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(ITU) للاتصالات الدولي الاتحاد في والمحفوظات المكتبة قسم أجراه الضوئي بالمسح تصوير نتاج (PDF) الإلكترونية النسخة هذه والمحفوظات المكتبة قسم في المتوفرة الوثائق ضمن أصلية ورقية وتئيقة من نقلاً

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# **Decisions of the XVth CCIR Plenary Assembly**



by E. J. WILKINSON



and R. C. KIRBY Director, CCIR

# Introduction

I N the April 1982 issue of the *Telecommunication Journal* (pages 208-209), limited information about the XVth Plenary Assembly of the International Radio Consultative Committee, held from 16 to 26 February 1982 in Geneva, was given. The results of CCIR studies which preceded it and the conclusions of the XVth Plenary Assembly are now summarized. Some implications of a practical nature are given concerning the preparations for the forthcoming radio conferences and regarding the development and operation of radiocommunication systems.

CCIR's main activities concern the technical aspects of spectrum utilization, propagation of radio waves and standards for performance and compatible interworking of radio systems.

A special Interim Working Party, IWP PLEN./1, under the chairmanship of

Mr. A. Bastikar (Canada), reviewed the structure and organization of the CCIR during the period between the XIVth and XVth Plenary Assemblies. The report which was produced by this IWP constituted the main source of information for the work of the Plenary Assembly's Organization Committee. It was decided that the present structure of the Study Groups should be maintained and only minor changes should be made to the titles and terms of reference of some of the Study Groups. In some cases, the number of vice-chairmen was increased for a Study Group where growth in the volume of work justified the increase. The increase in vice-chairmen also allows a greater participation of the developing countries in the leadership of the CCIR's Study Groups.

The work is carried out by 13 Study Groups (see table I). To expedite the Work of Study Groups on some particularly urgent or very specialized problems, where appropriate, Interim Working Parties are set up by the Study Groups, working mainly by correspondence.

Recommendations and Questions for study are approved by the Plenary Assembly, held every three to four years. Administrations, recognized private operating agencies, scientific and industrial organizations and international organizations participate in the work.

CCIR Recommendations and Reports provide the main technical bases for the ITU administrative radio conferences which establish international frequency allocations, radio regulations and, for certain services, the plans of frequency assignments and location of stations or orbital positions of satellites for specific uses. They also provide standard system characteristics for television and sound broadcasting, maritime and land mobile services, satellite and microwave radiorelay links and certain other services. CCIR Recommendations are frequently the basis of national planning and regu-

#### Table I

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Designation	Title	Chairman	Vice-Chairmen
Study Group 1	Spectrum utilization and monitoring	K. Olms (Federal Republic of Germany)	M. J. Hunt (Canada) R. G. Struzak (Poland)
Study Group 2	Space research and radioastronomy	F. Horner (United Kingdom)	H. G. Kimball (United States)
Study Group 3	Fixed service at frequencies below about 30 MHz	H. Kaji (Japan)	A. Gueye (Senegal)
Study Group 4	Fixed-satellite service	E. R. Craig (Australia)	E. Hauck (Switzerland) G. Mesias (Colombia) P. Remidi (Indonesia)
Study Group 5	Propagation in non-ionized media	A. Kalinin (USSR)	H. T. Dougherty (United States)
Study Group 6	Propagation in ionized media	L. W. Barclay (United Kingdom)	Miss G. Pillet (France)
Study Group 7	Standard frequencies and time-signals	J. McA. Steele (United Kingdom)	S. Leschiutta (Italy)
Study Group 8	Mobile services	G. Hempton (United States)	E. George (Federal Republic of Germany) K. P. W. Menon (Malaysia)
Study Group 9	Fixed service using radio-relay systems	J. Verrée (France)	M. Murotani (Japan) H. Willenberg (Federal Republic of Germany)
Study Group 10	Broadcasting service (sound)	C. Terzani (Italy)	H. Eden (Federal Republic of Germany) O. P. Khushu (India)
Study Group 11	Broadcasting service (television)	M. Krivosheev (USSR)	S. Aguerrevere (Venezuela) C. A. Siocos (Canada) Wu Xian-Lun (People's Republic of China)

#### List of CCIR Study Groups and their Chairmen and Vice-Chairmen

### **CCIR/CCITT** Joint Study Groups

Designation	Title	Chairman	Vice-Chairmen
CMTT	Transmission of sound broadcasting and tele- vision signals over long distances	Y. Angel (France)	W. G. Simpson (United Kingdom)
СМУ	Vocabulary	M. Thué (France)	S. J. Aries (United Kingdom) M. Ducommun (Switzerland) J. M. Pardo Horno (Spain)

lations. The CCIR works closely with the International Telegraph and Telephone Consultative Committee (CCITT) on matters related to the interface with the non-radio elements of telecommunication networks.

