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THE AGENCY'S PROGRAMME AND BUDGET FOR 1987 AND 1988

EXPANDED NUCLEAR SAFETY ACTIVITIES

Note by the Director General

1. In June of this year, within the framework of its consideration of the draft programme for 1987-88 and the draft budget estimates for 1987, the Board of Governors also considered Secretariat proposals for expanded nuclear safety activities in 1987-88, and it accepted a figure of US $ 2 030 000 as the upper limit for financing the additional activities foreseen for 1987. At the same time, the Board considered that the proposals needed to be developed further and defined more precisely and that it should review them in the light of the post-Chernobyl-accident analysis meeting held from 25 to 29 August, of other expert group meetings taking place this year and of additional comments received from Member States.

2. Following the Board's June session, the Secretariat reviewed the proposals in the light of the comments made in the Board and received from Member States and circulated a draft Revised Supplementary Nuclear Safety and Radiation Protection Programme with supporting details; also it invited Member States to submit comments on the draft.

3. Subsequently, the Secretariat amended the draft and the supporting details in the light of the results of the meeting - held from 21 July to 15 August 1986 - of governmental experts to draft international conventions on early notification of a nuclear accident and emergency assistance, of comments received from Member States in response to the Secretariat's invitation and - in particular - of the post-accident analysis meeting of 25-29 August, section 7 of the report on which (see document GC(SPL.I)/3) contains recommendations for a range of activities.

4. The Board, after considering the resulting material on 22 and 23 September 1986, requested the Director General to submit it in the Board's name to the General Conference in an Addendum to Conference document GC(XXX)/777 for examination within the context of the Conference's consideration - during its thirtieth regular session - of the Agency's programme and budget for 1987 and 1988.

5. In doing so, the Board recommends to the General Conference that it authorize the Board to further examine the proposed expanded programme and to make such modifications to it as it may deem necessary.

ANNEX 1

REVISED SUPPLEMENTARY NUCLEAR SAFETY AND RADIATION PROTECTION PROGRAMME

A. NUCLEAR POWER

(see paras VII.A.2 (3, 4, 5 and 10) in section VII of INSAG's report)

Area of Activity A.2

Technical and Economic Performance of Nuclear Power

1. The data bank of the Agency's Power Reactor Information System (PRIS) has until now mainly been used in analysing the technical performance of nuclear power plants, but it could also have other uses. A consultants' meeting in 1987 and an advisory group meeting in 1988 will consider additional potential uses of the data bank in studying, inter alia, the probable - but complex - general link between high levels of plant performance and safety, the benefits of quality assurance (QA) and the potential usefulness in connection with OSART missions of outage information as general "problem indicators". Integrated use will be made of PRIS and other data banks and sources of information within the Agency, notably the International Nuclear Information System (INIS), the Incident Reporting System (IRS) and reports on visits to plants. Starting in 1988, PRIS will be made accessible on-line for Member States in response to requests made by a number of them.

2. The post-accident review brought out the importance of the man-machine interface and of simulator training, subjects to which the International Working Group (IWG) on Nuclear Power Plant Control and Instrumentation has been devoting an increasing number of specialists' meetings since 1982. Early in 1987 the IWG will consider the implications of the post-accident review, and a specialists' meeting will be held in 1987 and in 1988 on subjects to be recommended by the IWG, which will also take into account the results of analyses carried out with the help of PRIS. At the first specialists' meeting, in 1987, specific aspects of experience with the man-machine interface will be examined with a view to promoting improvements in control room design.

3. It is planned in 1988 to hold an international conference on the man-machine interface in the nuclear industry to review and evaluate the many technological developments that have taken place in this area in recent years. The conference will be organized in co-operation with the Safety of Nuclear Installations programme.

4. The guidebook "Qualification of Nuclear Power Plant Operations Personnel" (TRS-242), which has proved to be a good basis for defining nuclear power plant personnel qualification goals, will be reviewed, the aim being to provide more specific, practical recommendations. Within the framework of existing activities related to training (Project A.1.05), more emphasis will be placed on defining desirable criteria for the training and qualification of plant operators to ensure operational safety (in co-operation with the Safety of Nuclear Installations programme) by convening advisory group meetings on the subject. The feasibility of a voluntary accreditation scheme for operator training programmes will be explored.

5. An effective QA programme for plant operation is one of the plant owner's most important management tools for achieving higher levels of both performance and safety. Advisory groups on the Agency's QA programme will be convened in 1987 and 1988 with the primary purpose of reviewing the programme from the point of view of its effectiveness in assisting plant owners and managers. An advisory group on QA in nuclear power plant operations will meet in 1987 to prepare a practical manual for plant managers. Increased assistance regarding the implementation of QA programmes in project execution and operation and the training and qualification of QA personnel will be given through advisory missions. Independent appraisals of QA programmes in Member States will be performed on request. A symposium on quality assurance activities in nuclear power plant operation will be organized for 1989 in co-operation with the Safety of Nuclear Installations programme.

Area of Activity A.3
Advanced Systems and Technology Development

6. Design improvements in power reactors which incorporate passive safety systems based on the laws of thermal hydraulics, gravity and nuclear physics and which are less dependent on direct actions of operators are being

studied in Member States. The design and the technical and economic viability of reactor concepts with enhanced safety features will be reviewed at an advisory group meeting in 1987 and at three technical committee meetings in 1988. The scope and objectives of a co-ordinated research programme on the thermal hydraulics of natural convection systems will be defined at a consultants' meeting in 1987.

7. The status of nuclear power plant robotics will be reviewed and the main near-term development issues defined at a specialists' meeting in 1987.

8. An exchange of information on safety-related core parameters such as reactivity effects, control rod efficiency and core flux stability needs to be established in the light of the Chernobyl' accident in order to facilitate better predictions of core behaviour under normal and accident conditions. The creation of core data files including neutron physics and thermal dynamics analyses is necessary for the modelling of reactors, for both operator training and safety analysis. The status of work in the field of reactor physics and thermal hydraulics will be reviewed at an advisory group meeting and two subsequent specialists' meetings in 1988.

B. NUCLEAR FUEL CYCLE

Area of Activity B.1
Resources and Supply of Uranium and Thorium

9. The environmental radiation measurements performed in many countries after the accident at Chernobyl' showed that there is a need for reliable information on the natural radiation environment. The high-quality airborne and ground radioactivity surveys which have been performed in many countries for exploration and geological purposes have produced a wealth of information on natural radiation backgrounds due to the radionuclide content of the earth. With a view to the establishment, in due course, of international standards for the collection, compilation and publication of national radionuclide distribution data, the Agency will arrange for a review of

national practices in this area and, in this connection, build up a collection of maps of the natural background radiation environment made available by Member States.

Area of Activity B.2
Production and Processing of Nuclear and Reactor Materials

10. The accident at the Sequoyah Facility in the United States in May 1986, with a release of uranium hexafluoride to the environment, underlined the need for special precautions to be taken in the design, construction and operation of facilities for the production, handling and storage of UF_6 (which is highly corrosive and toxic) to ensure the safety of workers and the public. In 1987-88, a study will be made and a code of practice prepared, in co-operation with ILO, on the safe design and operation of UF_6 facilities.

