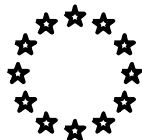


**2001**

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



**IN THE FIELD OF**

**NUCLEAR ENERGY  
FISSION**

*This is a 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, and also - as a novelty- covers also the implementation of the European Research Area (ERA) related activities .*

*The Commission has over the years been placing increasing emphasis on the evaluation of Community R&D activities. With the overall Reform of the Commission, evaluation activities are more and more placed in the heart of the decision process.*

*In the line with the continuous effort for improvement, a revised programme monitoring scheme has been introduced in 2001, based on the system launched in 1995 which involves independent external experts in the monitoring activities. The new mechanism launched this year, has been built in order to better involve the experts monitoring the implementation of ERA and specific programmes, by representing them in the Framework programme Panel. The timely response by the Programme management to the recommendations produced by the experts will be enhanced, providing the basis for a quick response mechanism to the programme developments as the follow up of experts recommendations will be received still more attention.*

*This report is the third covering the Fifth Framework Programme; the report also highlights progress in relation to the implementation of ERA and results and impact of previous Framework Programmes. The report should help reinforced establishment of the best practices and identify the scope for further improvements in programme implementation.*

*The report consists of two parts:*

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

Henri METIVIER (Chairman)

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**Part B:** *Responses of the Programme management to the external monitoring report.*

**PART A:**

**Report of the external Monitoring Panel**

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# 1. EXECUTIVE SUMMARY

The Euratom 5<sup>th</sup> FP Nuclear fission and radiation protection programme covers the research and technological development aimed to support the improvement of the Safety of existing nuclear reactors, to reduce the radiological risk in Waste management and to improve Radiation protection practices. It is also aimed at preparing the future of Nuclear fission energy. During 2001 officers of Unit J 4 negotiated 114 contracts proceeded from around 180 proposals received as responses to the two calls launched in 2000 and assumed the follow-up of about 100 previously funded projects. They have also actively participated in the meetings, thus contributing to the scientific work of international organisations, JRC and EU assistance programme. They have organised Conferences and Seminars. In addition to these scientific activities the Unit J4 has given constant support for the preparation of the 6<sup>th</sup> FP and ERA policies.

## **Specific Comments 1 - Toward ERA through EAV and networking**

The objectives of the 5<sup>th</sup> FP will be covered by the end of 2002. Most of the contracts are merged in clusters, which are today the proper way how to disseminate quickly the results among the interested scientific communities and to emphasise the EAV. Despite the fact that in the EU nuclear fission issues are mainly managed on national basis, EAV emerging from the Fission Programmes are visible. For instance, the development of new reactor concepts, development of Waste management practices in order to reduce its radiological impact and especially people's health and environment related concerns connected with ionising radiation are good example of EAV. Such development should increase confidence in the safety of nuclear power in general. The 6<sup>th</sup> FP will benefit from the strong effort of Unit J 4 to support networking, however to reach the fulfilment of ERA objectives it is necessary to define more precisely what is expected in the field of Nuclear fission energy.

The Education and Training activities are prerequisite for development of nuclear power and for maintaining the present culture of Nuclear safety and Radiation protection and are considered as a high priority of EU programmes. They are also important for advancement of knowledge in the related areas; nevertheless, difficulties in the implementation at individual level (fellowship) or at collective level (setting up networks) exist. More importance should be ascribed to this area in the 6<sup>th</sup> FP, from of which important EAV are expected.

*Dissemination of results of the successive FP toward decision-makers and the public is a challenging task and a redefinition of the objectives for a clear dissemination is necessary.*

## **Specific Comments 2 - Management**

The actions launched and implemented in 2001 are fully within the scope of the 5<sup>th</sup> FP. The Unit J 4 has managed with a high level of competence, the numerous yearly tasks required by the 5<sup>th</sup> FP implementation: updating Working programmes, evaluation of proposals, negotiation of contracts and merging them into clusters and follow up of the previous contracts. In particular the 2001 calls have been defined to cover all the area of the 5<sup>th</sup> FP for giving an equilibrated implementation.

## **Specific Comments 3 - Major recommendations of the Panel**

Many general recommendations coming from different Committees are directed to Unit J 4. The Panel endorses those that are really useful for this Unit. The Panel hopes that its own considerations,

of which some are at the border of its mandate, will be useful. Here are recommendations for actions.

### General recommendations for the whole ERA/FP

An important step before ERA became a reality in Nuclear Fission and Radiation Protection is to map the situation, in both the Members states and in the Applicant Countries (AC)<sup>1</sup>: that should comprise:

- mapping of competencies, even outside the nuclear fission community where expertise to solve some problems exist,
- mapping of large instruments for nuclear research,
- mapping of stakeholders.

The commission should launch as soon as possible as part of the 6<sup>th</sup> FP.

These mappings will show the fields of Nuclear science where expertise is being lost. Specific actions of Training and Education must be urgently promoted in the 6<sup>th</sup> FP to restore the expertise.

Progress to ERA needs an increased networking to facilitate organisation of the future research in large Programmes. Next calls for proposals of the 6<sup>th</sup> FP must clearly point out this need.

In view of very dissimilar nuclear development in the Member States and Accessing States, a common view on safety should have a high level of priority. Regulators must be more involved in participation in some projects or in sharing results.

To make visible the EAV in different areas of the Fission Programme, launching handbooks of the best practices and of the use of the best tools should be recommended in specific areas as done for decommissioning, which should help to improve safety based on common basis of references.

### Specific recommendation to Unit J 4 for management

Launch actions to fulfil the general recommendations to make ERA a reality and in particular prepare the nuclear community for ERA by:

- dissemination of specific documents,
- giving clear definition of the different instruments to encourage people to work together,
- set up an Editorial Committee for dissemination of results.

### Recommendations addressing the evaluation and monitoring methodology

The two levels monitoring, which allow extending the scope of monitoring, must be continued

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<sup>1</sup> They are some differences between this monitoring report on the Fission energy programme and the FPMP for Newly associated states (NAS). In this report we use the Euratom treaty terminology, AC (Applicant countries) which are Bulgaria, Czech republic, Hungary, Latvia, Romania, Slovak Republic and Slovenia)

The yearly "Self-Assessment of Programme Implementation", which is a valuable document must be continued.

## **2. PANEL METHODOLOGY**

The 2001 5<sup>th</sup> FP monitoring exercises of the expert-groups were "innovated", for the first time, by including horizontal level contacts and dynamical information exchanges between all the Chairmen and members of the expert-groups.