In the interval between the XIVth Plenary Assembly (Kyoto, 1978) and the XVth Plenary Assembly (Geneva, 1982), some 1200 delegates from 59 countries participated in the Interim and Final Study Group meetings of the CCIR. The XVth Plenary Assembly approved 283 Recommendations and 596 Reports of which a number were either maintained or revised from previous texts. Thirty-four entirely new Recommendations were approved as well as 149 Reports. The material will appear in 14 volumes to be published over the period from July 1982 to June 1983. Certain lengthy Reports are to be published separately.

The CCIR's most important results which were achieved during the 1978-1982 period are indicated hereafter.

## System characteristics

Some of the most significant decisions of the XVth Plenary Assembly concern broadcasting systems, mobile communications, microwave radio-relay, and point-to-point satellite service.

# **Broadcasting systems**

The CCIR unanimously adopted its first Recommendation on digital coding for

television, leading to standardization of video signals and equipment in television studios of the future (Recommendation 601). The principal provisions are:

- a) component coding based on the luminance signal and the two colour-difference signals;
- allowance for an extensible family of compatible digital coding standards;
- c) the family member to be used with main digital studio equipment and for international programme exchange is the 4:2:2 member, in which the sampling frequency is 13.5 MHz for the luminance signal and 6.75 MHz for each of the two colour-difference signals. The same sampling frequencies are applicable both to 525 lines/60 fields/seconds systems and to 625 lines/50 fields/second systems. Sampling structures are orthogonal and line, field and picture repetitive in both systems;
- d) uniformly quantized PCM, using 8 bits for each component signal.

The Recommendation is applicable to studio television including recording. It will provide the basis for a single world standard for exchange of digital colour television programmes. As a consequence the CMTT was able to define a number of guiding principles on encoding for transmission purpose and established Recommendation 604 intended both for post-production and for broadcasting. Today, because of different analog standards, elaborate standards conversion is often necessary for programme exchange. The new standard does not apply to the final broadcast emission and therefore has no effect on receivers in use by the public.

A revised CCIR Report 624 (which completes CCIR Recommendation 470) gives up-to-date technical details on the television broadcasting standards used by all countries.

A new Report 957 on "teletext" systems (systems intended to transmit textual or graphical information by means of the television broadcasting networks, in-tended to be displayed on television screens in selectable pages) defines this service and much of the complex terminology, while presenting technical characteristics of different systems. At present, the field blanking interval is used for this data broadcasting service. which is in regular operational service in some countries and is experimental in others. It appears unlikely that a single standard will be adopted internationally for this service, but perhaps a useful level of compatibility can be achieved,

also with the interactive videotex service.

A series of new or revised Reports outlines major features of satellite broadcasting systems and equipment, including the space segment and ground receiving equipment (Reports 215, 473, 632, 808, 810, 953, 954, 955). A comprehensive new Report on the implementation of systems and the economic aspects of satellite broadcasting was approved to provide guidance to developing countries. This Report which was prepared by Interim Working Party PLEN./3, under the chairmanship of Mr. T. V. Srirangan (India), completes and supersedes the previous editions.

The advent of digital technology also marked an important step toward the improvement of the sound reproduction quality for sound broadcasting systems. One revised and two new Reports in the field of studio digital techniques (Reports 799, 948 and 949) as well as one new Report concerning the use of digital coding for the emission of high quality sound signals in satellite broadcasting (Report 953) were adopted.

