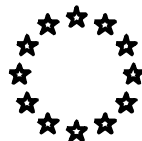


2000

**EXTERNAL MONITORING REPORT
ON THE
SPECIFIC PROGRAMME
FOR
RESEARCH AND TECHNOLOGICAL
DEVELOPMENT**



**IN THE FIELD OF
NUCLEAR ENERGY
FISSION**

MAY 2001

This report is part of the series of the external annual monitoring reports prepared for the EC Framework Programme and the Euratom Framework Programme, and their constituent Specific Programmes.

The Commission has over the years been placing increasing emphasis on the evaluation of Community R&D activities. As part of the process of continuous improvement, a new programme monitoring scheme has been introduced in 1995. The new scheme involves independent external monitoring experts and a timely response by the Commission Services to the recommendations produced by the experts. The new scheme thereby provides the basis of a quick response mechanism to programme developments and should give advice on key issues.

This report is the second covering the Fifth Framework Programme; the report also highlights progress in relation to ongoing activities under the Fourth Framework Programme. The report should help reinforce establishment of best practices, identify and correct weaknesses in programme implementation, and facilitate future multi-annual programme evaluation.

The report consists of three parts:

Part A: External monitoring report prepared by the following independent external experts:

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Part B: Commission Services' Responses to the 2000 Monitoring Report.

PART A:

Report of the external Monitoring Panel

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EXECUTIVE SUMMARY

The EU and Euratom FP5 Nuclear fission programme covers the research and technological development areas designed to support the improvement of the Safety of existing installations and the development of waste management methods, to improve Radiation Protection practices as well as the basic knowledge of Radiological Sciences and to open doors for more safe future use of this energy. It is in the continuity of the FP4 orientations, but has a new organisation of actions. Year 2000 has been devoted to the negotiation by Commission staff of 155 contracts, mainly issued from responses to the 1999 calls. Follow up of some actions of FP4 has also been done. In year 2000 many assessments Panels have come to conclusions on FP4 (partially on FP5) and on general management. They have given many recommendations, some directed to management of FP5.

Specific Comments 1 - Management of contracts

Management of the selected proposals to come to contracts within clusters is a demanding scientific work by itself. It is a time consuming process for Commission staff and tenders. Despite the overload of the staff the Panel finds that management was well done and in a constructive approach to overcome difficulties due to cuts in funding. The work programmes which are the key documents for calls reflect properly the FP5 objectives. The 2000 call has been improved by clarifying objectives and revisiting priorities. There is still 35 % of the money available which gives the possibility to fill gaps in some identified areas where researches are needed to complete FP5 objectives.

Specific Comments 2 - Significant achievements

The objectives of FP4 have been successfully achieved. Important results have been disseminated in the scientific community by different ways. In addition of technical achievements European Added Value (EAV) can be identified.

The 155 FP5 contracts negotiated by the end of year 2000 fit with the objectives of the 1999 work programme and are of a high standard value, from which EAV can be expected, in each of the areas covered. For instance our understanding of severe accidents will increase the possibilities to control and limit the consequences of core-melt accidents and the first results on new reactors with evolutionary and innovative features will further prove the feasibility of next generation of power reactors, the pursuit of full scale demonstrations in underground laboratories will increase confidence in the safety of waste disposal, and in nuclear power in general. The social aspect is covered by some direct research. Despite the effort of the Commission participation of accessing countries is rather low.

The efforts of the staff to put in clusters the contracts and to establish some networking is of a considerable help to launch FP6.

Specific Comments 3 - Major recommendations of the Panel

Develop and provide timely for monitoring quantitative indicators showing the increment in the yearly achievement of the programme.

Continue to clarify the objectives of the programme to stimulate and focus proposals. Give special attention to the rejected proposals to increase transparency.

Minimise inconvenience due to uncertainty in the allocation of resources and the schedule of starting contracts.

Facilitate participation of accessing countries to the programmes.

Prepare carefully the possible and recommendable shift from project management to programme management.

Next monitoring should check how far the objectives of the FP5 programme are achieved through the expert scientific technical reports.