Area of Activity B.3
Reactor Fuel Design, Fabrication and Performance

11. The reliability of reactor fuel is important for the safe operation of nuclear power plants, and satisfactory quality assurance during all steps in nuclear fuel fabrication is essential for ensuring the reliability of nuclear fuel. It is planned in this connection to prepare a guidebook on criteria and techniques for quality assurance and quality control in nuclear fuel fabrication, using the NUSS QA codes and guides as the basis.

Area of Activity B.4
Spent Fuel Management

12. The Chernobyl' accident has drawn attention to the current technology of at-reactor spent fuel storage since an accident in the core might lead to damage to the storage facility, which might in turn result in a loss of cooling water or in potentially dangerous changes in the stored fuel configuration. In 1986-88, international studies will be organized to review the adopted and planned methodological approaches and the existing technology of spent fuel storage in at-reactor pools. The results will provide input for

the preparation (in co-operation with the Safety of Nuclear Installations programme - see Table 6 in Annex 2) of a Safety Series document on spent fuel management after a nuclear accident.

13. The accident also raised a problem to which little attention had previously been given, namely the handling, conditioning, transportation and storage/disposal of fuel severely damaged during an accident. Existing spent fuel management concepts are not adequate for such situations. It is therefore planned to review the current technologies, methodologies and safety procedures and to issue a Safety Series document. This will be done in co-operation with the Safety of Nuclear Installations programme (see Table 6 in Annex 2).

C. RADIOACTIVE WASTE MANAGEMENT

Area of Activity C.2
Radioactive Waste Disposal

14. The damaged reactor at Chernobyl' is being entombed with cement grout. Construction of the tomb is due to be completed this month. Most of the data needed for basic consideration of this operation (data on the design of the entombment system, waste characteristics, etc.) and information about experience gained in constructing the tomb will be available soon, and data on radionuclide migration in the biosphere will be available in due course. The entombment technologies and the radioactive waste isolation system, including their safety aspects, will be reviewed.

Area of Activity C.3
Decommissioning of Nuclear Installations

15. A review will be made of the alternatives and special technologies required for the decommissioning and isolation of nuclear facilities after a major accident, including the extensive use of remotely operated equipment. Technical reports on technologies, methodologies and safety procedures will be issued in 1989 and 1990.

16. Techniques, operational and quality assurance procedures and special equipment for decontaminating large areas of land so as to permit their early return to productive use will be examined. This review will include decontamination and clean-up methodology and technology and methods for verifying that clean-up to stated levels has been achieved, and the means of disposing and stabilizing the large volumes of waste which result from the clean-up process. Technical and safety series reports on these topics will be issued in 1988 and 1990. This work will be carried out in co-operation with the Radiation Protection programme, with the preparation of a Safety Series document (see Table 5 in Annex 2).

17. Methods of on-site treatment, conditioning and disposal of large volumes of liquid and solid wastes generated at a nuclear facility as a result of a major accident and subsequent decommissioning activities - including experience in using mobile waste processing systems and disposal and stabilization of these wastes - will be reviewed and a technical report published in 1990.

E. HUMAN HEALTH

Area of Activity E.3
Radiation Dosimetry

18. An advisory group meeting will be convened in 1987 to consider ways of enhancing the capacity of SSDLs so that they can carry out dosimetry calibrations in connection with unintentional radiation exposures and ensure adequate accuracy and reliability in survey instruments and dosimeters used for radiation protection measurements and environmental monitoring. To this end, calibration and test procedures for such instruments will be developed and periodic calibrations and intercomparisons of reference instruments at SSDLs will be organized. The work will be carried out in co-operation with the Division of Nuclear Safety and competent international and national organizations under the guidance of the SSDL Scientific Committee.

Area of Activity E.4

Nutritional and Health-related Environmental Studies

19. If assistance and inputs are obtained from WHO, UNSCEAR, WMO, FAO and national health authorities, the Agency will initiate activities aimed at providing a set of reference methods for measuring key radioactive contaminants in environmental samples (such as air, rainwater, soil and vegetation) and foodstuffs. In the first phase, advisory and consultants' meetings will be convened to identify which type of basic sample should be considered and which key radioactive contaminant should be measured. Once these substrates and analytes have been identified, current analytical methods will be compared and assessed in the second phase of the project. Simple and detailed guidelines will be prepared on sampling methods, analytical procedures and result reporting in order to provide health and radiation protection authorities and relevant international organizations with reliable and comparable data. Laboratory intercomparisons using certified reference materials will be the basis for quality control. Developing Member States will be given help in setting up environmental monitoring laboratories through technical assistance projects.

H. RADIATION PROTECTION

20. The following activities are planned in connection with basic criteria for the radiation protection of the general public and workers.

21. The Agency, together with WHO, will co-operate in assessments - planned by UNSCEAR - of the individual doses and the collective dose resulting from the Chernobyl' accident. The Agency will establish a comprehensive data base for this purpose (see Annex 2, Table 5, H.2 and para. VII.B.1 (3) in section VII of INSAG's report).

22. During the post-accident period the Agency received numerous inquiries from developing Member States from all regions seeking guidance on radiation protection, and it is expected that there will be an increased demand for the services of Radiation Protection Advisory Teams (RAPATs) in strengthening the

radiation protection infrastructure in Member States. Six additional RAPAT missions are envisaged for 1987 and eight for 1988, after which demand is expected to remain relatively constant. Also, current experience indicates that RAPATs will need to be increased in size from 2-3 persons to 4-5 persons (see Annex 2, Table 5, H.2).

23. Given the expected increase in the demand for RAPAT services, there will be a substantial increase in Agency training activities. In addition to the training activities already planned for 1987-88, training will be provided in the following areas: radiation monitoring and dose assessment; emergency planning and preparedness; intervention actions; public education; and the maintenance and calibration of radiation measuring equipment (in collaboration with SSDLs). Relevant training material will be developed. The Secretariat's capacity for planning and co-ordinating such training activities will be strengthened (see Annex 2, Table 5, H.2).

Area of Activity H.1

Occupational Radiation Protection and Health Effects

(see para. VII.A.2 (8), sub-paras VII.B.1 (1 and 2) and paras VII.B.2 (6, 7, 8 and 13) in section VII of INSAG's report)

24. The Agency will develop technical guidance on assessments of the large-scale contamination of people (external and internal contamination), equipment, facilities, premises, ground, water and air after a nuclear accident.

25. The Agency will develop technical guidance on radiation protection aspects of the decontamination of a nuclear power plant and large areas of surrounding land after a nuclear accident and on radiation protection of the personnel carrying out such operations.

26. The Agency will develop, in the light of the Chernobyl' accident, technical guidance (criteria and specifications) for clothing which will protect against very high levels of airborne beta-contamination.

27. Operational radiation protection missions will be expanded to include nuclear fuel cycle activities and users of industrial and medical radiation sources. Participation in and liaison with OSART and research reactor mission

programmes will be enhanced to ensure compatability with the Agency's recommendations in operational radiation protection.

28. The Agency will initiate a programme for evaluating the considerable experience gained through accidents in the assessment, prognosis and treatment of non-stochastic effects in highly exposed persons - particularly the acute radiation syndrome and radiation-induced skin lesions. Also, guidance will be developed for the establishment of basic therapeutic schemes and the formulation of correct prognoses. This work will be done in co-operation with WHO.

