

TENTH UNITED NATIONS
REGIONAL
CARTOGRAPHIC CONFERENCE
FOR ASIA AND THE PACIFIC

Bangkok, 17-28 January 1983

Vol. I - Report of the Conference



UNITED NATIONS

Department of Technical Co-operation for Development

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NOTE

Symbols of United Nations documents are composed of capital letters combined with figures. Mention of such a symbol indicates a reference to a United Nations document.

The proceedings of the Tenth United Nations Regional Cartographic Conference for Asia and the Pacific, held at Bangkok, Thailand, from 17–28 January 1983, are being issued in two volumes, as follows:

Volume I. Report of the Conference

Volume II. Technical papers

The proceedings of the previous United Nations regional cartographic conferences for Asia and the Far East were issued under the following symbols and sales codes: E/CONF.18/6 (Sales No. 55.I.29) and E/CONF.18/7 (Sales No. 56.I.23) for the First Conference; E/CONF.25/3 (Sales No. 59.I.9) and E/CONF.25/4 (Sales No. 61.I.8) for the Second Conference; E/CONF.36/2 (Sales No. 62.I.14) and E/CONF.36/3 (Sales No. 64.I.17) for the Third Conference; E/CONF.50/4 (Sales No. 65.I.16) and E/CONF.50/5 (Sales No. 66.I.3) for the Fourth Conference; E/CONF.52/4 (Sales No. E.68.I.2) and E/CONF.52/5 (Sales No. E.68.I.14) for the Fifth Conference; E/CONF.57/2 (Sales No. E.71.I.15) and E/CONF.57/3 (Sales No. E.72.I.20) for the Sixth Conference; E/CONF.62/3 (Sales No. E.74.I.7) and E/CONF.62/4 (Sales No. E.74.I.25) for the Seventh Conference; E/CONF.68/3 (Sales No. E.77.I.12) and E/CONF.68/3/Add.1 (Sales No. E.78.I.8) for the Eighth Conference; E/CONF.72/4 (Sales No. E.81.I.2) for volume I of the Ninth Conference; volume II of the Ninth Conference is in preparation.

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I. ORGANIZATION OF THE CONFERENCE

A. OPENING AND DURATION OF THE CONFERENCE

1. The Tenth United Nations Regional Cartographic Conference for Asia and the Pacific was held at Bangkok, Thailand, from 17 to 28 January 1983. The Conference was held in accordance with resolution 1981/6 adopted by the Economic and Social Council on 4 May 1981.

B. ATTENDANCE

2. The Conference was attended by 185 representatives and observers from 38 countries and territories and six intergovernmental and international scientific organizations.

C. OFFICIAL ADDRESSES

3. Mr. S. A. M. S. Kibria, Executive Secretary of the Economic and Social Commission for Asia and the Pacific (ESCAP), inaugurated the Conference and welcomed the participants on behalf of the Commission. Mr. Max de Henseler, the Executive Secretary of the Conference, delivered an opening address on behalf of the Secretary-General.

D. ADOPTION OF THE RULES OF PROCEDURE

4. As interpretation into Russian and Chinese was made available, it was agreed that rule 33 should be amended to add those languages. With this amendment, the Conference adopted its rules of procedure as contained in document E/CONF.75/2, the text of which is reproduced in annex III to this report.

E. AGENDA

5. The Conference, at its opening meeting, adopted the following agenda:

- 1 Opening of the Conference
- 2 Election of the President of the Conference
- 3 Organizational matters
 - (a) Adoption of the rules of procedure
 - (b) Adoption of the agenda
 - (c) Election of officers other than the President
 - (d) Organization of work
 - (e) Credentials of representatives to the Conference
 - (f) Establishment of technical committees
- 4 Country reports and progress made since the Ninth Conference
- 5 Review of the latest techniques and recent developments related to:
 - (a) Conventional and satellite geodesy, ground control (including special-purpose geodesy)
 - (b) Aerial photography, photogrammetry and orthophoto mapping
 - (c) Remote sensing from space for cartography
 - (d) Automated cartography, computer mapping and digital terrain models
 - (e) Topographic and large-scale mapping
 - (f) Small-scale and thematic mapping, national and regional atlases, International Map of the World on the Millionth Scale and other international map series

- (g) Cadastral surveying and urban mapping (including land information systems)
 - (h) Aeronautical charting
 - (i) Hydrographic surveying and nautical charting
 - (j) Reproduction and printing of maps
 - (k) Organization of distribution and sale of maps and charts
- 6 Geographical names, including matters to be referred to the United Nations conferences on the standardization of geographical names
 - 7 Technical assistance and transfer of technology
 - 8 Education and training
 - 9 United Nations interregional cartographic conferences
 - 10 Provisional agenda for the next United Nations regional or interregional cartographic conference
 - 11 Adoption of the report of the Conference

F. TECHNICAL COMMITTEES

6. The Conference established four technical committees and allocated to each committee the agenda items shown below:

Committee I	Item 5(a) and (b)
Committee II	Item 5(c), (d), (f), (j), and (k)
Committee III	Item 5(e) and (g) and item 6
Committee IV	Item 5(h) and (i)

Agenda items 1, 2, 3, 7, 8 and 11 were considered at plenary meetings. The Conference decided not to discuss item 4, "Country reports and progress made since the Ninth Conference", as a separate item but to include it in the debate on the other relevant items. A working group, comprising representatives from the delegations of Australia, Canada, India, Japan, Malaysia and the United States and observers from the International Federation of Surveyors (FIG), the International Cartographic Association (ICA), the International Hydrographic Association (IHO) and the Committee on Space Research (COSPAR), was established to consider items 9 and 10 of the agenda.

G. ELECTION OF OFFICERS

7. The conference elected the following officers:

President:	Lieutenant-General Swasdi Pachikul (Thailand)
First Vice-President:	Mr. Srinivasa Sundaram (India)
Second Vice-President:	Mr. Jacub Rais (Indonesia)
Rapporteur:	Mr. Robert Burns (New Zealand)

8. The following officers were elected to the four committees:

<i>Committee I</i>	
Chairman:	Mr. C. Veenstra (Australia)
Vice-Chairman:	Mr. G. Konecny (Federal Republic of Germany)
Rapporteur:	Mr. Jacub Rais (Indonesia)
<i>Committee II</i>	
Chairman:	Mr. R. Southard (United States)
Vice-Chairman:	Mr. Shahta O. Al-Khatieb (Saudi Arabia)
Rapporteur:	Mr. R. Groot (Canada)

Committee III

Chairman: Mr. A. Christofi (Cyprus)
Vice-Chairman: Mr. C. Phalakonkun (Thailand)
Rapporteur: Lt. Col. M. A. Nolan (United Kingdom)

Committee IV

Chairman: Mr. T. Sato (Japan)
Vice-Chairman: Capt. S. C. Goh (Malaysia)
Rapporteur: Mr. C. R. Pascual (Philippines)

9. Mr. Max de Henseler, United Nations Secretariat, served as Executive Secretary of the Conference.

H. REPORT ON CREDENTIALS

10. The Conference received a report that the credentials of all participants had been submitted to the Credentials Committee and found to be in order.

11. Questions were raised by the representative of the USSR regarding the inclusion of a resident of Berlin (West) in the delegation of the Federal Republic of Germany; the representative of China expressed a reservation concerning the participation of the Republic of Korea in the Conference.

I. MAP EXHIBITS

12. The Executive Secretary announced that space had been made available for exhibiting maps and other cartographic materials. Delegations wishing to take advantage of that arrangement would do so on the understanding that the content of any exhibit was the responsibility of the delegation concerned and not of the United Nations.

J. VOTE OF THANKS

13. At its closing meeting, the Conference adopted by acclamation a vote of thanks to the Government of Thailand for the hospitality extended to the participants, and to the Economic and Social Commission for Asia and the Pacific for the excellent arrangements made and services provided for the Conference. It also expressed its appreciation to the President and the officers of the Conference for the way in which they had conducted the meetings and its gratitude to the officers and staff of the United Nations Secretariat for their hard work.

II. SUMMARY OF PLENARY MEETINGS

Items 7 and 8

14. The Conference considered in plenary meetings agenda items 7 (Technical assistance and transfer of technology) and 8 (Education and training), including national reports pertaining to these subjects. In addition, agenda items 9 (United Nations interregional cartographic conferences) and 10 (Provisional agenda for the next United Nations regional or interregional cartographic conference) were referred to a working group. The conclusions of the work of this group, as amended by the Conference, are reported in paragraphs 45 to 53.

15. The Conference considered 10 papers submitted under item 7.

16. In the paper entitled "Technical assistance in Asia and the Pacific" (E/CONF.75/L.24) Australia gave an outline of the mapping and charting projects undertaken by the Royal Australian Survey Corps in South-East Asia and the south-west Pacific during the past twenty-five years.

17. Australia also submitted a paper entitled "Completion of the Sugar Lands Surveying Project in Fiji" (E/CONF.75/L.25). This project, commenced in September 1974 and reported on at the Ninth United Nations Regional Cartographic Conference for Asia and the Pacific (E/CONF.72/4/Add.1),¹ had been successfully completed. The many benefits which resulted included security of tenure to landholders, a detailed land inventory, a comprehensive network of survey documentation for future land-use planning and the training of local personnel.

18. Australia submitted another paper, entitled "Technical assistance to the National Mapping Bureau of Papua New Guinea" (E/CONF.75/L.34), which describes the continuing assistance being provided by the Royal Australian Survey Corps to the National Mapping Bureau. This assistance includes recommendations on organization, establishing mapping programmes, improving map records, place names revision and training. Personnel from both organizations, as well as the people of Papua New Guinea, have benefited from the project.

19. Japan presented a paper entitled "Report by the Government of Japan on technical co-operation" (E/CONF.75/L.66). The report covers technical co-operation and training in surveying, mapping, hydrography and geological survey. To date the Geographical Survey Institute, through the Japan International Co-operation Agency, has trained over 200 personnel from 33 countries. Since 1964 the Institute and the International Engineering Consultants Association have sent 81 technical experts to recipient countries. Details are given on scientific mapping, survey and geoscientific projects completed in a number of countries. Training courses in hydrography have been attended by some 185 students from 14 countries, and those in marine prospecting methods and ground water development

attended by over 350 participants. Almost all expenses relating to those projects and courses have been met by the Government of Japan.

20. The representative of Saudi Arabia presented a verbal report on aerial photography and mapping activities in the Kingdom. The country is covered by a complete net of geodetic points and by aerial photography of more than one type and generation. Details of the various map series are provided, including the recently completed 1:50,000 scale toposheet with equivalent photomosaic. Mention is also made of the nautical and hydrographic survey at 1:50,000 being undertaken by the Ports Authority and of the photo map at 1:2,000,000 scale, prepared from LANDSAT images, which is now available.

21. The delegation of India advised that it would present a paper to Committee IV entitled "Training in hydrography and nautical cartography" (E/CONF.75/L.93) but at this time the delegation was pleased to announce that the long hydrographic course with admission prerequisites, conducted by the Indian Hydrographic School in Goa, had been accorded a Category A international certificate of recognition by the International Advisory Board set up by the International Hydrographic Organization and the International Federation of Surveyors.

22. A paper presented by the United Kingdom entitled "Irrigation projects in Indonesia: British technical assistance in the establishment of monitoring controls for orthophoto mapping contracts" (E/CONF.75/L.110), explains how Indonesia's current five-year plan includes a rapid increase in the production of large-scale planning maps, which has resulted in serious strain on the technical resources of the survey organization. The Directorate of Irrigation has contracted with private survey companies to produce mapping and the quality has been of variable standard, affecting the programme for engineering design. With this in mind, the Directorate has set up a Monitoring Unit under the guidance of the British Technical Assistance Programme to supervise all photogrammetric projects. The representative of Indonesia took the opportunity to thank the Government of the United Kingdom for the assistance it had provided.

23. A paper entitled "United Nations technical co-operation activities in surveying, mapping and charting with special emphasis on the ESCAP region" (E/CONF.75/1983/CRP.8) was presented by the Secretariat. This paper gives a general outline of United Nations technical co-operation activities in 1982 and details of the assistance provided in the region of the Economic and Social Commission for Asia and the Pacific since the Ninth Conference. The paper concludes with the statement that the strategy for this assistance follows the development strategy of the United Nations Development Programme

(UNDP), which places emphasis on increased self-reliance. To achieve this goal, on-the-job training of national personnel to enable them to assume all activities and responsibilities for national mapping is the most important factor, to which all other project activities are subordinate.

24. Commenting on the above paper, the representative of Nepal thanked UNDP for the technical assistance given to his country, under which training had been provided, at various levels, in photogrammetry, cartography and surveying. He noted, however, that although that assistance had ceased in June 1982, there remained a need for further training assistance, particularly at the professional level, in photogrammetry and cartography. Nepal had requested UNDP experts to undertake such training and was awaiting a response.

25. The representative of the Philippines also commented on the above paper and on behalf of his Government thanked UNDP for the assistance provided during the last five years, as a result of which the Philippines had enhanced its capacity for topographical map production.

26. Sweden presented a paper entitled "The role of the United Nations cartographic conferences" (E/CONF.75/L.31), in which the need to make the conferences of greater value is stressed. According to this paper, future conferences should focus on conditions and problems in developing countries and recognize the need for improved interface between map producers and map users. The paper also stresses the need to stimulate interest in the vital role that surveying and mapping can play in the context of human settlement and Sweden's efforts to achieve this.

27. A second paper presented by Sweden, entitled "Institutional co-operation—a role for survey organizations in developed countries" (E/CONF.75/L.32), explains that institutional co-operation activities have been concentrated in four main areas—technical assistance, consultancy, training and provision of information on and assistance with the purchase of equipment and with the repair and servicing of equipment. The paper mentions the lack of recognition often given to surveying and mapping as fundamental planning tools and concludes by stating that institutional co-operation on a Government-to-Government level is a guarantee of stability, objectivity and continuity and an effective way of providing assistance.

28. Commenting on the above two papers, the representative of the International Hydrographic Organization drew attention to the problem developing countries often have in making formal and informal aid contacts. He suggested that developed countries should explain to the developing countries represented at the Conference the scope of assistance available and the points of contact, both formal and informal.

29. As a further comment, the Executive Secretary of the Conference gave details of the type of assistance available from the United Nations and the procedure to be followed in seeking such assistance.

30. The representative of Australia quoted from the Australian national report, "Report on activities during 1980–1982" (E/CONF.75/L.37), referring to the assistance provided to Fiji, Indonesia, Papua New Guinea, the

Solomon Islands, Thailand and Tonga in survey projects, mapping, aerial photography, hydrography, geoscientific projects and training by various government agencies.

31. On the basis of paper E/CONF.75/L.116, "Capacités de Géocart dans le domaine de l'assistance technique et du transfert de technologie", the representative of Poland explained the geodetic network in his country and the assistance provided to nations of the ESCAP and other regions.

32. The representative of France, referring to the papers submitted by Sweden, "The role of the United Nations cartographic conferences" and "Institutional co-operation—a role for survey organizations in developed countries" (E/CONF.75/L.31 and L.32), supported the need for closer co-operation between the producers and users of mapping products. He also referred to the New Zealand paper "Technical education and training" (E/CONF.75/L.42) and concurred in the view expressed therein that the most effective aid was that which was adapted to local needs and provided in the local area. He added that France was providing expert consultants in the latest technology.

33. The representative of the Union of Soviet Socialist Republics reported on the contribution being made by the USSR Government to the assistance provided to various countries, including many in the South-East Asia region, and on the training given within the USSR to personnel from over 40 countries.

34. The representative of Finland suggested that many decisions affecting the utilization of natural resources were made at the political level without a proper appreciation of the importance of mapping to the planning and development of projects. He emphasized that members had a duty to bring the vital need for adequate and early mapping to the attention of all decision-makers.

35. The representative of the International Cartographic Association presented a paper entitled "Report on the International Cartographic Association" (E/CONF.75/L.57), which provides information on the aims of the Association, its member countries, executive committee, commissions and working groups, conferences and themes, and on its own and related publications.

36. The representative of ICA also presented a paper entitled "Third world strategy" (E/CONF.75/L.56) describing the Association's policy of introducing and disseminating cartographic knowledge and technology to developing countries. Experts from ICA member countries conduct training seminars in developing countries, many of which are unable to send representatives to international cartographic conferences. The paper recommends this policy as an economical and efficient method of providing assistance and transferring technology.

37. The Conference considered four papers submitted under agenda item 8.

38. The first paper submitted under this agenda item was from New Zealand and was entitled "Technical education and training" (E/CONF.75/L.42). The paper describes the system of survey and mapping education and training available in New Zealand at professional and

technician levels. A point of particular interest mentioned in the paper is the recently introduced university degree in measurement science. The paper also outlines New Zealand's involvement in the training of personnel from Pacific and South-East Asian countries, which is described as an extensive and continuing involvement.

