



UNITED NATIONS  
ECONOMIC  
AND  
SOCIAL COUNCIL



Distr.  
GENERAL

E/3886/Add.1  
6 May 1964

ORIGINAL: ENGLISH

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Thirty-seventh session  
Agenda item 6.

TWENTY-NINTH REPORT OF THE ADMINISTRATIVE COMMITTEE  
ON CO-ORDINATION

ANNEXES

## ANNEX I

### DRAFT FRAMEWORK OF FUNCTIONAL CLASSIFICATIONS FOR THE ACTIVITIES OF THE UNITED NATIONS, SPECIALIZED AGENCIES, AND IAEA IN ECONOMIC, SOCIAL AND HUMAN RIGHTS FIELDS RELATED TO THE DEVELOPMENT DECADE

The following classification is suggested as a guide for the manner in which activities of the United Nations, specialized agencies and IAEA, related to the objectives of the Development Decade, might be reported. It does not attempt to list specific projects or to cover the many activities of these organizations unrelated to these objectives. Nor does it reveal the comprehensive treatment given by certain agencies or groups of agencies to some complex subjects - e.g. preparation of young people for later responsibilities and certain aspects of scientific research. While some flexibility may be necessary in using this classification in making the special progress report called for by resolution 984 (XXXVI) Part I, it is believed that it will provide an orderly, comprehensible basis for preparation of the material requested in that resolution.

## I

### A. BROAD ISSUES AND TECHNIQUES RELATING TO DEVELOPMENT

1. Development trends and projections of development requirements and possibilities
2. Planning and programming
3. Institutional and administrative development
4. Adaptation and transfer of knowledge, methods and techniques
5. Development and provision of basic statistical information
6. Trade expansion
7. Development assistance, including provision of development finance, assistance in the improvement and application of methods and techniques for the mobilization of domestic and foreign capital, public and private; and food aid
8. International co-operation in the monetary field

B. DEVELOPMENT AND UTILIZATION OF HUMAN RESOURCES

1. Control of diseases and raising of health standards
2. Formulation and implementation of schemes and measures against famine, malnutrition and food deficits
3. Education and fostering of scientific and cultural development
4. Social welfare and security
5. Employment, organization and training
6. Rural and community development, including co-operatives
7. Social protection

C. DEVELOPMENT AND CONSERVATION OF PHYSICAL RESOURCES

1. Development of food and agriculture
2. Industrial development
3. Energy development
4. Water resource development
5. Mineral resource development
6. Housing, building and physical planning

D. DEVELOPMENT OF ESSENTIAL SERVICES

1. Development of transport
2. Development of communications, including postal services and telecommunications
3. Meteorology
4. Surveying and mapping

II

PROMOTION AND PROTECTION OF HUMAN RIGHTS

1. Collection, examination and publication of information
2. Elaboration of principles
3. Preparation of international instruments and measures of implementation
4. Development of human rights advisory services programme
5. Prevention of discrimination, and protection of minorities and refugees
6. Advancement of the status of women
7. Education of public opinion

### III

#### SPECIAL PROBLEMS

1. Natural disasters
2. Narcotics control

## ANNEX II

### COMMUNICATION OF THE ADMINISTRATIVE COMMITTEE ON CO-ORDINATION TO THE ADVISORY COMMITTEE ON THE APPLICATION OF SCIENCE AND TECHNOLOGY TO DEVELOPMENT

1. At its thirty-sixth session in May 1963, the Administrative Committee on Co-ordination considered the follow-up action required by the organizations of the United Nations family in order to achieve in the Development Decade the goals to which the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas had pointed. The ACC decided to establish a Sub-Committee on Science and Technology. It also suggested that the Economic and Social Council might wish to establish an Advisory Committee on Science and Technology (E/3765, paragraphs 38-41). On 1 August 1963 the Council in resolution 980 A (XXXVI) decided to establish an Advisory Committee on the Application of Science and Technology to Development. (Background information is given in Appendix 2.) The Council envisaged that the Advisory Committee would work in close co-operation with the ACC in reviewing the scientific and technological programmes and activities of the United Nations and related agencies. As a first step in this co-operation, the ACC submits the following information and suggestions for the consideration of the Advisory Committee.
2. The Advisory Committee is charged with studying and reporting to the Council on matters of the greatest importance. A vast potential undoubtedly exists for making modern science and technology the servants of the developing countries in their struggle for accelerated development. This field is by no means being neglected even today. As regards the organizations of the United Nations family, they have been working in their respective parts of this field for some years. Nevertheless it is necessary to try to come closer to realizing that full potential.
3. The basic problem of financial resources cannot, practically speaking, be avoided. It has two aspects - applicable not only to international assistance but of course to national expenditures as well and to the aggregate of all expenditures. First, when any proposal for new work or for the intensification

of existing work in behalf of the application of science and technology for the benefit of the developing countries is under consideration, one must be prepared to estimate what it will cost and whether the same investment might not yield a greater return if applied in other directions. Second, in general and in the aggregate, there is no doubt that considerably larger financial resources are needed for this work than it has commanded in the past. This remains true in spite of substantial offsets that should not be overlooked, notably the expenditures not needed for buying less modern equipment when more modern equipment is bought instead, and the savings, by way of avoidance of soon-obsolete investments, which can result from the making of well-chosen investments in various types of research.

4. The problems before the Advisory Committee form a complex network, and exactly where the emphasis should first be put is a matter of judgement. Two points in particular have to be clarified: (a) how broadly or narrowly science and technology should be defined for the purposes in view, and (b) within that definition, what aspects especially need the attention of the Advisory Committee, due account being taken of the activities already under way in the various fields of competence of the organizations of the United Nations family. As to (a), while a very broad definition could be justified in principle and also by reference to the subjects discussed at the Science and Technology Conference, it would clearly be uneconomical for the Advisory Committee to go deeply into matters such as training in general, economic development planning, various aspects of industrial development, etc. already under active study by other bodies within the United Nations system. As to (b), there is again the practical consideration that the Advisory Committee will wish to put its time to the best use and minimize its preoccupation with such activities as it finds to be proceeding satisfactorily in any case under the various going programmes.

5. With these considerations in mind, it is suggested that the following matters are among those meriting consideration by the Advisory Committee, once the Committee has acquainted itself with the work of the United Nations family of

organizations in the field of the application of science and technology to development:

- (1) Methods of keeping progress in the application of science and technology under review
- (2) Improved clearing (collection, retrieval, dissemination) of scientific and technological information needed for development
- (3) The possibilities of mobilizing the efforts of scientific and technological institutions of the developed countries for active co-operation with the developing countries
- (4) The structure of institutions required for the scientific and technological development of the developing countries and their integration into over-all social and economic policies
  - (a) the structure in general
  - (b) national, regional and international research and training institutes
- (5) The possibility of an immediate world-wide attack on a limited number of especially important problems of research or application.

Some comments on these numbered items are presented seriatim below, beginning with paragraph 8.

6. The work of the United Nations family of organizations in the field of the application of science and technology to development. At an early stage, the Advisory Committee will no doubt wish to consult with representatives of the various organizations of the United Nations family regarding the work of their respective organizations in this field. In the meantime the organizations concerned have individually transmitted to the members of the Advisory Committee, through the Secretary-General of the United Nations, summary reports which it is hoped will provide a useful introduction to the subject.

7. The general view of the organizations on their need "to discharge more effectively their growing responsibilities" in this field and on "the elimination of duplication" - subjects referred to in paragraphs 3 and 4 (b) of ECOSOC

resolution 980 A (XXXVI) - may be briefly stated here. First, it is felt that the gaps are far more of a problem than the overlaps, particularly since much of the significant contemporary work in science and technology is interdisciplinary in nature, making some overlapping of work essential. Second, it is felt that the main gaps are not inter-agency omissions but result from the fact that none of the agencies concerned commands the resources needed if its full job is to be done.

Item 1. Methods of keeping progress in the application of science and technology under review

8. The Economic and Social Council in paragraph 4 (a) of its resolution has made it the first function of the Advisory Committee "to keep under review progress in the application of science and technology and propose to the Council practical measures for such application for the benefit of the less developed areas". The effective discharge of that review responsibility will presumably necessitate developing a system or methodology that would permit answers to be given - not just once but periodically - to the following questions:

- (1) What is the present state of scientific and technological knowledge in the various relevant fields (excluding from consideration knowledge which is not applicable, or is only remotely applicable, to development)?
- (2) To what extent is the applicable modern knowledge being, in fact, applied in the developing countries?
- (3) In the light of research under way or planned, what anticipated future progress in scientific and technological knowledge needs to be taken into account for purposes of present development planning?

9. The answer to (2) of course immediately leads to a further question as to why some of the applicable scientific and technological knowledge is not being applied: is it that necessary adaptations have first to be worked out? that the developing countries, or some of them, are not ready to put modern equipment or techniques to use in some sectors or generally? that the transfer is being delayed by lack of funds and/or experts? that restrictive practices,



e.g. under patent procedures, are at fault? that significant possibilities are simply being overlooked?

10. Similarly, question (3) invites attention to the possibility that, in some cases, it may be cheaper to invest even substantial sums for obtaining a technological solution to a key problem within a predictable time period than to incur the wastes engendered by uncertainty, i.e. the wrong spending or the delays in right spending under "blindfold" development planning. (In this connexion, see item 5 below.)

11. The needed review methodology will presumably have two aspects. Systematic, comprehensive analyses in published form are required by researchers and other specialists. Quickly available reports highlighting the most significant new innovations and research under way, together with newly observed deficiencies in the application of modern knowledge, are required by the Economic and Social Council or other bodies concerned with over-all current appraisal.

12. As regards formal reports, the ACC at its above-mentioned meeting considered the steps that should be taken to keep up-to-date the information contained in the Survey of Current Trends in Scientific Research (E/3362/Rev.1) published in 1961. Its conclusions (E/3765, paras. 45-47) were that

"it would be most difficult, if not totally impossible, to mobilize a sufficient number of specialists to provide completely up-to-date and balanced information required for a report equally complete regarding all the fields of scientific and technological research ... If new similar studies should be undertaken it seems that they should be carried out in defined fields selected either for the variety of methods and trends of research, for the importance of the applications derived from the research activities, or for the utilization of new methods that should be made known to the specialists in these and/or related fields. This would appear to be, from a scientific point of view, the most commendable action to be undertaken as a follow-up of the Survey. In this eventuality, contracts might be established, as appropriate, with non-governmental organizations working in the fields of science and technology, to prepare a number of specialized reports based on the general lines of the 'survey' but adapted to particular fields of research for which more detailed and precise information may be provided".

In the Co-ordination Committee of the Council, which accepted these conclusions, the hope was expressed that the question would be referred to the Advisory Committee for observations.