#### Mobile communications

Automated maritime mobile radiotelephonyatVHFandUHFisnowstandardized in a comprehensive new Recommendation (586) covering system configuration and signalling. The CCIR digital selective calling standard (Recommendation 493), also revised, is a basis for the automation. Co-operation with the Intergovernmental Maritime Consultative Organization (IMCO)\* has strengthened on all radio aspects of distress and safety, and a new Report (747) gives technical and operating considerations for the proposed future global distress and safety system; emergency position indicating radiobeacons (EPIRBs) for use in a maritime satellite system are under study and two Reports (749 and 761) are given. A number of other Recommendations and Reports were adopted on maritime mobile-satellite systems, including interface, access and performance objectives for systems connected to the land network.

A revised Recommendation gives technical characteristics and frequency channels for land mobile communication between 25 and 1000 MHz (Recommendation 478). Standard codes and formats for radio-paging were adopted (Recommendation 584). The use of radiating/leaky cable systems in the land mobile service for use in tunnels and buildings are described in new Report 902.

For the aeronautical mobile services, new Reports with protection criteria and general considerations on harmful interference have been prepared (Reports 926 and 927).

In view of the planned Region 1 Administrative Radio Conference for FM sound broadcasting in the VHF band (1982 and 1984), a Report was prepared on the compatibility between the broadcasting service in the 87-108 MHz and the aeronautical services in the 108-136 MHz (Report 929).

#### Microwave radio-relay

Digital technique, with the trend towards replacing many analog techniques by digital systems, is the most notable development in microwave radiorelay systems. Most analog techniques have already been standardized. Limits for bit error rate standards for telephony were adopted (Recommendation 594). Performance objectives for digital radio-relay systems are also reported (Report 930).

For non-telephonic transmission of an integrated services digital network (ISDN), a performance objective in the form of "error-free seconds" has been discussed. Radio frequency channel arrangements were adopted for high-capacity digital systems in the 17.7 to 19.7 GHz band (Recommendation 595).

Another new Recommendation (596) covers baseband interconnection of digital radio-relay systems.

#### Point-to-point communication via satellite

After some 17 years of operation, the fixed service using communication satellites is a firmly established major telecommunication medium throughout the world. More than half of the intercontinental telecommunication service is provided by satellites, and domestic services have begun or are planned in more than 35 countries. CCIR's first Report on optimum frequency bands for space communications was prepared in 1959. Because communication satellites could be introduced initially only by sharing frequency bands already used by terrestrial microwave fixed services, problems of frequency sharing received attention from the outset. Since 1971, CCIR studies have provided the main technical bases for satellite matters in administrative radio conferences and have had a major impact in the establishment of new services such as the broadcasting-satellite and the inter-satellite services.

<sup>\*</sup> IMCO has since changed its name into "International Maritime Organization" (IMO).

Today, Study Group 4 specializes in the fixed-satellite service, concentrating in the following areas:

- fundamental technical criteria for spectrum utilization and for efficient utilization of the geostationary orbit;
- frequency sharing and co-ordination procedures among fixed-satellite service networks and with other space and terrestrial services;
- transmission techniques and characteristics for analog and digital system, including technical parameters of the feeder links to the broadcasting-satellite service.

The emphasis has gradually shifted from initial adaptation of terrestrialbased technology to the development of new standards, particularly for the introduction of digital transmission and for the use of frequencies above 10 GHz. Co-ordination with the fixed service (terrestrial) and with the work of the CCITT is especially important in view of areas of mutual interest.

Work was begun on a handbook on "the fixed-satellite service", aimed at providing useful information for developing countries.

An important new Recommendation (579) deals with the availability performance objective for a hypothetical reference circuit and a hypothetical reference digital path for telephony in the fixed-satellite service. A new Report in response to Resolution No. 18 of the Plenipotentiary Conference (Malaga-Torremolinos, 1973) gives information on low-capacity earth stations and associated satellite systems in the fixedsatellite service (Report 869). Another Report on the maximum permissible interference in single-channel-per-carrier transmissions, is also of special significance (Report 867).

A new Recommendation (580) concerning reference radiation diagrams of earth stations, with particular reference to side-lobe reduction, was adopted after some modifications required to obtain consensus.

Three new Reports reflect the continuing high level of interest in frequency sharing and orbital utilization problems:

• Report 871: Calculation of the equivalent satellite link noise temperature and the transmission gain

• Report 870: Technical co-ordination methods for communication-satellite systems

• Report 866: Interference allocations in analogue FM systems operating at frequencies greater than 10 GHz in the fixed-satellite service.