39. The representative of Thailand reported on survey education and training in the Royal Thai Survey Department as described in the Thai progress report on cartographic activities in Thailand, 1972-1982 (E/CONF.75/L.70). The report contains details of the various courses offered by the Department's Survey School and also notes that during the reporting period scholarships were granted to personnel of the Department to study at the Master's and other post-graduate levels in Thailand, the United Kingdom and the United States, and at the International Institute for Aerial Survey and Earth Sciences in the Netherlands.

40. The Executive Secretary drew attention to a report entitled "Study on the world's surveying and mapping manpower and training facilities" which was published in *World Cartography*, vol. XVI.² He emphasized the importance of that study, conducted by the United Nations Cartography Section in co-operation with Prof. Brandenberger of Laval University, which gives an analysis of the existing training facilities for surveying and mapping manpower; it also includes estimates and projections of future requirements.

41. The paper by Indonesia, entitled "Training and education in surveying and mapping in Indonesia" (E/CONF.75/L.86), explains the three levels of technical education in Indonesia and the Government's attempts to overcome the shortage of trained technicians. Although training and education in surveying and mapping is a comparatively new task, particularly at the technician level, it is gradually meeting the needs. There remains, however, a need for a better ratio between technician, technologist and professional, which is currently constrained by a shortage of equipment and qualified lecturers.

42. The Executive Secretary referred to the paper E/CONF.75/1983/CRP.3, "Training course in toponymy in Indonesia", prepared by the Secretariat, which reports on the successful training course held in June 1982. Five nations, namely, Indonesia, Malaysia, Nepal, the Philippines and Thailand, sent participants. The countries providing lecturers and training materials were Australia, the Federal Republic of Germany, Hungary, Indonesia, the Netherlands, the United Kingdom and the United States. The paper also makes recommendations regarding future training courses.

43. The representative of Thailand gave details of courses available in organizations other than the Royal Thai Survey Department, in particular those at the technician level.

44. The representative of the International Society for Photogrammetry and Remote Sensing (ISPRS) informed the Conference that Commission VI of his Society will sponsor a regional conference on photogrammetry and remote sensing education at the University of Technology,

Malaysia, from 16 to 19 May 1983. The objective is to promote education in these subjects in the countries of South-East Asia which will include exchanges of staff and students, curricula, stimulation of post-graduate studies and technical and scientific publications. The paper invites delegations to consider participating in the conference and presenting papers.

Report of the working group on United Nations interregional cartographic conferences and on the provisional agenda for the next United Nations regional or interregional cartographic conference as amended by the Conference

Items 9 and 10

45. A working group composed of the representatives of Australia, Canada, India, Japan, Malaysia and the United States of America and of the International Federation of Surveyors, the International Cartographic Association, the International Hydrographic Association and the Committee on Space Research was established at the first plenary meeting to consider items 9 and 10 of the agenda. The working group held two meetings under the chairmanship of the Vice-President, and the following conclusions were reached.

Item 9: United Nations interregional cartographic conferences

46. As requested by the Economic and Social Council in resolution 1981/6, the mandate of the working group on this item was to investigate the suitability and feasibility of holding interregional cartographic conferences.

47. The working group, after reviewing the effectiveness of the various regional cartographic conferences of the United Nations, with particular emphasis on the relevance of their content and proceedings to the Asia and Pacific region, was unanimous in stating that such conferences offer a unique opportunity in providing a forum for senior administrative, technical and management personnel of the various Governments to meet and discuss mutual problems and exchange of information, transfer of technology and exchange programmes. These conferences are the only ones in which:

(a) The subject matter covers a full range of subjects in surveying and mapping according to the United Nations definition of cartography;

(b) The level of discussion and the attendance are at the executive and management level, which is in line with the social and economic aims rather than the scientific and scholarly aims of most international professional associations;

(c) The discussion of technical subjects is weighed by attending managers and executives of mapping organizations in terms of policy, programme and production implications, reflecting specially the users' needs.

Comparable meetings were mentioned, e.g., the Commonwealth Surveyors' Conference and meetings of the Pan-American Institute for Geography and History.

48. The group reiterated the great concern already expressed at the Ninth Conference regarding the most unfortunate timing of the United Nations regional cartographic conferences, and pointed out that the Fifth Regional Cartographic Conference for Africa was scheduled to take place only one month after the closing of the present Conference and that therefore the conclusions on this subject already contained in resolution I of the Ninth Conference were even more appropriate currently.

49. The working group reviewed the present conference agenda and the allocation of items to the various committees. It also reviewed the presentation of the papers and the conduct of the debates. The proposed provisional agenda for the next United Nations Regional Cartographic Conference for Asia and the Pacific is given later in this report (see paragraph 53). The working group recommended that:

(a) Country reports and reports on the progress made since the last Conference should be discussed separately and not under relevant technical items, as at present. Guidelines on the content of these reports should be given by the Secretariat;

(b) In order to serve as a basis and to generate more interest in the discussion, the United Nations Cartography Section should, with the assistance of consultants, prepare and present background papers directed to the various committees outlining the state of the art in each appropriate discipline and summarizing the latest technical developments in users' needs and in resources likely to be available.

50. In conclusion, the working group recommended that:

(a) The regional cartographic conferences for Asia and the Pacific should be continued (agenda and organization as outlined);

(b) These conferences should be held at four-year intervals (instead of three-year as at present). The Executive Secretary investigated the possibility of shortening the length of the Conference to 10 days;

(c) The holding of world conferences should be envisaged for a distant future of eight to ten years;

(d) The scheduling of the various regional cartographic conferences should be better co-ordinated among United Nations bodies.

In addition the working group also recommended that:

(e) The United Nations Cartography Section should endeavour to prepare and distribute a calendar of cartographic events, giving the time, place, sponsoring organization, theme and general content of the conferences, seminars, etc., held around the world;

(f) For the distribution of this calendar and other material, the Cartography Section should compile a mailing list to be updated yearly which would include, *inter alia*:

(i) The executive and commission officers of all the international survey and mapping organizations;

(ii) All government senior survey officers of all countries;

(iii) All national survey and mapping societies and agencies.

51. Finally, the working group recommended that all countries and professional organizations should co-operate closely with the United Nations Cartography Section in sending appropriate material for the implementation of these recommendations.

Item 10: Provisional agenda of the next United Nations Regional Cartographic Conference for Asia and the Pacific

52. The working group unanimously agreed that an Eleventh United Nations Regional Cartographic Conference for Asia and the Pacific should be held and it established the following provisional agenda for it, taking into account the recommendations already discussed.

(a) Items 1, 2, 3, 4, 10 and 11 of the present Conference agenda should be retained.

(b) Items 5, 6, 7 and 8 should be grouped under the following four headings, the subjects of which should form also the names of the four technical committees of the Conference, i.e., review of the latest technology and its relationship to policy, economy and development in the following fields:

(i) Cartographic data acquisition and supporting activities;

(ii) Cartographic data manipulation;

(iii) Cartographic data depiction;

(iv) Policies and management of national mapping and charting programmes.

A possible breakdown under each heading is given below for guidance, the Cartography Section being left to finalize it at the appropriate time.

53. Proposed provisional agenda for the Eleventh Regional Cartographic Conference for Asia and the Pacific:

Review of the latest technology and its relationship to policy, economy and development in the following fields:

1. Cartographic data acquisition and supporting activities:

- 1.1 Conventional and satellite geodesy
- 1.2 Acquisition of cartographic data from space
- 1.3 Aerial photography and other remote sensing activities
- 1.4 Surveys for mapping and charting
- 1.5 Hydrographic surveying and nautical charting
- 1.6 Development of digital data bases

2. Cartographic data manipulation:

- 2.1 Conventional and digital large-scale topographic map compilation
- 2.2 Conventional and digital small-scale topographic map compilation
- 2.3 Conventional and digital charting compilation
- 2.4 Compilation of small-scale maps and charts, the International Map of the World on the Millionth Scale (IMW), national and regional atlases, etc
- 2.5 Digital terrain models
- 2.6 Conventional and digital cadastral mapping
- 2.7 Land information systems
- 2.8 Map revision techniques
- 2.9 Thematic mapping.

3. Cartographic data depiction:

- 3.1 Conventional and digital map and chart production and publishing
- 3.2 Reproduction and printing

4. Policies and management of national mapping and charting programmes:

- 4.1 Matters related to the establishment of national programmes
- 4.2 Map specifications
- 4.3 Geographical names
- 4.4 Training and education
- 4.5 Map and chart sales and distribution policies and practices.

In addition, the provisional agenda will include items dealing with the organization of the Conference and with country reports (see paragraph 49 (a)).

54. Six draft resolutions were submitted to the Conference and were subsequently adopted as resolutions 1 to 5 and 20. (For the text of the resolutions see chapter VII below.)

III. WORK OF COMMITTEE I: CONVENTIONAL AND SATELLITE GEODESY, GROUND CONTROL (INCLUDING SPECIAL-PURPOSE GEODESY) AND AERIAL PHOTOGRAPHY, PHOTOGRAMMETRY AND ORTHOPHOTO MAPPING

Item 5(a) and (b)

55. The work of Committee I covered items 5(a) and (b) of the agenda, being a review of the latest techniques and recent developments related to: (a) Conventional and satellite geodesy, ground control (including special-purpose geodesy); (b) Aerial photography, photogrammetry and orthophoto mapping. The Committee considered a total of 22 papers presented under these items. In addition six country reports relating to the items referred to Committee I were discussed.

A. CONVENTIONAL AND SATELLITE GEODESY, GROUND CONTROL (INCLUDING SPECIAL-PURPOSE GEODESY)

56. Australia submitted a paper entitled "The national geodetic data base" (E/CONF.75/L.7). This paper describes the formation of a data base of co-ordinates and other information for 18,000 horizontal control stations throughout Australia carried out by the Division of National Mapping. It also describes the computer used and the software necessary to manipulate the stored records.

57. Another paper submitted by Australia, entitled "A geoid for South-East Asia and the Pacific" (E/CONF.75/L.8), presents a map of the geoid compiled from some 600 Doppler satellite fixes at stations of known mean sea level in the South-East Asia and Pacific region. Information was contributed by twenty-three locations in this region. The representative of Malaysia inquired whether a one-metre contour interval could be provided. The Australian representative replied that this could be done by special request. The representative of Thailand indicated that since the construction of the geoid map Thailand had established considerably more Doppler stations. Professor Jacob Rais (Indonesia), in his capacity as Secretary of the Sub-commission of the International Association for Geodesy dealing with this subject, explained that the geoid map presented was based on the number of Doppler stations provided at the previous conference and it was the purpose of the coming Sub-commission meeting to update that map.

58. A paper entitled "The Natmap laser-ranging systems" (E/CONF.75/L.9), also presented by Australia, informed the Conference of the development of a high precision lunar and satellite laser-ranging facility near Canberra, Australia. The new system comprises telescope, laser, timing, receiver and computer sub-systems and will collect data for earth-rotation and polar-motion measurement, station co-ordinate determination and lunar and satellite ephemeris improvement. This project is a combined effort of the Division of National Mapping of Australia and the National Aeronautics and Space Administration of the United States.

59. The Federal Republic of Germany submitted paper E/CONF.75/L.28, "Contributions to very long baseline interferometry". This paper describes the installation of a dedicated geodetic radiotelescope for very long baseline interferometry and satellite interferometry at the Satellite Observation Station, Wetzell. The station is considered to be one of the fundamental geodetic and geodynamic reference stations of the global networks and will take part in the Merit campaign scheduled to commence late 1983.

60. Another paper submitted by the Federal Republic of Germany, entitled "A mobile laser-ranging system and its applications for the detection of earth plate motions" (E/CONF.75/L.29), deals with a mobile laser-ranging system and a planned campaign to detect crustal movements in the Eastern Mediterranean. The system was designed to be capable of observing at the 1-2 cm noise level to a maximum range of approximately 12,000 km and an average of 6,000 km.

61. Paper E/CONF.75/L.47, entitled "A United States test of the Swedish motorized leveling system" submitted by the United States describes the test conducted by the National Oceanic and Atmospheric Administration/National Ocean Survey, the National Geodetic Survey (NGS) and the National Land Survey of Sweden at a test network near Fredericksburg, Virginia. The test equipment consisted of an NI 002 reversible compensator levelling instrument, two Wild one-centimetre Invar-strip rods, a Micronic 445C programmable recording system with printer, two small DAF cars for the rod men, and a small Simca pick-up truck for the observer and recorder. The test results showed an increase in per person production of 70 per cent over conventional methods used by NGS levelling units. The motorized levelling system performed at an average rate of progress of 1.85 km/h. The paper shows also the cost for completing the readjustment of the North American Vertical Datum, estimated at US\$6.6 million using the motorized levelling system, compared with an estimated US\$10.5 million using the conventional NGS levelling system. A comparison is also made with the NGS motorcycle levelling system.

62. Japan's paper entitled "New satellite laser-ranging system of the Hydrographic Department of Japan" (E/CONF.75/L.63) describes the operation of a satellite laser-ranging system (SLRS) at Simosato Hydrographic Observatory. Tracking to day/night time passes of LAGEOS and some night time passes of STARLETTE and BE-C was successful. The SLRS will be used for constructing a precise marine geodetic network in Japan with transportable laser-ranging systems after the launch of Japan's geodetic satellite GS-1. It would also contribute to the determination of the gravity field and some geophysical parameters,

to the measurements of the earth rotation and polar motion, e.g., the Merit project, and to the future detection of plate motions by measuring base lines between sites located on different plates.

63. Malaysia presented a report entitled "Joint demarcation and survey of the international land boundary between Indonesia and Malaysia" (E/CONF.75/L.90). The report describes the progress made since the two countries agreed to start the joint project for demarcation and survey of the international boundary in September 1975. In 1978, both countries decided to use Doppler positioning techniques for demarcation of salient points along the watershed boundary where thick primary jungle and the lack of control points in the area make the use of conventional survey systems impossible. Forty stations had been established in the multi-station mode by the end of 1981.

64. The Hungarian representative reported on the Hungarian activity in the field of geodetic control nets (E/CONF.75/L.91). This paper describes the work of the Hungarian fundamental horizontal and vertical geodetic control nets. The Doppler satellite observations on 14 stations were completed in 1981-1982 by multilocation techniques. It is also planned to use stellar triangulation on a net of seven stations consisting of 11 sides with average lengths of 160-200 km before a total adjustment is made of Hungary's first-class astrogeodetic net, most likely during the period 1985-1990. The accuracy of the Hungarian levelling network is also reviewed.

65. Indonesia reported on its activity in Doppler surveys and precise levelling in the period since the last Conference. In its national report, "Cartographic activities in Indonesia 1979-1982" (E/CONF.75/L.92), Indonesia indicates that 706 Doppler stations have been established throughout the country in the multi-station mode. About 332 stations were established with Australian assistance. A precise re-levelling of the Java network was started in 1980 and up to the preparation of the present report, a total of 850 line-kilometres had been completed and 801 bench-marks established. In reply to a question from the Australian representative, the representative of Indonesia said that no decision had yet been made on the re-definition of the height datum as tidal observations at three stations were still in progress. Indonesia also reported on the use of airborne profile recording (APR) for vertical control for its topographic mapping at 1:50,000 scale.

66. In its paper entitled "Geodynamic survey in the USSR" (E/CONF.75/L.95) the Union of Soviet Socialist Republics describes the use of geodetic measurements to study the earth crust deformations in earthquake areas and also to determine the magnitude of the displacements following the earthquakes. The paper reports on the work in Alma Ata, Fergane and Tashkent, where repetitive measurements of the geodetic networks, including levelling networks, were made in order to assess the character of the displacements. The results of horizontal earth surface deformation in Kamchatka were also determined from specially organized geodetic measurements carried out after the eruption.

67. Japan presented a paper entitled "On the geodetic control survey in the northern part of the Philippines under

the technical co-operation of Japan (E/CONF.75/L.99). The paper describes the adjustment of geodetic networks to feed the existing triangulation points for the topographic mapping of the Cagayan valley river basin in Northern Luzon. The project area comprises approximately 15,000 square kilometres with aerial photography planned at 1:30,000 scale to prepare topographic maps at 1:25,000 scale and orthophoto maps at 1:10,000 scale. The project will take five years from 1979.

B. AERIAL PHOTOGRAPHY, PHOTOGRAMMETRY AND ORTHOPHOTO MAPPING

68. Australia presented a paper entitled "Camera calibration in the Division of National Mapping" (E/CONF.75/L.1), which describes the new goniometer camera calibration facilities at the Division of National Mapping. Australian National Mapping specifications call for annual calibrations of aerial cameras. The facility is available for this purpose to other countries also at \$250 per calibration plus airfreight.

69. Another paper submitted by Australia, "Lake Hume photogrammetric test range (E/CONF.75/L.10) reports that a new test range for the study of aerial triangulation and the choice of ground control positions has been established by the Royal Australian Survey Corps. It has 680 horizontal points over an area of about 100 x 100 kilometres in South-Eastern Australia. Aerial triangulation tests with super-wide-angle photography flown at scales from 1:60,000 to 1:140,000 showed that model and especially strip adjustment methods are inferior to bundle block adjustment in accuracy and error detection capability. A question by the Saudi Arabian representative elicited the clarification that super-wide-angle photography was preferred in Australia because of its larger coverage at a given aircraft ceiling. The representatives of Finland, the Federal Republic of Germany and Sweden commented on their own test ranges in conjunction with test programmes within the International Society for Photogrammetry and Remote Sensing.