29. The Agency will, in collaboration with other organizations (for example, UNSCEAR, WHO, and NEA/OECD), arrange for an exchange of experience of past epidemiological studies with a view to determining the usefulness of their results for the development of a methodology (including procedures for the establishment of a data base and of registers of individuals) for an epidemiological study of the late effects in selected groups exposed in the Chernobyl' accident.

30. With a view to enabling physicians to give appropriate advice to members of the public concerning the health consequences of accidental radiation exposures and to provide early treatment to accidentally exposed persons, the Agency will initiate, in collaboration with WHO, a study on what needs to be introduced into the basic and post-graduate training of physicians.

Area of Activity H.2

Radiation Protection of the General Public

(see paras VII.B.2 (1 and 11) in section VII of INSAG's report)

31. In order to improve predictions of the consequences of accidental releases of radioactivity, the Agency will, in collaboration with WMO, review and intercalibrate models of atmospheric transport of radionuclides over short and long distances and of radionuclide deposition on terrestrial surfaces (soils, vegetation, buildings, etc.) and establish a data base for validation studies on such models. In addition, it will carry out similar activities with regard to models of the transfer of radionuclides through the terrestrial

environment and in food chains, their transfer through surface waters (fresh water and seawater) and their transfer in urban environments.

32. Given the fact that the lack of internationally recommended values for the dose per unit intake (by inhalation or ingestion) of radionuclides as a function of the age of the individual and as a function of the physico-chemical forms of the radionuclides found in the environment was a problem encountered in many countries in assessing the consequences of the Chernobyl' accident, the Agency will promote the establishment of agreed values - initially for the most relevant radionuclides.

33. Following the nuclear accident at Chernobyl' various national authorities and scientific organizations are carrying out extensive environmental studies. In order to collate their experience, a symposium will be held in 1988 on experience in monitoring and assessing environmental radioactivity following the Chernobyl' accident.

Area of Activity H.3
Safe Transport of Radioactive Materials

34. The transport of large quantities of contaminated and activated materials resulting from the Chernobyl' accident will no doubt pose many problems. Information-sharing between the USSR and other countries in this area as early as possible is foreseen. A review of the experience gained will subsequently be organized, with the issue of a technical document in 1988.

Area of Activity H.4
Emergency Planning and Preparedness
(see sub-para. VII.B.1 (4) and sub-paras VII.B.2 (2-5, 9 and 10) in section VII of INSAG's report)

35. The draft Convention on Early Notification of a Nuclear Accident and the draft Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency foresee that the Agency will serve as a focal point for data reception and dissemination and for processing and co-ordinating requests for assistance.

36. On the assumption that the draft Conventions will be adopted by the General Conference at its special session and that they will enter into force soon, the Agency plans to establish appropriate communications and data processing capacities and to enhance its existing response capacity by developing an emergency response unit in order to carry out its functions under the two Conventions. Also, the Agency will assist Member States, on request, in establishing national mechanisms relating to the Conventions.

37. The first stage of implementation of the Agency's plans, in 1987, will entail the consideration of Secretariat proposals by experts from Member States and other international organizations.

38. The Agency will develop technical guidance on the use of real-time models able to accept actual meteorological and radiological monitoring system data in predicting the radiological consequences of a nuclear accident for persons and the environment and in determining what protective measures are necessary.

39. The Agency will examine the experience gained in sheltering and evacuating the public after the Chernobyl' accident with a view to determining the effectiveness of such protective measures, the problems associated with their introduction and their applicability as a function of time and environmental contamination levels.

40. On the basis of experience gained from the Chernobyl' accident, the Agency will, in collaboration with organizations such as WHO and FAO, develop additional guidance on intervention dose levels and corresponding derived intervention levels appropriate to reducing the stochastic risk and collective dose equivalent commitment, especially at distances beyond the immediate area of accident impact.

41. The Agency will develop technical guidance on criteria and procedures for radiological sampling and monitoring under emergency conditions, where the time and accuracy requirements, the radiation environment and the decision-making needs differ from those associated with routine radiological sampling and monitoring.

42. The Agency will develop technical guidance for the rapid reporting, compiling and collating of large quantities of data after a nuclear accident

(including environmental contamination data, meteorological data and population distribution data) to be used as input for radiological assessments.

43. The Agency will develop criteria for re-entry into facilities affected by nuclear accidents and into off-site areas and guidelines for recovery operations.

44. The Agency will formulate practical guidance for responding to releases of radioactive material into the national environment which originate outside the national boundaries but nevertheless require measures to be taken for protection of the public.

I. SAFETY OF NUCLEAR INSTALLATIONS

Area of Activity I.1

Safety Principles and Regulatory Organization

(see paras VII.A.2 (6 and 7) in section VII of INSAG's report)

45. The Agency will provide INSAG with the support necessary to formulate in a self-supporting document the basic safety principles for existing and future reactor types, with special attention given to those principles which emerge from the post-accident analysis.

46. Existing international standards (NUSS) will be reviewed, with the guidance of NUSSAG, in order to ensure the incorporation of the lessons learned from accidents regarding important matters such as reactivity-initiated accidents and fire prevention and fire-fighting.

Area of Activity I.2

Safety Research and Analysis

(see paras VII.A.2 (1 and 2) and para. VII.B.2 (12) in section VII of INSAG's report)

47. The Chernobyl' accident underlined the importance of human response in using all available plant systems and other techniques to stabilize conditions and control radioactive releases. In 1987-88, with the help of experts, a

study will be made and a publication issued on mechanisms for managing severe accidents at nuclear power plants taking into account national and international activities on the subject. In order to facilitate the international exchange of information from severe accident analyses, including the latest results of the Chernobyl' accident analysis, technical exchanges will be initiated on fuel behaviour research, on the modelling of reactivity transients and their consequences and on the behaviour of materials under extreme accident conditions. In order to draw lessons from the Chernobyl' accident regarding source term estimates, a co-ordinated research programme will be initiated in 1988.

48. The Agency will strengthen its work in promoting and facilitating the use of probabilistic safety assessment (PSA), by reviewing the techniques developed in Member States for the use of PSA, assisting in the formulation of guidelines for its use and helping Member States to apply such guidelines in order to enhance safety in all nuclear power plant operating modes. In this connection, the Agency will promote an exchange of information on computer codes available or being developed for the probabilistic assessment of accident consequences.

Area of Activity I.3

Safe Siting, Design and Construction of Nuclear Installations

(see paras VII.A.2 (4, 7 and 12) in section VII of INSAG's report)

49. The Chernobyl' accident underlined the need to re-examine all types of accident sequences, including power excursions, and to consider the safety features necessary in order to cope with them. The accident scenarios considered in the safety designs of various reactor types will be re-examined with a view to strengthening design features such as control capability, shutdown capability, fire prevention and protection, degree of automation (with particular emphasis on the balance between automation and direct human action and on the need for additional operator aids in the nuclear power plant control room) and containments capable of withstanding severe accidents. This will be done in co-operation with the Nuclear Power programme (see Table 1 in Annex 2).

50. In 1988 the Agency will organize a symposium on fire protection covering:

(a) the development of the scientific and technical bases for fire prevention and fire-fighting techniques, account being taken of severe conditions such as high temperatures and of the nuclear materials present; and

(b) improvements in fire prevention and fire-fighting equipment for nuclear power plants.