13. To meet the need for reports that would be available to the Council on a more current basis, there might be developed a system of "built-in" or institutionalized reporting procedures. Each agency with the help of its scientific and technological advisers might as a routine matter report at stated intervals on pertinent new developments in each of its fields of competence. The Advisory Committee may wish to consider the features that such a reporting system should have in order to serve its intended purpose.\*
14. It goes without saying that the introduction of such a system would be likely to necessitate the establishment by certain of the organizations or combinations of organizations in the United Nations family of additional groups or panels to advise them, and that it would place additional responsibilities on advisory groups, panels, etc. already in existence. The administrative and financial implications would certainly be considerable. As was indicated in paragraph 8, it would be necessary to keep track - within such limits as may be imposed by governmental and commercial secrecy - not only of scientific and technological progress already made but also of research under way and planned, and not only of the moving frontier of discovery but also of the moving frontier of application in the developing countries.

Item 2. Improved clearing (collection, retrieval, dissemination) of scientific and technological information needed for development.

15. The notion of a central "clearing house" for all scientific and technological information has many attractions, but the practical problems of establishing one that would be capable of coping with the enormous flow of such information and of sifting out masses of irrelevant material so as to meet quickly and simply the actual needs of the developing countries defy easy solution. Present methods clearly need to be improved; care has to be taken, however, not to defeat the purpose by creating procedures that are too cumbersome to use.

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\* IAEA has indicated a reservation regarding such built-in reporting procedures. IAEA doubts the value of additional routine reports of this kind and suggests instead, as noted in its own report, that the Advisory Committee might ask the competent agency for a spot report on progress and planned research in a particular field or project.

16. In 1962 UNESCO prepared a comprehensive report (Survey on the Organization and Functioning of Abstracting Services in the Various Branches of Science and Technology: E/3618) which reviewed possible means of rationalizing and simplifying existing practices in the publication of scientific documents. ECOSOC considered and approved this report in 1963 (resolution 980 B (XXXVI)). A more recent UNESCO statement concerning additional efforts required by UNESCO and other organizations of the United Nations family is presented below in considerably abridged form (for example, reference to numerous specific aspects of UNESCO's own work programme is here, for brevity, omitted):

(1) Bibliography: Bibliography is relatively successfully organized for the basic sciences (mathematics, physics, chemistry and biology) but the bibliography of scientific publications related to the different branches of engineering and other applied sciences is much less developed and has far to go to cover existing subjects and growing requirements. Special organizational and financial facilities should be created.

(2) Abstracting: The abstracting Board of the International Council of Scientific Unions, sponsored and supported by UNESCO, has elaborated a system of measures aimed at the rationalization of publishing and abstracting in the fields of mathematics, physics, chemistry and biology. The abstracting of the tremendous volume of material published in different branches of the engineering sciences has practically never been considered from the point of view of rationalization, improvement and meeting the requirements of the developing countries. This task should now be organized, at least in a selected branch of the engineering sciences. Facilities open for abstraction and bibliography through the application of electronic computers should be utilized. FAO notes that, in developing abstracting services in the agricultural field, existing facilities provided by institutions such as the Commonwealth Agricultural Bureau would need to be fully explored.

(3) Multilingual glossaries and dictionaries: There are different glossaries covering some fields of basic and applied sciences but, in general, engineering and technology are not covered by this type of scientific information.

(4) Periodic review of the level of knowledge and trends of scientific and technological progress: The 1961 Survey of Current Trends in Scientific Research (referred to in paragraph 12 above) stressed the importance of periodic review of knowledge and new tendencies of research, as well as of new opportunities for economic and practical utilization. UNESCO and FAO as well as the United Nations have carried out such reviews in several fields of applied sciences, e.g. utilization of saline water, evaporation and measures of control. Many specialized reviews have been published by the IAEA, WHO and WMO in their respective fields of interest. However, the field of modern engineering sciences and technology remains, in effect, uncovered by this type of activity. That is why it is important to arrange on a regular basis for the preparation and publication in three or four languages every 3-5 years of a comprehensive review of progress and advances made in engineering and applied sciences.

(5) Year books (or almanacs) of the most promising discoveries and inventions in science and technology: It would be very useful for mankind to have on a regular basis the most reliable reviews of scientific discoveries, inventions and technological advances of exceptional importance for progress in the near future. There is an example of such a publication in the Russian language, but on an international basis, undertaken by the Academy of Sciences of the USSR, entitled "Science and Humanity". Utilizing this experience, UNESCO and the United Nations might set up a four-language Year Book under the title "Science, Technology and Humanity" devoted to these subjects. The most eminent engineers, university professors and research workers of the various countries should participate in compiling this Year Book.

(6) Problem of translation: Some attempt to rationalize translations has been started in Europe (into German), in the United States (into English) and in the USSR (into Russian). But in many countries there still exists a great deal of duplication and parallelism. The cost of translation is high and the quality sometimes poor. Information on translated material is lacking, or is not reaching the developing countries. In this connexion, it would be important to outline and to consider for the future two groups of questions:

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(a) Possible rationalization of translation into the four official languages of the United Nations (English, French, Russian and Spanish).

(b) Possible creation in the future of an international centre for machine translation of scientific publications, utilizing electronic computers and similar devices. The Advisory Committee might discuss this matter and a decision could be reached to set up a large United Nations-UNESCO project for the creation of an international centre for machine translation of important publications in science and technology.

(7) Network of centres and clearing house for scientific and technical documentation: UNESCO has experience in the creation of centres of scientific documentation in Brazil, Mexico, United Arab Republic, and India, equipped with modern techniques for copying, microfilming, etc. Such types of scientific documentation centres should be established in each country. In the areas of the small developing countries, centres of scientific documentation could be created on a regional and sub-regional basis. The Advisory Committee might consider the question of the creation of international centres covering not only the exact, earth and life sciences, but particularly the main branches of the engineering and other applied sciences to serve the interests of all the Member States of the United Nations.

(8) Refresher training courses: The United Nations, the specialized agencies and the IAEA regularly organize so-called training and refresher courses for scientists, engineers and other technical personnel on a regional and sometimes on an inter-regional basis - for instance, in methods of amelioration of saline and waterlogged soils, in methods of prospection of underground water resources, in the field of ore dressing, in the chemical technology of cellulose, in earthquake engineering and others. This form of dissemination of the most modern knowledge should be reinforced and expanded, both as regards the network of courses and the subjects.

17. Some other current ideas on various aspects of the problem of clearing scientific and technological information so as to make such information more

readily available to the developing countries may be briefly mentioned here. In the Secretary-General's report to the Council on UNCSAT (E/3772, para. 237) it was suggested that

"An effort can already be made at the country level where, as also at regional and headquarters levels, the various agencies of the United Nations family will necessarily have a special responsibility for information in the scientific and technical areas of their competence. The field offices of the Technical Assistance Board and the Special Fund can play an important supporting role as a local channel and a focal point for referring inquiries to the primary sources of detailed information. In one direction would flow information on available techniques; in the other, information on problems requiring technical solutions that may be known elsewhere or may be obtainable through further research that can feasibly be undertaken."

18. In the United Nations Special Fund the conviction is growing that something must be done to reduce the waste from not using developmental experience already gained in many parts of the world. Enormous effort and billions of dollars have been spent to improve knowledge and techniques for raising the productivity of human and physical resources in the developing countries. Unfortunately, the lessons of this work and the benefits of this experience are not very widely shared. Thus, expert findings provided to one country are usually not made available to other countries, even where technical conditions may be similar. Hence work may have to be unnecessarily duplicated. This waste is all the more intolerable today when modern methods of information storage, retrieval and dissemination make the widespread diffusion of knowledge both more easy and less expensive. The United Nations Special Fund, eager to get "maximum mileage" from surveys and reports of projects it assists, is examining ways and means of having most of these project findings reproduced on microcards or microfilm for the use of various interested governments and parties. It would wish, however, to make this material available as part of a larger system for the convenient storage, retrieval and effective distribution of information useful in accelerating development.

19. As regards industrial technology, particular attention is being given in the Centre for Industrial Development to the means whereby the flow of needed information could be increased by strengthening the transmission mechanism at the demand end. Some designated person in each developing country should know where

to obtain the most reliable information about existing and approved techniques and how to keep himself informed of new techniques as they evolve. This problem might be solved if there were to be established an international service of high-level technological information officers, staffed with personnel from the developing countries themselves, who could, if desired, be attached to technological or industrial research institutes or other governmental agencies. Their training might be provided or arranged for by the Centre. In addition, the Centre hopes to establish a system for clearing information and providing periodic reports on programmes of industrial development in developing countries and the assistance being rendered in that field by the various agencies concerned.

Item 3. The possibilities of mobilizing the efforts of scientific and technological institutions of the developed countries for active co-operation with the developing countries

20. General Assembly resolution 1944 (XVIII), adopted on 11 December 1963, "Requests the Advisory Committee on the Application of Science and Technology to Development to examine, in keeping with its terms of reference, the possibility of establishing a programme on international co-operation in science and technology for economic and social development in which scientists and technicians of the highly developed countries would, as a matter of priority, help to study the problems of the developing countries and explore suitable solutions, having regard to limitations upon the material resources and trained personnel currently available to the developing countries" (operative paragraph 3). The resolution further "Recommends that the Advisory Committee envisage in connexion with such a programme the possibilities of: (a) Mobilizing the efforts of universities and scientific and technological institutions of the developed countries for active participation in such a programme; (b) Creating and strengthening, with the aid of the highly developed countries, national and regional institutes for scientific and technological research and training in the developing areas of the world; (c) Obtaining the human, technical and financial resources required for the execution of such a programme" (paragraph 6).

21. The scientific and technological institutions whose co-operation should be sought would include governmental institutions, non-governmental organizations and, in appropriate cases, the scientific and technological services maintained by industry.

22. In the execution of such a programme and in reference particularly to 6 (a), due attention should certainly be given to utilizing the experience and the established contacts of the specialized agencies. For instance, UNESCO has close ties with many international scientific non-governmental organizations. It grants annual subventions to non-governmental organizations in the order of \$250,000 and contracts in the order of \$150,000 annually. It maintains especially close relations with the strongest international scientific body, the International Council of Scientific Unions (ICSU), which co-ordinates the activities of the most important fifteen international scientific unions, including many associations and federations acting in mathematics and in pure and applied physics, pure and applied chemistry, geology, geophysics, geodesy, hydrology, seismology, etc. UNESCO is permanently in touch also with the Union of International Engineering Organizations (UIEO-UATI). It has a permanent consultative relationship with the International Association of Universities, and, acting with the assistance of this Association and in close co-operation with the European universities, it has set up a long-term project entitled "Post-Graduate University Training Course in Science and Technology" under which universities have organized a number of training courses for the gifted youth of the developing countries. With regard to semi-governmental and governmental organizations, the Natural Sciences Department of UNESCO has permanent contacts and works in close co-operation with national academies and central research organizations in many countries (a number of which have their own UNESCO committees), and is thus in close touch with authoritative scientific opinion in Member States.