1. INTRODUCTION

The main purpose of this report is to monitor the efficiency of the Commission's management and programme implementation in year 2000 on Key Action Area Nuclear Fission, and on Research and Technological Development Activities of a Generic nature. It also aims to give a rapid one year feedback for improvements. It covers mainly the processes of selection of the proposals corresponding to the 1999 calls (mainly those with dead line 17 June and 4 October) of the FP5 and of the management of the selected proposals up to funding of the corresponding contracts. Selections within 258 proposals have been made first by appointed external evaluators and then by the Commission staff, to lead, after negotiations, to a final list of 155 funded contracts. At the end/beginning of the 1999/2000 years, the 1999 Panel monitoring was in position to give only some general but pertinent comments on the implementation of FP5, since the way to go to signature of contracts lead only to 4 contracts signed by the end of December 1999.

This Panel was sufficiently documented with general and specific reports from key actions projects and figures and it had illuminating discussions with the Commission managers. It took the benefit of the conclusions of some other Panels set up within the framework of EU evaluation, mainly Five years assessment report (June 2000 covering 95-99 period) and Customer satisfaction workshop (June 2000). In general the Panel agrees with their, sometimes repetitive, conclusions. Methodology and performance indicators for yearly monitoring run since many years and are adapted to what is expected from the monitoring Panels. Improvement could be to provide the Panel immediately as it enters in action with selected high standard documents, with emphasis on quantitative performance indicators showing yearly progress compliance with objectives, as simplified EAV, size of the projects, increase in participation of accessing countries, share of travelling costs. The experience gained in developing nuclear energy in EU, and world-wide, shows that this energy has three major safety concerns, if safeguard is discarded: severe accident risk, long term HLW waste management and low dose effects. The common aim to support these concerns is to enhance search for excellence on nuclear Safety, which is directly related to radiation protection in many different situations. No rapid change is possible in European nuclear activity, however there are clear signs of strong interest for development of next generation evolutionary, more safe and more economic nuclear power plants. In accessing countries there is an on-going process to increase the safety of nuclear reactors. There are also problems of non-technical nature which necessary need to be solved.

2. ANALYSIS OF THE PROGRAMME, DEFINITION, EXECUTION AND PROGRESS

This section starts with some general considerations and ends with specific considerations on FP4 and FP5. In conclusion major trends are identified.

Definition

The Programmes of the EC and Euratom FP have been progressively changed from basic science driven research to more and more oriented researches to demonstrate the availability of practical solutions to the technical problems and public concerns in the nuclear and associated fields. The approach in FP5 is solving the problems defined in key actions and facilitating the use of the results.

The reduced Commission staff made a real effort to translate into precise goals the Council decision, mainly in restricting the vague social aspects to only one goal: building public confidence and trust. So objectives appearing in the work-programmes 1999 and 2000 for the FP5 calls are correctly stated. The structure and focus of call 2000 was

improved compared with call 1999. The work programme 2000 for the call launched on the 16 October 2000 (with dead line on 21 January 2001) has been updated to focus the research on some of the 1999 call areas, where submission was poor or missing. This rises the question of the loss of interest by the EU research community or a less successful definition of the objectives. The Commission restricted the 2000 call in some areas due to previous coverage and also cuts in funding involving the need of revisiting priorities. Emphasis is put on networking and expected deliverables. The Panel considers that the preparations of the calls have been well managed and it considers that the effort to improve wording and concision from 1999 to 2000 call was successful.

Execution

During the year 2000 the Commission staff has faced the management of 155 selected proposals (around 105 MECU) which were selected in the two 1999 evaluations. The files for submission have unnecessary details to be filled by those who already participated in the FP's. From FP4 to FP5 more informations are needed. The Panel recommends that simplification of submission process should be seriously considered by the appropriate services of the Commission. About the selection Panel feels that the problem of independence of evaluators, quoted in previous monitoring still exist, but the Panel thinks that priority must be given to the competence of experts. The clusterisation of the projects is now a more or less established practise. The Commission has also to follow the achievements of the contracts. The interim mid-term reports might help the Commission re-route the tasks if needed. The Panel feels that the assessment of the on going of the research could be made by external experts on the basis of these mid term reports. The identification of the long-term spin off of the contracts after their closure remains an important missing indicator.

Progress

In the beginning of year 2001 the proposals from the 2000 call will be evaluated (third evaluation) as well as few proposals on accompanying measures with dead line 25 September 2000. After that call, only one more is planned in the year 2001 with a fourth evaluation. The Panel considers that the main areas of the 1999 calls have been substantially covered. Today 65 % of the funding is attributed. The 35% still available gives the possibility to select only few more proposals to improve the fulfilment of the programme.

