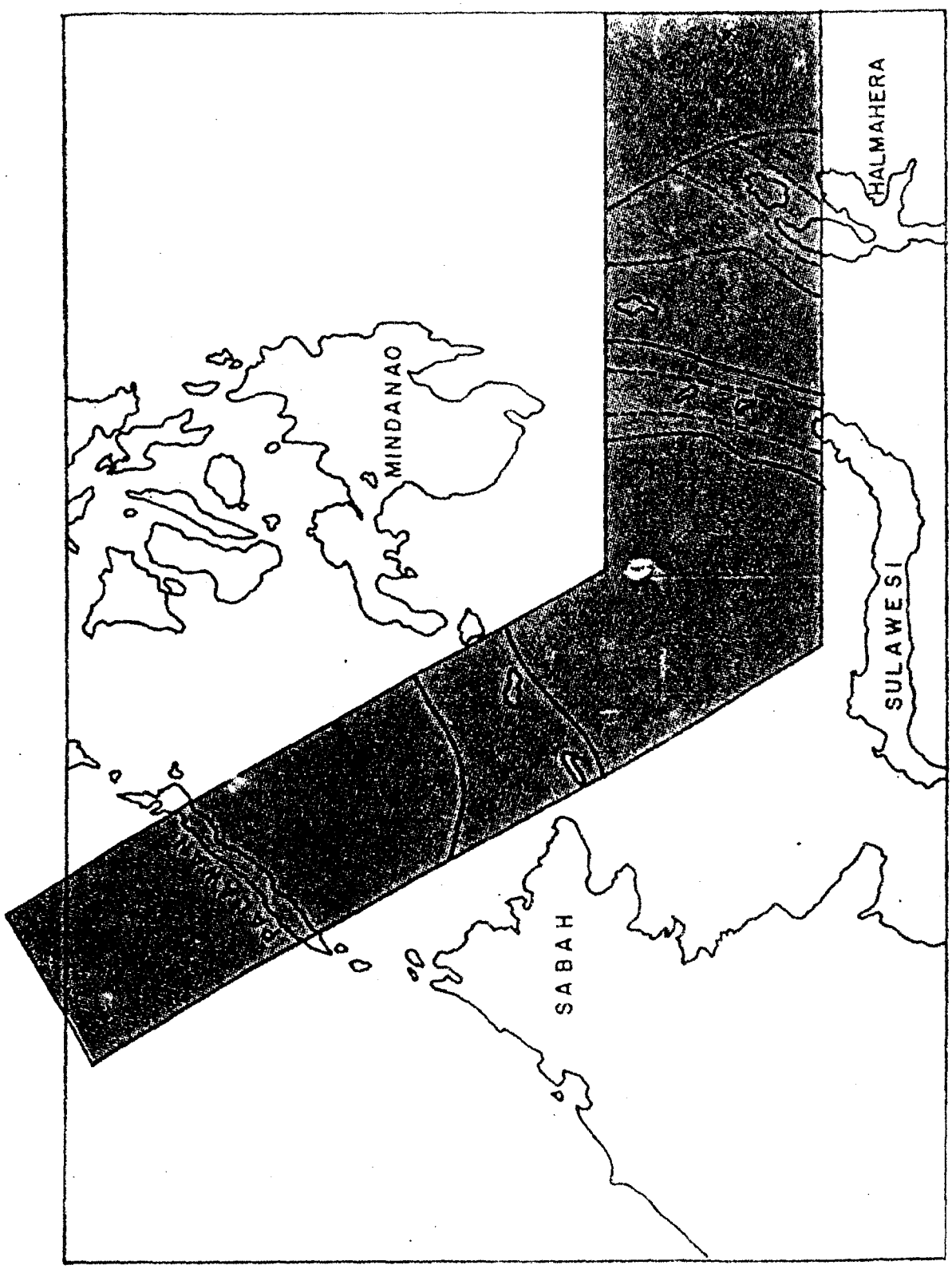


APPENDIX 6



Transect VII: Java - Kalimantan - Sarawak - South China Sea.
Final corridor - extension into the South China Sea
at the discretion of Dennis Hayes.

APPENDIX 7


TRANSECT VIII: SULU-CELEBES-MOLUCCA SEAS
MINDANAO
SABAH
SULAWESI
HALMAHERA

LIST OF DOCUMENTS FOR THE FOURTEENTH SEATAR WORKING GROUP

Symbol No.	Title	Source
CCOP-IOC/SEATAR (XIV)/1	Provisional Agenda	CCOP Secretar:
CCOP-IOC/SEATAR (XIV)/2	Report and Recommendations on the SEATAR Transects, by Prof. Charles S. Hutchison	CCOP Secretar:
CCOP-IOC/SEATAR (XIV)/3	Recent Tectonic Movements on the Sunda Forearc	Indonesia
CCOP-IOC/SEATAR (XIV)/4	Proposals for Finalising SEATAR Transect	Indonesia

ANNEX V

Northwest Quadrant Panel Meeting, Circum-Pacific Map Project, CPMP

Fourteenth Session
8 December, 1988 - 0900-1030 hrs.
Baguio City, Philippines

Minutes

The meeting was opened by Dr. T. Moritani on behalf of Dr. E. Inoue, Chairman Northwest Panel. Dr. Inoue was unable to attend and sent his regrets and best wishes for a successful meeting. Dr. Moritani asked the General Chairman, CPMP, Dr. George Gryc to chair the meeting.