23. The ILO has a unique relationship with industry and labour and a wide range of contacts with bodies involved in the practical application of science and technology for purposes of economic development.

24. FAO has made arrangements for consultation with 105 international non-governmental organizations, to secure expert information and advice and technical co-operation and assistance from them. In some instances they assist in carrying



out some of FAO's technical activities. FAO has also obtained the collaboration of individual scientists and technologists in their personal capacity through the World Food Congress, held in Washington in June 1963, and this collaboration is expected to be continued through the calling of periodical Food Congresses.

25. WHO has since its inception given great emphasis to its relationship with international non-governmental organizations in the whole field of health. At the end of 1962, the Executive Board of the Organization had admitted fifty-six such organizations into what is known as official relations, and more recently it approved a resolution which would intensify further the mobilization of the technical resources of the non-governmental organizations in the field of health.

26. WMO has for many years had formal Working Arrangements with ICSU and the International Union of Geodesy and Geophysics (IUGG). In accordance with these arrangements all research activities of WMO, organization of symposia etc. are closely co-ordinated with similar activities of ICSU, IUGG and their subordinate bodies. The members of the newly created WMO Advisory Committee were selected in consultation with ICSU, and the interest of ICSU is strongly represented on the Committee. In the field of atmospheric sciences existing arrangements provide convenient machinery for mobilizing the activities of universities, academies etc.

27. The IAEA maintains close relations with ICSU and sometimes provides financial support to non-governmental organizations whose work is closely connected with atomic energy, such as the International Commission on Radiological Protection (ICRP) and International Commission on Radiological Units and Measurements (ICRU) and industrial atomic forums.

28. Similar indications could be given for the other organizations of the United Nations family. For example, the United Nations itself - to mention one section of its programme - co-operates closely with the World Power Conference, the World Petroleum Conference and similar organizations in the fields of water, mineral and energy resources, as well as transport and cartography.

29. The Advisory Committee is not requested to report to the Economic and Social Council under the above resolution of the General Assembly until the Council's summer session in 1965. Some thought on the subject this year appears advisable, however. This would assist the ACC in its own consideration of the matter.

Item 4. The structure of institutions required for a nation's scientific and technological development and their integration into over-all social and economic policies

(a) The structure in general

30. Virtually all the developing countries have found it necessary to apply some form of planning to their economic and social development. Clearly, a short-term and long-term outline of the scientific progress desired, as well as a system of national measures for the application of science and technology to development, should constitute an integral part of governmental economic and social planning. In order to achieve this, each country requires its own national structure for the elaboration and execution of a national policy in science and in its application. This structure will naturally vary according to the context, i.e. the stages of economic and social development already achieved and the other conditions prevailing within particular countries. Ultimately it may become very comprehensive and many-sided. From a long-term point of view UNESCO has concluded that a structure along the following lines may often be desirable - of course supplemented as necessary by structures in special fields (health, agriculture, meteorology, hydrology, etc.):

- (1) A Committee of scientific advisers to the Chief of State, attached to his office or to the office of the Prime Minister.
- (2) A parliamentary group, committee or panel for science, responsible for discussing, outlining and obtaining decisions on the most important trends of national scientific and technological progress as well as necessary budgetary allocations.
- (3) A state committee for science, or national science policy council, or ministry for scientific and industrial research.
- (4) A national centre or centres of scientific and industrial research, or national academies of science, with responsibility in setting up a network of scientific institutions, laboratories, important inter-disciplinary projects and practical evaluation of the recommendations presented to Governments.
- (5) A network of universities, of polytechnic schools and research laboratories, and of applied research laboratories linked with industry.  
(Some could be organized on a regional or sub-regional basis.)

(6) Organizations for geodetic, geophysical and geological field surveys for mineral, water, soil and wild-life resources.

31. It should be particularly emphasized here that scientific and technological planning should be organized within the framework of the arrangements of the State concerned for the consideration of matters of general economic and social policy, and should include provision for full consultation with those whose co-operation will be required for the practical implementation of the proposed plans.

32. A reasonable balance (depending on conditions of a given country) between (i) basic research, (ii) oriented research, (iii) applied research and (iv) development work and studies will need to be defined by each country in accordance with local conditions and economic trends. One must take into account the fact that national budgetary allocations for science will have to be particularly large when it comes to financing research devoted to application and development. In relation to national income, the experience of the advanced countries suggests that the total allocation for national scientific and industrial research in the civilian field should be between 1 and 2 per cent.

33. UNESCO in the course of the past three years has completed a world survey of existing governmental institutions and organs responsible for national policy in science, including the organization and planning of scientific and industrial research. As reported in their special document, about seventy Member States of UNESCO either have very rudimentary organs responsible for these functions, or have none at all. IAEA has found that as many as fifty countries have an Atomic Energy Commission, while a survey by WHO has revealed that only forty-two countries have some sort of a central medical council or academy.

34. As regards training institutions, it is clear that a most important and most difficult task in connexion with the application of science and technology to development will be the continuation and the considerable intensification for several generations of the education and training of skilled specialists - engineers, university professors and research workers - belonging to the developing countries. Also needed is much fuller provision for the training of the industrial management, technicians and skilled workers necessary for the practical application of new processes and techniques.

35. Some impression of the magnitude of the task is given by UNESCO's estimate, based on the experience of the highly industrialized countries, that, for each one million people, 5,000-10,000 engineers and other highly qualified technical personnel (including doctors, agronomists, etc.) are required, and 500-1,000 research scientists on the average.

36. Specific targets for several generations need to be developed for the education of scientists and technicians, and for the creations of a network of hundreds of universities and institutes of technology which will in the best of circumstances take something like 30-40 years. As is indicated elsewhere, all agencies are now carrying out a broad programme for the creation of national and regional training centres as well as institutions for research and development. For the additional effort necessary, however, large financial resources will be required, and urgent and sustained organizational efforts at national, bilateral and international levels. Certainly all the existing scientific, technological and other institutes, universities and laboratories must be carefully preserved, reinforced and made part of an expanded network of national scientific institutions.

(b) National, regional and international research and training institutes

37. Research institutes, a vital part of the structure of institutions required for a nation's scientific and technological development, call for special attention. The problem is to find ways of strengthening existing national institutes in the developing countries, establishing others, and probably establishing additional institutes on a regional or even an international basis - an undertaking which admittedly sometimes presents special difficulties of financing etc. This will require a considerable investment of resources, but the ultimate returns are likely to justify the costs.

38. While it is vitally important that research institutes in the technologically advanced countries should devote more attention to the problems of special interest to the developing countries (see discussion under item 5 below), this cannot take the place of the establishment of more and stronger research as well

as training institutes in the developing countries themselves. The developing countries need such institutes in order to build their own scientific and technological capacity. Moreover, problems such as those of tropical medicine and tropical botany have to be investigated in tropical countries, and for many other problems, although the investigations can be largely conducted in the advanced countries, the final stages at least need to be carried out under conditions that will assure successful local adaptation of the findings.

39. A substantially strengthened system of regional research institutes could in principle supplement national efforts in a very useful manner. Some might be formed by a suitable strengthening and broadening of institutes originally established on a national basis, while others might be regional from the start. Money and skilled manpower would be economized by such a pooling of efforts, and findings used more widely. The countries least able to do research on their own would be especially benefited. The regional institutes could provide a "half-way station" for persons trained abroad and not yet able to find use for their newly acquired skills at home; thus the present inordinate loss of such persons through their failure to return to the developing countries would tend to be cut down.

40. Research institutes may need to be organized on an even broader geographical basis, as inter-regional or fully international institutes. Problems such as those common to all humid areas of the tropic or to all arid areas, for example, clearly know no regional boundaries. A useful link is being established between regional, inter-regional and national institutes by the collaborative or co-operative research programmes of certain agencies. Regional and national institutes agree to work on different problems and then exchange results or in other cases, where technically desirable, agree to follow parallel or co-ordinated lines of investigation. At the same time, certain scientific and technological problems do not lend themselves to adequate study by national or regional effort, or even by collaborative programmes. The possibility of promoting specialized international research institutes is therefore under consideration by various organizations of the United Nations family. Thus, for example, WHO is actively exploring at present the possibility of promoting an international research institute to deal with certain aspects of biomedical research.

41. UNESCO, with more than ten years of experience in the creation of institutions for training and research on the national, regional and international levels (Bombay Polytechnic, Latin American centres for basic and applied mathematics, International Computation Centre in Rome, European Organization for Nuclear Research (CERN), and others), has worked out detailed specifications for the institutions that are required on all three of these levels for the world of the developing countries. In recent UNESCO statements the view has been expressed that the most urgent priorities in the broad spectrum of interests are related to cartographic services, the agrarian economy, mining, and specialized fields of technology that will vary with the economy of the particular country. UNESCO has also concluded that education, basic research, applied research and the training of advanced scientists and engineers are inseparable and must be foreseen in the activities of any institution - naturally in proportions governed by human and economic conditions in the country concerned.

42. FAO also has a long history in the promotion of regional and national research centres as well as in co-ordination of research in existing laboratories and institutes. Some institutes originally established as an FAO project have now been handed over to the national authorities, as in the case of the Latin American Forest Research and Training Institute in Mérida, Venezuela. Co-ordination is exemplified in the Near East Animal Health Institute, linking the laboratory research of several countries in the region, the East African Marine Laboratory which promotes the research in marine sciences in that region, and the Near East wheat and barley project undertaken with the help of the Rockefeller Foundation. FAO has also strengthened national research centres such as the fisheries research institutes in several Latin American countries. In other cases, FAO promotes or strengthens applied research in technological institutes such as the Food Processing Institute in Syria or research institutes in individual commodities (the Hide, Skin and Leather Institute in Khartoum, the Wood Institute in India, the Cotton Research Institute in Cairo, etc.). On the other hand, FAO is using under special contracts the research facilities provided by institutes of world repute such as the Pasteur Institute in Paris for Sunn Pest, and the Anti-Locust Research Centre in London, and it enters into arrangements with universities like the University of California for the secondment of scientists to carry out studies

on water and irrigation problems. In addition to providing support to specific research institutions and programmes, FAO has a substantial programme for improving over-all national organization of food and agricultural research so as to ensure that research resources are directed to problems the solution of which is urgently required in the implementation of development plans and that an organizational link is established between applied research and the education, advisory and other developmental services and institutions essential for the application by farmers, foresters and fishermen of the findings of research.