The expert sub-group Fission (the Panel) was established with the objective to monitor the efficiency of the Unit J 4 Nuclear Fission and Radiation protection (the Unit), which comes under to the Directorate J, in charge of Researches on Energy. According to the 2001 Guidelines for monitoring the Panel had to assess the yearly 2001 activity of the Unit related to the implementation of the FP 5<sup>th</sup> Euratom and EC Fission and Radiation protection programme (the Programme) with special emphasis on the launching of 6<sup>th</sup> FP, which will be a starting point for creating ERA. The Unit has produced a "Self-Assessment of the Programme Implementation" report, a new and important document describing and commenting the Unit activity during the year 2001. This monitoring report tries to point out strong points and weaknesses, in the 2001 management of the Programme exercised by the Unit and to give recommendations for actions. This report also emphasis the specific issues mentioned in the 2001 Guidelines for monitoring.

The methodology followed by the Panel included the following steps:

- scrutinising the "Self-Assessment" of the Unit and the associated documents,
- interviews with the Programme co-ordinators of the Unit and officers from the Direction J and also with national stakeholders and members of the advisory Committees,
- examination of performance of the 2001 indicators,
- examination of the numerous peripheral general documents dealing with Nuclear energy and Radiation protection.

The Programme consist of three main distinct parts:

- operational safety of existing installations and Safety and efficiency of future systems,
- safety of the fuel cycle,
- radiation protection and generic research on radiological science.

Other two parts are devoted to Training and Accompanying measures.

The report structure is in compliance with the 2001 Guidelines for Monitoring. The Panel has focused its attention on the issues considered important for the implementation of the Programme, while avoiding duplicating the information of the "Self-Assessment" Unit report and the material and recommendations of the previous monitoring reports.

### 3. INTRODUCTION

The 2001 results of the Programme management, exercised by the Unit, can be evaluated by a detailed analysis of its activity that is shared between scientific, policy and administrative efforts. The working time of the officers spent on each activity depends on the areas of the Programme, generally they devote as much of their working time as possible to science, stimulating and co-ordinating research.

#### Activities

##### *Scientific activities*

In 2001, 172 proposals were evaluated of which 114 were recommended by external experts for negotiation, and, at the end of the year 2001, 95 contracts have been signed. The remaining contracts should be signed by early 2002. These proposals followed 6 calls launched in 2000 with cut-off dates from January to September 2001, covering cost shared actions, concerted actions and thematic networks from all areas of the Programme. In addition 17 proposals for fellowships, training and accompanying measures were selected. The main task of the Unit was the selection of 124 proposals from the RTD call with deadline January 22, into the course of a one-week February 2001 session, and the consecutive discussions on the contracts, on clusterisation and on networking. Fulfilment of such a task has required a quasi full-time participation of the co-ordinators of the Programme. An amount of 51.3 MEuro has been allocated during the year 2001. Out of the 193.9 MEuro of the 5<sup>th</sup> FP Fission programme 22.4 MEuro remain to cover the total implementation of the Programme in 2002. The financial commitments made in 2001 were done according to plan.

The revision of the Working programme 2001 for the last call of the 5<sup>th</sup> FP has been achieved by July as the result of a careful examination of the already covered areas of the Programme. Priorities have been set up to cover some lacks, and some areas were closed. Expected are proposals on scientific topics, but also, and mainly, on how to gain public confidence on waste disposal, on remediation of contaminated areas and on radiobiology and risk assessment in general.

Other management activities of the Unit during the year 2001 included meetings with international bodies (OECD/NEA, IAEA and ICRP) representatives, setting up international agreements between EU and AC, supporting development of the assistance programmes (TACIS, PHARE), organisation of the FISA-2001 conference and seminars, and finally attending a large number of meetings on the follow up of the contracts. Working meetings were required also within the frame of a special co-operation with JRC, DG ENV and DG TREN.

##### *Policy activities*

The Unit was providing continuing support on the preparation of the 6<sup>th</sup> FP and ERA (and also to other DG's). Proposals for the 6<sup>th</sup> FP were presented in March 2001 and a specific programme in June. Meetings with key players have supported these proposals. Situation of possible "Centres of Competence" has been assessed as well as the needs for education and training, with the objective to incorporate them into 6<sup>th</sup> FP and ERA. The Unit in particular supported extension of applicant countries involvement in the Programme. A special call was launched in October 2001 to give these countries possibility to accede to already existing projects. Finally, attention has been given to the participation of women and to the ethical screening of the projects.

##### *Administrative activities*

Unit J 7 handles administrative, financial and contractual matters of the contracts; nevertheless preparation of the files is the duty of the Unit.

Following chapters (especially Chapter 4) present analyses of the most important results of the Unit effort.

### Major programme objectives

The major programme objectives for the year 2001 were already established in the work programme of 2000, similarly as it was done for 2000 in work programme of 1999. Actually, these work programmes translate the general objectives decided on by the Commission into precise goals to stimulate and focus proposals and, in addition, they reflect the yearly follow-up of the Programme implementation. Clear formulation of the Programme's yearly targets is very important indeed, and the Panel considers that this task was well fulfilled for the last work programme of the 5<sup>th</sup> FP too. By now, most of the research areas of 5<sup>th</sup> FP have received a good coverage except the ones open to the 2001 call (see section 4.1.1.2). If these areas will attract "good" proposals, the 5<sup>th</sup> FP will be fully implemented.

The 4<sup>th</sup> FP Programme has produced a large number of important results that have been published. At present, the Unit is preparing an Impact Assessment Report of the 4<sup>th</sup> FP.

Certain priorities have been given by the Unit to the preparation of the 6<sup>th</sup> FP Fission Programme (over the classical areas of the FP programmes). These priorities include:

- "Waste management" addressing the known problems to be solved for the high-level long-lived waste (HLLW): their long term storage and their immediate or delayed disposal in geological strata, as well as the reduction of their harmfulness, and,
- Radiation protection addressing the main problem accompanying implementation of Nuclear energy.

## **4. ANALYSIS AND FINDINGS**

### **4.1 STRATEGY - OBJECTIVES**

#### **4.1.1 Progress in ERA and in programme implementation**

##### 4.1.1.1 ERA

Progress toward ERA in the field of fission energy can be appreciated, i) if a clear definition of what ERA is expected to be, is given, and, ii) according to the present and foreseen state of Nuclear energy and Radiation protection.

##### Status of ERA

The status of ERA appears depending on the document where ERA is addressed.

As understood by this Panel ERA corresponds to the ambition to establish a true EU research policy in all areas of Science. That necessitates surpassing the ongoing EAV concept, based on merging national competencies of excellence to reach goals surpassing each national capacity. ERA will lead the Commission to concentrate on identifying priorities and stimulating research through large programmes operated by "Networks of Excellence" and "Integrated Projects", with autonomy in definition of actions and in execution. This could need for the future important changes in objectives, priorities and resources of the Programme. The new situation created by the ERA may require that the Unit responsibility is extended to manage larger networks than today with more participants.