The meeting was attended by representatives of the CCOP Secretariat and the following nations: Australia, Canada, Federal Republic of Germany, Indonesia, Japan, Republic of Korea, Malaysia, Norway, Philippines, Thailand, USSR and the US.

Dr. Gryc reviewed the present scope and status of CPMP (see CPMP XIV/1). He noted that during the past year Geologic Maps for the NW and SW Quadrants were published, and excellent progress was made on ten other map sheets including Northwest Mineral Resources, Southwest Tectonic, Southwest Mineral Resources, Antarctic Geologic, Antarctic Base revised, Southeast Energy Resources (two sheets), Southeast Mineral Resources, Arctic Base and Geographic, and Pacific Basin Natural Hazards.

Dr. Gryc noted that the CPMP began officially in 1974 at the First Circum-Pacific Energy and Mineral Resources Conference and was sponsored by CCOP, Pacific Science Association and AAPG. The original plan included four quadrants and the Antarctic region at 1:10,000,000 scale and the Pacific Basin at 1:17,000,000. A sixth region, the Arctic, was included in 1987. Eight themes were to be compiled for each region for a total of 56 maps. Other special maps have been added including natural hazards and the total is now 62 of which 33 have been published. Each sheet has been published in 1600 to 2000 copies for a total of about 65,000 copies, and more than half have been distributed worldwide. Several sheets have been sold out and reissued - plate-tectonics being the most popular.

These maps have provided a focal point for geoscience data and interpretations and have stimulated interest in more detailed maps of specific regions. Two such projects have now been started within the CPMP structure and supported by the Circum-Pacific Council. These include a 1:2,000,000 scale eight-sheet series in the East Asia Region being compiled by the Working Group on Geotectonic Map, WGGM, and a two-sheet series in Central America at a scale of 1:1,000,000.

Discussion at the Annual Meeting of the Panel Chairmen, CPMP, held in Tsukuba, Japan, September 29-30, 1988 included suggestions for a metamorphic and plate-boundary map of the Northwest Quadrant, and a single-sheet geologic map of just the Western Pacific. No action was taken on these suggestions. Preliminary maps portraying paleogeography of the Pacific Basin were displayed and discussed.

A list of conferences and meetings at which CPMP will be described and products exhibited was announced and is included in CPMP XIV/3.

Dr. Moritani then displayed and discussed the status of maps currently being compiled by the Northwest Panel. The Geological Map was published in July, 1988. The Tectonic Map may be completed by the end of 1989. Magnetic data for the China and USSR part of the map and the assistance of the representative of these countries was requested. The Energy Resources Map is nearing completion and a first draft will be sent to the Menlo Park office by the end of this year and a first draft of explanatory text will be prepared for display at the International Geologic Congress to be held in Washington D.C. in July 1989.

The Mineral Resources Map is nearly completed. The mineral data has been sent to the Menlo Park office and a simplified geologic background will be sent by the end of this year. The explanatory text will be completed by September, 1989.

Dr. Moritani then discussed the draft of the "Report on First Workshop of East Asia Geotectonic Map Project, WGGM" prepared by the NW Quadrant Chairman, Dr. E. Inoue and the Chief Compiler, Dr. T. Sato (see CPMP XIV/2). He asked the country representatives to review the draft and send comments and additions to Dr. Inoue. The workshop was very well attended and good progress was reported. Another workshop will be scheduled for 1989.

Questions and comments included recommendations that a better review and co-ordinating mechanism be devised for all of the map products of CPMP and WGGM. Support for a metamorphic map of the Northwest Quadrant was expressed noting that such a compilation would aid in defining the major plates and plate boundaries.

Dr. M.J. Terman then displayed and described a color-proof of the Natural Hazards map of the Pacific Basin 1:17,000,000 scale (see CPMP XIV/5). Although comments were generally favorable, questions were raised regarding the departure from other CPMP map products that have a basic scientific theme. The Natural Hazards Map portrays geologic and meterological data that are not directly related but natural hazards is the unifying theme.

Dr. Terman described and displayed an example of the Geographic Map Series, 1:2,000,000 scale, for the East Asia Map Project. All eight map sheets now include both topography and bathymetry and only place names and spot elevations are missing. This will be completed in 1989. Plans include publication of this series in color. Comments focused on the definition and formal establishment of an East Asia Map Project. Although no action has been taken on such a project, it has been discussed in several past meetings. The project would be aimed at bringing together various geoscience information on the 1:2,000,000 scale base. It was suggested that CPMP should work with CCOP to prepare a project document including a suggested mechanism for co-ordination.

Dr. Moritani concluded the meeting by thanking the participants for their attention and helpful suggestions.