43. WHO has been promoting international and regional research centres for the last twelve years. The main approach used is the designation of an existing laboratory or institution as a centre to perform a specified function - such as the standardization of nomenclature, technics and methods; the production and distribution of standard reagents, sera or bacterial cultures; or the raising of certain types of laboratory animals - where this function cannot be adequately performed at the purely national level but is essential for the development of research at both national and international levels. These centres are known as the WHO reference centres and are assisted financially by the Organization. They also facilitate the exchange of scientific and technical information and are used as training centres for national research workers. The network of WHO reference centres by the end of 1963 consisted of 31 international, 45 regional and 29 other collaborating laboratories; one international centre and 21 regional centres were set up jointly by WHO and FAO. Another principle used by WHO is the creation of research centres for fields not covered by existing institutions or in order to meet special needs. The Nutrition Institute for Central America and Panama (INCAP), the Insecticides Testing Unit in Lagos and the Filaria Research Unit in Rangoon are typical examples of this approach.

44. A number of national institutes have been created by or with the assistance of ILO in order both to perform specific specialized functions and to make available the scientific and technological knowledge required for the achievement of their immediate aims. In the field of productivity and management development, national productivity centres have been launched or assisted in thirty-five countries in Asia, Africa and Central and South America. In all these cases, close contact with industrial and managerial circles has been not only a condition

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for the effective functioning of the productivity centres, but also a valuable source of guidance in bringing scientific and technological knowledge to bear on practical problems or determining the lines along which further research would prove most fruitful. In the field of small industries development, institutes have been established or assisted in Ceylon, Malaysia, Thailand, United Arab Republic and Morocco, and play an important role in identifying, clarifying and expressing the needs for scientific and technological innovations or improvements of the industries concerned and in disseminating and assisting in the application, for the benefit of small undertakings, of the results of research undertaken on the basis of their specifications. Whether actual research is carried out in specialized sections of the institutes themselves or is entrusted, sometimes on a fee basis, to academic or governmental institutions depends essentially on local facilities. Similar functions are being performed in the field of industrial safety by the Dahanbad Central Mining Research Station and by the regional labour institutes in Calcutta, Kanpur and Madras. In general, as regards the fields of ILO's interest, there would appear to be real scope for regional clearing houses. Their success would, however, continue to depend on maintaining close links between industrial needs and existing or planned research facilities rather than on creating new autonomous and largely self-inspired research and development schemes.

45. WMO considers that there is an urgent need for further research in tropical meteorology. The Organization is therefore in various ways assisting research institutes for this purpose. WMO is also the executing agency for some Special Fund projects in support of meteorological research institutes such as the Meteorological Institute in Israel and the Tropical Research Institute in India. It has also prepared a detailed plan for meteorological training institutes in Africa.

46. Both regional and international centres have been established under the auspices of the IAEA: for research and training in Cairo for the Arab countries, for Theoretical Physics in Trieste. Other regional centres are being considered in Africa, Asia and Latin America, as well as arrangements for sister relationships between laboratories in highly advanced centres and institutes in developing countries.



47. If (in addition to various national institutes to which United Nations help has already been given) regional research institutes were to be established in the areas of work for which the United Nations is responsible, they should be linked in some manner to the regional economic commissions. They might also be brought into relationship, as appropriate, to the specialized agencies and the IAEA. In delimiting the scope of their programmes, reference could be made to the following guidelines among others:

- (1) their greater suitability for applied research and for development (practical testing in pilot plants or otherwise) than for pure or fundamental research;
- (2) the growing emphasis on industrial development, and hence on the problems of establishing manufacturing industries, in the work of the United Nations;
- (3) the desirability of utilizing these institutes in connexion with "especially important" problems of research or application, assuming a decision to establish a list of such items (see item 5 below);
- (4) the nature of the substantial number of more purely technological projects presently being carried on by the regional commissions themselves;
- (5) the need for such institutes to avoid accumulating permanent interests in particular lines of research which would prevent them from transferring their interests at a certain stage to other suitable research organizations, thus freeing themselves to begin new pioneering activities.

48. Of the many aspects of the question of how the already existing research institutes can best be added to and strengthened, two are perhaps especially in need of consideration by the Advisory Committee. One relates to the identification of, and criteria for distinguishing, research problems and functions suitable for regional or international institutes from those better dealt with in national institutes. The other relates to phasing: on the basis of relative need on the one hand, and the resources that might reasonably be brought into play on the other, what practical conclusions should be drawn on the sequence of steps to be taken?

Item 5. The possibility of an immediate world-wide attack on a limited number of especially important problems of research or application

49. It has been suggested by the Secretary-General of the United Nations that there might be established an agreed list of especially important problems of research or application, including new inventions, adaptations or cost-reductions having each a potential development effect of extraordinary dimensions, directly or through its ultimate repercussions. The Secretary-General has expressed the belief that, were such a list to be established, it would be possible, in addition to bilateral governmental and United Nations resources, to obtain the support of foundations and similar private institutions to bring the research tasks having that kind of priority rating to a successful conclusion. He has also indicated that he would be willing to lend his full support to seeking such additional assistance.

50. The criteria on the basis of which a list of especially important research projects might be compiled should include: (a) on the demand side, (i) the degree of need as judged by the expected benefits, and also (ii) the degree to which the allocation of scarce resources under development planning would be assisted, and aggregate costs in the long run reduced, by minimizing the uncertainty as to when the improved technique could become available; (b) on the supply side, (iii) the estimated time and money required to achieve a break-through.

51. Much of the research work on the items in question would undoubtedly have to be done in the economically and technologically advanced countries. Sometimes indeed a pooling of the efforts of several of the advanced countries might be essential. But the developing countries would have a vital complementary part to play in helping to determine relative needs, in deciding on technical specifications, and in carrying out the final stages of research and field testing so as to make adaptation and acceptability an integral part of the technical solution itself.

52. The Advisory Committee could, it is suggested, render a valuable service by helping to decide on the feasibility and advisability of establishing such a list of especially important research items or projects and, assuming a decision in favour, by drawing up an actual list for recommendation in that sense to the Council. A rather lengthy list of items which have been given preliminary

attention by the ACC and from which a selection might be made is appended immediately below in Appendix 1. The ACC has in mind the importance of solving not only problems to which no answers exist anywhere as yet, and which may perhaps arise only or chiefly in the developing countries, but also problems of adapting existing equipment and processes to the conditions governing their application in the developing countries, including projects for self-maintaining equipment and the introduction of intermediate technology. However, if certain problems are to be designated as "especially important" in an over-all sense, with a view to launching world-wide attacks upon them and supporting those attacks with resources on a scale adequate to obtain the needed solutions quickly, the list of problems so designated at any one time will undoubtedly have to be short.

Appendix 1

Preliminary list<sup>1/</sup> from which a selection might  
be made for the purpose of establishing a list  
of "especially important" problems of research  
or of application in developing countries

a small energy unit for village use

a wheeled vehicle or hover-craft tailored in price, durability and other specifications to the needs of the developing countries

economical desalinization plants for areas short of fresh water

new telecommunication procedures for accelerating education and training

development of new and traditional forms of acceptable protein food on a mass scale to combat malnutrition

solutions for problems of human reproduction

solutions to medical problems largely centered in the developing countries, particularly parasitic diseases

solutions to universal medical problems, particularly cancer, cardiovascular disease and mental health

methods of overcoming the genetic and toxic effects of environmental pollutants and the side-effects of therapeutic and prophylactic substances

improvement of biomedical research communication

completion of monographic reviews of the natural resources of Asia, Africa and Latin America on a continental or sub-continental basis

preparation of global reviewing maps of geological and mineral deposits, particularly maps showing metallogenic concentration and potential location of petroleum fields

development of improved practices for the optimum use of water in agriculture

prevention and liquidation of waterlogging and salinity of irrigated land

restoration of fertility of eroded laterites

adequate supply of plant food, particularly chemical fertilizers, at low cost

improved cheap farm implements suited to local conditions

tsetse control and trypanosomiasis eradication

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<sup>1/</sup> See paragraph 52 of the text.

economical means of introducing synthetic fibres for fishing nets and handlines  
exploitation of potential yields from fishery resources

measures for minimising loss in storage of food for human consumption, and  
development of food processing and utilization of perishable foods

improved short- and long-range weather forecasting

weather modification and control

forecasting of earthquakes and improvement of anti-seismic construction

further development of various types of largely self-maintaining equipment

development of intermediate technological tools: an intermediate stage between the hand-loom and the power-loom; powered but non-automated machine-tools (such as lathes and grinders); improved kilns and ovens, for the production of bricks and tiles; simple but accurate gauges and measuring equipment for the chemical industry

improved manual earth-moving equipment including wheel-barrows, pick-axes, spades and shovels

training in all fields and at all levels

## Appendix 2

### Background events

The United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas (UNCSAT), which for practical purposes constitutes the starting point for the present intensified effort, was of course not an isolated event but was rather the logical culmination of a fairly lengthy series of steps. In response to various resolutions of the United Nations General Assembly and the Economic and Social Council,<sup>1/</sup> the United Nations Scientific Conference on the Conservation and Utilization of Resources took place as early as 1948; Conferences to discuss the Peaceful Uses of Atomic Energy were convened in 1955 and 1958; the International Atomic Energy Agency itself was established in 1957; the Survey of Current Trends in Scientific Research was undertaken under the joint auspices of the United Nations and UNESCO in 1958-1960; a Conference on New Sources of Energy was held in 1961; and attention has been increasingly directed to the value of international scientific and technical co-operation and exchange of experience. UNESCO under its charter has for years been active in the field of natural science. The application of science and technology to development has figured prominently in the work of all the specialized agencies, the IAEA and the United Nations itself, constituting indeed in the case of some agencies the essence of the work.<sup>2/</sup>

UNCSAT was convened in Geneva in February 1963. Its deliberations covered an extremely wide range of subject matter in natural science and in certain areas of social science as well. Nearly 2,000 technical papers were accepted. These, together with composite digests of their contents prepared by

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<sup>1/</sup> The relevant resolutions include: GA 810 (IX), 1043 (XI), 1164 (XII), 1260 (XIII), 1429 (XIV), 1512 (XV); ECCSCC 32 (IV), 695 (XXVI), 804 (XXV), 829 (XXXII), 910 (XXXIV), 911 (XXXIV). UNSAT itself was authorized by ECCSCC resolution 834 (XXXIV), adopted 3 August 1961.

<sup>2/</sup> A number of relevant resolutions of the specialized agencies and IAEA are referred to in the reports which have been prepared by them for the Advisory Committee.

the Conference Secretary-General and his staff and digests of the oral discussions prepared by the rapporteurs, constitute the technical record of the Conference in the strict sense. The proceedings and the substance of the written and oral discussions are summarized more broadly in the Report on the Conference by the Secretary-General of the United Nations to ECCSOC (E/3772 and Add.1), and especially in the eight-volume narrative report, Science and Technology for Development, now issuing from the press.