ERA is being created using methods and procedures established by the EC. The EC has formulated six objectives that should be achieved for a fully functional of ERA. They are: promoting research in EU, better investment in knowledge, public research effort, private investment, organisation of research in EU, real policy.

Promotion of these objectives implementation has been already decided on at the EU level as a set of specific measures.

An important step before ERA became a reality is to map the situation, in both the Members States and in the Applicant Countries. For the panel, it is not possible to recognize "Excellence" without definition of criteria. A high scientific quality through publications, impact factors, internal recognition are obvious criteria, but it is not only one. The panel recommends diversity and complementarity as key criteria, diversities in the specific program, but also in the different sectors of the program.

##### Status of Nuclear energy and Waste management

The present EU situation in the Nuclear fission field is rather "wait and see" than "go ahead" to promote Nuclear energy. For the next decade no major investment will appear. Today nuclear fission energy is rather competitive on the energy market. The lifetime of existing reactors as well as the burn-up of nuclear fuels is foreseen to increase, which will enhance the competitiveness of nuclear electricity. Advantages and weaknesses of nuclear fission energy, as they emerged from many well-documented analyses, are well known. It is clear, that the non-political decisions, within the next decades to come, with regard to "revival" of nuclear power and the choice of the new

reactors to be built, in the countries which have not decided to phase out Nuclear energy, will have to be taken under conditions of the EU deregulated electricity market. Thus, the present common interest of EU is to maintain a high level of safety of the present nuclear installations and to anticipate, as far as possible, the new reactor generation, i.e. leaving open the nuclear option, as one of possibilities.

The new idea that the HLLW management could be disconnected from the energy policy is growing up, but the EU Commission view and the public perception of the problem of electro-nuclear energy production remain still connected with Waste management issues. Storage/Disposal of these wastes will be the concern of the coming decades, whatever will happen, even in the case of political decision in a number of the EU member states to phase-out nuclear.

### Progress toward ERA in the field of Nuclear energy and Waste management

Progress toward ERA during implementation the 5<sup>th</sup> FP, especially during the year 2001, can be “measured” with respect to the fulfilment of ERA’s objectives.

Implementation of the Framework Programmes led to much closer, than before, co-operation within the European “nuclear community“, i.e. between research centres and industrial entities, (and to a certain degree between Regulatory Authorities) which have been sharing problems of their common interest. Benefits of such strengthening of the co-operation cover not only shared expertise and basic knowledge, exchange of information and good practice, but also lessen the substantial financial difficulties caused by the cuts in nuclear activities funding characteristic for many of the Member States. The results so obtained, besides their immediate value, constitute a basis for harmonisation of safety principles and the common approach to so called “Safety issues”. Over the last few years, a strong consolidation has taken place in the industry through cross-border mergers of companies. European research is essential for achieving “critical mass” in the major areas of progress in knowledge; an example of this is the European research on Partition and Transmutation (P&T) as well as that on future reactors.

Projects of the 5<sup>th</sup> FP have adequately covered objectives and priorities designed to reach EAV. Increased linking between research organisations characteristic for this FP projects, i.e. increased share of networks, contributed to a higher efficiency of the research – in compliance with the ERA criteria as one of its most important tools. An important role was played specifically oriented meetings between researchers involved, one of the most important was FISA-2001 Conference which provided a mid-term review of all the projects in the area of Safety of Existing Installations. Among the steps taken in 2001 with the objective to prepare 6<sup>th</sup> FP should be emphasised, were the efforts devoted to mapping the situation of “Centres of Competence” that could gradually develop into essential elements of ERA “Networks of Excellence”. It is expected that already established research clusters would be a firm basis for research integration within 6<sup>th</sup> FP.

To summarise, in the 5<sup>th</sup> FP, similarly as in the previous FPs, networking through clusters, concerted actions, thematic networking and large-scale projects allowing to reach a size effect and providing support to a continuous dissemination of results could be regarded as positive contributions to the first three general objectives of ERA. It is not clear how the remaining objectives will be reached, since national nuclear fission R&D in the EU states are very different in strategy and “weight” and it is obvious that private investment will only support short-term objectives

The Panel acknowledges that the 2001 progress toward ERA in the safety of nuclear cycle and Waste management was supported by the well-considered actions of the Unit, however that further

progress needs decisions taken at political level. To “measure” this progress qualitative and quantitative indicators must be set up.

### Status of Radiation protection

Present status of Radiation protection is very different to that of Nuclear energy and Waste management. Indeed during the last decades Radiation protection activities have become more and more independent from nuclear applications, increasingly concentrating on applications of X-rays or accelerated particle in medicine and on natural exposure of the public, e.g. from cosmic radiation during air transportation, or by telluric irradiation, e.g. radon. If in nuclear field the position is rather "wait and see", the need for a radiological protection program is totally independent from the energy options. Medical applications of radiation will probably increase in the next decade with such emerging technologies as radioimmunotherapy. Nevertheless the member states and AC involved in Nuclear energy have to maintain radiation protection competence for management or decommissioning of nuclear power plants.

### Progress toward ERA in the field of Radiation protection

As all the members states and the AC are interested in Radiation protection either in medical applications or as to the consequences of a nuclear accident; there is a common need of regulatory directives, and implementation of the Programme is a strong step toward ERA. Recently, such regulation directives have been published for general protection of workers and public from natural and technological exposures or medical workers and patients in medical applications. This is obviously an EAV and contributes to the harmonisation of the protection standards and to a common approach to radioprotection issues. Supporting associations like EURADOS for radiation dosimetry networking or EULEP for a radionuclides biokinetics database are two good specific illustrations of ERA's concept implementation in radiological protection.

Unfortunately, the Programme in Radiation protection has been since its beginning too strongly linked with Nuclear energy production and that has led to lack of interest of young scientists.

The Panel considers that the new orientation of the research in Radiation protection must be carefully considered to avoid complete disconnection from nuclear fission needs. For example, radiotoxicity is a concept largely used in Waste management, but really not more studied within a Radiation protection programme.

#### 4.1.1.2 Programme implementation

After selections of the projects following the 1999 and 2000 calls for proposals, most of research areas of 5<sup>th</sup> FP were adequately covered. A few exceptions are the areas dealing with soft science: Public attitudes and involvement in Waste management (only 2 projects selected) and Risk Assessment and Management (only 2 projects selected). Projects are also missing in remediation technology: Restoration and long-term management of contaminated environments (2 projects for a total of 1 MEuro as compared with the foreseen budget of 5 MEuro), and the important field: Behaviour of radioactive material in the terrestrial environment was not covered. These points were taken into account in the revision of Work programme 2001. As it was already said, if sufficiently good proposals come in, the implementation of 5<sup>th</sup> FP will be equilibrated and complete.