70. In the paper "Airborne profile recording" (E/CONF.75/L.11), Australia presented a description of the weapons research establishment mapping and profiling system (WREMAPS II) airborne profile recording equipment of the Royal Australian Survey Corps. It uses a vertically directed pulse laser which measures terrain heights when referred to the isobaric surface along the flight path; accuracies of ± 2 metres for terrain elevation were achieved. It is operable for altitudes between 1,000 and 5,000 metres. The representative of Saudi Arabia confirmed accuracies of ± 1 to 2 metres with a similar system. The representative of the United States reported on a system built in the United States which provides survey control inertially to ± 0.1 metres in height.

71. In the paper "Simulated colour for orthophoto map production" (E/CONF.75/L.12) Australia reported on a method developed by the Royal Australian Survey Corps (the Duotone/false colour orthophoto map process) to utilize black-and-white photography for orthophoto production, but to separate features in different print colours. Half-tone imagery or random dot imagery is used for the

process. Low-level colour photography is used to select the tonal separation between vegetation and open ground. In the discussion the representative of the United States reported on similar experiences in the mapping of the United States boundaries with Canada and Mexico.

72. In the paper "Cartographic enhancement of orthophoto maps" (E/CONF.75/L.13) Australia presented the experiences of the Royal Australian Survey Corps in producing orthophoto maps in remote and urban areas of Australia at scales between 1:50,000 to 1:10,000. The images are cartographically enhanced to portray a variety of different topographic features such as roads, lines, buildings, contours, names and spot elevations.

73. In the paper "Use of LANDSAT imagery to supplement conventional imagery in medium- and small-scale mapping and charting" (E/CONF.75/L.14), Australia presented the experience of the Royal Australian Survey Corps in utilizing LANDSAT images to position aerial photographs in remote areas and to plot detail in areas for which the aerial photography is of poor quality. The representative of India asked about costs. The Australian representative replied that the use of available LANDSAT images was very economical for the updating of prominent features, but was generally restricted to detail shown on maps at 1:1,000,000 scale.

74. In a paper entitled "Planning and cadastral projects for urban and rural regions with the aid of orthophoto mapping" (E/CONF.75/L.30), the Federal Republic of Germany presented experiences in the production of orthophoto maps at 1:10,000 scale as a basis for thematic maps and for urban studies, and orthophoto maps at 1:2,000 scale for cadastral purposes. These methods have proved particularly useful in technical co-operation projects in Central America, Brazil, Haiti and the Philippines.

75. In another paper, "Production of orthophoto maps, illustrated by an example" (E/CONF.75/L.44), the Federal Republic of Germany discusses the procedures for the generation of orthophoto maps at 1:5,000 or 1:10,000 scale for the *Länder* (states) of the Federal Republic of Germany. The use of analytical orthophoto devices has made the off-line production more efficient. The orthophotos are produced with the aid of digital terrain models derived from digitized 1:5,000 scale contour lines. In the discussion, the observer for the Committee on Space Research clarified that wide-angle aerial photographs at 1:12,000 scale were preferred because these were also used to derive contours or gridded spot heights in flat areas.

76. In a paper entitled "Volume estimation of Galunggung volcanic products and prediction of potential mudflows (*lahar*) using aerial photo interpretation techniques" (E/CONF.75/L.100), Indonesia reports on its monitoring of the twenty-two eruptions of the Galunggung volcano in 1982 by photogrammetric techniques. Black and white aerial photographs in the visual and in the near infra-red spectrum and color infra-red photographs at scales from 1:11,000 to 1:15,000 were used for this purpose. Digital data were produced on a Zeiss Stereocord for 30,000 hectares, and volumes of volcanic materials were

calculated. Predictions are possible on the basis of this mudflow.

77. Indonesia submitted a report entitled "The growth of domestic survey companies in support of mapping the country" (E/CONF.75/L.101) in which the development of private enterprises in the mapping field, as represented by the Association of the Indonesian Survey and Mapping Enterprises, is described. There are 49 commercial and one government firm offering mainly terrestrial surveys; about 20 per cent of the firms are active in photogrammetry. The companies are engaged in the transmigration programme, in urban and in agricultural projects, in resource surveys, in engineering projects, in cadastral surveys and in projects for the off-shore industry.

78. In a general discussion, matters pertaining to photogrammetry mentioned in the country reports were raised:

(a) The representative of Nepal reported that Nepal had given priority to geodetic and photogrammetric surveys since maps were required for many development projects, particularly in the areas lying below the altitude of 3,000 metres.

(b) The representative of the USSR reported on activities in analytical photogrammetry. As in Australia, bundle adjustments are preferred.

(c) The representative of Indonesia reported on the use of dual camera photography. He said that about 90 per cent of the country was covered with this type of high altitude photography; the remaining 10 per cent comprised areas of permanent cloud cover. Discussion followed on the possibilities of radar mapping for those areas. So far no contour mapping has been done from the radar images flown for some oil companies.

(d) The representative of Thailand inquired about the uses of reseau photography. In the discussion, the representatives of the Federal Republic of Germany, the USSR and the United Kingdom confirmed that reseau photography did not have any advantages over conventional aerial photography with mapping cameras.

(e) The representative of Indonesia reported on the follow-up on resolution 3 of the Ninth United Nations Regional Cartographic Conference for Asia and the Pacific regarding a regional periodical.³ No positive response had been apparent in the discussions held within the region, and there appeared to be little enthusiasm for pursuing the matter further.

(f) The representative of the International Society for Photogrammetry and Remote Sensing reported on the Society's activities (within its Commission VI) aimed at creating an information retrieval system for photogrammetry in conjunction with other efforts in the surveying and mapping area.

(g) The representative of Thailand commented favourably on the regional conferences on remote sensing organized by the Asian Association for Remote Sensing in coordination with the International Society for Photogrammetry and Remote Sensing.

(h) The representative of the International Federation of Surveyors asked to be informed of the present possibilities of using the global positioning system (GPS); a con-

firmation that the GPS system could be used in the interferometric mode either now or in the future; and a confirmation that the transit satellite system would remain operational in the future. The representative of the United States confirmed that it was intended to maintain the transit system and reported that decisions on the use of the GPS system had not yet been finalized;

(i) The Executive Secretary announced that a space applications seminar, based on the recommendations of

the Second United Nations Conference on the Peaceful Uses of Outer Space, Vienna 1982 (UNISPACE 82),⁴ would be held at the Economic and Social Commission for Asia and the Pacific, Bangkok, from 30 May to 30 June 1983.

79. Two draft resolutions were prepared and approved by the Committee for presentation to the plenary meeting. They were adopted by the Conference as resolutions 7 and 8. (For the text of the resolutions, see chapter VII below).

IV. WORK OF COMMITTEE II: REMOTE SENSING FROM SPACE FOR CARTOGRAPHY, AUTOMATED CARTOGRAPHY, COMPUTER MAPPING AND DIGITAL TERRAIN MODELS, SMALL-SCALE AND THEMATIC MAPPING, NATIONAL AND REGIONAL ATLASES, INTERNATIONAL MAP OF THE WORLD ON THE MILLIONTH SCALE AND OTHER INTERNATIONAL MAP SERIES, REPRODUCTION AND PRINTING OF MAPS, ORGANIZATION OF DISTRIBUTION AND SALE OF MAPS AND CHARTS

Item 5(c), (d), (f), (j), and (k)

80. The work of Committee II covered agenda item 5(c), (d), (f), (j), and (k), being a review of the latest techniques and recent developments related to:

- (c) Remote sensing from space for cartography;
- (d) Automated cartography, computer mapping and digital terrain models;
- (f) Small-scale and thematic mapping, national and regional atlases, International Map of the World on the Millionth Scale and other international map series;
- (j) Reproduction and printing of maps;
- (k) Organization of distribution and sale of maps and charts.

A. REMOTE SENSING FROM SPACE FOR CARTOGRAPHY

81. Australia reported on the application of LANDSAT to marine park management of the Great Barrier Reef, the world's largest and most complex expanse of living coral reefs, in paper E/CONF.75/L.15. The report describes how LANDSAT is used to create a data base to record and monitor the physical attributes of the Reef, including water depths, water turbidity, effluent plumes and oil spillages.

82. The People's Republic of China describes in a paper entitled "The compilation of satellite image maps for land use in China" (E/CONF.75/L.61) how remote sensing techniques are used in China to produce photo maps of land use which are based on large-scale topographic maps. These maps are used to meet the requirements of land resource investigations. The People's Republic of China also submitted a report (E/CONF.75/L.60) covering the progress of surveying and mapping in China during the period 1980 to 1982.

83. Paper E/CONF.75/L.68, entitled "Review of satellite remote sensing programmes", submitted by the International Society for Photogrammetry and Remote Sensing, is an overview of the various activities of countries in the launching of space craft used for remote sensing. The President of the Society, who presented this report, appealed to all those countries to ensure the fullest access and openness in the use of this technology.

84. In paper E/CONF.75/L.78, "Le programme d'observation de la terre par satellite SPOT," the representative of France presented an update of the progress made towards the realization of the launch and described the improved capabilities of SPOT, and its subsequent

generations. In particular, he announced the establishment of a branch office of Spot Image, in Washington, D.C., United States. In response to questions, he said that there was as yet no list of prices for client services.

85. Paper E/CONF.75/L.77, "Exploitation cartographique d'un satellite à défilement (application à SPOT)", also presented by France, gives details of the mathematics underlying the cartographic application of SPOT. In particular, SPOT's sensitivity to ground control and accuracy are identified. There was a discussion on the question of resolution in terms of pixel size as opposed to resolution in terms of photographic resolution. The French representative proposed that the term "sampling step" or "pas d'échantillonnage" should be used instead of pixel size or resolution to avoid confusion. He speculated on the possibility that with the stereoscopic capability of SPOT a planimetric accuracy of 5 metres might be achieved.

86. France also presented a paper, "Utilisation du TRASTER pour la restitution des images a géométrie non classique" (E/CONF.75/L.72), explaining the use of TRASTER for plotting images with unconventional geometry. The programme used is independent of the geometry, so that a variety of image types can be plotted regardless of the complexity involved in calculating the co-ordinates of the negatives.

87. The Paper entitled "Apport de SPOT à l'étude du milieu urbain" (E/CONF.75/L.73), also presented by France, explains the expected capabilities of SPOT in urban studies.

88. In its paper "Télé-détection par satellite et cartographie automatique" (E/CONF.75/L.76), France presented an overview of remote sensing applications to automated cartography, emphasizing such advantages as rapidity of production through automation, homogeneity, reduced costs and sometimes improved aesthetics, in both topographic and thematic cartography applications.

89. Another paper presented by France, "L'inventaire du littoral-France" (E/CONF.75/L.75), reports on the application of remote sensing to the inventory of the French littoral. It describes the integration of the remotely sensed area files with the details such as administrative boundaries, which are digitized separately. The inventory will be updated on a five-year cycle to provide derived maps, correlations between items and statistical calculations along a 5,000-kilometre coastline.

90. The acquisition of thermal data by airborne remote sensing equipment, together with sample thermometer

measurements on the ground and the subsequent integration and analysis of these data to establish surface temperatures of homogeneous zones such as water are the subject of still another paper presented by France, "Utilisation de la thermographie aéroportée en milieu littoral" (E/CONF.75/L.74). Discussion focused on the difficulties encountered in separating salinity and turbidity variations from the temperature results.

91. In paper E/CONF.75/L.89, "Mapping from space—preparations for the photogrammetric camera experiment on SPACELAB, September 1983," the Federal Republic of Germany reports on the preparations for the photogrammetric camera equipment to be deployed on the SPACELAB September 1983 mission. The camera is a high-quality aerial survey camera. The scientific objectives and the operation and control philosophy are explained.

92. In the context of the increasingly detailed information that may be obtained from space observation platforms, the representative of the USSR drew attention to the work of the United Nations Commission on the Peaceful Uses of Outer Space. He said that the Commission addressed the concern felt about the possibility that one country might give remotely sensed information on another country to a third. He emphasized that that should be possible only with the permission of the country to which the data pertained.

93. Paper E/CONF.75/L.106 "Remote sensing activities in India", submitted by the representative of the Committee on Space Research, who is from India, explains the establishment of the National Remote Sensing Agency (NRSA) in the Department of Space of the Government of India. It can offer training facilities in the fields of remote sensing and aerial photo interpretation and consultancy services to any country, and India is at present preparing the launching of Indian remote sensing satellites which are scheduled for 1985/1986.

94. Paper E/CONF.75/L.102, "The development of the method to produce colour composite orthophoto maps out of LANDSAT data", was presented by Japan. The paper refers to methods to produce 1:500,000–1:200,000 orthophoto maps, and thematic maps from LANDSAT Multispectral Scanner System (MSS) data with topographic map aerophotographs and national digital information by using a general computer image processing system installed in the Geographical Survey Institute.

95. The paper entitled "Cartographic work in Japan" (E/CONF.75/L.109), submitted by Japan, covers cartographic work in Japan in 1979–1981. Most of this work is carried out under the Surveying Law in such a way as to ensure efficient co-ordination and accurate standardization and to avoid overlapping. It is classified into two categories. The first is the Fundamental Survey, nation-wide, executed by the Geographical Survey Institute, and the second is the Public Surveys for particular projects or local government projects, which are carried out by other governmental or public organizations such as the Forestry Agency, the Geological Survey of Japan, the National Land Agency, etc. Preparation of various kinds of hydrographic charts is carried out by the Hydrographic Department of the Maritime Safety Agency.

96. The USSR presented the paper E/CONF.75/L.94, "Thematic mapping—the base of space natural studies", which describes the achievements of the USSR in the application of space vehicles, laboratories, the network of ground and marine polygons, and the interdepartmental centres of reception and processing of space information to thematic mapping for different branches of the national economy.

97. A paper submitted by the United Kingdom, "Some applications of satellite imagery to small-scale mapping for development" (E/CONF.75/L.104), covers the application of satellite imagery to small-scale mapping for development planning. The introduction of imaging satellites, such as those in the LANDSAT series, has released the production of small-scale maps for general administrative and development planning from its former dependence on surveys and mapping first produced at larger scales. The Directorate of Overseas Surveys has produced a number of different cartographic products from such imagery using manual and photographic techniques. It is considered that the latter will continue to provide the most appropriate technology for producing many such maps notwithstanding the increasing availability of digital image processing facilities.

B. AUTOMATED CARTOGRAPHY, COMPUTER MAPPING AND DIGITAL TERRAIN MODELS

98. Australia presented a number of papers on automated cartography. The first was entitled "Use of computers to prepare urban social atlases for Australia" (E/CONF.75/L.2). The paper reports that the Division of National Mapping has completed an atlas consisting of computer-drawn choropleth maps presenting statistical data on population and housing in Australia's major urban areas. Census information is classed using computer-drawn frequency graphs and the data are corrected to remove bias owing to non-residential areas. Selection of themes for mapping is expedited by computer test plotting. An updated and improved version of the atlas using 1981 data is in production.

99. The second paper presented by Australia was "Digital topographic mapping in the Division of National Mapping" (E/CONF.75/L.3). The Division of National Mapping is gradually converting its production for 1:100,000 and 1:250,000 topographic maps from graphical to computer-assisted digital techniques. Reasons for the change include the desire to reduce costs and production time and to make digital information available to users. Two systems based on DEC mini-computers have been installed. Digitizing equipment includes stereoplotters with tri-axis locators or shaft encoders, and table digitizers. Most editing is done by interactive graphic screens. Additional computing capacity and other hardware is being purchased during the 1982/1983 financial year. The main software used is a version of the System-house Limited (Canada) Automap. An interactive editing program, known as Cardit, is also used. Software development is continuing in-house.

100. A significant discussion followed on the subject of the justification for the application of digital technology

to topographic mapping. The main points were: (a) It is so far uneconomical to use digital technology for first cover topographic map production only owing to high capital and maintenance costs (exception: urban application); (b) It should be recognized that a price has to be paid for a digital topographic data base in addition to the mapping cost; (c) The justification for this additional expenditure lies in the benefits to users in a number of applications; (d) Numerical digital techniques and further digital topographic data are required to serve as a framework for digital thematic data; (e) To date there has been no international identification of the benefits to these users in economic terms to help justify national digital topographic data base programmes.

101. Paper E/CONF.75/L.16, "Automation in computer-assisted cartography—AUTOMAP 2", was submitted by Australia also. During recent years the Royal Australian Survey Corps (RASVY) has been involved in a number of unique and challenging developments in the field of computer-assisted cartography in a resource-sensitive map production environment. These developments include computer hardware and software systems designed to improve the efficiency of the cartographer in a military environment. Since the introduction of the AUTOMAP (automated mapping) system 1 in 1976, RASVY has been actively involved in the use of automation to streamline the task of making maps. The sophisticated techniques being employed are innovative and exciting and promise an equally challenging development period over the next few years. The present paper describes these new developments and provides a preliminary assessment of their impact on production of maps and map-associated data in RASVY, by way of designed throughput criteria. A brief overview of the total AUTOMAP system describes the planned three-phased implementation programme which will lead to largely digital techniques within all units of RASVY.