ATTENDANCE AT FOURTEENTH MEETING
OF THE NW QUADRANT PANEL OF THE
CIRCUM-PACIFIC MAP PROJECT

1.	DR. H.M.S. HARTONO	INDONESIA
2.	DR. J.A. KATILI	INDONESIA
3.	MR. J. WIDARTOYO	INDONESIA
4.	DR. J. HIRAYAMA	JAPAN
5.	MR. Y. HOSOI	JAPAN
6.	DR. T. MORITANI	JAPAN
7.	DR. M. WATANABE	JAPAN
8.	DR. CHONG SU KIM	R. OF KOREA
9.	DR. SAHNG YUP KIM	R. OF KOREA
10.	DR. LEE WON YOUNG	R. OF KOREA
11.	MR. T. SUNTHARALINGAM	MALAYSIA
12.	DR. G.R. BALCE	PHILIPPINES
13.	MR. RAMON D. QUEBRAL	PHILIPPINES
14.	MR. R.A. AVILA	PHILIPPINES
15.	MR. AKANIT SUWANASING	THAILAND
16.	DR. CHANIN RASRIKRIENGKRAI	THAILAND
17.	DR. D. FALVEY	AUSTRALIA
18.	DR. M.J. KEEN	CANADA
19.	PROF. DR. K. HINZ	FEDERAL REPUBLIC OF GERMANY
20.	DR. R. SINDING-LARSEN	NORWAY
21.	MR. S. HEIBERG	NORWAY
22.	DR. M.N. ALEKSEEV	USSR
23.	DR. M.J. TERMAN	USA

24.	DR. G. GRYC	USA
25.	MR. S. KULVANICH	CCOP TECH. SEC.
26.	DR. H. FONTAINE	CCOP TECH. SEC.
27.	MR. I. MILJETEIG	CCOP TECH. SEC.
28.	MR. B. ELISHEWITZ	UNDP/ESCAP TECH. SUPPORT TO CCOP PROJECT
29.	DR. C.Y. LI	HONORARY ADVISER

LIST OF DOCUMENTS

Symbol No.	Title
CPMP(XIV)/1	Agenda - CPMP - Northwest Quadrant Panel Meeting
/2	Report on First Workshop of Working Group of East Asia Geotectonic Map Project (WGGM) by NW Quadrant Panel Chairman, CPMP and General Compiler, WGGM, Sept. 26 - 28, 1988, Tsukuba, Japan
	- Abstracts - Symposium on Geotectonics and Energy Resources in East Asia, September 27 - 28, 1988, Tsukuba, Japan
/3	- Status Report CPMP as Dec. 1, 1988
	- Notes from 1989 Panel Chairman's Meeting - CPMP, Sept. 29 - 30, 1988, Tsukuba, Japan
/4	Compilation of Geographic Map Series for the East Asia Map Project (EAMP)
/5	Hazard Maps Submitted by Circum-Pacific Map Project - December, 1988

ANNEX VI

REPORT OF THE SPECIAL ADVISERS
TO THE 25TH SESSION OF CCOP

1. INTRODUCTION

The Special Advisers have taken part in the discussion of the 24th session of the Technical Advisory Group and related meetings, and submit the following comments.

2. LONG TERM PLANS OF CCOP

The Advisers are gratified that CCOP accepted their advice to begin formulating Long Term Plans.

However, the Special Advisers urge CCOP to develop a more comprehensive programme document incorporating well-defined corporate objectives, programme strategies, long-range programme structure, organizational and budget structure, and performance indicators/through more detailed consultation with member countries.

The Special Advisers draw attention to the importance for long term success, of incorporating the highest scientific standards in programmes designed to solve practical problems. They note in this respect that a number of important and relevant international programmes exist with which CCOP might want to be associated. These programs include the International Geosphere and Biosphere Programme and the Ocean Drilling Programme. Such an association could assist in CCOP's training objectives and help in effective technology transfer.

The Special Advisers offer the following suggestions for the development of a comprehensive corporate plan.

(i) The field of endeavour: CCOP's field of endeavour should be specific: studies of the appropriate geological and geophysical elements of the continental margin and coastal regions in time and space. These studies would normally be those where geoscientific research and development can promote the discovery and responsible exploitation of natural resources, and in the proper use of the coastal regions, the oceans and the sea-floor. These studies would normally include the appropriate elements of pure research through to the most directed research. They will normally be focused on applications appropriate to the Exclusive Economic Zones of the member nations, and these will range, for example, from studies concerned with nearshore mineral deposits to Marine Environment and Safety Programmes.

(ii) CCOP's special role: The member countries have their own Geological Surveys (and comparable national institutions), and CCOP's role must not be one of duplication. It is suggested that it focuses on co-ordination; training; and the research for new scientific and technological opportunities relevant to resource exploration and development in member nations. CCOP could define programmes to encourage participation in international programmes, and could co-ordinate exchanges within established national programmes.

(iii) CCOP's Programme Content: the Special Advisers compliment CCOP on its present specific programme elements, and note in the new draft of the Guidelines for CCOP the intention to develop infrastructure, strengthen technological capabilities, and monitor major break-throughs. The Special Advisers congratulate CCOP for the initiation of regional syntheses of various sorts, which should put valuable information in the public domain. The Special Advisers draw attention specifically to the possibility of new programmes concerned with:

Global Change; Hazard Analysis and Mitigation; Environmental Pollution and the general threat to living resources (and to mankind); identification and assessment of resources in deeper water areas of the Exclusive Economic Zones and the seafloor.