Since clusters are the best tools of EAV promoting, the Unit fully supported the trend of increasing their numbers. The Panel encourages the Unit to identify in the Programme the areas where clusters

have a chance to be viable. The officers have the necessary experience gained in previous management of FP, to do that, and would mean a more active role of the Unit and should also facilitate the follow-up of the projects and the evaluation of the research

#### **4.1.2 Significant results in the European and international context**

##### 4.1.2.1 Safety of existing installations and future systems.

Important results in these fields, even if some of them are so far incomplete, were obtained within major strategic projects of the 5<sup>th</sup> FP, such as Development of a Methodology and a Computer Tool for Source Term Estimation in Case of a Nuclear Emergency in Light Water Reactor, Preliminary Design Studies of an Experimental Accelerator-Driven System, Spent Fuel Stability under Repository Conditions, Improved Accident Management of LWR Nuclear Power Plants. These results, which are disseminated in the scientific community, will allow to support immediate improvement of the safety of existing nuclear installations and to reduce toxicity of the waste as well as to improve the radiation protection practices in case of need.

Improved understanding of the processes that take place in the course of severe accidents and subsequent focusing on the accident management area brought very encouraging expectations for an increased possibility to control and to limit the consequences of core-melt accidents.

Encouraging results were achieved in the follow-up projects covering the area of plant life extension with its sub-areas: integrity of equipment and structures, on-line monitoring, inspection and maintenance, and organisation and management of safety. It can be expected that the relevant projects will fulfil their objectives and will also contribute to safety of the plants in operation.

The first results on new reactors with evolutionary and innovative features will further the feasibility of next generation of power reactors. Attention was given to the passive safety design and thermal-hydraulics. International involvement comprises Poland, Slovenia, Czech Republic and Switzerland.

More attention was paid to such a key issue as the operational safety of the power plants in operation with special emphasis on VVER plants. Especially should be mentioned contributions of Applicant countries (Hungary, Slovak and Czech Republics) as well as some others (Russia and Canada).

##### 4.1.2.2 Safety of the fuel cycle

Safety of the fuel cycle comprises, Waste and spent fuel management and disposal (32 contracts, 3 concerted actions and 5 thematic networks), Partitioning and transmutation (12 contracts and 1 networking) and Decommissioning (1 contract and 4 thematic network).

Clearly the first significant results are coming from the RD implemented by the large scale experiments conducted in underground laboratories of the EU, located in clay, salt and granite (12 projects and 2 networks). That is a non-disputable EAV, moreover it is an AV at international level. These projects have contributed to the demonstration of the technical feasibility of geological disposal of HLLLV and to the assessment of a repository system performance. Some results were also obtained on the feasibility of retrieval of disposed packages. Combining all these results related to a full scale demonstration of disposal, which, with those obtained on the long term behaviour of packages, engineered and geological barriers, conducted in usual research laboratories

(14 projects and 3 thematic network/concerted actions), should result in an enhanced confidence of the public in the safety of waste disposal (and logically in nuclear power). It is however not certain that all these results will be sufficient to gain public trust and the acceptance of disposal. Very few proposals have been submitted and only 2 contracts were selected on the subject of public attitude towards this issue. In the same context there is only one projects selected concerned with the Waste management strategy (COMPAS), which is again the topic, dealing with public acceptance. Proposals for such projects are expected within 6<sup>th</sup> FP.

Other significant results concern Partition and Transmutation concept, where both partitioning processes (3 contracts) of long lived actinides and the preliminary basic studies and design of an accelerator driven system are studied. This concept is also studied outside the EU, in Japan and USA. Partition and Transmutation strategy is not expected before decades but these studies are a nice example of what can be done at the EU level to prepare the future.

Decommissioning has reached an operational status at the EU level, with exchange of information on ongoing activities, collection of data and techniques, cost estimation and training activities. This is a concrete example of EAV.

#### 4.1.2.3 Radiation protection and generic studies

In the area of Radiation protection the main effort was spent on developing new and innovative approaches for risk assessment, risk management and emergency management, the results already achieved are very encouraging.

##### 4.1.2.3.1 Radiation protection

In total 22 projects with a community funding of 11 MEuro have been selected within this key action of the Programme.

In the area of Radiation protection the main effort was spent on developing new and innovative approaches for risk assessment and risk management, the results already achieved were very encouraging (1 concerted action, 1 contract, 1 thematic network). The Panel appreciates that four programmes corresponding: i) to the objectives of gaining better understanding of the origins of public attitudes towards waste disposal and exploring other approaches to decision-making (COWAM and RISCOS-II), ii) to developing new and improved approaches for risk assessment and management (TRUSTNET 2, RISKGOV), are managed by the same scientific officer of the Commission even if these programmes are being included into two independent parts of the Programme. The Panel strongly encourages such attitude. It also appreciates the support of EAN (European ALARA Network) for its strong EAV.

Positive results were obtained in the field of Emergency preparedness (especially off-site) (7 contracts and 4 thematic networks). They include decision support tools, methods of predicting releases to the environment and information exchange systems. All EU co-operations in this area (including AC) should continue to obtain significant results. The Panel acknowledges the integrating role of RODOS programme for AC, however, implementation of this programme is not a priority for some member states. This System is installed in national emergency centres in several European countries for pre-operational use (Austria, Finland, Germany, Hungary, Netherlands, Poland, Portugal, Slovak Republic, Spain and Ukraine). Installation is also foreseen in Bulgaria, Czech Republic, Greece, Romania, Russia and Slovenia. Installation in the CEE and FSU has been

achieved with support from the Commission's ECHO, PHARE and TACIS programmes. The PANEL note that this positive result is the consequence of a good cooperation between FP and these different programmes.

Restoration and long-term management of contaminated environments (1 contract and 1 thematic network) are probably areas to be encouraged, but the Panel considers that the following actions should be launched: i) opening this field to non-nuclear contaminated environments specialists and producing a clear synthetic leaflet to explain to decision-maker the strategies to develop, ii) explanation to decision-makers, why more involvement in such programmes is needed 15 years after the Chernobyl accident.

#### 4.1.2.3.2 Generic research

The main objectives are to consolidate and to improve EU knowledge and competence that are essential for the safe and competitive use of nuclear fission and other industrial and medical uses of ionising radiation. This field includes Radiation protection and health (19 projects), environmental transfer of radioactive material (7 projects), industrial and medical uses and natural sources of radiation (7 projects) and internal and external dosimetry (9 projects), distributed among 28 contracts, 4 concerted actions and 10 thematic networks.

If epidemiology is strongly supported by decision-makers and Stakeholders, the Panel notes a large share of the generic activities in one direction only (molecular biology), neglecting studies in animals and, for example in radiotoxicology, which is probably a key issue for Waste management acceptance. The Panel considers that the future orientations for 6<sup>th</sup> FP as to this issue should be revised.