Any detailed findings aside, the main conclusions emerging from UNCSAT were that the effective application of modern science and technology can contribute enormously to the acceleration of the development of the less-developed countries; that vigorous follow-up action to the Conference is essential; and that this will entail the focusing of substantially larger resources - both in scientific brains and in money - than those problems have ever had directed to them to date.

Figuring prominently in informal discussions during the Conference was a query as to the adequacy of the existing international machinery for promoting the application of science and technology to development. Many persons present felt that this machinery needed to be strengthened. Some felt that consideration should be given to establishing a new agency.

In April 1963, the President and Secretary-General of UNCSAT and representatives of the fifteen Governments that had had Vice-Presidents at the Conference consulted informally with the Secretary-General of the United Nations in New York regarding the nature of the follow-up action required.

In May 1963 the Secretary-General of the United Nations and the Executive Heads of the specialized agencies and the IAEA discussed the same subject in Geneva in the course of their consideration of various matters in the Administrative Committee on Co-ordination. The ACC's conclusions have been indicated in para. 1 of the text of this Communication.

In the light of the foregoing consultations the Secretary-General presented his preliminary views to the Economic and Social Council at its thirty-sixth session in Geneva. Those views are set forth in Part Three of his report E/3772 and in E/SR.1271 which summarizes his address to the Council on 8 July 1963. As regards the question of organizational structure referred to

above, his view (as also that of his colleagues in the agencies) was and remains that the establishment of a new agency for science and technology would not be desirable; rather, the possibilities of utilizing the existing agencies should be developed to the fullest extent, with due attention to strengthening them individually and, as necessary, strengthening their co-ordination arrangements as well.

The importance which the Council attached to finding practical ways to promote wider application of science and technology to development is sufficiently indicated by its resolution 980 A (XXXVI) of 1 August 1963 which established the Advisory Committee on the Application of Science and Technology to Development.

In April-May 1963, the Director-General of UNESCO submitted to the Executive Board of the Organization at its 65th session a report on the Conference together with proposals for future action. The Executive Board adopted a resolution (65 EX/Decision 4.3.1) which noted in particular that "by virtue of Article IV.B.5 of its Constitution, UNESCO is charged with advising 'the United Nations Organization on the educational, scientific and cultural aspects of matters of concern to the latter'", and which approved in principle the Director-General's proposal "that scientific questions be accorded an importance in UNESCO's programme similar to that given to education". Accordingly, the Director-General submitted to the Executive Board at its 66th session, and the Executive Board adopted as a basis for the preparation of the Programme and Budget for 1965-1966, proposals for an increase of over 50 per cent (from \$4,775,000 to \$7,455,000) for programme activities in the field of science and technology. As a consequence, and in view of the anticipated increased number of projects in this field to be undertaken under the Expanded Programme of Technical Assistance and the Special Fund, UNESCO's secretariat has been reorganized. In addition to the existing Department of Natural Sciences, whose activities are being strengthened, a second Department, concerned with the application of science and technology to development, has been established, and both will be placed as from 1964 under the supervision of an Assistant Director-General in charge of the programme in science and technology.



A resolution adopted by the IAEA (GC/VII/Res 153) gives special emphasis in the Agency's long-term plan to projects of particular importance for the transfer of science and technology to the developing countries within four of the five priority areas suggested by the Special Committee on Co-ordination and endorsed by ECOSOC resolution 984 (XXXVI) on the Development Decade, i.e. industrial development, development of human resources, development of agricultural production and development of natural resources.

On 11 December 1963, the General Assembly adopted a resolution 1944 (XVIII), which envisages the establishment of a "programme" of international co-operation in science and technology for economic and social development.

Finally, in early January 1964, the ACC considered the programmes of the United Nations family of organizations in this field and exchanged views on further action to be taken.

ANNEX III

CO-OPERATION IN ACTIVITIES RELATING TO THE  
PEACEFUL USES OF ATOMIC ENERGY

APPENDIX A

RESOLUTIONS ADOPTED BY ORGANIZATIONS IN RESPONSE TO  
COUNCIL RESOLUTION 986 (XXXVI)

PART I

Text of resolution GC (VII)/RES/149 adopted by the  
General Conference of IAEA on 1 October 1965

CO-ORDINATION OF ATOMIC ENERGY ACTIVITIES

The General Conference,

1. Takes note of Resolution 986 (XXXVI) on co-ordination of atomic energy activities adopted by the Economic and Social Council of the United Nations (ECOSOC) at its thirty-sixth session, and in particular of the affirmation by ECOSOC that the Agency

"should act as the primary sponsor, in co-operation, where appropriate, with the interested specialized agencies, of activities in which atomic energy or research relating thereto forms the major part of the subject matter".

2. Affirms the Agency's readiness in accordance with the ECOSOC resolution to co-operate fully with the United Nations and the specialized agencies in seeking more effective co-ordination;

3. Requests the Board of Governors and the Director General to take such further steps as may be necessary to ensure co-ordination at the earliest possible stage in the development of Agency programmes and projects; and

4. Requests the Director General to circulate the text of the ECOSOC resolution to all Member States.

PART II

Text of Resolution 27/63 adopted by the Conference of FAO  
on 4 December 1963

CO-OPERATION BETWEEN FAO AND OTHER MEMBERS OF THE UNITED NATIONS SYSTEM

THE CONFERENCE,

Considering the importance of ensuring co-ordination of the steadily expanding activities of the organizations of the United Nations system;

Anxious to avoid duplication of effort and to ensure appropriate inter-agency co-operation in all cases affecting more than one organization;

Aware of the need of utilizing the limited financial resources of United Nations bodies to the maximum benefit of countries requesting assistance;

Noting with concern the problems of duplication discussed during the 11th and 12th Sessions, in particular as regards the United Nations, IAEA, UNESCO and ILO;

Also noting ECOSOC Resolution 986 (XXXVI) concerning work in the field of atomic energy;

Confirms the willingness of FAO to conform to the terms of that resolution and to co-operate with other international agencies in the field of atomic energy activities in order to prevent duplication of work, taking into account, however, that FAO has responsibility for the use of nuclear science techniques in applied research and development in agriculture, food, fisheries and forestry;

Supports the Director-General in his efforts in ACC to reach satisfactory inter-agency co-operation and co-ordination in fields where difficulties are experienced;

Expresses appreciation of the action of ECOSOC in keeping these matters of co-operation and co-ordination under continuing review;

Recommends to Member Governments to strengthen their efforts to ensure full co-ordination of the views expressed by their delegates at meetings of the governing bodies of the various inter-governmental organizations.

PART III

(a)

Text of Resolution EB 33.R50 adopted by the Executive Board of WHO  
on 24 January 1964

CO-ORDINATION WITH IAEA

The Executive Board,

Having considered the report of the Director-General on Co-ordination with IAEA;<sup>1/</sup>

Taking into account Resolution 986 (XXXVI) adopted by the Economic and Social Council of the United Nations at its thirty-sixth session;

Cognizant of the constitutional obligations of WHO;

Recalling the previous resolutions<sup>2/</sup> of the Executive Board and the World Health Assembly, including resolutions WHA11.50 and WHA13.56;

Recognizing the importance of the consultations between the Director-General of IAEA and the Director-General of WHO; and

Considering the need for fruitful collaboration among WHO and other interested agencies in radiation health,

1. REAFFIRMS the responsibility of WHO at the international level for any activities in the field of health involving ionizing radiation, including protection from radiation hazards and the medical uses of radiation and radioactive isotopes;

2. CALLS the attention of Member States and Associate Members to the responsibilities of their national health authorities in the protection of the population from radiation hazards and in the medical uses of radiation and radioactive isotopes;

3. CONSIDERS that WHO should assist countries at their request for technical assistance projects in the field of radiation health, collaborating as appropriate with IAEA in this work; and

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<sup>1/</sup> Document EB33/46 and Add.1

<sup>2/</sup> Handbook of Resolutions and Decisions, 7th edition, pp. 84-89.

4. REQUESTS the Director-General to continue to take every possible step to ensure the closest and earliest collaboration between WHO, IAEA and other agencies concerned in the development of projects and in the organization of meetings of mutual interest.

(b)

Text of Resolution WHA17.47 adopted by the World Health Assembly  
on 19 March 1964

CO-ORDINATION WITH THE INTERNATIONAL ATOMIC ENERGY AGENCY

The Seventeenth World Health Assembly,

Having considered the report of the Director-General on co-ordination with the International Atomic Energy Agency;<sup>1/</sup>

Having considered resolution EB33.R50 of the Executive Board;<sup>2/</sup>

Taking into account resolution 986 (XXXVI) adopted by the Economic and Social Council of the United Nations at its thirty-sixth session;

Cognizant of the constitutional obligations of WHO;

Recalling the agreement between the International Atomic Energy Agency and the World Health Organization and, in particular, Article 1 setting out the basis for co-operation and consultation;

Recalling the previous resolutions of the World Health Assembly, including resolutions WHA11.50 and WHA13.56;<sup>3/</sup>

Recognizing the importance of the consultations between the Director-General of the International Atomic Energy Agency and the Director-General of WHO; and

Considering the need for fruitful collaboration among WHO and other interested agencies in radiation health,

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<sup>1/</sup> Document A17/P and B/10 Add.1.

<sup>2/</sup> Off. Rec. Wld Hlth Org. 132, 27.

<sup>3/</sup> Handbook of Resolutions and Decisions, 7th ed., pp. 87-88.

1. CONGRATULATES the Director-General on the measures that he has taken to develop close co-operation between the World Health Organization and the International Atomic Energy Agency and in particular on the progress made in this direction through his discussions with the Director-General of the International Atomic Energy Agency;

2. REAFFIRMS the responsibility of WHO at the international level for activities in the field of health involving ionizing radiation, including protection from radiation hazards and the medical uses of radiation and radioactive isotopes;

3. INVITES again the attention of Member States and Associate Members to the responsibilities of their national health authorities in the protection of the population from radiation hazards and in the medical uses of radiation and radioactive isotopes; and.

4. ENDORSES the request of the Executive Board that the Director-General continue his efforts to ensure the closest and earliest collaboration between WHO, the International Atomic Energy Agency and other agencies concerned in the development of projects and in the organization of meetings of mutual interest.

APPENDIX B

CO-OPERATION IN ENERGY AND POWER MATTERS

PART I

Text of Resolution GC(VI)/RES/128 adopted by the General Conference  
of IAEA on 26 September 1962

CO-ORDINATION OF POWER QUESTIONS

The General Conference

(a) Conscious of the important role that power is destined to play in economic progress and in industrialization of the developing countries, particularly during the development decade,

(b) Taking into account the gradually growing share that will fall to nuclear power in that development, and

(c) Noting the need for increased attention by the United Nations, the specialized agencies and the International Atomic Energy Agency to problems of power in general,

1. Urges the Board of Governors and the Director General to take steps with a view to exploring ways and means of establishing a closer co-operation between the Agency, the United Nations, the specialized agencies and the World Power Conference in matters of power in general and of economics of power in particular, so as to achieve by joint effort a higher degree of co-ordination and efficiency in these important fields; and

2. Requests the Board and the Director General to submit to the General Conference at its seventh regular sessions a report on the progress achieved in that direction.