3. PROCEDURES

The Special Advisers would appreciate learning of the member countries' reactions to their suggestions. This could perhaps be accomplished if the Steering Committee discussed the report of the Special Advisers and passed on their comments at the Plenary session.

4. EQUIPMENT

The Special Advisers endorse the proposals for using savings, and urge that emphasis continue to be placed on replacements and on spare parts. They note that phasing out of the UNDP programme officers will place new strains on future operations and particular care and attention on the procedures for maintenance of equipment and its use responsibly are therefore needed. They urge that CCOP ensures that a proper infrastructure be established so that equipment is properly maintained, and maintenance schedules are respected. The Special Advisers observe that this can be done in several ways - using appropriate expertise in member nations, or maintenance by contract, are two examples.

5. REGIONAL QUATERNARY RESEARCH CENTRE

The Special Advisers suggest that CCOP work with the People's Republic of China to develop their national Quaternary Research Centre so that it can meet regional needs. In particular, in the absence of an official response from ESCAP to CCOP's request of 1982, the Advisers suggest that the People's Republic of China should seek the necessary funds from UNDP for the development of its national centre to meet regional needs.

6. MARINE ENVIRONMENT AND SAFETY PROGRAMMES

The Special Advisers note that the joint CCOP/ASCOPE/NECOR "Marine Environment and Safety Programme" is being well implemented in ASCOPE countries. It is also noted that an expansion of the programme will take place in 1989 as recommended by the Special Advisers at the 24th Session last year.

We also note that ASCOPE has prepared a 3 year perspective for the period 1989-91.

We would recommend that the CCOP Technical Secretariat seeks assistance from ASCOPE to draw up and implement a long term programme on "Marine Environment and Safety" for the period 1992-2000. We also recommend that CCOP considers the possibility of establishing a programme on Marine Environment and Safety at the University level.

7. SEATAR

The Special Advisers congratulate CCOP on the satisfactory planning for the rapid publication of SEATAR and the termination of the project. They suggest that it is time to consider a coherent strategy for a successor programme. They recommended that CCOP draw scientists together in workshops so that a successor to SEATAR is a part of the long term plans of CCOP. The Special Advisers consider that a programme focussing on frontier resource exploration and assessment is appropriate and suggest that IOC be approached concerning funding, and urge too that the results of scientific planning by other groups should not be neglected. Examples are: Ocean Drilling Program, COSOD II, International Geosphere and Biosphere Program, IOC Wespac.

8. COASTAL MANAGEMENT AND GLOBAL CHANGE

The Special Advisers compliment CCOP on its initiatives concerning coastal management. They recommend that particular attention be paid to the initiatives developed by the International Council of Scientific Unions (ICSU) on Global

Change, through the International Geosphere and Biosphere Program (IGBP). They suggest that contacts be made with IGBP so that awareness is heightened and the appropriate regional elements of the global programme can be more effectively developed.

9. RESOURCE EVALUATION

The Special Advisers recognise the complexity of regional programmes in resource evaluation for hydrocarbons and for non-fuel minerals. They endorse the activities of the Working Group on Resource Assessment, and urge greater co-ordination with related activities.

10. OCEAN DRILLING PROGRAMME

The Special Advisers note that this programme recently drilled in the Celebes Sea and the Sulu Sea with scientists from the Philippines participating. Results are exciting, and they will change the geodynamic framework for the region. They recommend that CCOP ask the Executive Committee of ODP to re-examine mechanisms which would allow scientists from developing nations to participate in programmes which lie outside the national EEZs.

11. UNDP PROGRAMMES

The Special Advisers draw attention to the problems which will arise with the loss of staff under contract to UNDP. We note that Mr. Elishewitz, Dr. Harding and Dr. Ringis have made very substantial contributions to CCOP and that member countries have benefited greatly from their services.

12. The Special Advisers thank the host country, the Philippines, for excellent arrangements in holding the 25th Session in the pleasant climate of Baguio City.

ATTENDANCE AT SPECIAL ADVISERS' MEETING

D. FALVEY	AUSTRALIA
R. PAEPE	BELGIUM
M.J. KEEN	CANADA (Rapporteur)
K. HINZ	FEDERAL REPUBLIC OF GERMANY
T. MORITANI	JAPAN
E. OELE	THE NETHERLANDS
O. BERG	NORWAY
M.N. ALEKSEEV	USSR
C.R. JONES	UK (Chairman)
M. TERMAN	USA
G. GRYC	USA, CPMP
G. GIERMANN	IOC, Honorary Adviser
C. Y. LI	Honorary Adviser

ANNEX VII

CCOP/ASCOPE/NECOR MARINE ENVIRONMENT PROGRAMME FOR 1988 AND PROPOSALS FOR 1989 AND BEYOND

Both Dr. Mario Berbano, ASCOPE Co-ordinator on Environment and Safety, and Dr. Oystein Berg, expert adviser to CCOP/ASCOPE on matters relating to Offshore Safety, presented comprehensive reports to the meeting. (Dr. Berbano's document CCOP (XXV)/49 was entitled "Joint CCOP/ASCOPE/NECOR Marine Environment and Safety Programmes for 1988" and Dr. Berg's "Annual Report - 1988" and "Perspective 1989-91 and Programme Proposal 1989"). The reports covered the background and activities of the Environment and Safety Programme from its inception in 1984 to the present, and listed the prioritized activities proposed through 1991. Activities through 1987 have been reported in previous Proceedings of the years' Annual Sessions.