Completion of computerisation of communication between Commission and contractors is a great advantage achieved and will facilitate running formal routines fully electronically on both sides, provided that necessary confidential precautions are taken.

Comments of the successive Panels are often repetitive. It means that they have addressed complex problems which cannot be solve on the short term. This subject is also well accounted for in the document "Customer Satisfaction Workshop".

2.1 CONCLUSION OF FP4 PROJECTS

The 1999 monitoring Panel has given many comments on the transition from FP4 to FP5 and the main significant achievements of FP4. Commission services gave responses to these comments and considered the recommendations of the Panel. In addition this Panel has been provided with documents which show that were too few FP4 contracts ending in 2000 to justify any modification of their conclusions, provided the implementation of their recommendation (see 2.3).

The FP4 has given important results.

In the area of reactor safety the focus was on severe accidents. Clusterised projects were successfully completed showing important synergism and dissemination advantages. Results gave an ample base to proceed with accident management for operating plants, to protect operators, the public and the environment. Plant ageing was for the first

time part of FP and grouped relevant participants successfully. Under the co-ordination of JRC main result was validation of important tools for safety assessment and inspection. Strong EAV in nuclear safety was evident. Unfortunately the participation of accessing countries was very weak.

With regard to radioactive waste management through geological disposal of long lived HLW key developments have been obtained for practical demonstration of feasibility of the main components of a deep repository and for the assessment of their long term behaviour. Consequently integrated performance assessments and safety analyses are given more confidence. Decommissioning projects have added specific "Know How "to the large pool of knowledge in this field.

The main result of FP4 in Radiation Protection area is successful networking and development of management tools for off-site accident preparedness as well as initiating co-ordinated research on radiation induced effects and cancer modelling on cell and molecular level.

Standardised summary reports for clusters might facilitate the transfer of achievements and problems in condensed form to programme committees, advisory groups, top managers and monitoring Panels.

2.2 START-UP OF FP5 PROJECTS

The documents in hands of the Panel related to the "Results of experts evaluation" and the "Commission intention for projects to be negotiated and funded and projects to be rejected" are well documented and very clear. They show how the proposals selection (2 out of 3 are rejected) was conducted by the different groups of experts. In particular the reports on the ranking of proposals are quite illuminating of the problems encountered by the experts during the evaluation through pungent discussions. The Panel notes that high priority was given to scientific value of the proposals, then to extend the researches in the field where Europe is in leading position and finally to enforce the researches where a weakness is obvious, compared to international developments. Difficulties encountered to select both competent and independent experts shows that a non partial independent expertise has been the major concern of the Commission.

Comments of the Commission staff for the final ranking of the proposals are well founded. The uncovered areas are mentioned and the Commission has been able to point out them in the 2000 call (and the 2001 call). The panel appreciates that reasons for rejecting the proposals are given. In some cases proponents have been given the opportunity to further discuss and improve the project. However, the Panel feels that the reasons for rejections should be made very clear to the proponents not only for transparency but to help them to improve their future actions. The panel notes the constructive approach of the Commission when major reduction of requested funding is needed. Reduction of objectives of project means normally a new prioritisation of the working packages.

Preparation of project proposals is a demanding task. However, probably too many details are requested, the necessity of which may be questioned at least for the selection process. A two step process separating technical and administrative aspects would be welcome. The negotiation of the contracts has been a long process which has often taken 10 to 18 months and has needed considerable amount of work both for the Commission and for the tenders who generally have to modify the. The last contracts for 1999 calls will hopefully be signed in early 2001. All this makes preparation of projects rather expensive especially for large projects with several participants. The Panel thinks that the time needed after ranking the proposals could be made shorter targeting to half a year.

The number of staff members has been drastically reduced during the transition phase

from FP4 to FP5. Despite of this reduction, unit succeeded in its management very well. The majority of funded proposals are shared cost actions but there are a very few concerted action and thematic networks.

As has been said by 1999 monitoring Panel the structure of the FP5 programme is different from the previous ones, but many of the topics of researches are the same, for instance in waste management. This is because answers to some questions require time consuming experiments (extending over decades). The Panel feels that clusterisation has been correctly adapted to the technical and scientific goals.

The panel gives in section 2.5 more details on the fulfilment of the key actions.

