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SCIENCE COMMITTEE

ACTIVITIES OF INTERNATIONAL ORGANIZATIONS CONCERNED WITH METEOROLOGY

Note by the Secretary

The attached document is in response to the request(2) of the Committee for information concerning the activities of international organizations concerned with meteorology. It is issued as background for the discussion of Item IV of the Agenda(3) at the forthcoming meeting.

(Signed) J. LECONTE

OTAN/NATO,
Paris, XVIe.

(1) This document becomes NATO UNCLASSIFIED when Annex III is detached.
(2) AC/137-R/19, paragraph 94
(3) AC/137-A/20

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ACTIVITIES OF INTERNATIONAL ORGANIZATIONS CONCERNED WITH METEOROLOGY

I. THE WORLD METEOROLOGICAL ORGANIZATION (WMO)

1. For information concerning the structure and function of the World Meteorological Organization, Committee Members are referred to document AC/137-D/139(Revised) (page 29). Since the issue of this document, there have been several important changes in the activities of the World Meteorological Organization, largely as a result of resolutions adopted by the General Assembly of the United Nations. Annex I contains an outline of the recent activities of the World Meteorological Organization.

II. THE INTERNATIONAL ASSOCIATION OF METEOROLOGY AND ATMOSPHERIC PHYSICS (IAMAP)

2. Unlike the World Meteorological Organization, the International Association of Meteorology and Atmospheric Physics is a non-governmental international scientific organization. It forms part of the International Union of Geodesy and Geophysics (IUGG), through which it is affiliated to the International Council of Scientific Unions (ICSU).

Annex II gives a brief account of the structure and activities of the International Association of Meteorology and Atmospheric Physics.

III. THE STANDING GROUP METEOROLOGICAL COMMITTEE (SGMC)

3. The Terms of Reference of the Standing Group Meteorological Committee are given in Annex III, together with a note outlining its principal activities.

WORLD METEOROLOGICAL ORGANIZATION

STRUCTURE AND ROLE OF THE WORLD METEOROLOGICAL ORGANIZATION(1)

Introduction

1. The questions raised in United Nations Resolutions 1721 (XVI), 1802 (XVII) and 1963 (XVIII) involve the World Meteorological Organization in all its normal tasks. These include all aspects of atmospheric sciences such as their application to weather prediction, the development of international observation and telecommunication networks, and the promotion of research. They also include assistance to new or developing countries in their effort to establish or improve the meteorological service, to promote research and to create training institutes. Consistent with the World Meteorological Organization Convention and by tradition, the World Meteorological Organization maintains and extends its international co-operation with governmental and non-governmental organizations for fostering the atmospheric sciences at all levels.

2. The World Meteorological Congress is the supreme body of the Organization which meets at intervals of about four years. Its main tasks are to determine the policy of the Organization for the following four years, establish the technical programme of the Organization and fix the budget for the interval between successive Congresses.

3. The last Congress (April 1963) took encouraging action to promote all aspects of the atmospheric sciences and their application to weather forecasting with particular emphasis to developments in outer space.

4. Between sessions of the World Meteorological Congress, the Executive Committee, comprising 21 members (President, 2 Vice-Presidents, the Presidents of the 6 Regional Associations and 12 elected members), meets annually and directs the technical work of the Organization by approving the recommendations of the Technical Commissions and taking action itself in the technical and administrative fields, as necessary, towards the execution of the policy decisions of Congress.

5. The technical work of the Organization rests mainly with the World Meteorological Organization's Technical Commissions which are as follows:

Commission for Aerology
Commission for Aeronautical Meteorology
Commission for Agricultural Meteorology

(1) The text of this Annex is from a document issued by the World Meteorological Organization, and is reproduced by the kind permission of the Secretary General of the World Meteorological Organization.

Commission for Climatology
Commission for Hydrometeorology
Commission for Instruments and Methods of Observation
Commission for Maritime Meteorology
Commission for Synoptic Meteorology

6. Whenever it is desirable that a particular problem should be studied by a group of experts, the Technical Commission or Regional Association concerned establishes a working group composed of experts in this field. At the moment there are about 100 such small working groups all actively working.

7. Problems of a regional nature are the responsibility of the six World Meteorological Organization Regional Associations, which deal mainly with observation networks, telecommunications and the regional application of decisions of Congress, the Executive Committee and Technical Commissions.