For environmental research, the Panel acknowledges the support provided for the FASSET programme that is a critical point for the future discussion with Stakeholders, and considers that this EAV could be strengthened by opening this programme to the AC.

Management of exposure to natural radiation needs scientific support, 2 to 4 projects are really new, but actions for aircrew exposure and radon in buildings do not seem very new and useful.

All the dosimetry projects strongly support the ERA concept and have a real EAV. However the DOSREC project is scientifically controversial if a chronic ingestion of contaminated food is assumed for these populations.

#### 4.1.2.4 Training and supporting activities

The Education and Training activities are indeed prerequisite for development of nuclear power and for maintaining the present culture of Nuclear safety and Radiation protection. They are also important for advancement of knowledge in the related areas. The Panel therefore regards projects in the area Support for Research Implementation and Education and Training as strategic ones, necessary to maintain non-interrupted continuity for the future (for instance projects ENEN or PLINIUS).

Training and Education are also considered as a high priority of EU programmes. But there are difficulties to implement it in the Programme at individual level (fellowship) or at collective level (setting up networks). The reasons why are known to the Commission and to the Unit from many

studies and few successful, but short in time, attempts of concrete actions. So implementation of Training and Education is a political question rather than a management question.

The Panel strongly endorses the document produced by the Commission "How to maintain Nuclear Competence in Europe"(EUR 19787). The Panel considers that: i) the launching in the 6<sup>th</sup> FP of Training and/or Education Centres in nuclear science is a high priority; this means probably that financial support has to be increased, ii) clarification of the definition of EU grant is necessary; this needs co-operation with other DGs, iii) a more active EU policy for the definition of common syllabus would be appreciated.

In the field of Radiation protection and health, 3 projects on Training and Education are supported, but after only a one-year of implementation, it is difficult to see the impact. The Panel considers as curious the support given only to one field of interest in only one member state. It considers also that relationships concerning the responsibility for training and education with the DG Environment (ex DG 11) need to be clarified, the answers given during interview being not satisfying. This field is probably the cardinal point of a future development of ERA, because it deals with the open circulation of workers.

Attributions of Marie Curie fellowship are difficult because the procedure is not easy to implement. It is difficult for the Panel to evaluate if 7 fellowships is a good or a bad number, without knowing the distribution of all the fellowships. The Panel considers that the tenderers would appreciate a shorter roadmap for attribution of these fellowships and a better co-ordination with project contracts.

The other accompanying measures, such as sponsoring of Scientific conferences, are very important for the dissemination of EU FP results. They clearly show, for example the crucial role of EU in some international projects like dosimetry for internal exposure of which EAV is not disputable.

#### **4.1.3 Contribution to enlargement**

The nuclear issue is obviously an important topic in the discussions on the EU enlargement. In 2001, the Atomic Questions Group of the Council produced a report on the status of the nuclear facilities and regulatory system in the Applicant countries (AC). Third countries (USA, Canada, Russia) have problem with the strict rules of the legal aspect in the EU contracts in particular with liability. A number of bureaucratic obstacles, as seen by the accessing countries, and not clear distinction between assistance and co-operation, which imply auditing, create difficulties. To solve this problem it was suggested that the Commission should consider setting up collaboration assistance service for the AC, including informal pre-proposal checking within identified projects clusters and, if possible, co-ordination, with TACIS and PHARE programmes.

The topics for the research that are important for the AC are essentially the same as for the Member States, i.e. Reactor safety and Innovative systems and Radiation protection. The participation of the AC in the first calls was quite successful and is improving in each subsequent call. Nevertheless, a special call was launched in October 2001 with the objective to give the possibility for researchers and organisations in the AC to join the existing projects. This move should improve integration of the AC in the research web of the EU Member States. The involvement of AC in the Commission activities includes participation of their experts in the Commission's committees and expert groups. In this connection an important initiative was mapping of so called "Centres of Competence" within both the Member States and AC. Results of this mapping should be helpful in deciding on which country (organisation) may be assisting or co-operating while entering existing or future projects.

Enlargement purposes closer involvement of the AC, were well served by the article 7 of the Euratom Treaty and composed of European Union country-members and seven AC of the Euratom treaty (Bulgaria, Czech Republic, Hungary, Latvia, Romania, Slovak Republic and Slovenia). This committee, which met 4 times in 2001, advised on the project selection process.

#### **4.1.4 Participation of SMEs**

No special measures are made for SME's in the Euratom programme.

#### **4.1.5 Women and science**

The problem is at different levels. Participation of women in the nuclear field in EU member's states is quite low except in the fields of chemistry/biology related to Nuclear energy. Gender equality is clearly expressed in the calls for proposals and in accepted projects. Each call specifies "The European Community pursues an equal opportunities policy and, in this context, women are particularly encouraged to either submit proposals or to be involved in their submission". At the EU level, the situation is more or less reflected in the number of women engaged by the Commission as scientific officer with a chance to become co-ordinators.

Gender equality in choosing external expert for evaluations at Commission level is a matter of political decision, but the expert list has perhaps to be reconsidered.

#### **4.1.6 Toward new FP: state of play**

Reports prepared by the Advisory Committees (see section 4.2.1) were important steps in the implementation of 6<sup>th</sup> FP.

The proposal of the Unit for 6<sup>th</sup> FP was presented in March 2001, and a specific programme was set up in June 2001. As already said the main components for this programme were Waste management and disposal and Radiation protection, with emphasis on the quantification of risks from low doses. The Panel considers that the balance of areas in the last topic should be re-discussed with regulators and stakeholders. The other areas are the continuation of the researches of FP 5. The proposal is now being discussed in Council and Parliament. The priorities given and the ways to formulate it have been the subject of discussions.

The Panel has not received a clear explanation for the ERA implementation as regard to former management of several projects by "Associations" and new management by "Clustering projects". Is the new or the old system more close to the ERA concept? The Panel considers that "Associations" were closer

The Panel considers that 6<sup>th</sup> FP should be driven by an integrated research strategy to support the overlapping problems of the Programmes shared by the three scientific communities, Nuclear safety, Waste management and Radiation protection. It is our opinion that these communities should work closer together in the new network projects.