102. Another paper submitted by Australia, "Analytical hill shading" (E/CONF.75/L.17), describes a procedure for producing hill shading from digital elevation data in vector form which has been developed by the Royal Australian Survey Corps. It takes relief data from AUTOMAP, generates a digital terrain model, calculates pixel values and produces the shading using an Optronics Colourwrite film recorder. The result is processed to half-tone by conventional procedures prior to printing.

103. Thailand presented paper E/CONF.75/L.26, "Structuring the urban data with the hypergraph-based data structure model", a subject of concern to all organizations dealing with the creation of special data bases, namely, the structuring of urban data; the paper suggests a hypergraph-based data structure model. Four abstract data types, i.e., class, object, attribute and link, which correspond to set, element, property and relation concepts, are applied to allow structuring of any phenomenon no matter how complex the relationships or how numerous the data. The structure avoids duplication in the data base, can be applied in a distributed mode and on small or large computer installations in a network or central data base application.

104. Australia submitted paper E/CONF.75/L.33, "A system for computer assistance in large-scale map production". Computers assist in photogrammetric data acquisition, data verification, cartographic editing and graphic output for the 1:10,000 series of topographic/cadastral maps in the State of South Australia. The application of the computer-assisted mapping system is being extended, and cost savings are expected.

105. Paper E/CONF.75/L.48, "Current research directions in the national mapping program", was submitted by the United States of America. It reflects the organizational effects of the change in the formulation of the content and extent of the national mapping programme resulting from the impact of digital technology on both users and producers of topographic and other land-related data. It emphasizes in particular the need to address cartographic and geographic research concurrently in the light of data base applications and digital cartographic opportunities.

106. The United States of America also presented an update of the automated cartography efforts at the Defense Mapping Agency Aerospace Center in paper (E/CONF.75/L.49) in its overview of those efforts. The paper relates to automated digitizing systems and the creation of colour separated positives in a plotter. It refers to the use of laser plate makers to produce printing plates from digital colour separations.

107. Paper E/CONF.75/L.59, "Digital map data base and application programmes developed at the National Board of Survey in Finland", introduced by the representative of Finland, provides an overview of the electronic data processing devices that are in use at the National Board of Survey: digital map data base and application programmes for geodetic and photogrammetric computation, orthophoto mapping, hill shading and the process of drawing basic maps (1:10,000 to 1:20,000), large-scale maps and thematic maps.

108. New Zealand presented paper E/CONF.75/L.40, "Computer-aided mapping in New Zealand". It includes references to cadastral and aeronautical chart applications as well as place names and street data for electoral purposes.

C. SMALL-SCALE AND THEMATIC MAPPING, NATIONAL AND REGIONAL ATLASSES, INTERNATIONAL MAP OF THE WORLD ON THE MILLIONTH SCALE AND OTHER INTERNATIONAL MAP SERIES

109. Australia presented paper E/CONF.75/L.6, "Mapping of Australia's present vegetation". The characteristics of Australia's vegetation cover have been modified significantly over the past two centuries and a new project to map the present situation has been started. An inventory at 1:1,000,000 scale will be compiled from all available sources, supplemented by limited field work; it is intended primarily for use in the publication of an atlas map but with a view to satisfying a wide range of other applications. The techniques include the updating of the basic map information from remote sensing and aerial photographs.

110. Paper E/CONF.75/L.38, "Development of data bases for small-scale and thematic mapping in the Division of National Mapping," was presented by Australia. The importance of reliable data bases—graphical or digital—for both thematic and topographic mapping at scales of 1:1,000,000 or smaller has been recognized. Roads, public lands, vegetation, water resources, base map and map library data bases have been developed to various stages, depending on their intended functions. With advances in computer-assisted mapping techniques, many of these data bases will be further improved. Future developments may possibly include the ability to combine and analyse various data sets according to user requirements.

111. The paper submitted by Indonesia, "Cartography at the Geological Research and Development Centre of Indonesia" (E/CONF.75/L.103), deals with geological map preparation and production in the Indonesian Geological Research and Development Centre, Ministry of Mines and Energy. Geological map preparation and production are one of the primary objectives of the Geological Research and Development Centre, while the function of actual map preparation is divided between the Division of Regional Geology and the Division of Documentation and Publications. Cartographic work includes base map preparation, colour separation, colour proofing and final positive film preparation. Printing is done by private printers. The final products, e.g., geological maps, comprise geological map quadrangles at scales of 1:250,000 for areas off Java, 1:100,000 for Java and Madura, and compilations at smaller scales of 1:1,000,000 and eventually 1:2,500,000 or smaller.

112. The paper "Atlas of Finland" (E/CONF.75/L.107) submitted by Finland consisted of an illustrative brochure describing the publication of the fifth edition of the Atlas of Finland, which began in 1977 with the appearance of the first folio volume. Upon completion, the Atlas will comprise a reference work of over 3,000 thematic maps and diagrams and a closely integrated text, providing a comprehensive view of the physical and living features of the land, population, economic life, society, and culture of Finland. The Atlas is being published jointly by the Geographical Society of Finland and the National Board of Survey. Work is under the general supervision of the Scientific Editorial Committee of the Atlas and is being carried out by the Editorial Office of the Atlas of Finland within the National Board of Survey. Specialists from each field assist in the planning of the maps and contribute the text of the accompanying articles. This brochure assembles some of the maps and diagrams prepared in the early stages of the work. Each page displays a different subject area. A short verbal description is included, based in part on the more detailed text of the Atlas.

113. Another paper submitted by Finland, "Thematic maps—important cartographic products" (E/CONF.75/L.108), covers the production of thematic maps in Finland and outlines their importance to user groups. A thematic map is based on topographic or statistical data illustrating the quality, quantity, location and distribution of the phenomenon selected for representation. A thematic map may depict widely different things, such as physical conditions,

population, economic activity, culture, society, etc. The period depicted may be past, present or future.

114. Paper E/CONF.75/L.45, "The application of a system of cartographic models to computer-assisted thematic mapping," was presented by the Federal Republic of Germany. It refers to the advantages and disadvantages of vector and screen mode data handling techniques, identifies electrostatic screen plotters as effective tools in thematic mapping and outlines the modular software system THEMAK for plotting various types of simple and complex thematic maps.

115. The Chairman referred to paper E/CONF.75/CRP.6 on the International Map of the World on the millionth scale (IMW) giving the status of publication of IMW sheets as at 31 January 1982, and asked all representatives to check the index accompanying the report for the facts about IMW coverage of their country.

D. REPRODUCTION AND PRINTING OF MAPS

116. Paper E/CONF.75/L.22, "Five-colour process printing of line mapping", submitted by Australia, covers the advantages and disadvantages of implementation of colour process printing. This type of printing is now considered a normal production procedure, and the improved quality control procedures necessary have become routine. The advantages in time and increased production have not been outweighed by the occasional and slight loss in the quality of the printed chart.

E. ORGANIZATION OF DISTRIBUTION AND SALE OF MAPS AND CHARTS

117. In "Information sheet on the organization of distribution and sale of nautical charts" (E/CONF.75/L.69), the International Hydrographic Organization summarizes the organization of the distribution and sale of nautical charts. The *IHO Yearbook*, obtainable from the International Hydrographic Bureau, published the area of chart coverage of each of 50 member States and several non-member States, together with the addresses of the National Hydrographic Offices. The *Yearbook* also includes details of the latest national chart catalogue published by member States. Details of new charts and new editions of charts are published monthly in the *International Hydrographic Bulletin*, also available from the Bureau.

118. The paper submitted by France, "Organisation de la distribution et de la vente des cartes" (E/CONF.75/L.79), covers organizing map sales and distribution of 2,000 different products outside of France (mostly in Africa) and 3,500 products in France. Since 1974 the Institut géographique national (France), a French Government administrative organization, has taken steps to sell its maps to a wide public. So far, the results are very encouraging both from the point of view of actual sales and from that of future expectations, in addition to the experience gained as a result of those activities.

119. Three draft resolutions were prepared and approved by the Committee for presentation to the plenary meeting. They were adopted by the Conference as resolutions 9, 10 and 11. (For the text of the resolutions, see chapter VII below.)

V. WORK OF COMMITTEE III: TOPOGRAPHIC AND LARGE-SCALE MAPPING, CADASTRAL SURVEYING AND URBAN MAPPING (INCLUDING LAND INFORMATION SYSTEMS), GEOGRAPHICAL NAMES, INCLUDING MATTERS TO BE REFERRED TO THE UNITED NATIONS CONFERENCES ON THE STANDARDIZATION OF GEOGRAPHICAL NAMES

Item 5(e) and (g)

120. The work of Committee III covered agenda items 5(e) and 5(g), i.e., a review of the latest techniques and recent developments related to (e) Topographic and large-scale mapping; (g) Cadastral surveying and urban mapping (including land information systems) and item 6, Geographical names, including matters to be referred to the United Nations conferences on the standardization of geographical names. The Committee considered 28 papers presented under these items.

A. TOPOGRAPHIC AND LARGE-SCALE MAPPING

121. A paper submitted by Australia, entitled "Map-accuracy surveys by the Division of National Mapping" (E/CONF.75/L.5), explains how this Division carries out ground surveys to test the accuracy of 1:100,000 scale topographic maps in relation to National Mapping Council standards. For horizontal accuracy not more than 10 per cent of tested points should be in error by more than 0.5 millimeters. Well-defined visible or recoverable points which are not subject to horizontal displacement on the map are surveyed and field survey and map co-ordinates are compared using traversing by electronic distance measurements and Doppler techniques. For vertical accuracy not more than 10 per cent of selected points should be in error by more than one half of the contour interval. Two sheets are randomly selected for testing each year, about 1 per cent of the annual compilation programme.

122. Another Australian paper, "Map production and map revision in New South Wales" (E/CONF.75/L.36), describes the practical and economical methods of initial map production and subsequent revision applied to rural and urban mapping in New South Wales. Owing to the wide variation in settlement and land use in the rural areas, medium-scale maps are used, 1:25,000 for the coastal areas, 1:50,000 for the larger farmed "broad acre cropping areas", and 1:100,000 for the sheep grazing areas of the interior. Conventional control, air and compilation methods are used and revision is done by air survey methods. Orthophoto mapping at 1:4,000 scale was adopted in 1970 as the most economical means of rapidly producing first time cover of the urban areas, and these are revised by similar techniques.

123. China describes in paper E/CONF.75/L.62, "Application of scribing of all the map elements in photogrammetric mapping", the technology and applications of the scribing method for photogrammetric topographic mapping. Scribing improves quality and simplifies and improves production and was adopted for map production in

the mid 1960s. In the 1970s direct scribing was used, first for contours only and later for all the components. This method is now extensively used with considerable improvements in working efficiency.

124. Cyprus reported briefly on the progress made in the field of surveying and mapping in Cyprus during the past three years in paper E/CONF.75/L.84, especially on the progress in the 1:5,000 scale topographic mapping carried out by the Cyprus Department of Lands and Surveys and the British Directorate of Overseas Surveys. Three hundred and eight square miles have been mapped. A further 350 square miles in the centre of Cyprus will be photographed in 1983.

125. The representative of India described the historical development of mapping in India, the completion of 1:50,000 scale mapping amounting to 5,026 15' x 15' sheets, the progress in 1:25,000 scale mapping and the mapping of various irrigation projects on large scales. No paper on this subject was submitted.

126. In its country report (E/CONF.75/L.109) Japan describes the continuing work in maintaining the topographic series in Japan and provides statistics on work done in recent years.

127. The part of the country report of the Republic of Korea (E/CONF.75/L.80) relevant to Committee III describes how the National Geographic Institute initiated a programme of 1:5,000 scale mapping in 1974 on completion of the programme of mapping at 1:25,000, 1:50,000, 1:250,000 and 1:1,000,000. The 1:5,000 series contains 15,000 sheets, each 1'30" square, and with a 5-metre contour interval and it is produced in diazo-copy, mono- or multi-colour as required. About 20,000 square kilometres of mapping are produced or revised annually. For urban and development areas orthophoto maps are produced at 1:5,000 scale. These are enhanced with colours, brown for roads and blue for rivers, to assist interpretation. About 100 square kilometres are so mapped each year.

128. An outline of the development of cartography in Malaysia was submitted by Malaysia in paper E/CONF.75/L.88 under that title. After a lengthy historical description of early cartographic work the paper describes the work of the Directorate of National Mapping Malaysia since its establishment in 1965. The 1:63,360 series L 7010 mapping was completed in 1974 but the revision programme ceased in 1977. A metric replacement, series L 7030 at 1:50,000 scale, has been started and 10 of the 177 sheets in it will have been produced by the end of 1983. Work on the 1:25,000 series has stopped since it is the intention to pro-

duce concurrently four 1:25,000 scale sheets for each of the series L 7030 sheets. Town plans and non-restricted planimetric street plans are produced at a variety of scales.

129. Nepal reported on its cartographic activities in paper E/CONF.75/L.98. "Cartographic activities in Nepal". This paper itemizes the various topographical surveying programmes in progress since the last report, including the production of land resources maps in co-operation with Canada. In the near future aerial triangulation by independent models is to be introduced, utilizing the computer facilities of the National Computer Centre of Nepal

130. The representative of Qatar briefly described the various topographic mapping projects undertaken since 1973 under the Survey Department of the Ministry of Public Works. Air surveys have been undertaken at scales of 1:16,000, 1:20,000 and 1:38,000 to provide country mapping cover at 1:200,000, 1:100,000, 1:50,000 and 1:10,000, with additional larger-scale cover of urban areas and some rural development areas. No paper was submitted.

131. In the part of its country report (E/CONF.75/L.81) relevant to Committee III, the Philippines describes topographic mapping and how mapping at 1:25,000 scale had been initiated with assistance from UNDP and the Japanese Government. Five 1:25,000 sheets have been produced, 72 are in progress, covering the Cagayan Valley, and printing of orthophoto maps of urban areas in this region is also being undertaken. There is a continuing programme of revision of topographic mapping at standard scales and a variety of special products have been published.

132. The Chinese representative, referring to boundary inaccuracies shown on maps in the country report of the Philippines (E/CONF.75/L.81), requested the Chairman of the Committee to ensure that those inaccuracies do not appear on the maps in the published proceedings of the Conference.

133. The observer for Samoa did not present a paper but briefly described the problems of mapping in the Pacific area and highlighted the difficulties of equipment maintenance. He made a plea for low-cost technology assistance like that described in papers from the United Kingdom for many of the small countries in the area. He urged that more consideration should be given to representing the Pacific as an entity in atlases and world maps.

134. The "Report on survey and mapping activities in Singapore 1980-1982" (E/CONF.75/L.114) briefly describes the progress of national topographic mapping at 1:50,000, 1:25,000 and 1:10,000 scales. The pace of development has prompted the adoption of orthophoto maps.

135. In the national report of Sri Lanka (E/CONF.75/L.113) the provision of a new coverage of the country at 1:50,000 scale to replace the mapping at 1:63,360 scale is described. This coverage has priority over the new mapping at 1:10,000 scale. Various large-scale mapping projects for the development of the country are also described.

136. Thailand submitted a "Progress report on cartographic activities in Thailand 1979-1982" (E/CONF.75/L.70). The part of this report relevant to Committee III describes how series L 7017 has been expanded to 830 sheets to include sheets covering the border previously

covered by other series. The 58 border sheets have been published. Additionally, 160 non-border sheets in series L 7017 have been recompiled to improve accuracy, and of these, 108 sheets have been published. Of the 273 sheets at 1:25,000 scale which are available, 20 sheets were produced in the reporting period. Thirty-five revised sheets of a 153-sheet city map series at 1:12,500 scale were published in the period and a further 10 are in progress. Work continues on the revision of the bilingual topographic map at 1:250,000 scale, series 1501, 1501 A and 1501 S (for public use).

137. The "United Kingdom report on activities" (E/CONF.75/L.115) briefly describes continuing overseas development topographic work in five countries.

138. The United States submitted a paper entitled "United States Geological Survey provisional edition maps" (E/CONF.75/L.50). This paper describes the production of a series of provisional edition maps to expedite the completion of about 12,000 outstanding 7.5 minute quadrangles not covered by 1:24,000 scale maps with a view to completion by 1988. Provisional editions meet national map accuracy standards and are printed in four or five colours at either 1:25,000 or 1:24,000 scale, depending on the policy of the state concerned. Although pre-field man-hours are increased to cover boundary, land net, drainage and woodland classification and names research, considerable savings accrue in field work, final scribing and editing. The adoption of the programme will hasten completion by 12 to 15 years. Although the aesthetic appearance of the map suffers slightly, accuracy, content and utility are retained and users have been enthusiastic. Standard editions will replace provisional editions in due course but in the meantime a perfectly usable product will be available to the user.