Frequency sharing between networks of the fixed-satellite service and those of other space radiocommunication systems also received considerable attention with the following resulting new Reports:

• Report 872: Sharing criteria between inter-satellite links connecting geostationary satellites in the fixed-satellite service and the radionavigation service at 33 GHz

• Report 873: An analysis of the interference from the broadcasting-satellite service of one Region into the fixedsatellite service of another Region around 12 GHz

• Report 874: Frequency sharing between the inter-satellite service when used by the fixed-satellite service and other space services

• Report 877: Interference criteria for digital radio-relay systems sharing frequency bands with the fixed-satellite service.

## Data relay satellites

The use of data relay satellites has considerably advanced beyond the stage of its introduction in the field of space research. Concise information is now given concerning basic system characteristics for data relay satellites used for Earth exploration (Reports 692 and 848). In addition, analyses are offered of the possibilities of frequency sharing between data relay satellite systems and other systems both space and terrestrial (Reports 846 and 847; Recommendation 511). Considerable use of data relay satellites by the mobile, Earth resources, meteorological and space research services is foreseen.

#### Standard frequencies and time signals

An enlarged version of Report 518 examines and compares the relative merits of both existing and projected satellite systems for time and frequency transfers. Satellite systems will hopefully circumvent many of the difficulties and limitations which affect groundbased standard frequency and timesignal services.

A comprehensive world-wide survey on various atomic standards and quartz crystal generators is contained in new Report 898. This Report together with updated Report 364 on the performance and reliability of frequency standards gives advice to CCITT Study Group XVIII (Digital networks).

The emission of time codes is appreciated in many areas. It is recommended that any additional code transmission should make use of one of the existing codes (Recommendation 583).

## Propagation

CCIR Recommendations and Reports on radio-wave propagation guide system planning activities in various countries and serve as the basis for most international arrangements for the estimation of interference and the sharing of frequencies.

For a number of years standard methods have been provided for ground-wave, microwave and beyond-the-horizon systems, mobile and broadcasting services, satellite communication and HF ionospheric systems. The XVth Plenary Assembly revised and updated most of the Recommendations and Reports in this field and nine new ones were approved. Substantial changes were especially made in the following Reports:

• Report 338: Propagation data for line-of-sight radio-relay systems

• Report 564: Propagation data for space telecommunication systems

• Report 565: Propagation data for broadcasting from satellites at frequencies above 10 GHz.

Basic changes were also made to Report 563 on radiometeorological data as regards the world's rainfall regions, to meet the requirements for planning satellite and microwave services.

In particular, the world's oceans are now included in the rainfall regions and this makes it possible to predict long-distance interference propagation in the case of overseas paths.

New information is also provided on the height of rain formations, and this is not only of importance for the prediction of interference due to rain scatter but also for attenuation on the slant path between the Earth and satellites.

A revised and simplified method for the prediction of high-frequency ionospheric propagation (Report 894), suitable for use in planning broadcasting in the HF band was approved subject to further review.

The introductory text to the well-known "CCIR Atlas of ionospheric characteris-

tics" was considerably updated to make the material more practical and suitable for hand calculation (Report 340). The definitions concerning maximum transmission frequencies in Recommendation 373 were changed to "operational MUF" and "basic MUF". Both the terms "standard MUF" and "classical MUF" which were in use earlier, are now incorporated in the new term "basic MUF". Great attention was paid during the last study period to the special properties of the ionosphere in various geographical regions. As a result a new Report 886 on "special properties of the high latitude ionosphere affecting radiocommunications" was adopted.

Other important achievements concerning the investigation of ionospheric propagation at frequencies below 30 MHz are the new Reports 895 on "skywave propagation and circuit performance at frequencies below about 30 MHz" and 892 on "the computation of circuit reliability for HF radio systems".

In addition to the regular CCIR volumes of Study Groups 5 and 6, which contain the principal information on propagation, it was approved that a world atlas of ground conductivities, valid for frequencies in the VLF, LF and MF bands (see Resolution 73) be prepared. A companion Resolution 72 requests the Director of the CCIR to publish groundwave propagation curves using the *GRWAVE* computer program adopted by Study Group 5 for these purposes as a basis. Both the ionospheric and ground conductivity atlases are to be published as soon as possible.