Measures taken by the above World Meteorological Organization bodies in relation to activities in Outer Space

8. The Fourth World Meteorological Congress, which was held in April 1963 in Geneva, formally accepted the responsibility placed upon the World Meteorological Organization by the Resolutions of the United Nations General Assembly and established a number of new programmes. Congress also took bold and constructive steps on the whole question of outer space activities and established a number of organizational improvements in order to carry out more efficiently its responsibilities in the field of atmospheric sciences.

Advisory Committee

9. As one of its principal actions, the Congress created a high-level World Meteorological Organization Advisory Committee with broad Terms of Reference in the fields of both research and operations. The Committee, now established, is composed of twelve members. These are:

Dr. G.P. Cressman	United States
Professor W. Dieminger	Federal Republic of Germany
Dr. P.K. Evseev	USSR
Professor K.I. Kondratiev	USSR
Professor L. Krastanov	Bulgaria
Dr. M. Nicolet	Belgium
Dr. P.R. Pisharoty	India
Dr. C.H.B. Priestley	Australia
Dr. W.O. Roberts	United States
Dr. R.C. Sutcliffe	United Kingdom
Professor S. Syono	Japan
Professor E. Vassy	France

These outstanding experts include scientists familiar with the activities of the International Council of Scientific Unions (ICSU) and of other scientific organizations. The Terms of Reference of the Committee are to advise the World Meteorological Organization Executive Committee concerning principal research problems in the atmospheric sciences, especially in connection with the application of meteorological satellites, on ways of promoting this research, and on methods of ensuring the availability of data for scientific purposes.

10. The Committee, at its first session held in Geneva in January 1964, discussed major operational problems and the overall policies and plans for training and education. It now appears that the Committee can advise on a wide range of problems, not only with the intent to identify problem areas but also to bring the best possible expert advice to bear on the methods of solving these problems.

11. As regards the technical work relating to activities in outer space carried out by the World Meteorological Organization Technical Commissions, the following Working Groups have, inter alia, been established:

Commission for Aerology

Working Group on Synthesis of High Atmosphere Data
Working Group on High Atmosphere
Working Group on the IQSY Meteorological Programme
Working Group on International Research Projects in Metecrology

Commission for Synoptic Meteorology

Working Group on the Synoptic Use of Meteorological Satellite Data
Working Group on Long-range Weather Forecasting

Commission for Instruments and Methods of Weather Observation

Working Group on Radiosondes
Working Group on Radiation Instruments and Observations for general use
Working Group on Special Radiation Instruments and Observations

World Weather Watch

12. The Congress also endorsed the concept of a World Weather Watch. This plan is proposed as an ultimate world weather service and will comprise the integration of national and international meteorological activities. It will involve a co-ordinated programme for making weather observations, for

communicating these observations to national, regional and world centres, for providing meteorological analyses and prognoses, and for their subsequent distribution to national services which desire them. Due to the complex nature of meteorological satellite systems, world-wide operational data from satellites will be available for processing only at a restricted number of centres. Therefore, an initial designation by the World Meteorological Organization of World Centres was restricted to Moscow and Washington, since these Centres would have available the satellite data from spacecraft operated by the Soviet Union and the United States. In the future, however, it is considered important that a third World Centre be established in the Southern Hemisphere.

13. In considering these plans and the vast increase of meteorological data to be available, both conventional and satellite, great concern has been expressed that necessary improvements in international meteorological telecommunications will not be realised soon enough to make the information available satisfactorily. Similar concern has been expressed regarding the vast gaps over oceanic areas in the world-wide network of conventional, particularly upper-air observations. These problems have, therefore, been cited for particular attention by the World Meteorological Organization in the early stages of its planning.

Research in Atmospheric Sciences

14. The Second Report on "The Advancement of Atmospheric Sciences and their Application in the Light of Developments in Outer Space" contains a comprehensive list of scientific problems of meteorology. The World Meteorological Organization Advisory Committee, when reviewing this report, undertook the task of selecting a number of items which, by virtue of their importance or imminence, should receive higher priority in their study. When making its recommendation, the Committee was guided by the principle that only research could bring about significant improvements in the application of atmospheric sciences in such important fields as transport by land, sea and air, food production, public health, land use, water resource development and communications.

15. Those fields requiring intensified research were, in the opinion of the Committee, inter alia, atmospheric composition and structure, solar and other external influences on the earth's atmosphere, interaction between upper and lower atmospheric layers, interation on earth's surface and atmosphere, cloud and precipitation physics, atmospheric pollution, weather prediction, modification of weather and climate, research in sensors and measuring techniques.