2.3 IMPLEMENTATION OF MONITORING 1999 RECOMMENDATIONS

The Panel views on the implementation of the 1999 year Panel recommendations are summarised by major areas in the following Table

Recommendation	Director's response	Comments
Education and training	Need to establish a clear vision	Important to continue. Policy discussion in CCE
Strategic reviews, interaction with decisions makers and politicians	In due course	To be continued. Stimulation of national decision makers is needed
Networking, Centres of excellence	In due course	To be continued and be ready for FP6
Permanent adjustment of actions with objectives	In due course	Done for dissemination and 2000 work programme

2.4 IDENTIFIED MAJOR TRENDS

2.4.1 Dissemination of the results

Nuclear fission safety area employs a mixture of different research communities. This leads to multiple ways of dissemination of results. Except the due contract reports, Conferences with corresponding publications as well as articles in scientific and technical journals serve the dissemination purposes. The Commission is active in making programme results visible through the nuclear community and, world wide through CORDIS, and in promoting workshops to enhance both collaboration and dissemination. Additional dissemination actions to political decision-makers and public could be done.

2.4.2 European Added Value (EAV)

The concept of EAV is increasingly recognised by specialised research communities. However quantification of EAV needs further development to be practicable. In Europe nuclear fission issues have traditionally been managed mainly on national basis. However, the development of reactor concepts, development of waste management practices and especially people's health and environment related concerns have strongly stimulated mobilisation of European countries to joint efforts. Demands for harmonisation and converging of opinions are slowly emerging also in nuclear areas. The generic research on radiological sciences, increase of knowledge and harmonisation of radiation protection safety standards is a good example of the efforts with high EAV.

Social aspects, other than radiation protection related, have been addressed in a limited scale on European level. TRUSTNET I (FP4) and TRUSTNET II (FP5) are the first attempts on this area and must be welcomed. There is a good opportunity and request to widen the co-operation of nuclear community with energy and social researches in the area of risk governance.

2.4.3 Third and Accessing countries

Despite the effort of the Commission to attract them the participation of accessing and third countries is low. Third countries (USA, Canada, Russia) have problem with the strict rules of the legal aspect of EU contracts. Major complaints are related to treatment of intellectual properties, free access for auditing and common liability among partners. Candidate countries are repelled by both their own and EU bureaucracy. Confusion between assistance and co-operation, which imply auditing, makes difficulties. To solve this main EU problem for the future the Panel suggests the Commission to considerate setting up a collaboration assistance service for accessing countries, including informal pre-proposal checking within identified clusters, and co-ordination, if possible, with TACIS and PHARE.

2.4.4 FP6 and European Research Area (ERA)

Looking for further improvement of management, the transfer from Project to Programme management of FP6 might be a useful step. This means giving more flexibility to research clusters organised around Centres of Excellence. Those clusters would form the basic elements of ERA.

The great effort done in FP 5 clusterisation will help to launch this new approach as well as the accompanying measures of ERA. The Panel recommends that Commission considers how to merge sub areas for FP6 especially thinking the interest of regulators and other end users of the results. Careful consideration is needed to eliminate the danger of monopolisation of RTD activities in too few places. The active participation of smaller institutions, SME's and accession countries has to be assured.

Finally the Panel considers that the Commission shall keep the programme in relation with those of international organisations especially for long-term project and considering limitation of resources.

2.5 INDICATIONS OF SIGNIFICANT SPECIFIC ACHIEVEMENTS

2.5.1 Key action area : operational safety of existing installations

Operational safety is one of the major key action areas of FP5. There is a clear shift from severe accident phenomenon centred contracts to contracts with the objective to support assurance of the safe continuation of the operation of current nuclear power plants. It seems that the strategically objectives for the FP5 calls will be achieved. In some cases the funding of small projects is so limited that some programmes could have been funded at the national level and EAV it is not apparent.

FP5 shows a significant increase in participation of accessing countries in the field of safety of operating plants. This is very satisfactory

2.5.1.1 Plant Life Extension

This area has been further split into the following sub-areas: integrity of equipment and structures, on-line monitoring, inspection and maintenance, and organisation and management of safety.

The first one is at certain extent the continuation of the FP4 AGE cluster. Contracts cope with most of the current issues related to component integrity of currently operating plants.

The second and the third ones are also well structured and all project objectives are relevant and potentially responding to general FP5 targets. There is a well-balanced presence of various nuclear industry members and there is also the presence of one Check Republic partner.