Area of Activity I.4

Operational Safety of Nuclear Installations

(see paras VII.A.2 (8, 9 and 11) in section VII of INSAG's report)

51. With a view to assisting Member States in reviewing their procedures for the safe operation of nuclear power plants during non-routine tests, the Agency will revise the relevant NUSS documents. Additionally, the NUSS documents on operator training and qualification will be reviewed to incorporate the results of the advisory group meeting on the subject (see Area of Activity A.2, paragraph 4).

52. The Operational Safety Review Team (OSART) programme of comprehensive on-site reviews of operating reactors by international experts, at the invitation of Member States, was conceived for up to 5-6 reviews annually of nuclear power plants and for a similar number of reviews of research reactors over the next few years. It is now expected that more Member States will wish to invite OSART missions, so that provision is being made for nine missions in 1987 and 17 in 1988 to nuclear power plants and eight missions in both 1987 and 1988 to research reactors. During the next few months, efforts will focus on further strengthening the OSART mechanism, with upgrading of the present guidelines for OSART missions. The present OSART scope will be modified to reflect recent developments, with additional emphasis on operating experience feedback, non-routine operating procedures, accident management and emergency response capabilities.

53. A programme for invited on-site visits by specialized teams (ASSETs - "Assessment of Safety-Significant Events Teams") to review the records relating to operating events and to perform root-cause assessments at plants

which have experienced safety-significant events will be initiated; this will permit the identification of accident precursors and the carrying out of preventive measures.

54. The Agency will expand its activities aimed at promoting exchanges of safety information relating to different reactor types - with a specialists' meeting on safety aspects of pressurized-heavy-water reactors.

55. The Agency's role in the feedback and sharing of operational safety experience will be strengthened in co-operation with other international bodies, the existing Incident Reporting Sytem (IRS) being expanded to include a broader range of events, the in-depth analysis of selected events with a view to learning generic lessons and a data base on the main safety features of operating nuclear power plants and research reactors. Wider and more active participation by Member States will be encouraged.

ANNEX 2

SUPPLEMENTARY ACTIONS PLANNED FOR 1987-88

Table 1: Nuclear Power

	Task	Action or source	Year of completion
Area of Activity A.2: Technical and Economic Performance of Nuclear Power			
1.	Technical document on specific aspects of experience with the man-machine interface at nuclear power plants	PRIS SPM 87, 88 IWG 87	1987
2.	Conference on the man-machine interface in the nuclear industry (1988) (in co-operation with the Safety of Nuclear Installations programme)		Proceedings, 1988
3.	Technical report on qualification criteria and the accreditation of operator training programmes (in co-operation with the Safety of Nuclear Installations programme)	CM 87, 88 AGM 87, 88	1988
4.	Internal reports evaluating the effectiveness of the Agency's QA programme	AGM 87 AGM 88	1987 1988
5.	Manual on QA in nuclear power plant operations	AGM 87	1988
6.	Advisory missions for QA programme appraisals (1-2 per year)		1987/88
Area of Activity A.3: Advanced Systems and Technology Development			
7.	Technical report on the technical and economic viability of power reactors with enhanced safety features	AGM 87 TCMs 88	1989
8.	CRP on core thermal hydraulics	CM 87	1990
9.	Technical document on the status of nuclear power plant robotics	SPM 87	1988
10.	Technical document on the status of work on safety-related core parameters	AGM 88	1989
11.	Technical documents (2) on coolant disturbances in reactor cores and plant accident prevention	SPMs 88	1988/89

Table 2: Nuclear Fuel Cycle

Task	Action or source	Year of completion
Area of Activity B.1: Resources and Supply of Uranium and Thorium		
1. Technical report on methods for the collection, compilation and publication of national radioelement distribution data and their conversion to exposure rates	AGM 86 CM 87	1988
2. Technical report - collection of maps of the natural radiation environment	AGM 88 CM 88	1989
Area of Activity B.2: Production and Processing of Nuclear and Reactor Materials		
3. Code of practice on the safe design and operation of UF_6 facilities	CM 87, 88 AGM 88	1989
Area of Activity B.3: Reactor Fuel Design, Fabrication and Performance		
4. Guidebook on criteria and techniques in quality assurance and quality control in nuclear fuel fabrication	CM 86, 87 AGM 88	1990
Area of Activity B.4: Spent Fuel Management		
5. Technical report on the main principles of the handling, conditioning, transportation and storage/disposal of severely damaged nuclear fuel	CM 87 AGM 88	1990
6. Technical report on design and engineering solutions for safe spent fuel storage in at-reactor pools under accident conditions	CM 86, 88 AGM 87 TCM 88	1989

Table 3: Radioactive Waste Management

Task	Action or source	Year of completion
Area of Activity C.2: Radioactive Waste Disposal		
1. Technical report on near-field effects of the post-accident entombment of the damaged nuclear facilities	CM 87, 88 AGM 87 TCM 88	1989

Table 3 (cont.)

Task		Action or source	Year of completion
2.	Safety Series report on safety and performance assessment for the radioactive waste isolation system at entombed nuclear facilities	CM 87, 88 AGM 87 TCM 88	1989
3.	Technical report on evaluation and optimization of post-accident concrete sealing technology for nuclear facilities	CM 87, 88 AGM 88	1990
Area of Activity C.3: Decommissioning of Nuclear Installations			
4.	Technical report assessing the decommissioning and disposal alternatives for a nuclear reactor after a serious accident	CM 87, 88 AGM 87 TCM 88	1989
5.	Technical report on the use of remotely operated equipment in the isolation, disposal or decommissioning of nuclear facilities after a serious accident	CM 88	1990
6.	Technical report on methodology and technology for cleaning up and decontaminating very large areas after a nuclear accident	CM 88	1990
7.	Technical report on the disposal and stabilization of very large volumes of contaminated material from the clean-up of large areas after a nuclear accident	CM 88	1990
8.	Technical report on on-site treatment of large volumes of liquid and solid wastes generated at nuclear facilities as a result of a major accident	CM 88	1990

Table 4: Human Health

Task		Action or source	Services needed	Year of completion
Area of Activity E.3: Radiation Dosimetry				
1.	Recommendations to the Secretariat on the role of SSDLs in the dosimetry of unintentional radiation exposures	AGM 87		1987

Table 4 (cont.)

Task		Action or source	Services needed	Year of completion
Area of Activity E.4: Nutritional and Health-related Environmental Studies				
2.	Technical document on the type of substrates and analytes to be used in monitoring radioactivity in the environment and food	Consult-ants		1987
3.	CRP on reference methods for the determination of key radioactive contaminants in basic environmental and food samples (87-90)		Lab-oratory	1990/91
4.	Technical report - Guidelines for monitoring radioactive contamination due to fallout in environmental samples and foodstuffs	Consult-ants		1991
5.	Laboratory quality control inter-comparisons		Lab-oratory	1987/88
6.	Development of certified references materials		Lab-oratory	1987/88
7.	Training course on sampling, sample preparation, measurement and data evaluation	TC	Lab-oratory	1988

Table 5: Radiation Protection

Task		Action or source	Year of completion
Area of Activity H.1: Occupational Radiation Protection and Health Effects			
1.	Guidelines on the rapid and reliable assessment (procedures and techniques) of large-scale contamination of equipment, buildings, roads, land, etc.	TCM 87 CM 87	1990
2.	Technical report on the rapid and reliable assessment of the large-scale contamination of people (external and internal)	AGM 88 CM 88	1990

Table 5 (cont.)