The various programme activities are co-ordinated by project managers in close co-operation with experts from the CCOP/ASCOPE member countries. Programme activities for subsequent years are recommended by the CCOP and ASCOPE Annual meetings. Programme proposals and application for financial support are submitted to the Norwegian Government by CCOP. Monitoring of the programme activities is undertaken by CCOP/ASCOPE/NECOR, and joint status meetings are held 2-3 times a year.

PROGRAMME ACTIVITY - 1988

Offshore Safety Regulations

Philippines has reported that there has been no change of status of offshore safety regulations. The Co-ordinator (Philippines), Dr. Mario Berbano, has cited that the reorganized Office of Energy Affairs does not at present have qualified personnel for offshore safety regulation. He, however, stressed that the Philippines has a need for trained safety personnel with the increase in exploration activity.

It was agreed that the Philippines will come up with a training programme which will cover both technical and financial assistance that will be sought from NECOR. It was suggested that NECOR Consultant/Chief Advisor of Safety Director of NPC visit the Philippines to help draw up the best possible training programme for the Philippines in the areas of offshore safety regulations.

Thailand is presently amending two laws with respect to petroleum. Safety rules and regulations are to be modernized following these amendments.

Indonesia reported that its government is in the process of establishing Government Regulations with emphasis on environmental protection and safety. These regulations will include prevention of water pollution through effluent discharge standards which will have an effect on the procedures and applications to offshore activities. NECOR will provide European diving regulations and submit these to Indonesia.

Malaysia has finalized its internal safety regulations and is presently working on diving regulations for upstream operations. Assistance is not required at the moment.

Singapore will submit their environmental regulations to Member Countries as well as NECOR.

Offshore Safety Training

- A course on "Basic Safety and Work Environmental Training" was held in Bangkok, Thailand from August 29 - September 3, 1988.

  The course was attended by sixteen (16) participants and covered 15 topics ranging from safety management to safety training and educational needs training. Instructors came from The Bergen Academy, Norway.

- A course on "Safety Management and Work Environment" was held in Kuala Lumpur, Malaysia, from September 5 - 15, 1988. The course was attended by 29 participants from various organizations in Malaysia. The feedback was very positive, and the evaluation of the course was very encouraging. It is hoped that the knowledge gained will be transferred to others in the various operating groups.
  Instructors came from The Bergen Academy, Norway.

Marine Environment

Development and implementation of an oil-drift model for the South China Sea (Joint programme with COBSEA/UNEP)

The objective of the project has been to develop an oil-drift

model for the South China Sea in two versions: one for prediction of movement of oil, in case of oil spills in the area, and one for statistical use to compute probabilities for oil trajectories from selected locations (minimum drifting time to arbitrary positions, maximum and mean amount of oil remaining on the sea surface). The models will to a large extent be based upon the experience with similar models which have been in operational use at The Norwegian Meteorological Institute for several years.

The experts representing NECOR in this work are the Norwegian Meteorological Institute and Dr. Jan N. Langfeldt.

There was a meeting in Bangkok between ASCOPE/NECOR/CCOP and COBSEA Coordinators on 13-15 July 1988. This meeting ended with the National Environment Board of Thailand (NEB) deciding to present its own individual proposal to the 7th COBSEA Meeting in Yogyakarta (17-19 July 1988). The 7th COBSEA Meeting decided that only the NECOR-assisted CCOP/ASCOPE oil spill modeling project, which was then ongoing, be adopted and pursued for the East Asian Seas region. NEB has been designated to liaise directly with the Norwegian Meteorological Institute (DNMI) where the model is being developed.

Other activities for 1989 would include verification of the already-developed oil spill model, and either a final workshop to explore and improve the predictive capabilities of the model or presentation of the model in the Oil Spill Contingency Planning joint meeting due in August 1989.

Safety Management

NECOR assisted Statoil in arranging a 2 week Safety Management Programme in the period 19-30 September, 1988, for 3 participants from the Petroleum Authority of Thailand and Petronas, Malaysia.

Quality Assurance Management

As a follow-up of the 1987 QA Workshop in Manila and in preparation for the 1989 programme, two QA experts from Statoil visited PTT, Petronas and Pertamina in the period 14-24 November 1988.

Meetings between CCOP/ASCOPE/ASGES/NECOR were held in:

- Kuala Lumpur, Malaysia, June 16-21
- Manila, Philippines, October 17-26
- Baguio, Philippines, December 5-13

A representative from NECOR, Dr. Jan Langfeldt, took part in the 7th COBSEA meeting,in Yogjakarta, July 18-19.

A total of NOK 0,9 million (approx US$ 135,000) was allocated by NECOR to the Safety Programme for 1988. The budget has been utilized fully with no overrun.

All activities scheduled for 1988 have been successfully carried out according to plan and budget. This has been achieved because of tremendous effort and interest by those involved in the CCOP and ASCOPE countries and the visiting lecturers and instructors.