139. The United States submitted also a paper (E/CONF.75/L.67) entitled "Report of the cartographic activities of the United States of America" covering the period since the last Conference. The part of this report relevant to Committee III describes how in 1980 a new National Mapping Division was formed. In implementing the National Mapping Programme, major products have been categorized under line maps, digital data, orthophoto quadrangles or cartographic data. Detailed text and statistics are then given for production and revision of the various map series at such scales as 1:24,000, 1:25,000, 1:100,000, and 1:250,000; and the orthophoto maps at the 1:24,000 scale.

140. The Union of Soviet Socialist Republics submitted the paper "Report on surveying and mapping in the USSR" (E/CONF.75/L.96), which describes the continuing work in topographic mapping in support of national development. Topographic surveys at scales 1:25,000, 1:10,000, 1:5,000 and 1:2,000 continue, as well as the map revision at all topographic scales. New technology is utilized to increase production including the computer-aided automatic cartographic system "AKS".

141. In its paper "Topographic survey techniques and activities in Bangladesh" (E/CONF.75/L.117), Bangladesh reports on its topographic mapping activities and the updating of map series at scales between 1:1,200 and

1:1,000,000. The report mentions also demarcation surveys along its international boundaries. The paper was submitted towards the end of the Conference and therefore could not be discussed.

B. CADASTRAL SURVEYING AND URBAN MAPPING (INCLUDING LAND INFORMATION SYSTEMS)

142. Australia described the development of a cadastral digital capture for Western Australia's Land Information System covering the period January 1981 to September 1982 in a paper (E/CONF.75/L.19) under that title. To create a digital land information system, existing cadastral maps are digitized instead of capturing the numerical survey data. The system will later be combined with computerized records of land titles.

143. Another paper submitted by Australia, "Hermannsburg aboriginal land grants in the Northern Territory, Australia" (E/CONF.75/L.20), describes land grants to five Aboriginal tribal clans, the historical background of these grants and the legal and surveying requirements for the issuance of registered titles. The paper states that the use of photogrammetric methods provides the most economical solution to the surveying task, and it shows how quick and accurate titles to land can be achieved.

144. "Cadastral surveying in Cyprus" was presented as paper E/CONF.75/L.82. In Cyprus a complete cadastre exists at 1:2,500 and 1:5,000 scales in rural areas and at 1:500, 1:1,000 and 1:1,250 scales in urban areas. Eighty-five per cent of the privately owned land is registered under the Torrens system. Current problems are the revision of plans necessitated by rapid development and the effects of population movement resulting from the Turkish invasion. A land information system has been considered with advice from overseas experts, but it has not yet been implemented because of its cost.

145. The International Federation of Surveyors presented a paper on land information systems (E/CONF.75/L.111). This paper contains the resolutions relating to land information systems adopted at the sixteenth Congress of the International Federation of Surveyors, held at Montreux in 1981. It includes a valuable definition of land information systems.

146. The paper entitled "Cadastral photo map 1:5,000" (E/CONF.75/L.58) submitted by Finland describes the various cadastral maps of urban and rural areas and the 1:10,000 cadastral index map. The user demand for the depiction of boundaries has led to the adoption of a 1:5,000 scale cadastral photo map involving active voluntary owner signalization of boundary points. By this means 50 per cent of boundary marks have been photogrammetrically co-ordinated. The remainder have to be computed from records or identified by photo interpretation.

147. In the "Report on survey and mapping activities in Hong Kong, 1980 to 1983" (E/CONF.75/L.85) brief mention is made of the responsibility of the Survey Division for cadastral surveys, and of the growth of private practice. A land information system based on digital plans and a pilot study have been proposed.

148. The New Zealand paper "Proposed land infor-

mation system for New Zealand" (E/CONF.75/L.41) describes the work of establishing a computerized land information system based on digital records of land parcels identified by centroid co-ordinated values. Parcel appellation, area, plan number, land title reference and valuation number data will also be recorded, and output will be either digital or graphic.

149. The "Report on survey and mapping activities in the Republic of Singapore 1980-1982" (E/CONF.75/L.114) briefly describes the cadastral survey in Singapore and the continuous updating of the 1396 sheets of cadastral index plans at 1:1,000 scale needed for its coverage.

C. GEOGRAPHICAL NAMES

150. The Asia South-East and Pacific South-West Division of the United Nations Group of Experts on Geographical Names submitted a divisional report (E/CONF.75/L.87) that was an update from 1980 and covered the enlargement of the Division and the production of a 1:7,000,000 political map of South East Asia and of various gazetteers. A pilot training course in toponymy was successfully completed in June 1982 in Indonesia and resulted in resolution 6 of the Fourth United Nations Conference on the Standardization of Geographical Names, Geneva, 24 August-14 September 1982 (see E/CONF.75/CRP.2).⁵

151. Australia submitted a paper entitled "Selection of topographic names for the national map series" (E/CONF.75/L.4), which describes the derivation of topographic names for national mapping, from map series R 502 (supplemented, updated and corrected from state authorities' work and by field work) and the derivation of a gazetteer. The Australian representative explained that the assignment of hierarchies for the various feature name codes in the data bank for derived topographic mapping had worked well for cartographic purposes, but was now being found inadequate as a multipurpose data base for current digital techniques.

152. Cyprus also reported on geographical names in a paper under that title (E/CONF.75/L.83). Despite its small size, Cyprus is heir to a rich cultural heritage and has a large number of toponyms. A gazetteer of the 2,000 most important toponyms has been produced and exhibited. The problems of transcription of Greek geographical names into the Roman alphabet have been resolved by Greece and Cyprus. No transcription of Turkish names is made since they are already in the Roman alphabet. Work on a full gazetteer continues.

153. The Federal Republic of Germany submitted a paper entitled "Geographical names: capture, preparation, storage and use by means of electronic data processing" (E/CONF.75/L.27). This detailed paper describes the compilation of the gazetteer of the Federal Republic of Germany and its value for the compilation of new maps by automated cartography. The various forms of output are described.

154. The Union of Soviet Socialist Republics reported on the work carried out in the field of standardization of geographical names in the USSR since 1980 in the paper

under that title (E/CONF.75/L.97). This paper reviews progress in derivation of rules for rendering names into the Russian language and the production of dictionaries of foreign names by various official departments.

Ad hoc working groups

155. A working group was set up to consider the problems of implementing land information systems and cadastral workshops. It produced three draft resolutions. A

further working group was set up to consider the work done by the Geographical/linguistic Division for Asia South-East and Pacific South-West of the United Nations Group of Experts on Geographical Names. This working group drafted one resolution. All four of these draft resolutions were approved by the Committee for presentation to the plenary meeting. They were adopted by the Conference as resolutions 12 to 15. (For the text of the resolutions, see chapter VII below.)

VI. WORK OF COMMITTEE IV: HYDROGRAPHIC SURVEYING, NAUTICAL AND AERONAUTICAL CHARTING

Item 5(h) and (i)

156. The work of Committee IV covered items 5(h) and 5(i) of the agenda, being a review of the latest techniques and recent developments related to (h) Aeronautical charting and (i) Hydrographic surveying and nautical charting. The Committee considered a total of eight papers presented under these items. In addition, one paper on training and eleven country reports relating to the topics assigned to Committee IV were discussed.

157. The United States presented a paper entitled "Aeronautical chart automated production system: operational scenario" (E/CONF.75/L.51). It deals with the 8,721 aeronautical charts and 1,652 related publications produced by the National Ocean Survey, which require continuous revision and editing owing to rapid changes in information and data. The revision and editing are intended to provide a proper reflection of the structure of the national airspace system of the United States. The paper further describes the method and the system to be used in the revision and updating of these charts and related publications by computer-assisted cartography, which call for a systems concept for an overall and coherent aeronautical chart—the automated production systems (ACAPS)—involving a cartographically created chart-independent data base and a dependent data base.

158. Paper E/CONF.75/L.21, "Laser airborne depth sounder (LADS)", submitted by Australia, discusses the concepts, operations, capabilities and characteristics of LADS. It further touches on the implications that may arise in the use of the depth sounder. The United States representative commented that LADS would be useful in the detection of shoals. The Japanese representative expressed apprehension about the possible danger LADS might pose to fishermen in the area of operations and also questioned the accuracy of data which might be affected by turbidity and other factors influencing LADS. The Australian representative gave replies which satisfied those who commented on the subject.

159. Paper E/CONF.75/L.52, "A bathymetric mapping effort by the United States of America", deals with the programme of the National Ocean Survey for the production of a systematic series of bathymetric maps which portray the topographical and geological features of the ocean floor as well as the features of the land masses within the coverage of the maps in sufficient detail to allow scientists and engineers to make some decisions in developing techniques for exploration, exploitation and management of marine resources. There were several comments and remarks made by the representatives of Australia, Canada, India, Japan, the USSR and the International Hydrographic Organization concerning varying reference datum, symbology, standard production cost and usage. The

United States representative answered the queries satisfactorily and made comments regarding the following: (a) The reference datum is mean low level water (MLLW) for isobaths and mean sea level (MSL) for topographic contours; (b) The symbology has been adopted from symbols used for topography and hydrography; (c) The standard specification conforms with the publication of the International Hydrographic Bureau; (d) Bathymetric maps are not used for navigational purposes. The representative of the USSR commented that his country also was producing similar charts combining topographic and bathymetric data for geological, morphological and other scientific purposes but not for navigation.

160. Japan submitted a paper entitled "On the large-scale bathymetric chart representation" (E/CONF.75/L.64), which describes the production of bathymetric charts of Japan similar to the bathymetric maps of the United States—a combined topographic map and nautical chart. The charts will cover the territorial waters of Japan. The comments made were similar to those made on the United States paper (E/CONF.75/L.52) on the same subject (see above).

161. The case for international large- and medium-scale nautical chart series in East Asia was pleaded in a paper under that title (E/CONF.75/L.53) submitted by the United States. This paper urges the hydrographic offices of the East Asian area to plan a series of international charts (INT charts) covering the region as a whole at large and medium scales for the benefit and safety of navigation in accordance with the resolutions on international co-operation adopted at the Twelfth International Hydrographic Conference, held in Monaco in April 1982. It further encourages the coastal States in the region to form a regional commission to undertake the planning and co-ordination of INT chart series at medium scales on a co-operative basis. The Australian representative commented that discussions were taking place on the formation of a regional commission in the South-West Pacific as a counterpart to the East Asian Hydrographic Commission. The representative of the International Hydrographic Organization remarked that his organization would promote co-operation among States in the area that were non-members of the Commission and encourage them to join the group in order to hasten the planning and co-ordination of international chart series. The IHO representative also informed the Conference of the initiative taken by the International Hydrographic Bureau to encourage the formation of geographical groups/commissions among countries of the region.

162. The United Kingdom presented a paper entitled "Fiji: An example of international hydrographic co-operation" (E/CONF.75/L.54). The paper briefly describes the

history of surveying and charting in Fiji, dating back to the early explorers, and the formation of the Hydrographic Unit of Fiji resulting from the international co-operation of the United Nations and the Governments of Australia, Fiji, New Zealand and the United Kingdom. The representative of Australia said that it was an excellent example of international co-operation and that similar co-operation was taking place in the Solomon Islands. The IHO representative also commented generally on hydrographic co-operation.

163. Paper E/CONF.75/L.65, "Joint production of common datum charts of the Straits of Malacca and Singapore-Phase II", presented by Japan, reports on the second phase of the joint co-operative hydrographic survey in the Straits of Malacca and Singapore being carried out by Indonesia, Malaysia, Singapore and Japan with a view to producing charts of the area on a common datum for promotion of navigational safety. The IHO representative commented generally that this was another excellent example of co-operation among the hydrographic offices of the States concerned for the benefit of mariners. The representative of Malaysia commented that the co-operating countries had also benefited through a transfer of technology.

164. Paper E/CONF.75/L.71, entitled "The International Hydrographic Organization", describes the history, organization, objectives and programmes of IHO and elaborates on its various activities to promote international co-operation among members and non-members in achieving its goals.

165. India submitted a paper entitled "Training in hydrography and nautical cartography" (E/CONF.75/L.93), which gives a general description of the training in hydrography and nautical cartography being offered by India

at its Hydrographic School. The paper outlines the location, course syllabuses, admission prerequisites and facilities and also gives the rationale of the establishment of the Hydrographic School and its international assistance programmes.

166. The following country reports containing items on hydrographic surveying and nautical and aeronautical charting were also considered: "Report on activities during 1980-1982" (E/CONF.75/L.37), submitted by Australia; "Report on cartographic activities in New Zealand 1980-1982" (E/CONF.75/L.39); "Report on the cartographic activities of the United States of America" (E/CONF.75/L.67); "Progress report on cartographic activities in Thailand 1972-1982" (E/CONF.75/L.70); "Country report and progress made in the field of mapping in the Republic of Korea" (E/CONF.75/L.80); "Country report, Philippines" (E/CONF.75/L.81); "Cartographic activities in Indonesia 1979-1982" (E/CONF.75/L.92); "Report on surveying and mapping in the USSR" (E/CONF.75/L.96); "Hydrographic activities in India 1980-1982" (E/CONF.75/L.112); "National report of Sri Lanka" (E/CONF.75/L.113); and "United Kingdom report on activities" (E/CONF.75/L.115). The above-mentioned papers report generally on progress, techniques, programmes and activities in the countries mentioned. All the reports were comprehensive and called for only a few minor clarifications from the floor.

167. Four draft resolutions were prepared, taking into consideration previous pertinent resolutions, and were approved by the Committee for presentation to the plenary meeting. They were adopted by the Conference as resolutions 16, 17, 18 and 19. (For the text of the resolutions, see chapter VII below.)

VII. RESOLUTIONS ADOPTED BY THE CONFERENCE

A. LIST OF RESOLUTIONS

1. Eleventh United Nations Regional Cartographic Conference for Asia and the Pacific
2. Bibliography of United Nations cartographic documentation
3. Periodic review of world cartographic status
4. International Map of the World on the Millionth Scale (IMW)
5. Technical assistance and transfer of technology
6. Organization of international seminars and workshops
7. Satellite geodesy
8. Geodesy in earthquake research
9. Remote sensing
10. Small-scale thematic mapping
11. Introduction of digital cartographic data bases
12. Establishment of an *Ad Hoc* Group of Experts on Cadastral Surveying, Mapping and Land Information
13. Land information systems
14. Workshops on cadastral surveying and mapping and land information systems
15. Geographical names
16. Standards for hydrographic data
17. Technical assistance in hydrography
18. Training in nautical cartography
19. International co-operation in hydrographic surveying
20. Vote of thanks

B. TEXTS OF RESOLUTIONS

1. *Eleventh United Nations Regional Cartographic Conference for Asia and the Pacific*

The Conference,

Recognizing the fundamental importance of surveying, mapping and charting infrastructures as an essential element of economic and social development of all nations,

Further recognizing the important contribution made by the Regional Cartographic Conferences for Asia and the Pacific for the benefit of all countries and territories of the region,

Bearing in mind the conclusions and recommendations contained in the report of the working group on future interregional cartographic conferences,

Recommends that the Economic and Social Council should convene the Eleventh United Nations Regional Cartographic Conference for Asia and the Pacific in the first half of 1987.

2. *Bibliography of United Nations cartographic documentation*

The Conference,

Noting that there is a great demand for bibliographical recording of the voluminous documentation presented at

the various United Nations Regional Cartographic Conferences for the past twenty-eight years,

Recommends that a standardized bibliographical survey of existing United Nations cartographic documentation be made by the Cartography Section of the Department of Technical Co-operation for Development of the United Nations Secretariat in co-operation with academic institutions engaged in the cartographic field and be presented to the Eleventh United Nations Regional Cartographic Conference for Asia and the Pacific

3. *Periodic review of world cartographic status*

The Conference,

Noting the great value of the work undertaken by the Cartography Section of the Department of Technical Co-operation for Development of the United Nations Secretariat in compiling and publishing periodically world status reports on various cartographic coverages,

Noting further resolution 10 adopted at the Seventh United Nations Regional Cartographic Conference for Asia and the Far East,⁶ and resolution 22 adopted at the Ninth United Nations Regional Cartographic Conference for Asia and the Pacific⁷ on this subject,

Urges States Members of the United Nations to co-operate in completing questionnaires sent by the Cartography Section of the Department of Technical Co-operation for Development of the United Nations Secretariat,

1. *Recommends* that the Cartography Section should continue to update periodically the existing status of world topographic map and cadastral coverage;

2. *Further recommends* that the scope of these status reports should be enlarged to include hydrographic surveying and nautical and aeronautical charting.

4. *International Map of the World on the Millionth Scale (IMW)*

The Conference,

Noting the slow progress made in the production of maps in this series covering the Asia and Pacific region,

Further noting that in resolution 21 of the Sixth United Nations Regional Cartographic Conference for Asia and the Far East,⁸ all countries were urged to continue in their endeavours to publish this map as soon as practicable,

1. *Recommends* that countries of the region endeavour to publish this map in the near future;

2. *Further recommends* that all countries participating in this publication should send to the Cartography Section of the Department of Technical Co-operation of the United Nations Secretariat copies of their new or revised IMW sheets so as to enable the section to continue to publish

accurately its annual report on the status of the International Map of the World on the Millionth Scale.