Task		Action or source	Year of completion
3.	Technical report on techniques for the removal or stabilization of high-level contaminants of buildings, equipment, roads, etc.	AGM 88 CM 88	1990
4.	Technical report on techniques for removing or stabilizing the contamination of large areas of the environment	AGM 88 CM 88	1990
5.	Technical report on protective clothing for operations in the presence of very high levels of contamination	CM 87 AGM 88	1990
6.	Safety Series document on radiation protection aspects of planning for the clean up and control of very large areas after a serious accident at a nuclear facility (to be prepared in co-operation with the Radioactive Waste Management programme)	CM 87, 88 AGM 87 TCM 88	1988
7.	Expansion of operational radiation protection missions to include fuel cycle activities and users of industrial and medical radiation sources (five missions)	TC	1987/88
8.	Safety Series document on the medical handling of highly irradiated persons (skin lesions, etc.)	2 AGM 87 2 CM 87 2 CM 88	1989
9.	Technical document with guidance on biological dosimetry (expansion of current activity)	CM 87 AGM 88	1989
10.	Technical report on using the results of past epidemiological studies in developing a methodology for an epidemiological study of the late effects in selected groups exposed in the Chernobyl' accident	TCM 87 CM 87	1987
11.	Technical document on introducing the basic principles of the assessment and treatment of radiation injuries into the basic and post-graduate training of physicians	AGM 87 CM 88	1990
Area of Activity H.2: Radiation Protection of the General Public			
12.	Environmental monitoring data base for use in assessing the radiological impact of the Chernobyl' accident	CM 87 AGM 87	1989

Table 5 (cont.)

Task		Action or source	Year of completion
13.	Fourteen RAPAT missions (6 in 1987, 8 in 1988)		1987/88
14.	Four training courses on radiation monitoring and dose assessment	TC CM 87, 88	1987/88
15.	Training course on the maintenance and calibration of radiation measuring equipment	TC	1987
16.	Fifteen training missions to Member States (7 in 1987, 8 in 1988)	TC	1987/88
17.	With the help of a data base established for the validation of radionuclide transport and transfer models (1986), preparation of a technical report on the modelling of the atmospheric transport of radionuclides	CM 87 2 AGM 87 CM 88	1991
18.	With the help of the same data base, preparation of a technical report on the modelling of radionuclide transfer through the terrestrial and aquatic environment	CM 87 CRP 87	1991
19.	Safety Series report on doses per unit intake for selected radionuclides (the results from the CRP on dose intake factors for the public (see document GC(XXX)/777, Table 80, No. 14) will be used as input for this document)	CM 88 AGM 88	1990
20.	Symposium on experience in monitoring and assessing environmental radioactivity following the Chernobyl' accident		Proceedings, 1988
Area of Activity H.3: Safe Transport of Radioactive Materials			
21.	Technical report on the safe transport of large quantities of contaminated materials arising from nuclear power plant accidents	CM 88	1990
Area of Activity H.4: Emergency Planning and Preparedness			
22.	Technical report on the effectiveness of evacuation and sheltering measures after a nuclear accident	CM 87	1989

Table 5 (cont.)

Task		Action or source	Year of completion
23.	Safety Series document on intervention dose levels and corresponding derived intervention levels appropriate to reducing the stochastic risk and collective dose equivalent commitment in the event of a major nuclear accident	2 CM 87 AGM 87 AGM 88 CM 88	1991
24.	Safety Series document on radiological sampling and monitoring under emergency conditions	CM 87 AG 88	1990
25.	Safety Series document on the rapid reporting, compiling and collating of large quantities of data after a nuclear accident	CM 87	1989
26.	Safety Series document on criteria for re-entry into affected facilities and off-site areas and for recovery operations after a nuclear accident	2 CM 87 AGM 87 CM 88	1989
27.	Safety Series document on the planning of emergency responses to the impact of transboundary releases of radioactive material	CM 87 AGM 87	1988
28.	Establishment of a system for the reception and dissemination of data following an accident	2 CM 87 AGM 87	1988
29.	Development of the Agency's emergency response unit	CM 87 AGM 87	1988
30.	Safety Series document on the use of real-time models in predicting the radiological consequences of a nuclear accident and determining the necessary protective measures	CM 87 AGM 87 2 CM 88	1991

Table 6: Safety of Nuclear Installations

Task		Action or source	Year of completion
Area of Activity I.1: Safety Principles and Regulatory Organization			
1.	Safey Series document on safety objectives and principles	2 CM 87 2 CM 88	1988

Table 6 (cont.)

	Task	Action or source	Year of completion
2.	Review by NUSSAG of new safety guides and the revised versions of existing guides before their promulgation	AGM 87 AGM 88	Continuing
	Area of Activity I.2: Safety Research and Analysis		
3.	Technical document on severe accident management	CM 87 AGM 87 CM 88 AGM 88	1988
4.	Technical document on research into and the modelling of reactivity transients and their consequences for accident analysis purposes	TCM 87	1987
5.	Technical document on research into fuel behaviour and fuel-coolant interactions for accident analysis purposes (in co-operation with the Nuclear Fuel Cycle programme)	TCM 87	1987
6.	Technical document on research into material interactions under severe accident conditions	TCM 88	1988
7.	CRP on radionuclide behaviour and release after a severe accident (88-90)		1990
8.	Technical document on guidelines for the use of probabilistic safety assessment (PSA) in nuclear power plants	CM 87 AGM 87 TCM 87	1987
9.	Technical document on human error statistics	CM 88 TCM 88	1988
10.	Technical document on the PSA of new power reactor designs and mitigating systems	CM 87 TCM 87	1987
11.	CRP on standard problems in modelling accident sequences (87-89)	CM 87 2 CM 88	1989
12.	Technical document on computer codes for the probabilistic assessment of accident consequences	TCM 87	1988
13.	CRP on standard problems in probabilistic consequence assessment (88-90)		1990
	Area of Activity I.3: Safe Siting, Design and Construction of Nuclear Installations		
14.	Symposium on fire protection and fire-fighting at nuclear facilities (1988)		Proceedings, 1988

Table 6 (cont.)

Task		Action or source	Year of completion
15.	Safety Series document on methodologies for the safe interim storage of spent nuclear fuel (to be prepared in co-operation with the Nuclear Fuel Cycle programme)	CM 88	1990
16.	Safety Series document on safety design in relation to fast reactor transients, including reactivity excursions (to be followed by the preparation of Safety Series documents on related subjects in 1989)	CM 87 CM 88 AGM 88	1988
17.	Safety Series documents (revision of NUSS documents 50-SG-D13 and 50-SG-03) on the monitoring of primary coolant conditions	CM 87 TCM 87 CM 88	1988
18.	Technical document - Manual on the balance between direct human action and automated controls for enhanced safety of nuclear facilities	CM 88 AGM 88	1989
Area of Activity I.4: Operational Safety of Nuclear Installations			
19.	Revision of NUSS documents with a bearing on the safe operation of nuclear power plants during non-routine tests (documents 50-SG-07, 08 and 010)	CM 87 CM 88 TCM 88	1988
20.	Safety Series documents (revision of NUSS documents 50-SG-G6 and 50-SG-06) on the preparedness of public authorities and of operating organizations (licencees) for emergencies at nuclear power plants	CM 87 TCM 87 CM 88	1988
21.	Revision of NUSS document 50-SG-01 on operator training and qualification	CM 88 TCM 88	1989
22.	Safety Series document on spent fuel management after nuclear accidents (in co-operation with the Nuclear Fuel Cycle programme)	CM 88	1990
23.	Nine OSART missions in 1987 and 17 in 1988 to nuclear power plants		
24.	Eight OSART missions in 1987 and eight in 1988 to research reactors		

Table 6 (cont.)