16. Another important problem was considered at great length, namely the modification of weather and climate. While control of weather and climate on a microscale is now an accepted and well understood practice, the Committee noted that control experiments are also being made on the scale of clouds and small cloud systems. However, control on any large scale, at present, remains entirely conjectural. Since the route towards the large scale objective will need to rely on fundamental studies in the general circulation, the Committee stressed that only when our understanding of the effects of changes in energy sources, albedo, etc. and of ocean circulation linkage is greater than it is at present, will a real prospect of large scale artificial modification be open. The Committee, however, stressed that before experiments on large scale modifications are attempted full assurance must be obtained that the full consequences can be predicted and that harm will not result.

New Development Fund

17. The World Meteorological Organization has, for a number of years, been active in the various assistance programmes of the United Nations. The extent of the World Meteorological Organization participation in the Expanded Programme of Technical Assistance, the Special Fund, OPEX and the Congo, has increased progressively, and now constitutes a large and active programme. Nevertheless, such support has not been sufficient to respond fully to the requirements for general development of meteorological facilities and services throughout the world. Furthermore, in each of these programmes, there are particular limitations as to the types of activities which can be financed, and these limitations have precluded the possibility of making certain improvements requiring capital expenditures.

18. The recent World Meteorological Organization Congress, because of these limitations, and the increasing requirements placed upon the Organization, authorised the establishment of a New Development Fund. The initial approved amount, for the financial period beginning 1st January, 1964, was for 1.5 million United States dollars. This Fund will be used to give particular attention to development of observation networks and associated telecommunications, and to provide assistance to World Meteorological Organization members in the procurement of equipment for operational purposes. Attention will also be given to the need of assistance to members in meeting their regional obligations which do not qualify under any of the United Nations Technical Co-operation programmes. Authorisation to incur expenditures was made contingent upon approval of the plan by members of the Organization, and approval of projects and annual expenditures by the Executive Committee.

New Satellite Technology

19. Of particular importance among the new developments in satellite technology is the recent experimental introduction of an automatic picture transmission system (APT), which is, at present flown successfully on TIROS VIII. This is a separate camera system which is included in the satellite instrumentation without replacing other functional elements of the spacecraft. The automatic picture transmission system provides photographic data of an area roughly 1,600 km. in radius of the ground station. The photographs are taken when the satellite is in sunlight and are transmitted automatically to ground stations suitably equipped to receive transmissions.

20. The ground equipment required for receipt of these photographs is relatively simple and may be obtained and installed for less than $50,000. Information has been received that such ground stations are successfully operating in France, India, Australia and the United States. This new device is of great importance for weather prediction and meteorological research, in particular over ocean areas where conventional meteorological data are scarce.

Education and Training

21. The success of the meteorological satellite programme has produced atmospheric measurements which have great potential for both operational forecasting and research purposes in global meteorology. Since much of this information has hitherto been unavailable, and is therefore unfamiliar to the profession, a major concern is to provide adequate instruction and training in its use. In order to carry out its responsibilities in this field, the World Meteorological Organization is assisting in the sponsorship of a series of laboratory workshops in various parts of the world.

22. An initial international workshop was held in Washington, DC, (13th to 22nd November, 1961), with participants from many of the member weather services of the World Meteorological Organization. This was followed by a limited workshop on the use of satellite data in tropical areas, held in Tallahassee, Florida, (26th February to 1st March, 1963). Future plans call for another international workshop to be held in Tokyo later in 1964.

23. In the more general field of education and training, the Fourth Congress of the World Meteorological Organization urged that activities in the field of meteorological training should be pursued as a matter of high priority, with special attention to the following items:

(a) providing advice and guidance on all training questions to members, as required;

(b) maintaining adequate standards in the technical and scientific training of meteorological personnel throughout the world;

(c) assisting in national and regional programmes through participation by the World Meteorological Organization in the technical co-operation programmes of the United Nations;

(d) collaborating with United Nations, UNESCO, and other international organizations in their respective activities which have a bearing directly, or indirectly, on meteorological training.

Future Planning

24. The World Meteorological Organization Congress noted that recent dramatic advances in meteorological science and technology, together with associated advances in data processing and telecommunications, required that a completely new examination be made of the procedures and practices followed in national and international meteorology. It was considered that a group must be established which would consider the requirements of users of meteorological information resulting, in particular, from the operation of meteorological satellite systems. While considering these questions, the limitations in the world weather system should be determined, especially those which have resulted from shortages in trained manpower, equipment, communications and financial support. Congress accordingly authorised the establishment as from January 1964 of a Planning Unit in the World Meteorological Organization Secretariat to study these problems.