Three-Years Programme (1989-1991)

The ASGES Meeting was informed that a joint UNIDO/NECOR Workshop on Coastal Industry Planning in Developing Countries will be held this May 1989 in Oslo, Norway. ASCOPE member countries were provided with copies of the communications from NECOR Executive Director Mr. Per Laheld to Dr. Delos of UNIDO. The Meeting tasked the ASGES Coordinator to explore with UNIDO the possibilities of ASGES being able to benefit from attendance at such workshop.

A three-year programme has been drafted by the Malaysian representative in co-operation with ASGES members and NECOR. The programme was discussed in detail at the Joint ASCOPE/CCOP Intersecretariat Meeting, and a proposed programme for the period 1989-91 was agreed upon.

Listed below are the agreed upon programme for 1989, 1990 and 1991 (all cost figures are preliminary estimates):

A. Year 1989 Programme (in order of priority)

i. Oil Drift Modeling (ongoing)

ii. Safety Management (Thailand - June 89)

iii. Transfer of Data Bank & SOBAS Programme

iv. Environment follow-up/Oil Spill Conference & Environment Impact Assessment & Effluent Water Treatment (Indonesia-August 89)

v. Quality Assurance Follow-up Conference (Statoil-organised) (Thailand-April 89)

vi. Safety Regulation (Philippines-January/February 1989)

vii. Risk Analysis (HAZOP) (Malaysia-September 1989)

B. Year 1990 Programme

i. Underwater Inspection, Maintenance, Diving

ii. Oil Spill Table-top Exercise

iii. Explosion Protection and Area Classification

iv. Safety Regulation/Q.A./Risk Analysis (Subject to available funds)

C. Year 1991 Programme

i. Transfer of Oil Spill Cost/Benefit Model

ii. Decommissioning of Platform Conference

iii. Underwater Technology

iv. Safety Regulation/Q.A./Risk Analysis (Subject to available funds)

These programmes will be subject to the endorsement of the forthcoming CCOP annual meeting in December 1988. NECOR has indicated that due to requests by a number of universities in the region, the University Programme could be activated in 1992 subject to financial availability. As has been done in previous years under the ASCOPE/NECOR arrangement, all local transport, accommodation and food for the experts will be borne by the host country.

ANNEX VIII

CCOP FINANCIAL REPORT

Content

This audited financial statement summarized expenditures incurred on the activities of CCOP for the period 1 January to 30 September 1988 from the funds administered by the CCOP Technical Secretariat. Those funds include cash contributions from the CCOP member countries, NECOR's support to CCOP work programme, French fund for travel costs of Dr. Henri Fontaine and the other funds from the Japanese and The Netherland Governments.

The Cash Book, relevant accounting documents and the daily transaction books are maintained in both US dollars and Thai Bahts. However, the amount of each transaction covered under the above statement is shown in the US dollars only by adopting the following UN operational rates of exchange:

Effective 1 January 1988 : Baht 25.08 to US$ 1

Effective 1 April 1988 : Baht 25.15 to US$ 1

Effective 1 July 1988 : Baht 25.23 to US$ 1

The beginning balance of US$ 299,647.60 shown in the report is the amount carried forward from the balance of the last accounting period ending 31 December 1987, the financial statement of which had already been presented to the last Steering Committee meeting in May 1988. The remaining balance at the end of the reporting period (30 September 1988) is US$ 367,536.83. Gain on currency exchange resulted from the changes in the UN operational rate of exchange, and the difference between the Bank rate and the UN rate amounts to US$ 2,616.05.

Mr. Sermsakdi Kulvanich
Director
CCOP Technical Secretairat

AUDIT REPORT

I have examined the Statement of Income and Expenditure of the Committee for Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas for the period 1 January to 30 September 1988 and the related statement of income and expenditure for the period then ended. My examination was made in accordance with generally accepted auditing standards and, accordingly, included such test of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In my opinion, the financial statements referred to above present fairly the financial position of the Committee for Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas and the results of its operations for the period then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding period.

Mrs. Manee Manidool
Certified Public Account
Registration No. 1322
97 Sukhumvit Road, Soi 53
Bangkok 10110

9 October 1988

CCOP

STATEMENT OF INCOME AND EXPENDITURES

for the period covering 1 January - 30 September 1988
(amount in US dollars)

Receipts

Member countries' contributions	190,372.05	
France's contribution for Dr. Fontaine's Services	29,226.91	
Assistance from NECOR	23,785.34	
Contributions from oil companies for Dr. Fontaine's research work and publications	2,000.00	
Proceeds from sales of CCOP publications	3,701.26	
Interest earned	13,137.91	
Miscellaneous income	2,769.68	
Total		264,993.15

Expenditures

Personnel expenses	92,133.23	
Official travel	20,637.67	
Travelling expenses for training courses	44,344.40	
General operating expenses	13,524.30	
Purchase of office equipment	512.32	
Purchase of office supplies	2,126.38	
Maintenance of office equipment	1,339.24	
Organizational expenses for the 11th Steering Committee Meeting, May 1988	14,689.08	