Task		Action or source	Year of completion
25.	Revised guidelines for OSART missions	CM 87 TCM 87 CM 88 TCM 88	1988
26.	Technical document on safety aspects of pressurized-heavy-water reactors	SPM 87	1988
27.	Two missions by ASSETs in 1987 and four in 1988		
28.	Technical report on methodologies for reviewing selected events of worldwide interest (IRS)	3 CM 87 AGM 88	1988

ANNEX 3

ACTIONS CANCELLED OR POSTPONED

Table 1: Nuclear Power

Table/Task	Action affected	Explanation
69, No. 7	Technical report on national experience with energy, electricity and nuclear power planning studies in developing countries (AGM 87, 88)	Report cancelled as it is expected that the the main elements will be covered by the report of the senior expert group on mechanisms to assist developing countries in the promotion and financing of their nuclear power programmes
69, No. 15	Technical document on SMPR capital costs (AGM 88)	Postponed for one year because of lack of response and absence of new information

Table 2: Nuclear Fuel Cycle

Table/Task	Action affected	Explanation
72, No. 4	Technical report on uranium geology and resources in Europe (TCM 87)	The report has been cancelled as Europe is considered to be a low priority area for work of this type
74, No. 1	Seminar on methods of characterization and quality control of nuclear fuel and their feedback to fuel fabrication behaviour (1988)	This seminar will be organized by the Karlsruhe Nuclear Research Centre in 1987
75, No. 7	Technical report on improvement of structural materials resistance to chemical degradation and irradiation (CM 87, TCM 88)	Report cancelled. The subject will be covered under a CRP planned for initiation in 1987 (T.75, No. 9)
75, No. 17	Technical report on Sr and Cs arisings, demand and utilization (CM 87, TCM 88)	Meetings postponed to 1989-90

Table 3: Radioactive Waste Management

Table/Task	Action affected	Explanation
76, No. 9	Technical report on design of ventilation and air-cleaning systems at non-nuclear fuel cycle facilities (CM 87, TCM 87)	To be combined with the technical report on design and operation of off-gas cleaning systems at low- and intermediate-level waste treatment and conditioning facilities (T.76, No. 8)
77, Nos 4-6	Safety Series code of practice on underground disposal of radioactive waste and the two related guides to the code (AGM 87, 88)	Meetings postponed until 1989-90
77, No. 10	Safety Series document on siting, design and construction of geological repositories for high-level and alpha-bearing radioactive wastes	Preparation of document postponed until 1989
77, No. 11	Safety Series document on operation, shutdown and closing of deep geological repositories	Preparation of document postponed until 1989

Table 4: Radiation Protection

Table/Task	Action affected	Explanation
79, No. 1	Safety Series guide on the design of radiation protection systems in nuclear fuel fabrication plants (AGM 87)	Meeting postponed by one year
79, No. 3	Safety Series guide on radiation protection services in uranium refineries and nuclear fuel fabrication plants (AGM 88)	Meeting postponed by one year
79, No. 10	Safety Series document on minimum requirements for personnel monitoring (CM 88)	Meeting postponed by one year
79, No. 17	Review of BSS for radiation protection (CM 87)	Meeting postponed by one year
79, No. 21	Technical report on beta and gamma spectra and detector responses for radiation protection purposes (CM 87, TCM 88)	Meetings postponed by one year
79, No. 24	Technical document on radiation protection aspects of fusion safety (TCM 87)	Meeting postponed by one year
80, No. 5	Safety Series guide on controlling consumer products containing radioactive substances (CM 87, AGM 88)	Meetings postponed by one year
80, No. 15	Establishment of an international registry system for consumer products containing radioactive substances (CM 88)	Meeting postponed by one year
82, No. 8	Safety Series guide on radiological protection principles applying to the control of off-site emergency workers under accident conditions at a nuclear installation (CM 87, 88; AGM 87)	The subject will be covered under other activities
	Seminar on the adoption, application and implementation of the Agency's regulations for the safe transport of radioactive materials (1987, No. 16 in Annex I of GC(XXX)/777)	The objectives of this seminar will be met through a training course

Table 5: Safety of Nuclear Installations

Table/Task	Action affected	Explanation
83, No. 2	Technical documents - INSAG conclusions on current safety issues (2 TCM 87)	Converted to specific subjects covered under the supplementary programme
83, No. 3	NUSS Newsletter (AGM 87, AGM 88)	The Newsletter will be produced within the framework of other NUSSAG activities, so that no meetings will be needed
84, No. 3	Two technical documents on specific research topics (to be determined annually) (CM 87, 88; TCM 87, 88)	The topics planned will be be covered under the supplementary programme
84, No. 18	Technical document on evaluation of reliability data sources (TCM 88)	Meeting postponed by one year
85, No. 6	Technical document - Manual on management of nuclear power plant construction and its safety implications (CM 87, AGM 87)	Meetings postponed by two years
85, No. 7	Technical document - Manual on assessment of fire protection design at nuclear power plants (CM 88, AGM 88)	Meetings postponed by one year
86, No. 2	Technncial documents - Manual on operational limits and conditions for nuclear power plants (CM 87, 88: AGM 88)	The subject will be covered during the revision of NUSS documents 50-SG-D13 and 50-SG-03 (see task 5 of Table 6 in Annex 2)
	Symposium on the implications of degraded core accidents for the design and licencing of nuclear power plants (1987, No. 14 in Annex I of GC(XXX)/777)	Symposium postponed by one year
	Seminar on safety aspects of research reactors and critical assemblies (1988, No. 13 in Annex II of GC(XXX)/777)	Seminar postponed by one year

ANNEX 4

ADDITIONAL MANPOWER 1987 - 1988

		1987		1988 c/	
		P	GS	P	GS
A.	Nuclear Power	1	1	1	1
B.	Nuclear Fuel Cycle	-	-	1	1
C.	Radioactive Waste Management	1	1	1	1
H.	Radiation Protection a/	8	4	8	5
I.	Safety of Nuclear Installations b/	7	3	11	4
		17	9	22	12

a/ Includes three P staff currently paid from TC funds.

b/ Includes two P staff currently paid from TC funds.

c/ Includes 1987 posts.