## **4.2 MANAGEMENT AND PROCESSES**

### **4.2.1 Main management issues**

#### Advisory groups and other Panels

Management of the Fission and Radiation protection programme is in the hand of the Unit. In order to implement it, the Unit is assisted, or may consult, three external advisory groups, set up in the

framework of the Euratom treaty (STC and CCE) and by the Commission (EAG). These groups are supposed to represent the national scientific communities. The STC is a consultative committee of individual experts which gives official advice on Euratom research programmes (on the 6<sup>th</sup> FP for 2001) and discusses on long-term issues of Nuclear energy. The CCE is representative of the EU members states and gives advises on the projects selection process and also on the lines to be followed for the preparation of the FP. Finally the individual experts of the EAG give advice on the content of the work programmes. According to their missions these Committees have produced during the year 2001 (and the end of 2000) a number of well-documented papers on strategic issues of Nuclear energy and on their views on the implementation of 5<sup>th</sup> FP. The Panel is not in charge to comment the issues of these Committees directed to the EU Authorities DG J and the Unit.

Three general documents issued by Panels of external experts: Five years assessment of the FP 1995-1999 (October 2000), Customer satisfaction workshop (June 2000) and the more recent 2000 Annual Monitoring report on the RTD activities conducted under the EC and Euratom Framework Programmes (May 2001), give general recommendations.

All these recommendations are directed to fulfil different objectives. Many of them overlap showing a common share of preoccupation.

### Working programme

The Unit has to take into account the above recommendations when setting up works programmes for calls. This Panel considers that it was the case especially for the 2001 work programme. In particular it feels that the general recommendations has been clearly transformed into specific actions ranked with regard to priorities to solve the problems addressed by these Committees or Panels. The Panel considers that by this way the strategic approach of EU: solving problems by key actions and use results to come in action is fulfilled.

### Evaluation of the proposals

The evaluation of the proposals is done according to general EU rules and a specific procedure of the Unit addressed in documents given to tenderers. It is based on a multi-weighted-criteria analysis implemented by several qualified evaluators for a given proposal. This criteria leads to a non-partial evaluation decision to worth for funding or to not worth for funding a proposal. It is not only based on a score but results on deep discussions (consensus meetings) between evaluators under the careful attention of a moderator, who is a scientific officer of the Unit. Ranking of proposals was also effectively implemented through scores consideration and extended comparisons. This self-correcting evaluation system, with regard of bias or failure, works well.

The success of the evaluation depends mainly on the quality of both evaluators and moderators. The role of moderators is essential. They have to prepare the workload of evaluators in the best way; it is to say right distribution of proposals to a given evaluator. They are also the guarantee for the correct management of the consensus meetings as well as for the difficult task of ranking. Moderator takes care that rules are followed and that comments are given in a positive way. They have a large knowledge of the problems in the field that they have to manage. The February 2001 session evaluation showed a high quality of selection of evaluators and a high quality of discussions. A special report has been given to the Unit in which no change in the evaluation process is recommended. The non-technical criteria objectives: societal and economy development, were the most difficult to apply in the selection. EAV were generally more easily identified.

Nevertheless the selection of the proposals makes that not all of the areas of calls are equally covered. The Panel considers that high quality must be maintained until a new organisation of research policy will be set up ("Networks of Excellence" to which tasks would be given).

#### From selected proposal to contracts

A recommendation from the previous monitoring was to reduce the time between selection proposal and signature of contract. This year the delay has been considerably shortened. The target to take not more than half a year seems not possible to be reduced due to splitting of responsibility in the process of funding.

#### Monitoring of the contracts

The cross fertilisation of works in a given area result from merging them in cluster. So the monitoring concerns are both on clusters and on contracts. The scientific officers in close collaboration with the co-ordinators of the projects do it. Today 206 multi-partners contracts have been funded since the launching of the FP 5, which is near to completion. Annual reports and mid term review are milestones that help eventually to re-route the studies and change tasks of partners. Impacts of the researches are the constant care of the follow up of the contracts by the officers. The Panel considers that there are too many projects to be followed by only one person.

#### Human resources

Discussion on human resources is a critical point as regards to ERA implementation. The Panel thinks that if ERA was fully implemented with delegation of management to "Association" for example of "Networks of excellence", Human Resources are largely sufficient, the EU has only to attract "top level" scientific manager for monitoring delegations of management.

Human resource reorganisation was intended to give good tools and to delegate responsibility to those who are close to management as well to increase relation into and between Units. To reach these objectives much work is to be done at local level to overcome the transitional phase of implementation. Training management people needs resources and the Panel encourages increasing them thinking that they are today not sufficient.

Considering the tasks to be done to implement the Programme and to follow the previous 4<sup>th</sup> FP the Panel considers that the human resource of the Unit appears low, particularly when positions are vacant. It is clear that during the transition phase of ERA implementation we can observe such ambiguity.

The Panel strongly encourage ERA implementation as regards to the potential problem which should be created by a today employment of more scientists before the future need of a restructuration.

The Panel wishes to point out the scientific manager mobility problem. It appreciates the clear need of renewal of scientific manager, but such a step could lead to a potential risk of lack of competence if the rotation of experts is too extensive. In avoiding the creation of "friendships networks" among managers, rotation is not the unique solution. Keeping same level of expertise without systematic changes of scientific officers could be reached using independent experts. This could be a compromise.

#### **4.2.2 Communication and information dissemination**

The dissemination of the calls in the Western EU Nuclear community is easy because all people are aware of the EU FP which are now a reference. It is necessary to verify if the situation is the same for the AC. If not, the implementation of the Programme will remain west oriented.

Great efforts have been spent by the Unit in disseminating results of the researches among the scientific community, the ways of dissemination chosen is in compliance with each particular part of the Programme. Periodical conferences, such as FISA are events where industry and regulators meet with research organisations. They must be maintained.

To comprise practical issues into the Programme, the Panel considers that handbooks of best practices and best-used tools as well as databases should be established in certain area and continuously updated. Such material will help to harmonise the safety rules.

To improve the efforts already done new dissemination vectors must be found: delegation of dissemination to major Institutes in the member states, use of scientific journals, use of CORDIS to summarise results in different areas of the Programme. Scientific Conferences related to research areas of the Programme are good place for dissemination. The Panel considers that the budget of accompanying measure to support such Scientific Conferences should be increased. Scientists could be good agents of the EU results dissemination while lecturing to students and at conferences. Unfortunately, it is quite impossible to find on a web site clear summaries of the important results. The Panel considers that in the final reports the scientific coordinators should produce some clear slides (3 - 4) usable at such conferences. As it was already said, CORDIS, if simplified, could participate in this action.

Dissemination of results is not only giving information to those who know but also giving information to those who have to decide and to the public. This is more difficult to do because of these targets are changeable. The Unit must pursue its effort giving short and clear direct messages, may be with the help of professional in communication (like a scientific journalist). The Panel considers that a redefinition of the objectives for the clear dissemination of the results to decision-makers and Stakeholders is a necessary action to be launched.

The Panel should be happy to know the real impact of some actions taken to disseminate the results; e.g., RAD SC NEWSLETTER, which actually informs only scientists who have been already informed.