Printing cost	1,707.51	
Miscellaneous expenses	1,800.28	
Advance made by CCOP	3,305.75	
Advance recoverable locally	983.76	
Total		197.103.92
Surplus for the above period		67,889.23
Balance B/F (1 January 1988)		299,647.60
Savings (30 September 1988)		367,536.83

CCOP

FINANCIAL STATUS

as at 30 September 1988
(amount in US dollars)

	Maintained at CCOP	Maintained at ESCAP	Total
1. Annual cash contributions of the member countries	321,653.36	-	321,653.36
2. Japanese fund	-	192,343.42	192,343.42
3. The Netherland fund	4,721.14	41,201.64	45,922.78
4. French fund	33,383.54	-	33,383.54 1/
5. Contributions for Dr. Fontaine's research work and publications	6,988.32	-	6,988.32 2/
6. NECOR fund	790.47	-	790.47 3/
	367,536.83	233,545.06	601,081.89

1/ The French fund is obligated to cover travelling expenses in connection with Dr. Fontaine's mission in the CCOP region from Dec. 1988 - Mar. 1989.

2/ This amount is obligated to cover the costs of printing a special technical volume to highlight outstanding work of Dr. Fontaine for CCOP over the past 10 years.

3/ The remaining balance of NECOR's financial support for the WGRA Workshop to be refunded to NECOR.

ANNEX IX

LIST OF DOCUMENTS

Symbol No.	Title	Source	Agenda Item
CCOP (XXV)/1	Provisional Agenda	CCOP Tech. Sec.	
/2	Annotated Provisional Agenda	CCOP Tech. Sec.	
/3	Annual Report of Director, CCOP Technical Secretariat	CCOP Tech. Sec.	5
/4	Report on Fourth WGRA Meeting (Map Compilers' Workshop)	Japan	TAG 1.2.2
/5	Expert Mission on Resources Assessment and Data Management, June/July 1987	CCOP Tech. Sec.	TAG 1.2.1
/6	A Review of Activities Relating to Hydrocarbon Resources of Malaysia from 1 October 1987 to 30 September 1988	Malaysia	TAG 1.1
/7	Review of Activities in the Areas of Technical Assistance Provided by CCOP	Malaysia	TAG 1-7
/8	Marine Geology Activities of the Geological Survey of Japan, 1987-1988	Japan	TAG 2.1
/9	Report on Aeromagnetic Map Compilation Programme	CCOP Tech. Sec.	TAG 4
/10	Report on the Activities of CCOP in the Application of Microcomputer Technology	CCOP Tech. Sec.	TAG 5
/11	Involvement of CCOP in Coastal Zone Resources and Management	CCOP Tech. Sec.	TAG 6
/12	Future Activities of CCOP in Quaternary Geology	CCOP Tech. Sec.	TAG 3.9
/13	Digitizing and Gridding Programs for APC	CCOP Tech. Sec.	TAG 4.3
/14	Interpretation of Magnetic Anomalies of Prisms Using a PC	CCOP Tech. Sec.	TAG 4.3
/15	FILGEO: Filtering Program for APC	CCOP Tech. Sec.	TAG 4.3

Symbol No.	Title	Source	Agenda Item
CCOP (XXV)/16	Petroleum Exploration Activities Offshore in Japan 1987	Japan	TAG 1.1
/17	British Geological Survey: Summary of Proposals for Project Entitled "Thermal History of Petroliferous Basins in the CCOP Region"	U.K.	TAG 1
/18	Reports on Missions by Members of UNDP/ESCAP Technical Support Team to CCOP (November 1987 to November 1988)	CCOP Tech. Sec.	
/19	Report from the Visit of Resource Assessment Experts to Thailand, Philippines, Indonesia, Malaysia, Korea and Japan	Expert Mission on Integrated Play Modeling	TAG 1.2.2
/20	Technical Cooperation among CCOP Member Countries	CCOP Tech. Sec.	10
/21	Oil and Gas Exploration in China	China	TAG 1.1
/22	Heat Flow Measurements in China Seas	China	TAG 1.2.3
/23	Progress of the Survey for Detrital Minerals along the Coast of Yangjiang-Dianbai in the Southwestern Guandong Province of the People's Republic of China	China	TAG 2.1
/24	Deep Sea Investigations in the Pacific Region	China	TAG 7.1
/25	Progress of Quaternary Geology in China in 1988	China	TAG 3.1
/26	Geophysical and Geological Surveys in the Area Offshore Rayong and Chantaburi Provinces, East Thailand	Thailand	TAG 2
/27	Hydrogeology of Mae Ing Basin	Thailand	TAG 3
/28	Working Activities on Continental Shelf Mapping Project for 1988 in the Republic of Korea	R. of Korea	TAG 2.1
/29	Marine Geological Study on the Continental Shelf off Southern Coast Between Pusan and Ulsan, Korea	R. of Korea	TAG 2.1
/30	Petroleum Exploration Activity in 1987	R. of Korea	TAG 1.1
/31	A Comparison of Petroleum Potential Between Australian and Korean Offshore Basins	R. of Korea	TAG 1.2.2