ADDITIONAL PROFESSIONAL POSTS IN 1987

Department of Nuclear Energy and Safety

Division of Nuclear Power

One nuclear engineer specializing in neutron physics, heat transfer and thermal hydraulics is required to conduct the supplementary programme on reactor core design. (1 P-5)

Division of Nuclear Fuel Cycle

An additional Professional officer is required to meet the expansion in workload connected with the development and review of special technologies, methodologies and options available or required to decommission and/or dispose of nuclear facilities after a major accident. (1 P-5)

Division of Nuclear Safety

A Senior Professional Officer is required to manage the implementation of the expanded RAPAT programme, and in particular to arrange for and organize the increasing number of RAPAT missions to developing Member States, to participate in such missions and to provide technical support in the execution of long-term technical co-operation projects. The extensive practical experience in technology transfer to developing Member States that is required for this work justifies the high level of this post. (1 P-5)

A Senior Professional Officer is required to manage the implementation of the expanded radiation protection educational and training programme, and in particular to arrange for and organize training courses, to lecture at such courses, to carry out training missions to developing Member States, to prepare necessary training materials and to co-ordinate technical evaluation of fellowships. The impact that this work will have on radiation protection activities in Member States justifies the high level of this post. (1 P-5)

A Professional Officer is required to collate the considerable experience gained through accidents in the assessment of human radiation overexposure, to examine and evaluate the data on human radiation overexposure, to prepare guidelines for publication on this subject and to develop actions to be initiated to ensure fulfillment of specified needs and requirements in this context. Additional assignments will include arranging for an exchange of experience of past epidemiological studies for application in planned studies on late effects in selected groups exposed in a radiation accident. (1 P-4)

A Senior Professional Officer with wide experience in the field of environmental modelling is required to collate and review environmental transport models (atmospheric transport of radionuclides over short and long distances; radionuclide deposition on terrestrial surfaces; transfer of radionuclides through the terrestrial environment, in food chains, through surface waters and in urban environments), to establish and maintain a data base for validation studies on such models and to prepare guidance for publication on these subjects. The very specialized knowledge required for this work justifies the high level of this post. (1 P-5)

A Senior Professional Officer is required to manage the development and operation of the IAEA emergency response arrangements. These arrangements include making provision for receiving early notification of a nuclear accident; prompt dissemination of comprehensive information that will assist Member States in determining relevant protective measures; establishment of a resource assistance data bank of technical expertise, equipment and materials that Member States could make available, or draw upon, on request; and, provision of the Agency's internal emergency assistance response plan. The enhanced importance attached to the Agency's capability to implement an effective response in the event of a nuclear accident justifies the high level of this post. (1 P-5)

A Senior Professional Officer is required to execute expanded operational radiation protection activities. These activities comprise preparation of technical guidelines on assessments of large-scale contamination of people (external and internal contamination), equipment, facilities, premises, ground, water and air after a nuclear accident, on radiation protection aspects of the decontamination of a nuclear power plant and large areas of surrounding land after a nuclear accident and on clothing which will protect against very high levels of airborne beta-contamination. The activities also include planning of and participation in operational radiation protection missions (in the context of the Agency's OSART and research reactor safety programme and as part of the technical co-operation programme). The high degree of technical competence required for this work justifies the level of this post. (1 P-5)

A Professional Officer is required to assist in the execution of the expanded safety programme, in particular in work on establishing values for dose per unit intake of radionuclides, in work on developing technical guidelines on criteria and procedures for radiological sampling and monitoring under emergency conditions (where constraints differ from those associated with routine radiological sampling and monitoring) and in activities in support of technical co-operation work. (1 P-3)

A Professional Officer is required to assist in the execution of the expanded safety programme, in particular in work on the development of agreed derived intervention level values, in work on the examination of experience gained in sheltering and evacuating the public after a nuclear accident and determination of protective measures, in work for the preparation of guidelines on the rapid reporting, compilation and collation of large quantities of data after a nuclear accident and guidelines on criteria for re-entry into facilities affected by nuclear accidents, into off-site areas and for recovery operations, and in activities in support of technical co-operation work. (1 P-3)

A Senior Professional Officer is required to participate in the management and implementation of the expanded OSART programme and to participate in the missions. The nature of the OSART missions requires that the incumbent have technical management experience in operating nuclear power plants and is therefore at a high level. (1 P-5)

Two Professional Officers are required to participate in the implementation of the expanded OSART programme and to participate in the missions. Persons with technical operating and supervisory experience in operating nuclear plants are required in order to properly review the effectiveness of the operational safety programmes in the plants. (2 P-4)

One Professional Officer is required to participate in the expanded implementation of the IRS programme, finalizing the operating procedures, developing review procedures and participating in event reviews. (1 P-4)

One Professional Officer is required to participate in the expanded programme in the design and research areas, development of standards, assisting in co-ordination of research activities. (1 P-4)

Two Senior Professional Officer posts concerned with OSART missions (power reactors and research reactors) are transferred from the Department of Technical Co-operation. (2 P-5)

ADDITIONAL GENERAL SERVICE POSTS IN 1987

Department of Nuclear Energy and Safety

Division of Nuclear Power

An additional GS post is required to carry out the secretarial work for the supplementary programmes on reactor core design and on reactors with enhanced safety features. (1 GS)

Division of Nuclear Fuel Cycle

An additional GS post is required to perform the increased secretarial, administrative and clerical work resulting from the supplementary safety programme in the post-accident waste management area. (1 GS)

Division of Nuclear Safety

One technical assistant is required to perform support work for the IAEA emergency response arrangements, to assist with the compilation of a resource assistance data bank of technical expertise, equipment and materials that Member States could make available, or draw upon, on request, and to help with the compilation of routine and post-accident environmental monitoring data and the maintenance of the Agency's internal emergency assistance response plan. (1 GS)

Six GS posts are required to carry out the increased secretarial and clerical work resulting from the expansion of the nuclear safety and radiation protection programme. (6 GS)

ANNEX 5

REVISED SUPPLEMENTARY NUCLEAR SAFETY AND RADIATION PROTECTION PROGRAMME

Summary of Estimates by Programme

PROGRAMME	1987 at 1987 prices	1988 at 1987 prices	1988 at 1988 prices a/
Implementation of a Special Nuclear Safety Programme, Expert Working Group to Improve International Co-operation in Nuclear Safety, See Gov/2238/Add.1, Annex 1, para. 3	60 000		
Programme A - Nuclear Power	161 000	641 000	672 000
Programme B - Nuclear Fuel Cycle	3 000	155 000	162 000
Programme C - Radioactive Waste Management	100 000	170 000	178 000
Programme E - Human Health	195 000	183 000	192 000
Programme H - Radiation Protection b/	787 000	956 000	1 002 000
Programme I - Safety of Nuclear Installations b/	724 000	1 813 000	1 900 000
Total	2 030 000	3 918 000	4 106 000

The exchange rate used for presenting these estimates is again AS 19.50.

a/ In the present document as well as in document GOV/2238/Add.1 of 3 June 1986 and in the Note by the Secretariat on the Revised Supplementary Nuclear Safety and Radiation Protection programme dated 12 August 1986, the detailed cost estimates for 1987 and 1988 were calculated at 1987 prices. In order to make the estimates comparable with those included in the "Blue Book" GC(XXX)/777, the 1988 estimates at 1987 prices of $ 3 918 000 have been recalculated at 1988 prices by adding a total of 4.8% or $ 188 000 in respect of price increases, resulting in a total at 1988 prices of $ 4 106 000.

b/ As indicated in paragraphs 7 and 8 of document GOV/2238/Add.1, it is foreseen that the costs of the OSART programme will, from 1987 onwards, be met entirely from Regular Budget resources and not, as has been the practice in the past, from technical co-operation resources. Furthermore, as stated in paragraph 7 in the same document, it is proposed that the technical management of the technical assistance programme on radiation protection become a part of the regular nuclear safety programme. Consequently, three posts previously financed from technical co-operation are to be included in the Regular Budget manning table.