## PART II

Text of the joint progress report by the Board of Governors and  
the Director General of IAEA in response to General Conference  
Resolution GC(VI)/RES/128

### POWER DEVELOPMENT: CO-ORDINATION

#### INTRODUCTION

1. This progress report is submitted under Resolution GC(VI)/RES/128 which calls for closer co-operation between the Agency, the United Nations, the specialized agencies and the World Power Conference in matters of power, "so as to achieve by joint effort a higher degree of co-ordination and efficiency".
2. The General Conference has recognized that the industrialization of developing countries will depend largely on their ability to produce plentiful and cheap electric power, and nuclear energy will provide a gradually growing share of their power needs.<sup>1/</sup> A country's plans for expanding the production of electricity must be based on assessments both of the energy resources of all kinds that would be available to it and of the expected growth in the demand for electricity. The international organizations dealing with this subject should therefore be in a position to arrange, on request, for comprehensive studies of a country's energy resources and future power needs; they should also be able subsequently to help with the making first of preliminary, and then of detailed estimates of the costs of alternative ways of meeting these needs. These desiderata require a higher degree of co-ordination between the international organizations concerned. Besides the Agency, the organizations in the United Nations family that deal at present with power to any large extent are the United Nations itself, which is concerned principally with conventional energy resources, and the International Bank for Reconstruction and Development (IBRD).
3. In the context of its work on the preparation of a long-term programme for the Agency's activities, the Scientific Advisory Committee (SAC) has made several recommendations about the responsibilities of the Agency in connexion with energy and power. Amongst them are that the Agency, while retraining its special interest in nuclear power, should be equipped to give competent advice on all power

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<sup>1/</sup> Resolution GC(VI)/RES/128, paras. (a) and (b).



development schemes including those for power networks that are to be supplied with energy generated by different means. It should continue to employ specialists in power engineering and economic development in its surveys, arranging for the participation in such surveys of experts from other organizations. The Agency should both acquire a staff of leading nuclear power economists and also engage experts in conventional power. SAC also considered the Agency should, to the appropriate extent, seek participation with IBRD in surveys and assessments of progress.

#### CO-OPERATION WITH THE UNITED NATIONS AND THE SPECIALIZED AGENCIES

4. Resolution GC(VI)/RES/128 was brought to the notice of the Secretary-General of the United Nations and, as a result of subsequent consultations with the United Nations Secretariat, a power economist from the Agency's staff has been seconded to the Resources and Transport Branch of the Department of Economic and Social Affairs at United Nations headquarters, in order to enable the Agency to become completely familiar with the work done by the Branch.<sup>2/</sup>

5. The responsibilities of the regional economic commissions of the Economic and Social Council of the United Nations (ECOSOC) in the domain of energy and power have grown in recent years, and it is expected that they will grow further during the United Nations Development Decade. The Agency has previously co-operated with the Economic Commission for Europe (ECE) in parallel studies of methods of estimating the generating costs of nuclear and conventional power;<sup>3/</sup> the possibility is being considered of extending this co-operation by inviting ECE to join in a study that

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<sup>2/</sup> The Agency also contributed a paper entitled Prospects and Problems of Nuclear Power in Developing Areas to the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas. One of the conclusions of the paper was that "The question of introducing nuclear power reactors for developing countries with limited resources of conventional energy is therefore beginning to change from one of principle to one of suitable timing. ... The problem of timing is, however, of fundamental importance and the best possible investment of large capitals depends on its correct solution ..." (United Nations document E/CONF.39/A.103, para. 70 (d) and (e)).

<sup>3/</sup> The Agency's study was published in 1961 as No. 5 in the Technical Report Series (STI/DOC/10/5).

the Agency is planning to make of the economics of integrating nuclear power stations into electric power networks. The Agency also contributed a technical paper to the symposium on the covering of peak loads, held by ECE in May of this year. The Agency and ECE are each represented at most of the other's panels and similar meetings on the economic or technical aspects of energy and power, and there is close co-operation at the secretariat level.

6. Several nuclear power projects are planned or under way in the region covered by the Economic Commission for Asia and the Far East (ECAFE), and the 1963-64 programme of ECAFE provides for a regional study of power demand, including the contribution that nuclear power might make to meet it. The Director General has offered the Secretariat's co-operation in this study and broader arrangements for closer co-operation with ECAFE are being considered.

7. The Agency presented a paper on nuclear power costs and their trends to the seminar on electric power held by the Economic Commission for Latin America (ECLA) in Mexico in August 1961, and the Chief of ECLA's Programme of Energy and Water Resources spent a month at the Agency's headquarters that year to study the Agency's programmes. The work of the Economic Commission for Africa (ECA) on energy and power started relatively recently; arrangements have been made for the Agency and ECA to keep each other informed of their work on these subjects.

8. It is now the practice of the Agency to include conventional as well as nuclear power experts in its missions to Member States, such as the preliminary assistance mission to Africa in 1962 and the special missions sent in that year and early 1963 to the Philippines<sup>4/</sup> and Thailand.

9. By the end of June 1962 IBRD had made loans to the value of US\$2214 million to finance numerous conventional power plants and one nuclear power plant in its Member States; this sum represented 34 per cent of the US\$6544 million that IBRD had lent for all purposes by that date. The Agency has not concluded a relationship agreement with IBRD, but satisfactory working arrangements have been made for the briefing of experts sent out by the Agency to study individual power projects.

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<sup>4/</sup> The Philippines has since submitted a request to the Special Fund for a "pre-investment study on power, including nuclear power, in Luzon".

## CO-OPERATION WITH NON-GOVERNMENTAL ORGANIZATIONS

10. The World Power Conference, which has had consultative status with the Agency since July 1959, collects and publishes much material on energy resources and their utilization, and holds plenary international conferences at six-yearly intervals to review all aspects of the development and use of energy resources; it also holds "sectional conferences" on individual subjects at frequent intervals. It is regularly represented at the General Conference and is invited to attend technical meetings of the Agency that are of interest to it, such as the Panel on Economic Aspects of the Integration of Nuclear Power Plants in Electric Power Systems, which met in April 1963. The Agency's representative at the plenary conference of the World Power Conference in Melbourne in 1962 was chairman of the sessions that dealt with nuclear fuels and nuclear energy.

11. Another non-governmental organization having consultative status, the Union of Producers and Distributors of Electric Energy, has offered its support in achieving the objects of resolution GC(VI)/RES/128.

## CONCLUSIONS

12. The assignment of a power economist to the United Nations Secretariat may be regarded as a first step towards the closer administrative integration of the work of the United Nations and the Agency on energy and power. The General Assembly itself has recently considered the desirability of integrating the responsibilities of various members of the United Nations family for this and other aspects of industrial development; in December 1962 it recommended the Advisory Committee set up by ECOSOC under resolution 873 (XXXIII) to examine what organizational changes would be needed to intensify "the United Nations effort for industrial development", to take account of the question "whether it is advisable to deal with problems of industrial development, natural resources, energy and possibly other related fields, within the framework of one organizational structure".<sup>5/</sup> The Advisory Committee's views will be submitted to ECOSOC and the General Assembly this year.

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<sup>5/</sup> General Assembly resolution 1821 (XVII), part I, para. 1(a).

13. The Board and the Director General consider that as far as energy and power are concerned, appropriate joint arrangements between the Agency and the United Nations (including its regional economic commissions) could go far towards meeting the desired concentration of responsibility. Hence they believe that closer substantive and organizational co-operation with the United Nations in matters of energy and power, and in particular the economics of power, should be promoted. It would also be timely to recall to the attention of the General Assembly resolution GC(VI)/RES/128, the steps taken since that resolution was adopted and the views of the Board and the General Conference on further steps for the closer integration of the work of the Agency and the United Nations. They accordingly recommended the General Conference to consider the adoption of the draft resolution set out below.\*

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\* The proposed draft resolution is not included in the ACC report as the text was adopted by the General Conference on 1 October 1963 and is reproduced in Part III below.

PART III

Text of resolution GC(VII)/RES/155 adopted by the  
General Conference of IAEA on 1 October 1965

CO-OPERATION WITH THE UNITED NATIONS  
IN MATTERS OF ENERGY AND POWER

The General Conference,

(a) Having received from the Board of Governors and the Director General the progress report on co-ordination in power questions<sup>1/</sup> which it requested in resolution GC(VI)/RES/128,

(b) Noting that the General Assembly of the United Nations has been concerned with this matter in the context of industrial development, and has asked the Advisory Committee established by the Economic and Social Council under resolution 873 (XXXIII) to take into account the recommendations it has made in resolution 1821 (XVII), and

(c) Recalling that the Agreement Governing the Relationship Between the United Nations and the International Atomic Energy Agency provides that the Secretary-General of the United Nations and the Director General of the Agency may enter into such arrangements for the implementation of the Agreement as may be found desirable in the light of the operating experience of the two organizations,<sup>2/</sup>

1. Strongly recommends a closer co-ordination of the Agency's activities in matters of energy and power, in particular its studies of the comparative economics of conventional and nuclear power and the complex economic analyses which it makes with those of the United Nations including its regional economic commissions and of interested intergovernmental organizations having relationship agreements with the United Nations or the Agency;

2. Requests the Board of Governors and the Director General to take action to this end in consultation with the Secretary-General of the United Nations, and

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<sup>1/</sup> GC(VII)/229.

<sup>2/</sup> INFCIRC/11, Article XXII.

5. Requests the Director General, as a first step, to transmit to the Secretary-General, for the attention of the appropriate organs of the United Nations, the texts of resolution GC(VI)/RES/128, of the progress report in document GC(VII)/229 and of the present resolution.

## APPENDIX C

### MEASUREMENTS OF ATMOSPHERIC RADIOACTIVITY

#### PART I

#### WMO Plan for implementation of Part II of UN General Assembly Resolution 1629 (XVI)

##### Introduction

1. At its sixteenth session the General Assembly of the United Nations adopted resolution 1629 (XVI), Part II of which was addressed to WMO. A first plan for implementing this resolution was prepared by WMO in consultation with IAEA, the United Nations Secretariat, the Presidents of Technical Commissions and the WMO Panel of Experts on Atomic Energy. This first plan was based on the assumption that the purpose of the UN resolution was to introduce a system whereby every country would be able to receive speedily standardized measurements of atmospheric radioactivity from a world-wide network of stations and the parameter to be measured was proposed to be the concentration of gross beta radioactivity in surface air.
2. Taking into account the comments of UNSCEAR at its March 1962 meeting, the Panel of Experts on Atomic Energy prepared a second plan which was submitted to the General Assembly of the United Nations at its seventeenth session. This plan was based on the view that the measurements of radioactivity in samples of air and precipitation be made by procedures which would provide information on the different components of the fission product mixture.
3. At its seventeenth session, the General Assembly adopted resolution 1764 (XVII), Part II of which was addressed to WMO.