5. *Technical assistance and transfer of technology*

The Conference,

Recognizing the substantial contributions which have been made to the development of cartography in developing countries through expert assistance from the United Nations and through bilateral agreements,

Noting the need for continued and increasing assistance in this field,

Noting further the value of broad and continuous co-operation between surveying and mapping organizations in developed countries and sister organizations in developing countries,

Recommends the encouragement and extension of such Government-to-Government institutional co-operation.

6. *Organization of international seminars and workshops*

The Conference,

Recognizing the needs of developing countries for training and assistance at all levels in surveying and mapping activities,

Noting that previous United Nations Regional Cartographic Conferences have resolved that wherever possible training programmes and courses should be provided within the recipient country,

Further noting that seminars, workshops and courses are conducted by some non-governmental professional organizations at the request of developing countries in accordance with the resolutions of previous United Nations Regional Cartographic Conferences and are in keeping with the spirit of United Nations assistance to developing countries,

Recommends that the United Nations should give support to developing countries seeking assistance in the conduct of seminars and workshops for the transfer of technology to be organized in their countries.

7. *Satellite geodesy*

The Conference,

Recalling resolution 8 of the Ninth United Nations Regional Cartographic Conference for Asia and the Pacific,⁹

Being aware that additional satellites are being planned such as those of the Global Positioning System of the United States of America,

Recognizing the potential benefits of higher accuracy and the reduced observing time required by such systems,

Recommends that Member States developing such systems should publicize the probable accuracies which may be achieved, the approximate time frame in which the systems may be implemented, and the availability of instrumentation and software to other nations for their use in precise geodetic positioning

8. *Geodesy in earthquake research*

The Conference,

Noting the enormous scientific and social importance of the study of preliminary indications of earthquakes,

Further noting the success achieved in several countries by combining precise geodetic surveys and studies with geophysical investigation and other related research,

Recommends that countries in the active seismic zones should take advantage of these advanced techniques to solve the problem of predicting earthquakes.

9. *Remote sensing*

The Conference,

Recognizing that many developing countries in Asia and the Pacific need assistance in training in the use of various remotely sensed data, from both space and aerial platforms, for rapid development of their natural resources,

Noting that some of the countries in the region have developed facilities and are capable of offering assistance in such training,

Recommends that countries needing such training assistance should approach the United Nations for assistance under appropriate technical co-operation programmes to be applied at a training facility within the region. Countries within the region which are able to provide such training should so inform the United Nations.

10. *Small-scale thematic mapping*

The Conference,

Recognizing the importance and necessity of small-scale thematic maps for national and regional social and economic development,

Recognizing further the necessity of improving the utility of these maps by speeding up their production and widening their range of topics,

Noting the progress made in this field by some Member States of this region,

1. *Recommends* that countries having completed national and regional maps or atlases should endeavour to make their experience known to all countries of the region;

2. *Further recommends* that the appreciation of computer-assisted techniques should be intensified for small-scale thematic mapping;

3. *Also recommends* that the topic of thematic mapping should include survey and census data as well so as to portray better the scope and complexity of the human environment;

4. *Urges* that the activities in small-scale thematic mapping should be improved by encouraging more co-operation between governmental and non-governmental scientific organizations.

11. *Introduction of digital cartographic data bases*

The Conference,

Being aware of the increasing number of users of cartographic data who themselves apply digital technology in

their work and therefore need cartographic data in digital form,

Recognizing that there are additional costs involved in the creation of digital cartographic data bases as compared to analogue mapping technology,

Noting that programmes to create digital cartographic data bases are a matter of economics and public policy,

Noting further that several international associations have done studies in this field,

Requests the United Nations to undertake a review, in consultation with such international associations as the International Cartographic Association, the International Federation of Surveyors, the International Geographic Union and the International Society for Photogrammetry and Remote Sensing, in order to obtain more information on and a better understanding of the problems and costs of making and maintaining digital cartographic data bases and of reflecting the uses and benefits of cartographic data in digital form.

12. *Establishment of an Ad Hoc Group of Experts on Cadastral Surveying, Mapping and Land Information*

The Conference,

Reaffirming the need for an adequate system of land registration and land information as a basis for social and economic development,

Noting resolution 10 of the Sixth United Nations Regional Cartographic Conference for Asia and the Far East¹⁰ that an *ad hoc* group of experts should be convened to study in depth the problems of cadastral survey and to consider the setting up of a permanent committee to keep the developments in this field under constant review,

Noting further resolution 24 of the Seventh United Nations Regional Cartographic Conference for Asia and the Far East¹¹ concerning the establishment of an advisory panel to advise the United Nations on action to be taken in respect of the conclusions of the *Ad Hoc* Group of Experts on Cadastral Surveying and Mapping,¹²

Noting further the continuing interest and concern of subsequent United Nations Regional Cartographic Conferences for Asia and the Pacific regarding the need for adequate land registration and land information systems and for the establishment of the advisory panel as referred to in resolution 3 of the Eighth United Nations Regional Cartographic Conference for Asia and the Far East¹³ and resolution 16 of the Ninth United Nations Regional Cartographic Conference for Asia and the Pacific,¹⁴

Noting further that a United Nations advisory panel on cadastral surveying and mapping has not so far been established by the United Nations owing to lack of funding,

Recommends to the Economic and Social Council that the *Ad Hoc* Group of Experts on Cadastral Surveying and Mapping be reconstituted with an enlarged scope, namely: (a) to study in depth the problems of cadastral survey and of land information systems and to report on them at the Eleventh Regional Cartographic Conference for Asia and the Pacific; (b) to support this *Ad Hoc* Group with suffi-

cient funds to enable it to function effectively and continuously until the next Regional Cartographic Conference for Asia and the Pacific.

13. *Land information systems*

The Conference,

Recognizing the growing concern regarding the indispensability of land information systems for the planning and the implementation of measures for efficient and effective social and economic development,

Noting that land information systems are being developed in several countries,

Noting further that such work is promoted by international scientific and professional societies in the cartographic field such as the International Federation of Surveyors, the International Cartographic Association and the International Society for Photogrammetry and Remote Sensing,

Noting further, however, that guidelines for planning, implementation and evaluation of such systems are lacking,

1. *Recommends* that the Economic and Social Council should initiate measures to prepare an in-depth study on the principal features and the different variations in the design of land information systems, bearing in mind other basic information systems;

2. *Recommends further* that funding for such a study should be provided by the United Nations;

3. *Recommends further* that the results of the study should be published by the United Nations and that this study should be made in close co-operation with the said professional societies.

14. *Workshops on cadastral surveying and mapping and land information systems*

The Conference,

Reaffirming the urgent need for cadastral surveying and land information systems as a basis for social and economic development,

Noting the technical complexities involved in implementing such systems,

Noting further that the United Nations has held workshops on cadastral surveying, mapping and land information in co-operation with the Federal Republic of Germany (in 1974 and in 1978) with outstanding success,

Reaffirms the need for continuing such workshops, as recommended in resolution 17 of the Ninth Regional Cartographic Conference for Asia and the Pacific,¹⁵ on a world-wide and on a regional basis,

Appreciating the offer of the Federal Republic of Germany to organize such a workshop in co-operation with the United Nations, if possible by the autumn of 1983,

Recommends that this workshop should be organized if possible in conjunction with the *Ad Hoc* Group of Experts on Cadastral Surveying and Mapping and Land Information recommended in resolution 12 of this Conference.

15. Geographical names

A

The Conference,

Recalling resolution 15 on geographical names adopted by the Ninth United Nations Regional Cartographic Conference for Asia and the Pacific,¹⁵

Recognizing that the Asia, South-East, geographical/linguistic division of the United Nations Group of Experts on Geographical Names has been enlarged and renamed the Asia South-East and Pacific South-West Division,

Recognizing further the progress which has been made towards standardization of geographical names through the co-operation of the members of the enlarged Division for Asia South-East and Pacific South-West of the United Nations Group of Experts on Geographical Names,

1. *Recommends* that the work of the Group of Experts for the Division should be continued and that all member countries in Asia South-East and Pacific South-West be urged to contribute to and participate in the activities of the Group of Experts;

2. *Further recommends* that the representative of Malaysia should continue to represent the Division as its Chairman.

B

The Conference,

Taking into account the success and benefit obtained through the first pilot course in toponymy, held at Cisarua, Indonesia, in June 1982,

Endorses resolution 6 of the Fourth United Nations Conference on the Standardization of Geographical Names,¹⁶ which recommends "the holding of similar courses and seminars in other geographical/linguistic divisions and further recommends that a submission should be made by the Cartography Section of the Department of Technical Co-operation for Development of the United Nations Secretariat on behalf of the Conference for the provision of the necessary funds to provide for such courses and seminars".

C

The Conference,

Recalling resolution 15 of the Ninth United Nations Regional Cartographic Conference for Asia and the Pacific,¹⁷

Noting Working Paper No. 4 submitted by the United Nations Secretariat to the United Nations Group of Experts on Geographical Names at its tenth session,

Recognizing that considerable demands exist within the Asian and Pacific countries for a map containing standardized geographical names for major geographical features,

Recognizing further the advantages of publishing a regional map as a preparatory step towards publishing a composite map of the world,

Recommends that the Cartographic Unit of the Department of Conference Services of the United Nations Secretariat should be urged to give priority to the task of compiling, publishing and distributing a regional map of Asia and the Pacific with standardized geographical names.

16. Standards for hydrographic data

The Conference,

Noting that in order to be adequate for the purposes of international shipping hydrographic surveys must meet certain minimum standards,

Further noting that the International Hydrographic Organization, the only competent international authority in hydrography, has established such standards for the conduct of surveys,

1. *Recommends* that coastal States should conduct hydrographic surveys which will at least meet the minimum standards set by the International Hydrographic Organization so that the survey data may be incorporated into navigational charts and documents;

2. *Further recommends* that coastal States should send their hydrographic data, including navigational charts, to the charting authorities which have international coverage for incorporation in their charts, for the benefit of national and international shipping.

17. Technical assistance in hydrography

The Conference,

Recognizing that there is an urgent need for technical assistance to developing countries in the field of hydrography,

Further recognizing that the International Hydrographic Bureau is a source of technical advice and acts as a coordinating body to promote measures aimed at establishing or strengthening hydrographic capabilities of developing countries,

Noting that the International Hydrographic Organization has charged the International Hydrographic Bureau to respond to requests from developing countries for technical assistance,

Further noting that the Bureau maintains close contact with international aid-giving agencies and acts as a repository for specific information on technical assistance programmes available from its member States,

1. *Recommends* that coastal States should approach the International Hydrographic Bureau for advice on technical assistance in the field of hydrography;

2. *Urges* the United Nations to give, in co-operation with the International Hydrographic Organization, full support, including financial and material aid, to technical assistance programmes undertaken by member States in this field.

18. Training in nautical cartography

The Conference,

Recalling resolution 11 of the Seventh United Nations Regional Cartographic Conference for Asia and the Far East¹⁸ on the establishment of facilities for training in cartography (including hydrography) on a regional or subregional basis,

Further recalling resolution 8 of the Eighth United Nations Regional Cartographic Conference for Asia and the Far East¹⁹ on the provision of financial assistance by the United Nations for India to extend its facilities for training in hydrography to meet the requirements of the region,

Noting that additional facilities for training in hydrography have been provided with financial assistance from the United Nations Development Programme,

Considering the urgent and increasing need for the establishment of similar facilities on a regional or sub-regional basis for the training of personnel from developing countries in nautical cartography at all levels,

Realizing that the most expeditious and economic means of providing such training facilities is through the expansion of existing national facilities,

Further noting that such additional facilities would require financial support,

Appreciating the offers made by Governments in the region to provide training in nautical cartography to meet the requirements of the region,

1. Recommends that the United Nations should give favourable consideration to requests for financial assistance to improve and modernize existing facilities for such training in countries of the region;

2. Further recommends that the United Nations and other aid-giving agencies should consider offering financial assistance in the award of scholarships to personnel from developing countries of the region for training in nautical cartography.

19. *International co-operation in hydrographic surveying*

The Conference,

Noting that in most developing countries, the available charts based on old surveys are not adequate for modern deep draft vessels,

Further noting that there is an urgent need for new sur-

veys and updated charts of coastal waters of developing countries,

Recognizing that many developing coastal States have inadequate or no hydrographic surveying capability to meet the needs of international shipping,

Further recognizing that such limitations could be overcome by regional co-operative hydrographic survey programmes and that the International Hydrographic Organization is the competent organization to co-ordinate such programmes,

1. Recommends that coastal States should co-operate in the formation of regional groups or commissions for the conduct of co-operative hydrographic survey programmes, and urges coastal States which are not yet members of existing groups or commissions to join them;

2. Further recommends that coastal States should approach the International Hydrographic Bureau for assistance in the formation of such regional groups or commissions.

20. *Vote of thanks*

The Conference,

1. Expresses its heartfelt thanks to the Economic and Social Commission for Asia and the Pacific for the excellent arrangements and services provided for the Conference;

2. Further expresses its deep appreciation to the Government of Thailand for the hospitality extended to the participants;

3. Also expresses its appreciation to the President and the officers of the Conference for the way in which they conducted the meeting and its gratitude to the officers and staff of the United Nations Secretariat for their hard work.

NOTES

¹Ninth United Nations Regional Cartographic Conference for Asia and the Pacific, Wellington, New Zealand, 11-22 February 1980, vol. II, *Technical Papers* (United Nations publication—to be issued).

²World Cartography, vol. XVI (United Nations publication, Sales No. E 80.I 12).

³Ninth United Nations Regional Cartographic Conference for Asia and the Pacific, Wellington, New Zealand, 11-22 February 1980, vol. I, *Report of the Conference* (United Nations publication, Sales No. E 81.I 2), chap. VII.

⁴See E/CONF 75/1983/CRP 7.

⁵Fourth United Nations Conference on the Standardization of Geographical Names, Geneva, 24 August-14 September 1982, vol. I, *Report of the Conference* (United Nations publication, Sales No. E 83.I 7), chap. III.

⁶Seventh United Nations Regional Cartographic Conference for Asia and the Far East, Tokyo, 15-27 October 1973, vol. I, *Report of the Conference* (United Nations publication, Sales No. E.74.I 7), chap. VII.

⁷Ninth United Nations Regional Cartographic Conference for Asia and the Pacific, Wellington, New Zealand, 11-22 February 1980, vol. I, *Report of the Conference* (United Nations publication, Sales No. E 81.I 2), chap. VII.

⁸Sixth United Nations Regional Cartographic Conference for Asia and the Far East, Tehran, Iran, 24 October-7 November 1970, vol. I, *Report of the Conference* (United Nations publication, Sales No. E 71.I 15), chap. VII.

⁹Ninth United Nations Regional Cartographic Conference for Asia and the Pacific, Wellington, New Zealand, 11-22 February 1980, vol. I, *Report of the Conference* (United Nations publication, Sales No. E 81.I 2), chap. VII.

¹⁰Sixth United Nations Regional Cartographic Conference for Asia and

the Far East, Tehran, Iran, 24 October-7 November 1970, vol. I, *Report of the Conference* (United Nations publication, Sales No. E 71.I 15), chap. VII.

¹¹Seventh United Nations Regional Cartographic Conference for Asia and the Far East, Tokyo, 15-27 October 1973, vol. I, *Report of the Conference* (United Nations publication, Sales No. E 74.I 7), chap. VII.

¹²Ibid., vol. II, *Technical Papers* (United Nations publication, Sales No. E 74.I.25), p. 275.

¹³Eighth United Nations Regional Cartographic Conference for Asia and the Far East, Bangkok, 17-28 January 1977, vol. I, *Report of the Conference* (United Nations publication, Sales No. E.77.I 12), chap. VII.

¹⁴Ninth United Nations Regional Cartographic Conference for Asia and the Pacific, Wellington, New Zealand, 11-22 February 1980, vol. I, *Report of the Conference* (United Nations publication, Sales No. E 81.I 2), chap. VII.

¹⁵Ibid.

¹⁶Fourth United Nations Conference on the Standardization of Geographical Names, Geneva, 24 August-14 September 1982, vol. I, *Report of the Conference* (United Nations publication, Sales No. E.83.I.7), chap. III.

¹⁷Ninth United Nations Regional Cartographic Conference for Asia and the Pacific, Wellington, New Zealand, 11-22 February 1980, vol. I, *Report of the Conference* (United Nations publication, Sales No. E 81.I 2), chap. VII.

¹⁸Seventh United Nations Regional Cartographic Conference for Asia and the Far East, Tokyo, 15-27 October 1973, vol. I, *Report of the Conference* (United Nations publication, Sales No. E 74.I 7), chap. VII.

¹⁹Eighth United Nations Regional Cartographic Conference for Asia and the Far East, Bangkok, 17-28 January 1977, vol. I, *Report of the Conference* (United Nations publication, Sales No. E 77.I 12), chap. VII.