The publication policy of the Unit seems to the Panel not clearly defined, more especially for workshops that are either published as EU documents or as special issues of peer-review Journals. Moreover the Panel should be happy to know the conditions of selection of these Journals (calls for offers).

#### **4.2.3 Evaluation and monitoring methodology, including indicators**

Experts who evaluate the FP implementation have first of all to understand how the EU research policy and management operate, which is quite complicated because of some hidden political aspects and because of the heavy EU machinery. The second step, in which experts check the appropriateness of actions to objectives and to point out weaknesses, is easier. However, annual monitoring of a several years programme requires some continuity to assure coherence in actions, even if different points of view are looked for.

The training of experts is of importance. It is easier when experts have been already involved in EU issues. The two level 2001 monitoring gives a nice opportunity to learn some of these issues.

Selection of the experts for setting up a Panel according to the EU rules can be difficult, if the expert's list is not sufficiently documented and not updated.

As the Unit officers know the scientific communities well, the Panel considers that they should encourage scientists to submit application to be included into the expert list. The Panel also considers that the practice of appointing one expert for two consecutive monitoring must be continued. Young scientists should participate in the EU processes of evaluation along with older ones.

Quantitative indicators and particularly indicators showing the yearly increments of implementation are of importance for monitoring but are not so informative as discussions with the officers. Such indicators as Tables of figures and graphs, showing breakdown of proposals, selected proposals, contracts signed and financial attribution, as well as the use of the 5th FP budget can show weaknesses, but not the reason of weaknesses. The quantitative indicators to appreciate EAV or ERA have to be set up. The Panel got all the information and had detailed discussions with officers in charge of the different areas of the Programme. The Panel considers that within monitoring such discussions must be given more importance.

The Panel considers that the 2001 well-documented Monitoring Guidelines is a necessary document.

As it has been already said, the Panel considers that a yearly "Self-Assessment of Programme Implementation" is a central document around which the work of the monitoring Panel can be organised.

#### **4.2.4 Follow-up of impact of previous research FPs and SPs**

Only very few of 4<sup>th</sup> FP projects are still running. The main results have been already published, even if some summary reports are still in progress. The Unit will do an impact assessment of the 4<sup>th</sup> FP completed projects in 2002. Such a delay seems to be long, but due to the overlapping in the management of the 4<sup>th</sup> and 5<sup>th</sup> FP, extending over 2 to 3 years, it is difficult for the Unit to emphasise impacts on time. The Panel considers that there is continuity in the researches and that the follow-up of these researches, assuring the coherence of the FPs, is the main advantage of the successive programmes. Of course, it is always possible to point out "Success stories" in each area of the Programme, but the main Success is to pursue at EU level research on the safety in Nuclear energy, whatever is the changing social context.

#### **4.2.5 Other relevant aspects**

##### JRC

The researches performed in JRC (281 MEuro for the 5<sup>th</sup> FP) are supposed to be complementary of the DG the 5<sup>th</sup> FP actions (191 MEuro). To judge this indirect action it is necessary to have the programme of the direct implication of JRC in the implementation of the Programme. For the 6<sup>th</sup> FP, The Panel considers that a closer cooperation with the JRC would be beneficial for the FP. The Panel considers that this will help EU progress toward ERA

##### International co-operation

International activities of the Unit are specific and directed on the new fields of research where EU is often in advance. International co-operation needs strong implication of the officers of the Unit.

This co-operation is well established and very fruitful with OECD/NEA and IAEA (participation as members to Committees and Steering Committees and working exchange meetings). There is no conflict of interest in this collaboration because EU RD gives support to discussions and brainstorming conducted in these organisations. The Unit has direct implications in ISTC and in direct discussion with USA and Japan nuclear scientific organisations. The Panel considers that the open window of the Unit over the international nuclear scene is better than in the past.

For radiological protection, the EU plays an important role in the discussion opened by the ICRP for the future revision of the ICRP recommendations. The EU role in FASSET has been already pointed out. The Panel considers that EU officers should be regularly involved in ICRP committees as they were in the past. However, their participation in technical committees is only possible if there will be a continuity of the same officers involved (see section 4.2.1.).

A larger number of common projects (with the USA for example) should be implemented for epidemiology studies in the former Soviet territories. The Panel considers that discussion on creating a permanent structure, like RERF in Japan, will be useful, if EU really wishes to use the maximum of information from these contaminated territories and those affected by the consequences of Chernobyl accident.

#### Participation of regulators in the Programme

Common view on Safety in nuclear community is of the highest value for EU Nuclear energy. It is necessary that regulators know new scientific results. Bringing different players together in a neutral environment as in FP meetings help to find common positions. Today regulators are more or less outside FP due to different culture and goals except in Reactor management and in Radiation protection. The Panel considers that their participation must be in general encouraged, especially in Waste management.

#### Social impact

A common concern of the three main parts of the Programme is to enhance confidence of the public in the use of Nuclear energy. The Panel considers that this issue should not be treated separately in each part but in a co-ordinated way.

#### Economic impact

The economic impact of the Programme (and of previous FP) is evident through its contribution to the improvement of safety in implementing nuclear fission energy. This impact cannot be evaluated in terms of money but may be, it could be evaluated in the future, by comparison with other sector of energy generation or service when these sectors will have to stiffen up their safety rules to match those of the nuclear sector. The Panel considers that it is easier to assess the gain in making a current technology safer than to assess whether the change has led the technology become more economic.

### **4.3 IMPACT OF PREVIOUS RESEARCH FPS**

The impacts of the previous research projects can be measured by considering EAV, when a qualitative increase in knowledge or in technology has been obtained within a co-operation, when a problem common to several members states is addressed, when efficiency of EU resources is increased (representation of members-states in internal organisations, use of large scales facilities)

and when consensus in safety regulation is achieved. The Panel has in Section 4.1.2 described the main achievements of the Programme with a special emphasis on ERA. The Five years assessment report has highlighted the effectiveness of the 4<sup>th</sup> FP

In conclusion, despite the fact that research supporting nuclear fission energy is rather a matter of member states, many projects of the 5<sup>th</sup> FP have added a new dimension to the research in this field.

#### **4.4 FOLLOW UP OF PREVIOUS MONITORING AND FIVE YEAR ASSESSMENT RECOMMENDATIONS**

The 2000 Panel monitoring made several recommendations, which were followed by the Unit, and one has been rejected. Arguments for the rejection have been given. This Panel has no more comment.