25. The new Planning Unit, attached to the Office of the Secretary General, will assist in the development of the detailed global plan for the World Weather Watch. It will also provide support to the Advisory Committee and other World Meteorological Organization bodies concerned with questions on outer space, and will assist in keeping the United Nations and its agencies fully informed with respect to the World Plan. In addition, it will keep under regular review the possibilities of obtaining financial assistance for implementation of the plan from sources external to the Organization.

26. More details on the activities of the World Meteorological Organization, as a result of Resolution 1963 of the XVIIIth session of the General Assembly of the United Nations, are given in a separate progress report which supplements the Second Report on "The Advancement of Atmospheric Sciences and their Application in the Light of Developments in Outer Space" (June 1963).

THE INTERNATIONAL ASSOCIATION OF METEOROLOGY AND ATMOSPHERIC PHYSICS (IAMAP)

1. The International Association of Meteorology and Atmospheric Physics was founded in 1919. Its objects are to promote the study of all problems on the physics of the atmosphere; to initiate, facilitate and co-ordinate in this field, those researches which require international co-operation; and to stimulate discussion and provide for the publication of the results of researches.

2. Countries which are members of the International Union of Geodesy and Geophysics may appoint delegates to the International Association of Meteorology and Atmospheric Physics, which meets in General Assembly every few years. The General Assembly elects a Bureau (President, two Vice-Presidents and a Secretary), which directs and co-ordinates the scientific activities of the Association. An Executive Committee, composed of the Bureau and three members from three different countries, provides guidance between meetings of the General Assembly.

I. SCIENTIFIC ACTIVITIES

3. The scientific activities of the International Association of Meteorology and Atmospheric Physics are mainly carried out under the guidance of Commissions established for the study of particular questions, and Joint Scientific Committees between the International Association of Meteorology and Atmospheric Physics and other associations.

There are Commissions concerned with:

(1) Atmospheric Radiation
(2) Atmospheric Ozone
(3) Atmospheric Chemistry and Radioactivity
(4) Meteorology of the Upper Atmosphere
(5) Polar Meteorology
(6) Dynamic Meteorology

4. There is also a Committee for Meteorological Data for Research and an Ad Hoc Committee for Cloud Physics and Cloud Modification.

The Joint Scientific Committees are concerned with:

(1) The Interaction between Atmosphere and Oceans (with the International Association of Physical Oceanography)

(2) Radiometeorology (with the International Scientific Radio Union (URSI) and IUGG)

(3) Solar-Terrestrial Relationships (with the International Astronomical Union, URSI and IUGG)

(4) Lunar Variations (with the International Association of Geomagnetism and Aeronomy)

Commissions and Joint Committees each elect a President and a Secretary from among their members (who are normally drawn from several countries). They meet at the same time as the General Assembly.

5. The most recent General Assembly was at Berkeley, in August 1963; the preceding one was at Helsinki in 1960. In addition to considering the reports and recommendations of the Commissions and Joint Committees, the General Assembly provides the occasion for scientific conferences on a number of topics, quite often chosen from the subjects studies by the Commissions or Committees, but not limited to these subjects.

6. The International Association of Meteorology and Atmospheric Physics maintains close relations with the World Meteorological Organization, and many of the recommendations made by the Association have been subsequently endorsed and implemented by the World Meteorological Organization.

THE STANDING GROUP METEOROLOGICAL COMMITTEE (SGMC)

NATO CONFIDENTIAL

I. TERMS OF REFERENCE

Composition

1. By authority of the Standing Group there is hereby established a Standing Group Meteorological Committee.

2. The Committee shall consist of one member from each of the nations represented on the Standing Group. Meteorological representatives of the Supreme Commanders, ACCHAN and the CUSRPG will be invited to participate in the work of the Committee. Each non-Standing Group nation will be invited to participate by sending an observer to the meetings, if they so desire. The Standing Group Meteorological Committee may invite consultants from NATO nations to participate in meetings, when required.

3. Each member shall be a specialist in meteorology and be in a position to represent the views of his nation on all meteorological matters pertaining to meteorological requirements for NATO.

4. To provide continuity of effort and to ensure close liaison and co-ordination with other Standing Group Committees and Teams, the Meteorological Committee shall provide itself with a meteorological officer of appropriate rank to serve as permanent secretary to the Committee.