ANNEXES

Annex I

LIST OF PARTICIPANTS

A. STATES MEMBERS OF THE UNITED NATIONS OR MEMBERS OF THE SPECIALIZED AGENCIES

AUSTRALIA

Representative

Mr. C. Veenstra, Director, Division of National Mapping, Department of National Development and Energy

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BRUNEI

Observer

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Mr. Lu Qiankun, Engineer, National Bureau of Surveying and Mapping

Ms. Ching Minjie, Engineer, National Bureau of Surveying and Mapping

Mr. Yu Yongchang, Engineer, National Bureau of Surveying and Mapping

Mr. Bai Bo, Secretary for Foreign Affairs, National Bureau of Surveying and Mapping

Mr. Xie Tiantao, Department of Treaties and Law, Ministry of Foreign Affairs

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Mr. Zhang Haozhong, Engineer, National Bureau of Surveying and Mapping

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FRANCE

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Mr. Henri Journoud, Chargé des relations avec les organismes internationaux

Mr. Serge Soudoplatoff, Ingénieur géographe

Mr. Hervé Guichard, Spot Image

Mr. Jean Denis Dupuy, Spot Image

Mr. Christian Veillas, Centre national d'études spatiales

GERMANY, FEDERAL REPUBLIC OF

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Prof. J. Nittinger, Economic Association for Surveying and Mapping (Geokart)

Prof. U. Freitag, Institut für Geographic und Kartographie (Institute for Geography and Cartography) Berlin (West)

Mr. Franz W. Samblowsky, Product Manager for geodetic and photogrammetric instruments for Asia and the Pacific, Carl Zeiss, Inc., Oberkochen

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Miss Dolly P. Phukkanasut, Honorary Consul, Consulate of the Republic of Peru in Thailand

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Mr. Eduardo R. Mora, Chief Geodetic Engineer, Bureau of Lands

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Mr. Manit Nayanetra, Chief of Forest Mapping and Remote Sensing Sub-Division, Forest Management Division, Royal Thai Forest Department

Mr. Pote Luaphong, Chief of Photogrammetric Section, Land Reform Operation Division, Agricultural Land Reform Office

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Mr. Tasana Patanaphanich, Director of Calculating Division, Department of Lands

Mr. Pongtep Panyarachun, Chief of Photogrammetric Section, Department of Lands

Mr. Paisal Kasivat, Chief of Planning and Operating Section, Department of Lands

Mr. Phyool Chantasiro, Director of Topographic Survey Division, Royal Thai Irrigation Department

Mr. Gomet Hongpakdee, Chief of Aerial Triangulation Section, Topographic Survey Division, Royal Thai Irrigation Department

Second Lieutenant Vishit Sathavanond, Chief of Data Processing and Checking Section, Topographic Survey Division, Royal Thai Irrigation Department

Second Lieutenant Suphachai Chansomboon, Technical Forest Officer, Forest Management Division, Royal Thai Forest Department

Mr. Thongchai Charupat, Technical Forest Officer, Forest Management Division, Royal Thai Forest Department

Mrs. Jirawan Charupat, Scientist, Forest Management Division, Royal Thai Forest Department

Mr. Narong Vainitra, Surveyor, Land Reform Operations Division, Agricultural Land Reform Office

Mr. Boriboon Siri, Surveyor, Land Reform Operations Division, Agricultural Land Reform Office

Mr. Kait Maneekul, Surveyor, Land Reform Operations Division, Agricultural Land Reform Office

Mr. Chaiwat Pholprasit, Geologist, Aerial Photo-Interpretation Section, Geological Survey Division, Department of Mineral Resources
 Mrs. Ngampis Yamniyom, Geologist, Economic Geology Division, Department of Mineral Resources
 Mr. Taveesak Kanjanakanok, Surveyor, Land Classification Division, Land Development Department
 Mr. Aporn Prompasit, Soil Surveyor, Soil Survey Division, Land Development Department
 Miss Promchist Trakuldist, Agriculturist, Land Classification Division, Land Development Department
 Mr. Suvit Vibulsresth, Director of Remote Sensing Division, National Research Council
 Mr. Paibul Ruangsiri, Engineer, National Research Council
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 Mr. Prasit Kunuratn, Lecturer, Department of Social Science Faculty of Humanities and Social Science, Khon Kaen University
 Mr. Chaitat Pairintra, Assistant Professor, Head of Department of Soil Science, Khon Kaen University
 Mr. Montree Boonsaner, Assistant Professor, Department of Geology, Faculty of Science, Khon Kaen University
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 Mr. Wutipong Tungtanakan, Lecturer, Department of Geography, Faculty of Social Science, Chiang Mai University
 Mr. Prayong Khokhad, Lecturer, Department of Social Science, Faculty of Humanities and Social Science, Songkhlanakharin University
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 Mr. Vichien Chatupote, Lecturer, Department of Geology, Faculty of Natural Resources, Songkhlanakharin University
 Mr. Samut Siriburi, Assistant Professor, Department of Geography, Faculty of Social Science, Srinakharinwirot University
 Mr. Pakdi Charti-Utis, Lecturer, Department of Geography, Faculty of Social Science, Srinakharinwirot University
 Mrs. Chuchanee Wyllie, Assistant Professor, Head of Geography Department, Faculty of Education, Ramkhamhaeng University
 Mr. Chusak Kongkanon, Lecturer, Faculty of Education, Ramkhamhaeng University
 Mr. Kungwan Taweeritt, Faculty of Engineering, Khon Kaen University

UNION OF SOVIET SOCIALIST REPUBLICS

Representative

Mr. L. A. Kashin, First Deputy Chairman, Central Board of Cartography and Geodesy, Council of Ministers of the USSR

Alternates

Mr. V. B. Kuchuk, Deputy Chief of Department, Ministry of Foreign Affairs, Moscow
 Mr. E. E. Obminski, Permanent Representative of the USSR to the Economic and Social Commission for Asia and the Pacific
 Mr. V. V. Postnov, Attaché, Ministry of Foreign Affairs
 Mr. V. I. Polivoda, Attaché, Assistant Permanent Representative of the USSR to the Economic and Social Commission for Asia and the Pacific

UNITED ARAB EMIRATES

Representative

Mr. Obeid Mohammed Hilal, Engineer, Ministry of Public Works and Housing

UNITED KINGDOM

Representative

Mr. B. E. Furrnston, Director of Overseas Surveys, Directorate of Overseas Surveys

Deputy Representative

Lieutenant-Colonel M. A. Nolan, RE, Directorate of Military Survey

Alternates

Mr. I. H. Shouesmith, Directorate of Military Survey
 Mr. B. E. Skittrall, Head of Nautical Chart Branch, Hydrographic Department

UNITED STATES OF AMERICA

Representative

Mr. Rupert Southard, Chief, National Mapping Division, US Geological Survey, Department of the Interior

Alternate

Ms. Sandra H. Shaw, Office of the Geographer, Bureau of Intelligence and Research, Department of State

Advisers

Mr. Mark M. Macomber, Deputy Director, Systems and Techniques, Defense Mapping Agency
 Mr. Frank W. Maloney, Office of Aeronautical Charting, National Ocean Survey, National Oceanic and Atmospheric Administration

VANUATU

Representative

Mr. Jean Tranut, B.P. 622, Port-vica

B. ASSOCIATE MEMBERS OF THE ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE FAR EAST

Brunei
 Hong Kong

C. REPRESENTATIVES OF UNITED NATIONS SECRETARIAT UNITS

Economic and Social Commission for Asia and the Pacific	Mr. Usoe K. Khaw, Chief, Mineral Resources Section, Natural Resources Division Mr. Denis Borel, Expert on Environmental Monitoring and Assessment, Office of the Executive Secretary/ Environmental Co-ordinating Unit
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D. INTERNATIONAL SCIENTIFIC ORGANIZATIONS

Committee on Space Research (COSPAR)	Dr. L. R. A. Narayan, Head, Applications Division, National Remote Sensing Agency (NRSA), India
International Cartographic Association (ICA)	Mr. B. E. Goodrick, Australia
International Federation of Surveyors (FIG)	Mr. Charles H. Weir Mr. C. W. Youngs
International Hydrographic Organization (IHO)	Rear-Admiral F. L. Fraser
International Society for Photogrammetry and Remote Sensing (ISPRS)	Mr. Frederic Doyle, Research Cartographer, United States Geological Survey
Scientific Committee on Antarctic Research (SCAR)	Mr. C. Veenstra

E. SECRETARIAT OF THE CONFERENCE

Executive Secretary	Mr. Max C. De Henseler, Chief, Cartography Section, Department of Technical Co-operation for Development
Deputy Executive Secretary	Mr. K. H. Stabe, Cartography Section, Department of Technical Co-operation for Development

Annex II

*LIST OF DOCUMENTS
(in the language of their presentation)*

<i>Document No.</i>	<i>Title</i>	<i>Agenda item</i>
E/CONF 75/1	Provisional agenda	3(b)
E/CONF 75/2	Rules of procedure	3(a)
E/CONF 75/3 and Add.1-6	Draft report of the Conference	11
E/CONF 75/4	List of participants	
E/CONF 75/5	Report of the Conference	11
E/CONF 75/INF 1	Documentation for the Conference	
E/CONF 75/INF 2	Advance information regarding general arrangements of interest to the participants	
E/CONF 75/INF 2/ Add.1	Information for participants	
E/CONF 75/INF 3 and Add.1-3	Provisional list of documents	
E/CONF 75/L 1*	Camera calibration in the Division of National Mapping (submitted by Australia)	5(b)
E/CONF 75/L 2*	Use of computers to prepare urban social atlases for Australia (submitted by Australia)	5(d)
E/CONF 75/L 3*	Digital topographic mapping in the Division of National Mapping (submitted by Australia)	5(d)
E/CONF 75/L 4*	Selection of topographic names for the national map series (submitted by Australia)	5(e)
E/CONF 75/L 5*	Map-accuracy surveys by the Division of National Mapping (submitted by Australia)	5(e)
E/CONF 75/L 6*	Mapping of Australia's present vegetation (submitted by Australia)	5(f)
E/CONF 75/L 7*	The national geodetic data base (submitted by Australia)	5(a)
E/CONF 75/L 8*	A geoid for South-East Asia and the Pacific (submitted by Australia)	5(a)
E/CONF 75/L 9*	The Natmap laser-ranging system (submitted by Australia)	5(a)
E/CONF 75/L 10*	Lake Hume photogrammetric test range (submitted by Australia)	5(b)
E/CONF 75/L 11*	Airborne profile recording (submitted by Australia)	5(b)
E/CONF 75/L 12*	Simulated colour for orthophoto map production (submitted by Australia)	5(b)
E/CONF 75/L 13*	Cartographic enhancement of orthophoto maps (submitted by Australia)	5(b)
E/CONF 75/L 14*	Use of LANDSAT imagery to supplement conventional imagery in medium- and small-scale mapping and charting (submitted by Australia)	5(c)
E/CONF 75/L 15*	LANDSAT—its application to marine park management of the Great Barrier Reef, Australia (submitted by Australia)	5(c)
E/CONF 75/L 16*	Automation in computer-assisted cartography—AUTOMAP 2 (submitted by Australia)	5(d)
E/CONF 75/L 17*	Analytical hill shading (submitted by Australia)	5(d)
E/CONF 75/L 18*	Innovations in Australia's national atlas (submitted by Australia)	5(f)
E/CONF 75/L 19*	The development of a cadastral digital capture for Western Australia's land information system covering the period January 1981 to September 1982 (submitted by Australia)	5(g)
E/CONF 75/L 20*	Hermannsburg Aboriginal land grants in the Northern Territory, Australia (submitted by Australia)	5(g)
E/CONF 75/L 21*	Laser Airborne depth sounder (LADS) (submitted by Australia)	5(i)
E/CONF 75/L 22*	Five-colour process printing of line mapping (submitted by Australia)	5(j)
E/CONF 75/L 23*	Production of orthophoto maps using a duotone, random dot technique (submitted by Australia)	5(j)
E/CONF 75/L 24*	Technical assistance in Asia and the Pacific (submitted by Australia)	7
E/CONF 75/L 25*	Completion of the Sugar Lands Surveying Project in Fiji (submitted by Australia)	7
E/CONF 75/L 26*	Structuring the urban data with the hypergraph-based data structure model (submitted by Thailand)	5(d)
E/CONF 75/L 27*	Geographical names: capture, preparation, storage and use by means of electronic data processing (submitted by the Federal Republic of Germany)	6

<i>Document No.</i>	<i>Title</i>	<i>Agenda item</i>
E/CONF 75/L 28*	Contributions to very long baseline interferometry (submitted by the Federal Republic of Germany)	5(a)
E/CONF 75/L 29*	A mobile laser-ranging system and its applications for the detection of earth plate motions (submitted by the Federal Republic of Germany)	5(a)
E/CONF 75/L 30*	Planning and cadastral projects for urban and rural regions with the aid of orthophoto mapping (submitted by the Federal Republic of Germany)	5(b) and (g)
E/CONF 75/L 31*	The role of the United Nations cartographic conferences (submitted by Sweden)	7
E/CONF 75/L 32*	Institutional co-operation—a role for survey organizations in developed countries (submitted by Sweden)	7
E/CONF 75/L 33*	A system for computer assistance in large-scale map production (submitted by Australia)	5(d)
E/CONF 75/L 34*	Technical assistance to the National Mapping Bureau of Papua New Guinea (submitted by Australia)	7
E/CONF 75/L 35*	Automated cartography, computer mapping, digital terrain models (submitted by Australia)	5(d)
E/CONF 75/L 36*	Map production and map revision in New South Wales (submitted by Australia)	5(e)
E/CONF 75/L 37*	Report on activities during 1980–1982 (submitted by Australia)	4
E/CONF 75/L 38*	Development of data bases for small-scale and thematic mapping in the Division of National Mapping (submitted by Australia)	5(f)
E/CONF 75/L 39*	Report on cartographic activities in New Zealand, 1980–1982 (submitted by New Zealand)	4
E/CONF 75/L 40*	Computer-aided mapping in New Zealand (submitted by New Zealand)	5(d)
E/CONF 75/L 41*	Proposed land information system for New Zealand (submitted by New Zealand)	5(g)
E/CONF 75/L 42*	Technical education and training (submitted by New Zealand)	8
E/CONF 75/L 43	Country report (submitted by the Federal Republic of Germany)	4
E/CONF 75/L 44*	Production of orthophoto maps, illustrated by an example (submitted by the Federal Republic of Germany)	5(b)
E/CONF 75/L 45*	The application of a system of cartographic models to computer-assisted thematic mapping (submitted by the Federal Republic of Germany)	5(d)
E/CONF 75/L 46* and Add. I	Orthophoto mapping for the market place: the Queensland experience (submitted by Australia)	5(b)
E/CONF 75/L 47*	A United States test of the Swedish motorized levelling system (submitted by the United States)	5(a)
E/CONF 75/L 48*	Current research directions in the national mapping program (submitted by the United States)	5(d)
E/CONF 75/L 49*	Overview of automated cartography efforts at the Defense Mapping Agency Aerospace Center (submitted by the United States)	5(d)
E/CONF 75/L 50*	United States Geological Survey provisional edition maps (submitted by the United States)	5(e)
E/CONF 75/L 51*	Aeronautical chart automated production system: operational scenario (submitted by the United States)	5(h)
E/CONF 75/L 52*	Bathymetric mapping effort by the United States of America (submitted by the United States)	5(i)
E/CONF 75/L 53*	The case for an international large- and medium-scale nautical chart series in East Asia (submitted by the United States)	5(i)
E/CONF 75/L 54*	Fiji: An example of international hydrographic co-operation (submitted by the United Kingdom)	5(i)
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E/CONF 75/L 56	Third world strategy (submitted by the International Cartographic Association)	7
E/CONF 75/L 57	Report on the International Cartographic Association (submitted by the International Cartographic Association)	4
E/CONF 75/L 58	Cadastral photo map 1:5,000 (submitted by Finland)	5(g)
E/CONF 75/L 59	Digital map data base and application programmes developed at the National Board of Survey in Finland (submitted by Finland)	5(d)
E/CONF 75/L 60* ^b	Report on the progress of surveying and mapping during 1980–1982 (submitted by China)	4
E/CONF 75/L 61*	The compilation of satellite image maps for land use in China (submitted by China)	5(c)
E/CONF 75/L 62	Application of scribing of all the map elements in photogrammetric mapping (submitted by China)	5(e)
E/CONF 75/L 63	New satellite laser-ranging system of the Hydrographic Department of Japan (submitted by Japan)	5(a)
E/CONF 75/L 64	On the large-scale bathymetric chart representation (submitted by Japan)	5(i)