2.5.1.2 Severe Accident Management

In general the transition from FP4 to FP5 implied a consolidation of the results of research on basic phenomena and focusing on the accident management area. Two sub-areas have been identified: severe accident management measures and assessment of severe accident risks

In this area participation of extra-Union countries is even better shared among accessing countries (Hungary, Slovakia and Check republic) and others (Russia and Canada).

2.5.1.3 Evolutionary Concepts

This sub-area has been retained and even reinforced in FP5. It has been further divided into: evolutionary safety concepts and high burn-up and Mixed Oxide Fuel (MOX).

Attention is given to passive systems design and assessment and thermal-hydraulics. Commenting single projects is outside the scope of the report, but it could be necessary to understand how the general objectives of FP5 have been achieved.

In this area the participation of extra-Union countries is weaker, but it includes countries as Poland, Slovenia, Check republic and Switzerland.

2.5.1.4 Summary of Lessons for the Future

This Key Action area has been well managed and a good mixing of participants has helped to address several extremely important points for the Reactor safety. However, it might appear that an overall strategy is missing. This is probably more a fault of the industry than of the Commission.

The Commission should be better prepared to manage the consequences of the entering of new countries in the Union, which could be reflected in change of priorities and change of knowledge necessary to properly manage the new situation.

2.5.2 Key Action Area: Safety of the Fuel Cycle

2.5.2.1 Waste and spent fuel management and disposal

The contracts in this sub-area are spread over classical topics according to work programme.

The radiological characterisation of present waste packages needs finalisation of researches and this is correctly considered. The check of their chemical content is not explicitly addressed in the FP5 programme, nor the checking of long-lived beta emitters. This could be in the near future a matter of question for both.

In each of the topics important for the disposal of HLW and long lived MLW, there are contracts on: repository technology, performance assessments of repository systems and long term behaviour of components systems in addition with studies on migration of radionuclides. Many projects are supported by full-scale experiments in underground laboratories. The EU added value and needs of the EU countries are here obvious. The set up of the thematic network CROP, a forum for assessing the experience gained from underground laboratories, has strong EAV.

No submitted proposal addressed the topic of waste management strategies. The Panel thinks that a more precise definition of the objectives of waste management strategies might encourage proposals on this topic.

The transfer of radionuclides to living matter in the biosphere is part of "Generic researches on radiological science". Proper bridge between waste and radiological researchers need attention.

2.5.2.2 Partitioning and Transmutation

In FP4 programme research on PT was included in Innovative systems and considered as long term research. Including PT in the safety of fuel cycle gives to PT an ambiguous status. It is important to understand that PT is not an alternative to geological disposal which is in every case needed.

The Panel feels that Partitioning objectives are fulfilled. FP5 does not deal with the conditioning of separated nuclides in ceramic matrix. This topic is not ignored by the Commission but its cancellation from calls is due to cuts in funding.

Concerning Transmutation the first Commission selection of contract is reasonably cautious due to the fact that Transmutation is a rather new field in the EU programme, which needs exploring researches. Work programme of call 2000 is designed to know as soon as possible if some components of an Accelerator Driven System (ADS) could be "show-stoppers". It is expected that all important industrial and researches organisations in this field will participate forming a strong cluster.

2.5.2.3 Decommissioning

Few contracts have been signed because "know how" on decommissioning is fairly good and technology of the heavy dismantling tools available. Networking provides EAV and helps to optimise dismantling of reactors to green land.

2.5.2.4 Summary of lesson for the future

The work-programme for the 16 October 2000 call has been revised on several points by the Commission. For instance other types of long lived wastes than those considered in the successive FP are taken into account. Problems with long term interim storage of waste and retrieval of disposed wastes are addressed for feasibility. These topics open the door to further research in FP6. These issues should be addressed by the Commission from a technical point of view. STC "FP6 Strategic discussion paper" deals with some of these points

2.5.3 Key Action Area: Safety and Efficiency of Future Systems

This separate Key Action area is one of the novelties of FP5. It shows that the Commission is interested in supporting designs that might come available several years from now in parallel to signals coming from other large nuclear research areas such as USA and Japan looking to fourth (or third) generation reactors. Two areas have been identified: Innovative and revisited systems and innovative fuels and fuel cycles.