In the light of this resolution the WMO second plan was commented upon by UNSCEAR at its January 1963 session.

4. At its fourth session the WMO Congress was informed of the developments which had taken place since the adoption of resolution 1629 (XVI) by the General Assembly of the United Nations. In brief, Congress preferred the second plan (see paragraph 2 above) but felt it required further revision in the light of the comments received from UNSCEAR (see paragraph 3 above). Congress also considered

that it was not necessary to use meteorological telecommunication channels for transmission of the data. It was decided that the revised plan should be transmitted to Members inviting them to implement it and to be prepared to exchange the data by airmail on a regular basis upon receipt of a request from any Member desiring these data.

5. The present plan has been prepared along the lines indicated by Congress, taking into account the comments received from UNSCEAR.

#### Observational programme

##### (a) Air

6. Samples of surface air should be taken through consecutive periods of twenty-four hours each. The sampling instruments should consist of a pump drawing air through a fixed filter. It is rather difficult to give specific details regarding the filter diameter, filter paper and the volume of air to be sampled. Provided adequate corrections are made for filter diameter, it does not seem necessary to specify this parameter. For the volume of air, it is desirable to take daily samples of the order of 3,000-5,000 cubic metres. This will greatly simplify gamma spectrometry.

7. The measurements of air concentration of radioactivity are more valuable if undertaken as part of a programme of physical and environmental investigation at qualified research laboratories, especially those concerned with such subjects as food chain and soil contamination. These air concentration measurements need to be co-ordinated in these laboratories with other radioactivity and meteorological observations.

8. Analysis of the air samples should consist of:

- (i) A measurement of the gross gamma activity above 1 MeV threshold energy. This measurement should be carried out on individual daily samples, preferably five days after the end of the collection period. Counters should be standardized. It is recommended to use  $\text{Ba}^{140}\text{-La}^{140}$  as standard.
- (ii) A determination of individual nuclides of importance to health physics such as the following:  $\text{Sr}^{89}$ ,  $\text{Sr}^{90}\text{-Y}^{90}$ ,  $\text{Zr}^{95}\text{-Nb}^{95}$ ,  $\text{Cs}^{137}$ . This determination should routinely be carried out on monthly composited samples, using gamma spectrometry and/or radiochemical techniques,

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as applicable. Determinations of  $I^{131}$  and  $Ba^{140}-La^{140}$  are also of value if carried out on samples from shorter sampling period. In the event of unusually high daily gross gamma counts, determinations of the individual nuclides may have to be made daily. In the case of unusually high single observations, gross gamma counts may also be supplemented by autoradiography to detect the possible presence of highly radioactive individual particles.

(b) Measurements of deposition

9. Measurements of deposited radioactivity should be taken. The analyses of deposited radioactivity should include such nuclides as:  $Sr^{90}$ ,  $Sr^{89}$ ,  $Zr^{95}$  and  $Cs^{137}$ . For short sampling periods the analysis should also include  $I^{131}$  and  $Ba^{140}$ . The choice of the collection systems is left to the participating country.
10. The period of sample collection should preferably be monthly, but not longer than quarterly.
11. In view of the fact that the analyses of radionuclides indicated in paragraph 9 above are rather difficult, they should be carried out in well-qualified laboratories. The scientific procedures involved in sampling should be determined by these laboratories. New analytical laboratories should thoroughly intercalibrate with well-established laboratories to assure comparability of data.
12. For countries not having laboratories sufficiently well-equipped for dealing with these samples, arrangements may be made for the measurements to be carried out at the laboratories of IAEA or of several Member States who have volunteered to accept samples for analysis.

Network and location of stations

13. It is recommended that members desiring to operate new stations should take into consideration the existing national networks and programmes for collecting and sampling by air filtration and deposition techniques. UNSCEAR considers that the present estimates of the inventory based on existing stations and the observed variation with latitude is probably accurate enough. However, the existing network would be further improved if measurements from high seas and

land areas not already covered could be obtained. The placement of additional stations should have due regard for areas of high population density, areas of large scale food production, and different meteorological regimes.

Storage and publication of data

14. In accordance with resolution 12 (EC-XIV), the Secretary-General of WMO is already endeavouring to arrange for a member to accept responsibility for the central collection and publication under WMO sponsorship of certain atmospheric radioactivity data, including monthly mean data on the gross radioactivity of surface air. It is recommended in the same resolution that the corresponding daily values should be collected and published locally.

15. Members are urged to arrange for the permanent storage of all their atmospheric radioactivity data and to exchange them on a regular basis by airmail upon request.

PART II

Text of Resolution 25 (Cg-IV) adopted by the World  
Meteorological Congress on 27 April 1963

MEASUREMENTS OF ATMOSPHERIC RADIOACTIVITY

THE CONGRESS,

NOTING:

- (1) United Nations General Assembly resolution 1629 (XVI);
- (2) Abridged Report of EC-XIV - General Summary, paragraph 5.5;
- (3) United Nations General Assembly resolution 1764 (XVII);

HAVING EXAMINED the reports by the Secretary-General on the action taken by WMO in implementing the above-mentioned resolutions and the draft plans prepared in consultation with the International Atomic Energy Agency (IAEA) and the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR);

APPROVES the second plan on the understanding that the meteorological telecommunication channels are not to be used for transmission of the data and also that the plan may be revised in the light of further comments received from UNSCEAR;

DIRECTS the Secretary-General:

- (1) To revise this plan, incorporating the comments offered by UNSCEAR during its twelfth session;
- (2) To take into account results of further consultation with UNSCEAR;
- (3) To transmit the plan to the Permanent Representatives of members of WMO;

INVITES members:

- (1) To assist in implementing the plan;
- (2) To exchange the data by air mail on receipt of requests from members desiring these data.

# APPENDIX D

## SCIENTIFIC MEETINGS DEALING WITH THE PEACEFUL USES OF ATOMIC ENERGY

(1 January - 31 December 1964)

Date	Subject	Place	Sponsor	Organizations invited to participate
6 - 8 January	ACC Sub-Committee on Science and Technology <sup>*/</sup>	Paris	UN	ACC representatives
13 - 17 January	International Nuclear Data Scientific Working Group	Vienna	IAEA	-
20 - 24 January	Panel on Co-ordination of National Research Projects in Radioactive Waste Management	Saclay France	IAEA	-
10 - 14 February	Panel on Basic Requirements of an Adequate System for Personnel Dosimetry for Radiation Workers	Vienna	IAEA	UN, ILO, WHO, UNESCO
17 - 21 February	Panel on the Application of Mineral Reactions in Radioactive Waste Treatment	Vienna	IAEA	FAO, WHO, UNESCO
17 - 21 February	Panel on the Preparation of Tests and Calculative Methods for Approving Packaging for Radioactive Materials	Vienna	IAEA	-
24 February - 6 March	(Thirteenth session of UNSCEAR	Geneva	UN	FAO
24 - 25 February	(Symposium on Atmospheric Movements of Radioactive Materials		WHO	WHO
			WMO	IAEA

<sup>\*/</sup> At which questions relating to nuclear techniques are considered.

Date	Subject	Place	Sponsor	Organizations invited to participate
25 February - 6 March	Advisory Committee on the Application of Science and Technology to Development */	New York	UN	All ACC members
9 - 13 March	Panel on Reactor Shielding	Vienna	IAEA	UN, ILO, WHO, FAO, WMO
16 - 20 March	Panel on Thermodynamic Properties of Nuclear Materials	Vienna	IAEA	UN, UNESCO
16 - 20 March	Study Group Meeting on Radioisotope Economics	Vienna	IAEA	UN, ILO, UNESCO, FAO
23 - 26 March	Panel on Analytical Chemistry of Nuclear Materials	Vienna	IAEA	
6 - 10 April	Working Group Meeting on the Co-ordination of Hydrology Programmes	Vienna	IAEA	WMO
7 - 17 April	Inter-Governmental Meeting of Experts on Scientific Hydrology (in connexion with the International Hydrologic Decade) */	Paris	UNESCO	UN, FAO, WHO, WMO, IAEA
13 - 18 April	Standing Committee on the Vienna Convention on Civil Liability for Nuclear Damage	Vienna	IAEA	
20 - 24 April	Symposium on Medical Radioisotope Scanning	Athens	IAEA	UN, WHO, UNESCO

\*/ At which questions relating to nuclear techniques are considered.

Date	Subject	Place	Sponsor	Organizations invited to participate
21 - 28 April	Expert Committee on the Technical Basis for Legislation on the Wholesomeness and Microbiological Safety of Irradiated Foods	Rome	FAO WHO IAEA	
27 - 30 April	Panel on the Use of Nuclear Energy in Saline Water Conversion	Vienna	IAEA	
11 - 16 May	Symposium on the Assessment of Radioactive Body Burdens in Man	Heidelberg Federal Republic of Germany	IAEA ILO WHO	UN, FAO
25 May - 1 June	Technical Meeting on the Use of Induced Mutations in Plant Breeding	Rome	FAO, IAEA in co-operation with the European Assoc. of Plant Breeders	WHO
1 - 5 June	Nuclear Materials Management Panel	Vienna	IAEA	
1 - 5 June	Panel on Co-ordination of Research Contracts on Isotopes in Tropical Medicine	Vienna	IAEA	WHO
7 - 9 June	International Conference on the Use of Isotopically Labelled Drugs in Experimental Pharmacology	Chicago, United States	Organized by Dept. of Pharmacology, University of Chicago; supported by the Agency	

Date	Subject	Place	Sponsor	Organizations invited to participate
24 June - 1 July	Standing Committee on the Brussels Convention on Liability of Operators of Nuclear Ships		IAEA	
2 - 8 July	Congrès International de Physique Nucléaire	Paris	Initiated by Assc. F et I. Joliot-Curie; IUPAP, UNESCO, Société française de physique; and supported by IAEA	
13 - 17 July	Panel on Pile Dosimetry	Vienna	IAEA	
20 - 24 July	Panel on Advances in Insect Population Control by the Sterile Male Technique	Vienna	IAEA	FAO, WHO Regional Commissions, Special Fund
27 - 31 July	Panel on Isotopes and Radiation in the Study of Soil Moisture and Irrigation	Vienna	IAEA	UN, FAO, Regional Commissions, Special Fund
? July	Panel on a World-wide Survey of the Concentration of Hydrogen and Oxygen Isotopes in Precipitation	Vienna	IAEA	UN, WHO, ILO, FAO, WMO, UNESCO
3 - 7 August	Panel on the Application of Food Irradiation in Developing Countries	Vienna	IAEA	UN, ILO, FAO WHO, Special Fund, Regional Commissions