<i>Document No</i>	<i>Title</i>	<i>Agenda item</i>
E/CONF.75/L. 65	Joint production of the common datum charts of the Straits of Malacca and Singapore—Phase II (submitted by Japan)	5(i)
E/CONF.75/L. 66	Report by the Government of Japan on technical co-operation (submitted by Japan)	7
E/CONF.75/L. 67 ^a	Report on the cartographic activities of the United States of America (submitted by the United States of America)	4
E/CONF.75/L. 68 ^a	Review of satellite remote sensing programmes (submitted by the International Society for Photogrammetry and Remote Sensing)	5(c)
E/CONF.75/L. 69	Information sheet on the organization of distribution and sale of nautical charts (submitted by the International Hydrographic Organization)	5(k)
E/CONF.75/L. 70 ^a	Progress report on cartographic activities in Thailand 1972–1982 (submitted by Thailand)	4
E/CONF.75/L. 71	The International Hydrographic Organization (submitted by the International Hydrographic Organization)	5(i)
E/CONF.75/L. 72 ^b	Utilisation du TRASTER pour la restitution des images à géométrie non classique (présenté par la France)	5(c)
E/CONF.75/L. 73 ^b	Apport de SPOT à l'étude du milieu urbain (présenté par la France)	5(c)
E/CONF.75/L. 74 ^b	Utilisation de la thermographie aéroportée en milieu littoral (présenté par la France)	5(c)
E/CONF.75/L. 75 ^b	L'inventaire du littoral—France (présenté par la France)	5(c)
E/CONF.75/L. 76 ^b	Télé-détection par satellite et cartographie automatique (présenté par la France)	5(c)
E/CONF.75/L. 77 ^b	Exploitation cartographique d'un satellite à défilement (application à SPOT) (présenté par la France)	5(c)
E/CONF.75/L. 78 ^b	Le programme d'observation de la terre par satellite SPOT (présenté par la France)	5(c)
E/CONF.75/L. 79 ^b	Organisation de la distribution et de la vente des cartes (présenté par la France)	5(k)
E/CONF.75/L. 80 ^b	Country report and progress made in the field of mapping in the Republic of Korea (submitted by the Republic of Korea)	4
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E/CONF.75/L. 83 ^a	Geographical names (submitted by Cyprus)	6
E/CONF.75/L. 84	A brief report on the progress made in the field of surveying and mapping in Cyprus during the past three years	4
E/CONF.75/L. 85	Report on survey and mapping activities in Hong Kong, 1980 to 1983	5(g)
E/CONF.75/L. 86	Training and education in surveying and mapping in Indonesia	8
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E/CONF.75/L. 88	An outline of the development of cartography in Malaysia (submitted by Malaysia)	5(e)
E/CONF.75/L. 89 ^a	Mapping from space—preparations for the photogrammetric camera experiment on SPACELAB, September 1983 (submitted by the Federal Republic of Germany)	5(c)
E/CONF.75/L. 90	Joint demarcation and survey of the international land boundary between Indonesia and Malaysia (submitted jointly by Indonesia and Malaysia)	5(a)
E/CONF.75/L. 91 ^a	The Hungarian activity in the field of geodetic control nets (submitted by Hungary)	5(a)
E/CONF.75/L. 92	Cartographic activities in Indonesia 1979–1982 (submitted by Indonesia)	4
E/CONF.75/L. 93	Training in hydrography and nautical cartography (submitted by India)	8
E/CONF.75/L. 94 ^a	Thematic mapping—the base of the space natural studies (submitted by the Union of Soviet Socialist Republics)	5(c)
E/CONF.75/L. 95	Geodynamic survey in the USSR (submitted by the Union of Soviet Socialist Republics)	5(a)
E/CONF.75/L. 96 ^a	Report on surveying and mapping in the USSR (submitted by the Union of Soviet Socialist Republics)	4
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E/CONF.75/L. 98	Cartographic activities in Nepal (submitted by Nepal)	5(e)
E/CONF.75/L. 99	On the geodetic control survey in the northern part of the Philippines under the technical co-operation of Japan (submitted by Japan)	5(a)
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<i>Document No</i>	<i>Title</i>	<i>Agenda item</i>
E/CONF.75/L.101	The growth of domestic survey companies in support of mapping the country (submitted by Indonesia)	5(b)
E/CONF.75/L.102 ^a	The development of the method to produce a colour composite orthophoto map out of LANDSAT data (submitted by Japan)	5(c)
E/CONF.75/L.103 ^a	Cartography at the Geological Research and Development Centre of Indonesia (submitted by Indonesia)	5(f)
E/CONF.75/L.104 ^a	Some applications of satellite imagery to small-scale mapping for development planning (submitted by the United Kingdom)	5(c)
E/CONF.75/L.105 ^a	Computer-assisted mapping in Kuwait (submitted by Kuwait)	5(d)
E/CONF.75/L.106	Remote sensing activities in India (submitted by the Committee on Space Research (COSPAR))	5(c)
E/CONF.75/L.107 ^a	Atlas of Finland (submitted by Finland)	5(f)
E/CONF.75/L.108	Thematic maps—important cartographic products (submitted by Finland)	5(f)
E/CONF.75/L.109	Cartographic Work in Japan 1979–1981 (submitted by Japan)	4
E/CONF.75/L.110 ^a	Irrigation projects in Indonesia: British technical assistance in the establishment of monitoring controls for orthophoto mapping contracts (submitted by the United Kingdom)	7
E/CONF.75/L.111	Land information systems: resolutions adopted at the Congress of the International Federation of Surveyors (FIG), Montreux, 1981 (submitted by FIG)	5(g)
E/CONF.75/L.112	Hydrographic activities in India 1980–1982 (submitted by India)	5(i)
E/CONF.75/L.113	National report of Sri Lanka (submitted by Sri Lanka)	4
E/CONF.75/L.114	Report on survey and mapping activities in Singapore 1980–1982 (submitted by Singapore)	4
E/CONF.75/L.115 ^a	United Kingdom report on activities (submitted by the United Kingdom)	4
E/CONF.75/L.116 ^b	Capacités de Géocart dans le domaine de l'assistance technique et du transfert de technologie (présenté par la Pologne)	7
E/CONF.75/L.117	Topographic survey techniques and activities in Bangladesh (submitted by Bangladesh)	5(e)

Conference Room Papers

E/CONF.75/1983/CRP.1 and Rev.1	Provisional List of Participants	
E/CONF.75/1983/CRP.2	Fourth United Nations Conference on the Standardization of Geographical Names, Geneva, 24 August to 14 September, 1982, Volume I, Report of the Conference (preliminary version)	6
E/CONF.75/1983/CRP.3	Training course in toponymy in Indonesia	8
E/CONF.75/1983/CRP.4	Status of world mapping	4
E/CONF.75/1983/CRP.5	Tentative allocation of agenda items to the Plenary and Committees, and tentative schedule	3(d)
E/CONF.75/1983/CRP.6	International Map of the World on the Millionth Scale (IMW)—Status of publication of IMW sheets as at 31 January 1982	5(f)
E/CONF.75/1983/CRP.7	Report of the Meeting of the Group of Experts on Satellite Remote Sensing for Natural Resources	5(c)
E/CONF.75/1983/CRP.8	United Nations technical co-operation activities in surveying, mapping and charting with special emphasis on the ESCAP region	7
E/CONF.75/1983/CRP.9	Election of Officers	3(c)

NOTES

- ^aAbstracts available in French only
- ^bAbstracts available in English only

Annex III

RULES OF PROCEDURE

CHAPTER I. REPRESENTATION AND CREDENTIALS

RULE 1

Each State participating in the Conference shall be represented by a head of delegation and such other accredited representatives, alternate representatives, experts and advisers as may be required.

RULE 2

The credentials of representatives and the names of alternate representatives, experts and advisers shall be submitted to the Executive Secretary of the Conference if possible not later than 24 hours after the opening of the Conference. The credentials shall be issued either by the Head of the State or Government or by the Minister for Foreign Affairs.

RULE 3

The President and the Vice-Presidents shall examine the credentials and report to the Conference without delay.

RULE 4

Pending a decision of the Conference on their credentials, representatives shall be entitled to participate provisionally in the Conference.

CHAPTER II. OFFICERS

RULE 5

The Conference shall elect a President, two Vice-Presidents and a Rapporteur from among the representatives of the States participating in the Conference.

RULE 6

The President shall preside over the plenary meetings of the Conference. He shall not vote but may designate another member of his delegation to vote in his place.

RULE 7

If the President is absent from a meeting or any part thereof, a Vice-President designated by him shall preside. A Vice-President acting as President shall have the same powers and duties as the President.

CHAPTER III. SECRETARIAT

RULE 8

The Executive Secretary of the Conference appointed by the Secretary-General of the United Nations shall act in that capacity in all meetings of the Conference. He may appoint a deputy to take his place at any meeting.

RULE 9

The Executive Secretary or his representative may at any meeting make either oral or written statements concerning any question under consideration.

RULE 10

The Executive Secretary shall provide and direct such staff as is required by the Conference. He shall be responsible for making all necessary arrangements for meetings and generally shall perform all other work which the Conference may require.

CHAPTER IV. CONDUCT OF BUSINESS

RULE 11

Representatives of a majority of the States participating in the Conference shall constitute a quorum.

RULE 12

In addition to exercising the powers conferred upon him elsewhere by these rules, the President shall declare the opening and closing of each plenary meeting of the Conference, direct the discussion at such meetings, ensure observance of these rules, accord the right to speak, put questions to the vote and announce decisions. He shall rule on points of order and, subject to these rules of procedure, shall have complete control over the proceedings.

RULE 13

The President may, in the course of the discussions, propose to the Conference the closure of the list of speakers or the closure of the debate. He may also propose the suspension or the adjournment of the meeting or the adjournment of the debate on the item under discussion. He may also call a speaker to order if his remarks are not relevant to the matter under discussion.

RULE 14

The President, in the exercise of his functions, remains under the authority of the Conference.

RULE 15

During the discussion on any matter, a representative may at any time raise a point of order, which shall be immediately decided by the President in accordance with these rules of procedure. A representative may appeal against the ruling of the President. The appeal shall be immediately put to the vote and the President's ruling shall stand unless overruled by a majority of the representatives present and voting. A representative raising a point of order may not speak on the substance of the matter under discussion.

RULE 16

During the discussion of any matter, a representative may move the adjournment of the debate on the item under discussion. Any such motion shall have priority. In addition to the proposer of the motion, one representative shall be allowed to speak in favour of, and one representative against, the motion.

RULE 17

During the course of the debate, the President may announce the list of speakers and, with the consent of the Conference, declare the list closed. The President may, however, accord the right of reply to any representative if, in his opinion, a speech delivered after he has declared the list closed makes this desirable. When the debate on an item is concluded because there are no other speakers, the President shall declare the debate closed. Such closure shall have the same effect as closure by decision of the Conference pursuant to rule 18.

RULE 18

A representative may, at any time, move the closure of the debate on the item under discussion, whether or not any other representative has signified his wish to speak. Permission to speak on the motion shall be

accorded only to two speakers opposing the closure after which the motion shall be put to the vote immediately

RULE 19

1. No one may address the Conference without having previously obtained the permission of the President. Subject to rules 15 to 18, the President shall call upon speakers in the order in which they signify their desire to speak

2. Debate shall be confined to the question before the Conference and the President may call a speaker to order if his remarks are not relevant to the subject under discussion

3. The Conference may limit the time allowed to speakers and the number of times the representative of each State may speak on a question; permission to speak on a motion to set such limits shall be accorded only to two representatives in favour of and to two opposing such limits, after which the motion shall be put to the vote immediately. In any event, the President shall limit interventions on procedural questions to a maximum of five minutes. When the debate is limited and a speaker exceeds the allotted time, the President shall call the speaker to order without delay

RULE 20

Proposals and amendments shall normally be introduced in writing and submitted to the Executive Secretary of the Conference, who shall circulate copies to the delegations. As a general rule, no proposal shall be discussed or put to the vote at any meeting of the Conference unless copies of it have been circulated to all delegations not later than the day preceding the meeting. The President may, however, permit the discussion and consideration of amendments or motions as to procedure even though these amendments or motions have not been circulated or have only been circulated the same day

RULE 21

A proposal, amendment or motion may be withdrawn by its sponsor at any time before voting on it has commenced, provided that it has not been amended. A proposal or a motion thus withdrawn may be reintroduced by any representative

RULE 22

When a proposal or an amendment has been adopted or rejected, it may not be reconsidered unless the Conference, by a two-thirds majority of the representatives present and voting, so decides. Permission to speak on the motion to reconsider shall be accorded only to two speakers opposing the motion, after which it shall be put to the vote immediately

CHAPTER V VOTING

RULE 23

Each State participating in the Conference shall have one vote, and the decisions of the Conference shall be made by a majority of the representatives present and voting

RULE 24

For the purpose of these rules, the phrase "representatives present and voting" means representatives casting an affirmative or negative vote. Representatives who abstain from voting shall be considered as not voting

RULE 25

The Conference shall normally vote by show of hands, but any representative may request a roll-call, which shall be taken in the English alphabetical order of the names of the States participating in the Conference, beginning with the delegation whose name is drawn by lot by the President

RULE 26

After the President has announced the commencement of voting, no representative shall interrupt the vote except on a point of order in connection with the actual process of voting. Explanations of their votes by representatives may, however, be permitted by the President either before or after the voting. The President may limit the time to be allowed for such explanations

RULE 27

Parts of a proposal shall be voted on separately if a representative requests that the proposal be divided. Those parts of the proposal which have been approved shall then be put to the vote as a whole; if all the operative parts of a proposal have been rejected, the proposal shall be considered rejected as a whole. For the purpose of this rule, the word "proposal" shall be considered as including amendments

RULE 28

When an amendment is moved to a proposal, the amendment shall be voted on first. When two or more amendments are moved to a proposal, the Conference shall first vote on the amendment furthest removed in substance from the original proposal and then on the amendment next furthest removed therefrom, and so on until all the amendments have been put to the vote. Where, however, the adoption of one amendment necessarily implies the rejection of another amendment, the latter amendment shall not be put to the vote. If one or more amendments are adopted the amended proposal shall then be voted on. A proposal is considered an amendment to another proposal if it merely adds to, deletes from or revises part of that proposal

RULE 29

If two or more proposals relate to the same question, the Conference shall, unless it decides otherwise, vote on the proposals in the order in which they were submitted. The Conference may, after each vote on a proposal, decide whether to vote on the next proposal

RULE 30

All elections shall be held by secret ballot, unless otherwise decided by the Conference

RULE 31

1. If, when one person or one delegation is to be elected, no candidate obtains the required majority in the first ballot, a second ballot shall be taken, which shall be restricted to the two candidates obtaining the largest number of votes

2. In the case of a tie in the first ballot among the candidates obtaining the second largest number of votes, a special ballot shall be held for the purpose of reducing the number of candidates to two. In the case of a tie among three or more candidates obtaining the largest number of votes, a second ballot shall be held; if a tie results among more than two candidates, the number shall be reduced to two by lot

RULE 32

If a vote is equally divided on matters other than elections, a second vote shall be taken after an adjournment of the meeting for 15 minutes. If this vote is also equally divided, the proposal shall be regarded as rejected

CHAPTER VI OFFICIAL AND WORKING LANGUAGES

RULE 33

Chinese, English, French and Russian shall be the official languages of the Conference, and English and French the working languages of the Conference

RULE 34

Speeches made in one of the official languages of the Conference shall be interpreted into the other such languages. A representative may speak in a language other than a language of the Conference if the delegation concerned provides for interpretation into one such language

CHAPTER VII SOUND RECORDINGS

RULE 35

Plenary meetings of the Conference and committee meetings shall have sound recordings and such recordings shall be kept by the Secretariat in English only

CHAPTER VIII PUBLIC AND PRIVATE MEETINGS

RULE 36

The plenary meetings of the Conference and the meetings of its committees shall be held in public unless the body concerned decides that exceptional circumstances require that a particular meeting be held in private

CHAPTER IX COMMITTEES

RULE 37

The Conference may establish such committees as may be necessary for the performance of its functions. Items relating to the same category of subjects may be referred to the committee dealing with that category of subject

RULE 38

Each committee shall elect its own Chairman, Vice-Chairman and Rapporteur

RULE 39

In so far as they are applicable, these rules shall apply to the proceedings of the committees. A committee may dispense with certain language interpretations

CHAPTER X OBSERVERS

RULE 40

Representatives of associate members of the Economic and Social Commission for Asia and the Pacific that are not independent States may

participate, without the right to vote, in the deliberations of the Conference and its committees

RULE 41

1 Representatives of the specialized agencies invited to the Conference may participate, without the right to vote, in the deliberations of the Conference and its committees, on the invitation of the President or the Chairman of a committee, as the case may be, on questions within the scope of their activities

2 Written statements of such specialized agencies shall be distributed by the Secretariat to the delegations at the Conference in the languages and in the quantities that such statements are made available to the Secretariat

RULE 42

1 Observers designated by other intergovernmental organizations and non-governmental organizations invited to the Conference may participate, without the right to vote, in the deliberations of the Conference and its committees and, on the invitation of the President or the Chairman of a committee, as the case may be, may make oral statements on subjects in which these organizations have a special competence

2 Written statements of such organizations on subjects in which they have a special competence and which are related to the work of the Conference shall be distributed by the Secretariat in the languages and in the quantities that such statements are made available to the Secretariat

CHAPTER XI AMENDMENTS

RULE 43

These rules of procedure may be amended by a decision of the Conference