2.5.3.1 Innovative and Revisited Systems

Most of the projects are related only to the HTR technology. This reflects the fact that either the industry and the Commission have recognised that this type of reactor is at the moment the most promising considering the fourth generation reactors.

There are also three projects not related to HTR, i.e. one on high performance LWR, power gas-cooled reactor, and reactors for seawater desalination.

The question is whether this set of projects is really capable of spinning-off the most important chance for the Union to have a novel nuclear option available in the medium-long term (>10 years). A precise strategy needs to be strengthened and on such an important item a clear commitment should be taken. This Action has a high potential to achieve a very high EAV

2.5.3.2 Innovative fuels and fuel cycles

As expected it was a good response of European industry to develop fuel and fuel cycle

for HTR. Commission initiative coincides with national interests and industry needs. The Commission included this subject in the 2000 call for proposals.

2.5.3.3 Summary and lesson for the future

There is a certain disconnection between the importance of the target and the actual effort, for example comparing with the level of efforts dedicated to the fusion reactor.

In FP5 programme's "Future systems" key action area the research for the next generation nuclear reactors and the research on PT strategy are clearly separated. However HTR or other adapted reactors could as well be used to transmute separated elements and fuels for ADS be used in the new innovative reactors. So there are evident connections between the sub-area PT and this key action area, which need attention.

2.5.4 Key Action Area: Radiation Protection

Radiation protection constitutes an area fundamental to all aspects of the presence of radiation, whether natural or man made. It remains a key priority to reduce uncertainties in the scientific understanding of the interaction of radiation and people and the behaviour of radionuclides in the environment as well as to harmonise radiation protection standards aiming to optimise and standardise radiation protection practices. This is a common problem for all European countries and the European Added value of a scientifically sound and technically comparable common position is clear.

The main objective of Key Action radiation protection is to develop new and improved approaches for risk assessment and management that can find broad technical and social acceptance and can contribute to the more effective and rational allocation of resources to nuclear safety.

2.5.4.1 Emergency Preparedness

The objective is to improve the efficacy and coherence of off-site emergency preparedness in Europe. Key elements of practical management, such as decision support tools, methods for predicting releases to the environment and information exchange systems have been and are also in the future subjects of European wide co-operation, not forgetting the Accessing countries. Notwithstanding remarkable progress on this area, continuous efforts are needed to respond to the increasing demands.

On this area all the forms of practical European co-operation, from basic research through education and development of facilities to concerted action exercises are an excellent example of Added Value of European Research Area.

2.5.4.2 Restoration and Long-term Management of Contaminated Environments

The panel shares the view of the Commission. This sub-area must be devoted to technologies of restoration rather than to strategies. The meaning of nuclear accident must be clarified. Large amount of secondary radioactive wastes which could arise from restorations are not addressed and that could be subsequently included as an additional objective in the next step of fulfilment of FP5.

2.5.4.3 Monitoring and assessment of occupational exposure

The objectives are to improve the monitoring and assessment of exposures to radiation in the workplace, whereby providing improved possibilities for better protection and use of resources. The practicability, reliability and possibilities to standardise are here the subjects of concern both in the areas of internal and external dosimetry.

2.5.4.4 Risk Management and Governance

Highest practicable protection of health and safety, as well as clean environment and optimal allocation of resources is the objective of risk assessment and management (Risk Governance). This is done through development work and European wide networking between nuclear utilities, radiation practitioners, research laboratories and regulators in the frame of the projects on this area.

Because this is a matter of the whole society transparency and participation of representatives from different sectors and levels of society are needed. Efforts towards Risk Governance have been started and they need additional consideration to reach a more objective and harmonised view on risks.

2.6 GENERIC RESEARCH OF RADIOLOGICAL SCIENCES

The generic research in radiological sciences is a multidisciplinary area that addresses the basic understanding of the effect of radiation on Man and Environment and serves directly the development of basic safety standards; and as a corollary promotes optimisation and harmonisation of radiation protection related practices.

2.6.1 Radiation Protection and Health

The major objectives in this area are: to gain a thorough understanding of radiation action leading to health effects; to develop tools to identify possible individual differences in susceptibility; to improve the quantification of radiation risk at low doses and low dose rates through a combination of experimental and theoretical radiobiological and epidemiological approaches. In practice it means continuation of FP4 projects especially in the areas where achievements have been made such as: cancer modelling, radiation micro-beam studies, DNA double strand break repair, formation of chromosomal aberrations, early events in radiation carcinogenesis and epidemiology.