Functions

5. The Meteorological Committee shall:

(a) advise the Standing Group on meteorological matters affecting the North Atlantic Treaty Organization and make appropriate recommendations as required;

(b) act as the co-ordinating agency for military meteorological policies, procedures and techniques as deemed necessary for the provision of the proper meteorological support for the military forces of the North Atlantic Treaty Organization;

(c) consult with the meteorological agencies of the nations of the North Atlantic Treaty Organization not represented on the Standing Group on meteorological matters affecting the Organization;

(d) provide, within the overall policy guidance of the Standing Group, policy guidance in meteorological matters to NATO nations, commands and the Canada-United States Regional Planning Group;

(e) recommend to the Standing Group the establishment of such permanent working groups as necessary;

(f) perform the following specific functions and such other functions as the Standing Group may direct:

(1) prepare guidance for NATO commands and nations relating to meteorological support for military organization and plans in peace and war;

(2) advise on policy and formulation of procedures for implementation of control of meteorological information in wartime;

(3) co-ordinate activities relating to the application to NATO requirements of the procedures of World Meteorological Organization (WMO) and the International Civil Aviation Organization (ICAO), particularly with respect to the provision of basic meteorological data and forecasts and to meteorological communications;

(4) determine the extent to which compatibility is required with regard to meteorological equipment, procedures, techniques and training, and prepare appropriate guidance;

(5) co-ordinate, integrate and review, as required, the meteorological aspects of military plans as submitted by NATO commands and the Canada-United States Regional Planning Group;

(6) establish policy guidance on the provision of Climatological studies for NATO;

(7) prepare plans for eliminating deficiencies affecting meteorological support to NATO forces;

(8) maintain liaison with NATO agencies concerned with meteorological research.

International Co-ordination

6. In peacetime, since international co-ordination of meteorological activities will normally be accomplished between and among the various nations and services by direct negotiation and through the World Meteorological Organization, action by the Meteorological Committee will be confined to those matters having a direct bearing on the military plans and activities of the North Atlantic Treaty Organization.

7. In wartime, action by the Meteorological Committee will be extended as necessary to encompass all aspects of international co-ordination of meteorological activities.

Frequency of Sessions

8. The Committee shall meet as often as necessary to ensure the efficient conduct of its business.

(a) The Committee will normally meet annually in peacetime, but may convene more frequently at the request of two members or as directed by the Standing Group;

(b) The Committee will not automatically convene on the declaration or beginning of war. However, the Committee may be convened during an alert or in wartime by the Standing Group or at the request of the Deputy Secretary, MET, or any member of the Committee.

Chairmanship

9. The Chairmanship of the Committee shall be held in turn by the members in accordance with a system agreed by the Committee.

Procedures

10. The Committee will observe procedures as laid down by the Standing Group.

Location

11. The Committee shall be located in Washington, DC. Meetings may be held elsewhere as necessary to meet the convenience of the members.

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ANNEX III to
AC/137-D/227

NATO SECRET

II. PRINCIPAL ACTIVITIES OF THE STANDING GROUP METEOROLOGICAL COMMITTEE

12. The Committee has established a Working Group on Weather Plans (WG/WP) and a Working Group on Weather Communications (WG/WC). These Working Groups each meet twice a year normally, while the main Committee normally meets once a year.

13. A Record of Meteorological Committee Studies (MSR) is published annually, the latest being MSR 10, 1st April, 1964. The Meteorological Committee Studies lists all of the problems currently under study by the Standing Group Meteorological Committee, and gives further references.

14. MSR 10 includes the following topics:

(1) Co-ordination with NATO civil agencies concerned with meteorology;

(2) Review of meteorological capability;

(3) Policy and general guidance in the provision of meteorological service to NATO;

(4) Strategic military concepts applied to meteorological planning;

(5) Status of weather analysis and/or fleet weather centres;

(6) Nomenclature of meteorological formations;

(7) Specialised meteorological observation equipment;

(8) Rawin/radiosonde observations;

(9) Encryption facilities for ocean weather stations;

(10) Sferics observations;

(11) Meteorological reconnaissance by aircraft;

(12) Plans for obtaining weather information from enemy territory;

(13) Meteorological satellites;

(14) Numerical weather prediction;

(15) Meteorological alert measures;

(16) FALLEX 64;

(17) Policy for the control of weather information;

(18) Sea ice formation;
(19) Cryptographic equipment requirements;
(20) Handbook of meteorological communications;
(21) Requirements for meteorological communications.