# Spectrum utilization

A few Reports were adopted concerning new and future radiocommunication techniques which are of advantage to spectrum utilization. Among these are the Reports on bandwidth expansion, band-sharing techniques and multifunction telecommunication systems (Reports 826, 832 and 833). A new Report concerning the definition and estimation of spectrum occupancy was adopted and the existing Reports concerning the definition of spectrum use and efficiency were considerably updated (Reports 825 and 662). New Reports were adopted concerning techniques for the reduction of interference (Reports 830 and 831).

A new Recommendation 575 was approved on the protection of fixed monitoring stations against radio interference. A handbook on computer utilization in spectrum management was also approved and will be published shortly.

An important new study, following a Resolution of the WARC-79 is "to specify as soon as possible, the limits to be imposed on radiation from industrial scientific and medical (ISM) equipment". An Interim Working Party, IWP 1/4, was established to conduct this study in close co-operation with the International Special Committee for Radio Interference (CISPR).

Another new Interim Working Party, IWP 1/5, has already started its work on the preparation of an updated version of the CCIR handbook for "Monitoring stations".

# Administrative radio conferences

Some ten ITU administrative radio conferences are foreseen during the 1980s to plan the use of the spectrum by various services and to adopt further necessary radio regulations.

The XVth Plenary Assembly already noted completion of CCIR technical preparation for two such conferences:

- the Region 1 (Europe, Africa and certain neighbouring countries) VHF Broadcasting Conference, in 1982;
- the WARC on Mobile Telecommunications, in 1983.

The Report on mobile telecommunication covers channel spacing, use of shared bands, distress and safety communications, numerical identification of ship stations, and other topics.

A preliminary Report has been prepared for the Region 2 Satellite Broadcasting Conference, to be held in July 1983. This conference will have the responsibility to plan frequency-and the orbitutilization for satellite broadcasting in the 12 GHz band in the Region of the Americas. The Plenary Assembly decided to set up a CCIR Conference Preparatory Meeting (special joint meeting of Study Groups) to be held from 26 June to 9 July 1982. The CCIR Report to the conference, based on the preliminary studies and the decision of the Plenary Assembly, is to cover: terminology, propagation factors; technology for broadcasting-satellite systems; elements for feeder-link and down-link planning; frequency sharing

within the broadcasting-satellite service, with other services, and with other Regions.

Progress in CCIR preparation for the High-Frequency Broadcasting Conference (1984) was also noted, with a decision to leave approval of final texts to Study Groups 6 and 10. These texts cover an improved, simplified, computerized propagation prediction method adapted for use in planning HF broadcasting and to make Recommendations where these do not already exist for protection ratios, channel spacing, and minimum signal-to-noise ratios. Finally, CCIR will report on the possible eventual introduction of single sideband broadcasting and the specifications for a suitable system.\*\*

Preliminary work has also been carried out for the WARC on the geostationary satellite orbit and the planning of the space services utilizing it. The objective of this conference will be "to guarantee in practice for all countries equitable access to the geostationary satellite orbit and the frequency bands allocated to space services". The CCIR studies are to provide the first session (1985) with technical information concerning principles, criteria and technical parameters, including those necessary for planning space services. The preliminary Report considered by the XVth Plenary Assembly covers: technical principles of efficient orbit/spectrum utilization; propagation; frequency sharing between space networks; frequency sharing between space and terrestrial services; planning methods for equitable access to the geostationary orbit; technical characteristics of the fixed-satellite service and theoretical capacity of the geostationary satellite orbit; technical characteristics and requirements of various services using the geostationary satellite orbit, such as the inter-satellite service, the space-operation service, the broadcasting-satellite service, the mobile-satellite service, the Earth-exploration service, the meteorological-satellite service and other services. An analysis is given of all the frequency sharing problems foreseen according to the present allocation table. The Plenary Assembly decided to set up a CCIR Conference Preparatory

<sup>\*\*</sup> It should be noted that in connection with the recent decision of the 37th Session of the Administrative Council, the CCIR is now requested to undertake studies on all of the items included in the agenda of this conference.

Meeting (special joint meeting of Study Groups) to be held in two sessions, the first in the early part of 1983.