2.6.2 Environmental Transfer of Radioactive Material

Environmental transfer is of importance in safety assessment as mentioned in 2.5.3. In general overall transfer between biosphere compartment is only considered but the mechanisms of transfer are poorly studied. This approach give operational data to perform radiological impact to man, in a given situation, but the basic knowledge of the phenomena remain largely unknown. This is not in line with the place given in FP5 to such studies under the title "Generic Research". The panel thinks that basic radiochemistry of short and long lived radionuclides considering radioactive waste should earn more attention in this programme sub-area or opening a new entry in the programme.

2.6.3 Industrial and Medical Uses and Natural Sources of Radiation

Industrial and medical uses of radiation are the traditional, increasing occupational radiation application areas in every country. Nevertheless, the dominating source of radiation exposure to humans and environment is natural radiation.

Reducing natural exposures is in many cases costly that is why better understanding of low dose low dose rate effects might improve optimisation of allocation of protection resources and is thus of common European interest.

2.6.4 Internal and External Dosimetry

The qualitative detection of ionising radiation is in many cases very easy, but quantitative metrology of ionising radiation is in most cases very complicated. It is far from being an exact science. Thus it is clear that even the old exposure situations, such as the doses to Hiroshima and Nagasaki victims, Soviet weapon workers etc. are still under studies whenever improved possibilities for retrospective assessments are available. On the other hand stringent radiation safety requirements and new technological applications, such as high altitude aeroplanes generate new metrological problem areas, where European co-operation is needed.

3. CONCLUSIONS AND RECOMMENDATIONS

The panel summarises here the main points of its observations of management of FP5 and gives only operational recommendations, keeping in mind that more general ones or wish-recommendations are well known from the Commission (see Five years assessment report 95-99).

3.1 PROGRAMME IMPLEMENTATION

1 - FP4 contracts have been successfully completed, 86% were finished by the end of 1999, less than 10% are still running. Main FP4 results were effectively disseminated in scientific community through experts meetings and publications. Clear EAV can be identified. Participation of accessing countries was low.

2- FP5 management from definition of objectives through selection of proposals up to contracts is improved with regard to FP4 despite a remarkable reduction of personal. Main improvements were on technical documentation with clear work programme for calls and the selection of competent evaluators from an enlarged registered list. However the project proposal still assumes very detailed data, the necessity of which is questionable, at least for selection process. Additionally reduction of EU share means most often doubling of the preparatory work. This makes preparation of projects rather expensive. Finally administrative compliance took too long time, up to more than one year, which is not acceptable. The last contracts will be hopefully operative early 2001. Half a year for the whole selection and negotiation step could be a target.

3 - FP5 contracts cover properly the defined objectives and priorities of the work programmes. They have high values and potential EAV. Setting up clusters and networking would increase EAV.

4- Participation of accessing countries is slightly increased (5% of the contracts) but will probably remains fairly low in FP5.

5 - Implementation of the 1999 monitoring Panel recommendations has been considered by the Commission staff as far as practicable.

6 - Preparation of FP6 with EAG, STC and CCE has been started in due time. In this field the participation of the Commission staff is very strong.

3.2 RECOMMENDATIONS FOR IMPROVEMENTS

1 - Develop and provide for monitoring quantitative indicators showing the increment in the yearly achievements of the programme.

2 - Continue to clarify the objectives of the programme to stimulate and focus proposals. Give special attention to the rejected proposals to increase transparency.

3 - Concentrate on the most important aspects of the selection process and minimise inconvenience due to uncertainty in the allocation of resources and the schedule of starting contracts through a clear schedule for negotiation.

4 - Assessment of mid term reports of on going research by external experts is recommended.

5 - Write non-technical short reports on FP results to improve feed back with decision-makers and public. Stimulate the co-ordinators of the projects to give publicity to the results.

6 - Facilitate participation of accessing countries to the programmes.

7 - Keep touch with other international organisations in the view of long term projects and limited resources.

8 - Prepare carefully the possible and recommendable shift from project management to programme management.

9 - Special attention should be given to Radiation Protection that has been managed formally in two areas; as apart of Key-Action area and as Fundamental Radiological Sciences. Panel considers the situation artificial and proposes that radiation protection related subjects are in FP6 programme under a single title.