Symbol No.	Title	Source	Agenda Item
CCOP (XXV)/32	Activities on Hydrocarbon Resources on the Continental Shelf of Korea in 1988	R. of Korea	TAG 1.1
/33	Working Activities on Quaternary Geological Programme for 1988 in the Republic of Korea	R. of Korea	TAG 3.1
/34	The State of the Art in Airborne Geophysical Survey in Korea	R. of Korea	TAG 4.1
/35	Aerosurvey Activities in 1988	R. of Korea	TAG 4.1
/36	Current Status of Geochronology in the Republic of Korea	R. of Korea	TAG 7.2
/37	Correlation of Onshore-Offshore Sequences in Northwestern Peninsular Malaysia	CCOP Tech. Sec.	TAG 2.4
/38	Status Report - The Offshore Tin : Exploration in Indonesia	Indonesia	TAG 2
/39	Exploration and Production of Oil and Gas in Indonesia Offshore Areas	Indonesia	TAG. 1.1
/40	Indonesian Technical Co-operation Among Developing Countries (TCDC)	Indonesia	10
/41	Bali Coastal Erosion and Nearshore Sedimentation Processes	Indonesia	TAG 2
/42	Geological and Geophysical Survey Karawang Waters, West Java (Karawang)	Indonesia	TAG 2
/43	Geological and Geophysical Survey in Tengerang Waters, West Java (Tengerang)	Indonesia	TAG 2
/44	Report on Group Training Course in Offshore Prospecting, Japan, 1988	Japan	TAG 8
/45	Oil and Gas Natural Reservoirs	USSR	TAG 1
/46	Status of Quaternary Geological Activities of the Geological Research and Development Centre (1988)	Indonesia	TAG 3.1
/47	Report on Petroleum Activities, November 1987-1988	Philippines	TAG 1.1
/48	Oil and Gas-Bearing Potential of Riftogenic Structures within Western Pacific Mobile Belt (Region of ESCATO Activity)	USSR	TAG 1

Symbol No.	Title	Source	Agenda Item
CCOP (XXV)/49	Joint CCOP/ASCOPE/NECOR Marine Environment and Safety Programs for 1988	Philippines	TAG 1.3
/50	Offshore and Coastal Geophysical Surveys	Philippines	TAG 2
/51	Aeromagnetic Map Compilation Programme	Philippines	TAG 4
/52	Comments on Techniques in Underwater Photography	CCOP Tech. Sec.	TAG 7.4
/53	Quaternary Geology Activities of the Geological Survey of Japan, 1987-1988	Japan	TAG 3
/54	Biostratigraphic Importance of Triassic Foraminifera and Algae from South-East Asia	CCOP Tech. Sec.	TAG 1.4
/55	Quaternary Geology Studies	Philippines	TAG 3
/56	Technical Advisory Group (TAG) - Investigation and Research Relevant to CCOP Activities	Philippines	TAG 7.2
/57	Coastal Zone Resources and Management Studies	Philippines	6
/58	Co-operation with International and National Bodies	Philippines	10
/59	Technical Co-operation Among Developing Countries of CCOP	Philippines	10
/60	Technical Advisory Group (TAG) Investigation and Research Relevant to CCOP Activities	Philippines	TAG 7.4
/61	Activities Relating to Hydrocarbon Resources in Thailand	Thailand	TAG 1
/62	Research Vessel GEOMARIN I operated by Marine Geological Institute - Bandung, Indonesia	Indonesia	TAG 2
/63	Microcomputer Based Image Processing System For Remotely Sensed Data	Indonesia	TAG 7.4
/64	Priority Problems of Mineral Resources in the CCOP Region and Participation of the USSR in their Solution	USSR	9
/65	Philippine Position Paper	Philippines	

12TH STEERING COMMITTEE MEETING

LIST OF DOCUMENTS

Symbol No.	Title	Source	Agenda Item
STEER.COM.(XII)/1	Provisional Agenda	CCOP Tech. Sec.	-
/2	Annotated Provisional Agenda	"	
/3	Draft Rules of Procedure	"	8
/4	Draft Administrative and Financial Rules	"	8
/5	Draft Long-term Objectives of CCOP	"	5
/6	Evaluation of Benefits Received by Member Countries vs Their Contributions	"	14.5
/7	CCOP Financial Report	"	9
/8	Updated Status of Member Countries Contributions to CCOP	"	11
/9	Definition of Special Advisers' Role	"	14.2
/10	CCOP Work Plan for 1989	"	6
/11	Conditions for "Loan" of Survey Equipment to CCOP Member Countries	"	12
/12	Status of the Regional Experts Programme and Recommendations for Future Action	"	7
/13	CCOP Budgetary Requirements for 1989	"	10
/14	The Experience of CCOP in Offshore Prospecting for Mineral Resources	"	-
/15	Report on Status of Offshore Survey and Associated Equipment	"	16
/16	Report on First Meeting of the IOMAC Technical Group on Offshore Prospecting for Mineral Resources in the Indian Ocean	UNDP/ESCAP Project	-

ROPEA REPORTS

Symbol No.	Title	Source	Agenda Item
ROPEA-R.150	Third Meeting of the CCOP Working Group on Resources Assessment	Project Office	TAG 1.2
ROPEA-R.151	The CCOP/ASCOPE/IUGS Workshop on "Impact of Computer Technology on the Management and Analysis of Petroleum Exploration Data"	Project Office	TAG 1