# **Technical co-operation**

The Technical Co-operation Committee of the XVth Plenary Assembly noted the increase in technical assistance work carried out in accordance with CCIR Resolution 33-3, particularly the preparation of contributions to special tutorial publications on subjects of interest to the developing countries, such as the forthcoming handbooks on the fixed-satellite service and on the use of monitoring stations, as well as the special publication "Satellite-broadcasting systems" produced by Working Party PLEN./3 established by the XVth Plenary Assembly.

The Committee noted that the Study Group Chairmen's reports to the Plenary Assembly generally included a section on the problems of developing countries. The Director, in his report to the XVth Plenary Assembly had noted that participation by the developing countries in the work of the CCIR had increased but could be further improved. This point was endorsed by the Committee.

The Technical Co-operation Committee adopted three new Opinions and three new Resolutions:

• Opinion 77 on CCIR involvement in the work of the Special Autonomous Groups (GAS). Administrations are asked to encourage and enable certain of their Study Group participants to be involved in the work of the related Special Autonomous Groups. The CCIR is of the opinion that these and any other Special Autonomous Groups which may be set up now or in the future which, in the judgement of the Directors of the CCIR and the CCITT, involve radiocommunication matters, may be considered as joint CCIR/CCITT activities, within the framework of the CCITT management responsibilities.

• Opinion 78 on Study Group meeting venues. When possible, selected Study Group meetings should be convened in locations suited to the needs and resources of developing countries without this giving rise to additional costs.

• Opinion 80 on CCIR preparations for the Nairobi Plenipotentiary Conference. Matters of importance to developing countries in the work of the CCIR are brought to the attention of the 1982 ITU Plenipotentiary Conference.

• Resolution 80 on CCIR liaison with regional telecommunication (including broadcasting) organizations. Administrations should encourage regional telecommunication and broadcasting organizations to acts as a focal point for regional studies of radiocommunication questions, taking into account the global activities of the CCIR Study Groups. The Director of the CCIR and the Secretary-General of the ITU encourage increased involvement by regional telecommunication organizations in CCIR activities.

• Resolution 84 on special handbooks. The Secretary-General is asked to consider the possibility of preparing handbooks on selected topics, specifically for the training of technicians and engineers in the developing countries, as a joint activity of the Training Division of the Technical Co-operation Department of the ITU General Secretariat in collaboration with the CCIR.

• In Resolution 81 the Director of the CCIR is asked to establish, from the staff of the CCIR Secretariat, a small technical writing project to prepare special publications on selected topics, within the existing staff resources and financial budget.

The CCIR is already involved in the preparation of several handbooks:

- the CCIR handbook for "Monitoring stations";
- the CCIR handbook on "Spectrum management and computer-aid techniques";
- the CCIR handbook for the "Fixed-satellite service";
- the CCIR handbook on "Sound and television recording"; and
- the CCIR "Book of antenna diagrams".

The Technical Co-operation Committee also examined the status of CCIR activities relative to several Resolutions and Recommendations of WARC-79:

Resolution No.5 — The Committee expressed the hope that studies and project activities related to propagation in tropical areas will be extended, and that means will be found to implement this Resolution.

Resolution No. 7 — The Committee reemphasized that the purpose of the meetings referred to in this Resolution was to design structures suitable for the establishment and operation of radio-frequency management systems.

Resolutions Nos. 15 and 16 and Recommendation No. 37 — Additional information was given on the status of the handbooks and other special publications, as noted above.

The Committee also requested the Director to prepare a report on the work of the CCIR of interest to the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE-II), held in Vienna in August 1982.

The increased participation of representatives of developing countries among the group of Chairmen and Vice-Chairmen of the CCIR Study Groups should be noted (see table I).

## Conclusion

The CCIR Study Group Chairmen and Vice-Chairmen (see table I) were also elected or re-elected by the Plenary Assembly.

As reported in the summary record of the closing session, the XVth Plenary broke many records: the volume of work accomplished, the volume of Study Group documents presented, the number of Recommendations approved.

It also introduced some important changes to the structure and working methods of the CCIR: the establishment of Conference Preparatory Meetings, the introduction of additional positions of Vice-Chairmen within the bigger Study Groups, a considerable growth in the number of countries from whom the Study Group leaders are drawn.

Despite the very large volume of work handled by the XVth Plenary and the inevitable difficulties which arose in harmonizing the wide range of viewpoints presented, the goodwill of the participants enabled mutually acceptable and therefore successful conclusions to be reached on all matters considered.

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