3.3 NEXT MONITORING

1 - Look at the implementation of the announced Progress Review of the Customer Satisfaction Workshop.

2 - Check how far the objectives of the FP5 programme are achieved through the expert scientific technical reports.

3 - Planning transfer to the Programme management raises some concerns. Next monitoring Panel should carefully look at the transfer period.

4 - The effect of the change in 2001 in Commission's organisation on PF5 management should be assessed.

PART B:

**Responses of the Programme Management to the
external Monitoring Report**

Responses of the Programme Management to the recommendations of the Monitoring Panel

The Commission services would like to thank all members of the 2000 Monitoring Panels for their dedicated work and the efforts invested in this complex task. Some of the recommendations included in the monitoring reports address issues of relevance to all Specific programmes. Such issues are discussed from the Framework Programme viewpoint in the responses to the recommendations of the Framework Programme.

The following comments represent the responses of the relevant Directorates General to the recommendations regarding the specific programme *Nuclear Energy – sub-programme: Fission*.

	Recommendation	Commission Service's Response	Target date of implementation / progress
1	Develop and provide for monitoring quantitative indicators showing the increment in the yearly achievements of the programme.	The development of adequate indicators for monitoring the development of the programme is an important task. Some common indicators are already applied all over the Framework programme. A programme internal study will be made to develop some additional indicators for the nuclear energy programme.	December 2001
2	Continue to clarify the objectives of the programme to stimulate and focus proposals. Give special attention to the rejected proposals to increase transparency.	The broad objectives for the fifth Framework Programme have already been set. However, in the revision of the Work Programme clarifications can be given on a more detailed level. Further clarifications will be introduced in the revision 2001. Improvements have been made in the evaluation process to further encourage the evaluators to extensively comment on the proposals liable to be rejected. Also a quick response system have been introduced to inform the proposers of the results of the evaluation within a few weeks after the evaluation.	July 2001 Done
3	Concentrate on the most important aspects of the selection process and minimise inconvenience due to uncertainty in the allocation of resources and the schedule of starting contracts through a clear schedule for negotiation.	The uncertainties, not necessarily the delays, in the time-schedules for negotiations and decision making have caused some concerns amongst those making proposals. In the presently ongoing negotiation phase the Commission services are trying to improve that by giving clearer best estimates of the time periods foreseen	Done
4	Assessment of mid term reports of on going research by external experts is recommended.	The Commission services will consider the advantages of having external experts also for the mid-term review of projects and weigh them against the administrative difficulties involved. As an example, in the reactor safety area the FISA-conference provides a kind of mid-term assessment on programme level.	November 2001

	Recommendation	Commission Service's Response	Target date of implementation / progress
5	Write non-technical short reports on the Framework Programme results to improve feed back with decision-makers and public. Stimulate the co-ordinators of the projects to give publicity to the results.	A series of non-technical short reports or leaflets are being prepared to present the results of the fourth Framework Programme and the ongoing work in the fifth Framework Programme. The Commission services will also encourage the project partners to make more publicity, not least locally, about the ongoing research.	Ongoing
6	Facilitate participation of accessing countries to the programmes.	The Commission services are well aware of the difficulties for the accessing countries to enter into the programme, and are planning different activities to alleviate the situation, e.g. specific call to allow organisations from the accessing countries to participate in ongoing projects, targeted information days.	Autumn 2001
7	Keep in touch with other international organisations in the view of long term projects and limited resources.	The Commission services are actively engaged in the work of other international organisations, e.g. IAEA, OECD/NEA and ICRP. Possibilities of co-operation are continuously evaluated. The rules of participation of the Framework Programme provide the possibility for the participation of international organisations, if in the interest of the Community.	Ongoing
8	Prepare carefully the possible and recommendable shift from project management to programme management.	This will be done in the preparations for the next Framework Programme	2002
9	Special attention should be given to Radiation Protection that has been managed formally in two areas; as apart of Key-Action area and as Fundamental Radiological Sciences. Panel considers the situation artificial and proposes that radiation protection related subjects are in the sixth Framework Programme under a single title.	Although the radiation protection issues are formally under two different headings of the present Framework Programme it is being managed as one programme. The Commission services are, however, aware that the double appearance of radiation protection has caused some confusion to the proposers of projects. In most cases this has, however, been sorted out. For the next Framework Programme it is proposed that all radiation protection activities are found under one heading.	Done