Date	Subject	Place	Sponsor	Organizations invited to participate
31 August - 9 September	Third International Conference on the Peaceful Uses of Atomic Energy	Geneva	Organized by United Nations in co-operation with IAEA	Invitations to be sent by the United Nations
? September	Panel on Planning of Radiotherapy Departments Equipped with Radio-isotope Teletherapy Units	Vienna	IAEA WHO	
4 - 9 October	Panel on the Application of Chemical Engineering Processes in Waste Treatment	Vienna	IAEA	
5 - 7 October	Panel on Equipment for Radiochemistry and Nuclear Physics Training Laboratories	Vienna	IAEA	UNESCO
19 - 23 October	Symposium on Radiochemical Methods of Analysis	Salzburg Austria	IAEA	UN, UNESCO, WHO
26 - 30 October	Study Group on Research Reactor Utilization	Bucharest	IAEA	
? October	Panel on Activation Analysis of Trace Elements in Medicine	? Salzburg Austria	IAEA	UN, WHO, ILO
3 - 6 November	Panel on Reactor Containment	Vienna	IAEA	
9 - 13 November	Panel on the Economics of Waste Management Practices	Vienna	IAEA	



Date	Subject	Place	Sponsor	Organizations invited to participate
9 - 13 November	International Nuclear Data Scientific Working Group	Vienna	IAEA	
16 - 20 November	Panel on Basic Safety Standards for Radiation Protection	Vienna	IAEA	UN, ILO, WHO, FAO, IMCO, ICAO
23 - 27 November	Panel on Permissible Emergency Doses to the Public	Vienna	IAEA	UN, WHO, ILO, FAO
? November	Symposium on the Use of Radioisotopes in Animal Nutrition and Physiology	? CSSR	IAEA FAO	
? November	Panel on New Methods of Increasing Radiation Sensitivity	Vienna	IAEA	UN, WHO, FAO
? November-December	Panel on the Use of Nuclear Energy in Saline Water Conversion	Tunisia	IAEA	UN
? 30 November-4 December	Study Group Meeting on Nuclear Power for Developing Countries	Pakistan	IAEA	
7 - 11 December	Panel on the Use of Plutonium for Power Production	Vienna	IAEA	
End 1964	Seminar on Public Health Programmes in Radiation Protection	Manila	WHO	IAEA
15 - 19 September	Scientific Meeting on Methods of Radiochemical Analysis	Geneva	WHO FAO IAEA	
?	International Congress of Nuclear Physics	?	IUPAP UNESCO	

## APPENDIX E

## TRAINING COURSES IN 1964

- IAEA Inter-Regional Training Course on the Maintenance and Repair of Nuclear Electronic Equipment  
(University of Ceylon, Colombo) 13 January-12 June 1964
- WHO Training Course in Radiation Health for Public Health Administrators  
(Santiago, Chile: 30 March-17 April)
- IAEA Regional Training Course on the Use of Research Reactors for the Production of Radioisotopes and Activation Analysis  
(Trombay Establishment, Bombay, India: 28 September 1964 for eight weeks)
- IAEA/UNESCO International Refresher Course on Nuclear Physics for University Teaching Staff in Developing Countries  
(Copenhagen, Denmark: 4 May 1964 for five months)
- IAEA Advanced Inter-Regional Training Course on the Cellular and Molecular Aspects of Radiobiology  
(Radioisotope Training Centre, Rehovoth, Israel, 20 April 1964 for seven weeks)
- IAEA International Advanced Summer School on Reactor Physics  
(Zakopane, Poland: 14-29 September 1964)
- IAEA Regional Training Course on the Application of Radioactive Isotopes in Soil-Plant Relations  
(Piracicaba, Brazil: 15 September 1964 for two months)
- IAEA Regional Training Course on the Application of Radioisotopes in Medicine  
(Athens, Greece: 31 August 1964 for eight weeks)
- IAEA Regional Training Course on the General Applications of Radioisotopes  
(Japan: 13 August 1964 for eighteen weeks)
- UNESCO/IAEA Orientation Course on Scientific and Technical Documentation  
(Buenos Aires, Argentina: September 1964 for six weeks)

- IAEA                    Regional Training Course on the Application of Radioisotopes  
                         in Medicine  
                         (Philippines: 19 October 1964 for two months)
- UNESCO/IAEA           International Seminar for Research and Education in Physics\*  
                         (University of Uppsala, Sweden)

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\* A sequence of courses, each of a year's duration, is being organized, which deal in part with theoretical and experimental physics, closely linked with nuclear physics and an approach to atomic energy problems.

## APPENDIX F

### SUMMARY OF RESEARCH BEING SUPPORTED BY THE UNITED NATIONS FAMILY

The different organizations are concerned with research to meet different needs and it is carried out in different ways including contractual arrangements with other organizations or institutes. In the case of IAEA, research is also carried out in its own laboratory near Vienna and in its laboratory of marine radioactivity in Monaco.

A summary of the subjects on which research is being supported by the United Nations family is described under the following main headings:

#### A. Health physics and radiation protection

WHO continues to provide support to ICRU for studies in the development of basic standards and units for the measurement of ionizing radiation, and to ICRP for the collection of fundamental data on the effects of radiation, and for studies and recommendations on radiation protection and maximum permissible doses.

IAEA has awarded technical contracts to ICRU and ICRP to support that part of their work which has a direct bearing on IAEA's activities.

In addition, IAEA has awarded or renewed twenty-four research contracts on subjects coming under this heading.

#### B. Radioisotope applications in agriculture

IAEA has awarded or renewed research contracts dealing with twenty-one aspects of the application of radioisotopes in agriculture.

#### C. Radioisotope applications in medicine

IAEA has awarded or renewed twenty-two research contracts.

#### D. Radioisotope applications in hydrology

There is one continuing joint WMO/IAEA project.

IAEA has awarded or renewed six research contracts.

E. Radiobiology

IAEA has awarded or renewed sixteen research contracts.

F. Radioactive waste management and environmental research

IAEA has awarded or renewed fourteen research contracts.

G. Studies involving the use of reactors

IAEA is organizing regional study groups for research on reactors and has awarded or renewed three research contracts.

In addition to the studies under the above main groupings, IAEA has renewed a research contract on phosphate metabolism of Escherichia coli, and another on ion exchange separation of uranium and thorium in non-aqueous and mixed media.

IAEA has also awarded or renewed four research contracts on safeguard methods which are of concern only to IAEA.

## APPENDIX G

### HEALTH AND SAFETY CODES AND STANDARDS

1. A number of international codes and standards have been formulated which apply to different groups of people exposed to ionizing radiation. Since ACC last reported on this subject<sup>1/</sup> there have been the following developments in the work of United Nations organizations.

#### Basic safety standards

2. IAEA's basic safety standards, which were approved by its Board of Governors in June 1962 as a first edition, were published in IAEA's Safety Series.<sup>2/</sup>

#### Transport of radioactive materials

3. IAEA's Regulations for the Safe Transport of Radioactive Materials<sup>3/</sup> were reviewed by a panel of experts in March 1963. Groups of consultants were subsequently convened in October and December 1963, to prepare packaging tests and design criteria for incorporation into a final draft of the Regulations which has been revised in the light of comments received from Member States and international organizations concerned.

4. The Working Party on the Transport of Dangerous Goods of the Inland Transport Committee of the ECE at its fifteenth session in November 1963, reviewed progress made in the revision of IAEA's Regulations. In this regard, the Working Party was informed of relevant action arising from the Vienna Convention on Civil Liability for Nuclear Damage of 21 May 1963, in the event of damage occurring in the course of transport governed by the Convention on the Contract for the International Carriage of Goods by Road (CMR) and by the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). The Working Party accordingly decided to ask Governments to communicate to the ECE

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<sup>1/</sup> See document E/3765, paragraph 151, and Part IV of Annex II.

<sup>2/</sup> IAEA publication No. STI/PUB/26.

<sup>3/</sup> IAEA publication No. STI/PUB/40.

secretariat their views on the desirability of amending the CMR or other conventions drawn up under the auspices of ECE's Inland Transport Committee, in order to make them consistent with the new principles laid down in the Vienna Convention.

5. Preparations have been made by UPU, in consultation with IAEA, for the next Congress of UPU beginning in May 1964 in Vienna, to consider draft regulations for the control of the transport of radioactive materials by post. IMCO is preparing a code on the transport of dangerous goods by sea, which will contain a chapter on the transport of radioactive materials.

#### Protection of workers against ionizing radiation

6. ILO is preparing for publication in 1964 Parts III, IV and V of its Manual of Industrial Radiation Protection, on which IAEA has been invited to comment.

7. These will take the form of illustrated guides: Part III will give advice on fundamental "do's" and "don'ts" of radiation protection for all applications of ionizing radiations, and particularly on those having a bearing on industry; Part IV will deal specifically with radiation protection in industrial gamma and X-ray radiography and fluoroscopy; and Part V will be devoted to the radiological protection of workers using luminous compounds (dial painting etc.).

#### Control and treatment of radioactive waste

8. The report of the Panel on the Legal Implications of Disposal of Radioactive Waste into the Sea, which met for the fourth time in January 1963, was sent to Member States and interested inter-governmental organizations for comment in June. It is foreseen that the question of waste disposal into the sea will be discussed during the course of 1964 by the Board of Governors of IAEA in the light of the observations received.

#### Civil liability

9. In April/May 1963 IAEA convened an international conference which adopted the Vienna Convention on Civil Liability for Nuclear Damage. The Standing Committee on the Brussels Convention of 25 May 1962 on Liability of Operators of Nuclear Ships, held its first meeting in October 1963 in Monaco, when it discussed the following questions referred to it: the establishment of an

international compensation fund; the establishment of an international procedure to determine the competent court in cases of dispute; and the conditions to be fulfilled by international organizations before they could accede to the Convention for the purpose of acting as a licensing authority.

Emergency assistance

10. In June 1963, the Board of Governors of IAEA reviewed the question of the provision of emergency assistance in the event of a radiation accident, and at that time authorized the Director General to sign the Nordic Mutual Emergency Assistance Agreement in connexion with Radiation Accidents concluded with the Governments of Denmark, Finland, Norway and Sweden. At the same meeting, the Board also reviewed a draft model bilateral agreement for use between a State requesting aid and a State offering assistance. Both agreements are intended to obviate the need for hasty negotiations of the conditions under which assistance might be offered and accepted should an emergency arise.

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