	1987		1988	
NUCLEAR POWER				
Power Reactor Information System - PRIS - (A.2, para. 1)	1 CM	3 000	1 AGM	20 000
Man-Machine Interface (A.2, paras. 2 & 3)	1 SPM	1 000	Conference and Proceedings	350 000
	1 IWG (TC)	1 000	1 SPM	1 000
Qualification Criteria and Accreditation of Operator Training Programme (A.2, para. 4)	CM, AGM	20 000	CM, AGM	20 000
Quality Assurance programmes (A.2, para. 5)	2 AGM	30 000	1 AGM	20 000
	Advis. Missions 5 man/weeks	15 000	Advis. Missions 5 man/weeks	15 000
Review of the present and future generation of power reactors (A.3, paras. 6 - 8)	1 AGM	15 000	1 AGM	20 000
	1 SPM	1 000	2 SPM	2 000
	3 RCs	15 000	5 RCs	25 000
	1 CM	10 000	1 RCM	25 000
			3 TCM & WS	45 000
Additional programme		111 000		543 000
Additional staff		60 000		140 000
Sub-total, additions		171 000		683 000
Reductions		(10 000)		(42 000)
Total, net additions		161 000		641 000

	1987		1988	
NUCLEAR FUEL CYCLE				
Use of airborne radiometric data to define the natural background radiation environment (B.1, para. 9)	1 CM	5 000	1 AGM 1 CM 1 Tech.Report	20 000 5 000 20 000
Safe design and operation of UF_6 facilities (B.2, para. 10)	1 CM	5 000	1 CM 1 AGM	5 000 20 000
Quality control in nuclear fuel fabrication (B.3, para. 11)	1 CM	5 000	1 AGM	20 000
Spent fuel management (B.4, paras. 12 & 13)	1 CM 1 AGM	5 000 18 000	1 AGM 1 CM 1 TCM	20 000 5 000 10 000
Additional programme		38 000		125 000
Additional staff		-		70 000
Sub-total, additions		38 000		195 000
Reductions		(35 000)		(40 000)
Total, net additions		3 000		155 000

	1987		1988	
RADIOACTIVE WASTE MANAGEMENT				
Entombment of nuclear facilities after accidents (C.2, para. 14)	2 AGM 3 CM	35 000 15 000	1 AGM 2 TCM 3 CM	25 000 30 000 15 000
Special technologies for decommissioning after major nuclear accidents (C.3, para. 15)	1 CM 1 AGM	5 000 15 000	1 TCM 2 CM 1 Safety Series	15 000 10 000 25 000
Decontamination of large areas (C.3, para. 16)			2 CM	15 000
On-site waste processing (C.3, para.17)			1 CM	5 000
Additional programme		70 000		140 000
Additional staff		45 000		75 000
Sub-total, additions		115 000		215 000
Reductions		(15 000)		(45 000)
Total, net additions		100 000		170 000

3211V

	1987		1988	
HUMAN HEALTH				
Secondary standards dosimetry laboratories (E.3, para. 18)	1 AGM	12 000		
Measurements of radioactive contaminants (E.4, para. 19)	Consultants	63 000	Consultants	63 000
	SSA		SSA	
	Equipment	100 000	Equipment	70 000
	Res. contr.	20 000	Res. contr.	50 000
Additional programme		195 000		183 000
Additional staff		-		-
Sub-total, additions		195 000		183 000
Reductions		-		-
Total, net additions		195 000		183 000

3212V

RADIATION PROTECTION	1987		1988	
Contamination assessment, decontamination and protective clothing (H.1, paras. 24-26)	1 TCM 1 AGM 3 CM	15 000 17 000 15 000	1 TCM 4 AGM 4 CM	15 000 80 000 20 000
Overexposures (H.1, paras. 28,30)	3 AGM 3 CM	49 000 15 000	1 AGM 3 CM	20 000 15 000
Epidemiological study (H.1, para. 29)	1 TCM 1 CM	15 000 5 000		
Environmental monitoring and modelling (H.2, paras. 21, 31, 33)	3 AGM 3 CM 2 Data Bases 1 CRP	51 000 15 000 25 000 20 000	1 Symposium and Proceedings 1 CM 2 Data Bases 1 RCM	128 000 5 000 25 000 20 000
Dose per unit intake (H.2, para. 32)			1 CM 1 AGM	5 000 20 000
Safe Transport (H.3, para. 34)			1 CM	25 000
Functions under conventions (H.4, paras. 35-37)	3 CM 2 AGM Control Centre	15 000 34 000 60 000	Control Centre	20 000
Emergency response (H.4, paras. 38, 39, 41-44)	3 AGM 7 CM	51 000 36 000	1 AGM 3 CM	20 000 15 000
Intervention levels (H.4, para. 40)	1 AGM 2 CM	17 000 10 000	1 AGM 1 CM	20 000 5 000
Additional programme		465 000		458 000
Additional staff		439 000		583 000
Sub-total, additions		904 000		1 041 000
Reductions		(117 000)		(85 000)
Total, net additions		787 000		956 000

SAFETY OF NUCLEAR INSTALLATIONS	1987		1988	
Safety Principles (I.1, paras. 45 & 46)	2 CM	24 000	2 CM	30 000
	1 AGM	20 000	1 AGM	25 000
Severe Accident Management (I.2, para. 47)	1 CM	10 000	1 CM	10 000
	1 AGM	22 000	1 AGM	25 000
	2 TCM	40 000	1 TCM	20 000
			1 CRP	25 000
			1 RCM	20 000
Probabilistic Safety Assessment (I.2, para. 48)	3 CM	15 000	3 CM	30 000
	1 AGM	20 000	1 TCM	11 000
	3 TCM	41 000	1 CRP	15 000
			* 1 Symposium and Proceedings	130 000
Improved safety features and updating of NUSS Standards (I.3 paras. 49 & 50)	2 CM	18 000	1 Symposium and Proceedings	200 000
	1 TCM	15 000	4 CM	25 000
			2 AGM	40 000
Operational improvements and updating of NUSS Standards (I.4, para. 51)	2 CM	17 000	4 CM	35 000
	1 TCM	15 000	2 TCM	35 000
OSARTs (I.4, para. 52)	9 Missions to NPPs	180 000	17 Missions	365 000
	8 Missions to res. reac.	40 000	8 Missions	40 000
	1 CM	5 000	1 CM	5 000
	1 TCM	15 000	1 TCM	15 000
ASSETs (I.4, para. 53)	2 Missions	32 000	4 Missions	64 000
Safety aspects of pressurized-heavy-water reactors (I.4, para. 54)	1 SPM	10 000		
IRS (I.4, para. 55)	3 CM	25 000	1 AGM	25 000
	Operating Costs	15 000	Operating Costs	15 000
Additional programme		579 000		1 205 000
Additional staff		365 000		736 000
Sub-total, additions		944 000		1 941 000
Reductions		(220 000)		(128 000)
Total, net additions		724 000		1 813 000

* Postponed from 1987