Recommendations given in the Five years Assessment of Nuclear fission and Radiological sciences, issued in June 2000, were considered in the 2000 Monitoring exercise which took place at the beginning of 2001 and were of value to 2001 Monitoring panel. The report covers mainly the 4<sup>th</sup> FP (1994-998) and the two first years of the 5<sup>th</sup> FP implementation. The statements and recommendations of this report (30 specific and 14 general recommendations) address topics which are now in the focal point of the EU interest, such as ERA, Training and Governance, discussing how to manage activities where the overall risk arises from contributions of many factors, including technical and social. In short, the main idea was to make actions in the 5<sup>th</sup> and the 6<sup>th</sup> FP to reach EAV (and consequently ERA) coherent, using networking and clusters, with more active role of the Unit in the implementation. The Panel considers that the Unit has taken into account the suggestions of the five years assessment Panel. Some recommendations have been put into action.

In the proposal adopted in January 2000, the Commission recognises that world-class excellence exists in the EU in practically all areas and disciplines. The Lisbon European Council on 23-24 March endorsed the ERA project and requested to map by 2001 research and development excellence in all member-states, in order to foster the dissemination of excellence. For the Programme a group of experts was mandated to produce a map of competencies. The reports was submitted to Commission during 2001, but, the Panel notes and regrets that the difference between "Mapping of Excellence" and "Mapping of Competence" was not explained clearly either to expert group or the member states which supported this exercise. Moreover, the approach for such an exercise should be better-discussed prior its realisation as to some recommended procedures. For example, combination of two kinds of indicators: "number of scientists employed" and "number of publications" was a good approach but needs to be modified for the nuclear fission activities, introducing a profile of age for scientists employed and describing the type of publication. For example, in some sciences the first rank journals evaluate contributions submitted to the publication. However, such an approach cannot apply to the contributions of the Radiological protection programme, which contains a part of fundamental research and a part of applied research. This last part is published in peer-review journals not considered as first rank journal by the Current Contents system.

Document sent in to the 2002 FP Panel has indicated that this exercise should be limited to "Life Sciences", "Nanotechnologies" and "Economics". The Panel includes two experts who participated to the mapping of Competence exercise, and more comments on this part of Commission work should be appreciated. Moreover, it does seem that the produced report is not really used either by Commission members or members-states.

## 5. CONCLUSIONS AND RECOMMENDATIONS

### 5.1 STATEMENTS

1. The officers of the Unit have a deep knowledge of the scientific and the management problems. The actions they have launched and implemented in 2001 are fully within the scope of the Programme.
2. The workload of the Unit is heavy. Nevertheless the Unit has found time to manage at a high level of competence the numerous yearly tasks required by the 5<sup>th</sup> FP implementation: updating Working programmes, evaluation of proposals, negotiation of contracts and merging them in networks and follow up of the contracts. The Unit has also maintained scientific connections with other DG, international organisations and organisations of nuclear state outside EU, and has prepared the 6<sup>th</sup> FP and shared its expertise in the nuclear field with Authorities to prepare ERA.
3. The contracts of the 5<sup>th</sup> FP cover properly and with high quality the defined objectives and priorities of the work programmes. These contracts have been brought into clusters as far as possible. This will improve the necessary follow up of the 5<sup>th</sup> FP in the coming years.
4. Scientific results have been correctly disseminated among the scientific communities.
5. Weakness on management is on dissemination of non-technical report to decision maker and the public and on launching Training and Education programmes.

### 5.2 RECOMMENDATIONS

Many general "directions to go" and recommendations coming from different Committees are directed to Unit J 4. The Panel is aware of the all the documents dealing. The Panel endorses most of these general recommendations but considers that few are really useful for the Unit. The Panel along this monitoring has made many considerations of which some are at the border of its mandate. The Panel hopes that they will be of some help to the scientific officers of the Unit.

To be constructive and efficient the Panel gives in these section only recommendations for action.

#### General recommendations for the whole ERA/FP

1. An important step before ERA became a reality in Nuclear Fission and Radiation Protection is to map the situation, in both the Members states and in the Applicant Countries (AC) that should comprise:
  - mapping of competencies, even outside the nuclear fission community where expertise to solve some problems exist,
  - mapping of large instruments for nuclear research,
  - mapping of stakeholders.

The commission should launch as soon as possible as part of the 6<sup>th</sup> FP.

2. Such mappings should show, where in the Nuclear science, the expertise may be lost and where in opposite the expertise is being maintained or increased. Specific actions of training and education must be urgently promoted in 6<sup>th</sup> FP to restore the expertise endangered.
3. Progress to ERA requires increasing networking that will facilitate organisation of research in Programmes. Transition from a Project structure to a Programme structure implies an increase in 6<sup>th</sup> FP projects clustering. Next calls for proposal must clearly identify this need.
4. The mechanisms for the creation, financing and efficient functioning of future ERA tools, like networking of “Centre of Competence”, “Centre of Excellence” or “Virtual Centre” must be defined as soon as possible.
5. Due to very different nuclear development in the Member states and Accessing States, a common view on safety should have a high level of priority. Regulators must be more involved in some projects or in sharing results.
6. To make visible the EAV in different areas of the Programme, handbooks of the best practices and of the best tools to use should be issued in certain areas. This will help to improve safety based on common basis

#### Specific recommendation to Unit J 4 for management

1. Maintain the high quality of management
2. Launch actions to fulfil the general above recommendations to make ERA a reality.
3. Prepare the Nuclear community to ERA by dissemination of specific documents
4. In calls for 6<sup>th</sup> FP make clear the new challenges to be fulfilled to progress to ERA and try to explain it in simple terms
5. Give clear definitions of the different instruments to bring people to work together.
6. Set up an Editorial Committee for dissemination of results
7. Try to connect fellowships attribution to project

#### Recommendations addressing the evaluation and monitoring methodology

1. The two levels monitoring, which allows to extend the scope of monitoring, must continue
2. The "Self-Assessment of Programme Implementation", which is a valuable document bringing together the information disseminated in many other documents, must continue. It marks a change from a "constrained monitoring", as it was before, to an "open monitoring" giving the opportunity to the Unit J 4 of a closer collaboration with independent experts.
3. The simplification of administrative forms for proposals is a recurrent recommendation of monitoring. Try again to improve it.

4. Scientists do not perceive the objectives of intermediates reports clearly enough. A more clear explanation is needed and a simpler form used. Some projects co-ordinators request a "guide to explain the guide".
5. Do not increase the number of general documentation given to the Panel.
6. Give to the Panel a glossary explaining acronyms and new terms and carefully check that definitions are clearly elucidated.

*The Panel expresses its thanks to the officers of the Unit J who have been very co-operative in this monitoring.*

## 6. ANNEXES

### 6.1 ABBREVIATIONS

AC	Applicant Countries associated to the Euratom program
CORDIS	Community Research and Development Information System
COWAM	Comparison of decision-making processes at the local and regional community level in nuclear waste facility siting
CREST	Scientific and Technical Research Committee
DG	Directorate General
EAG	External Advisory Group
EAV	European Added Value
EC	European Commission
ENEN	European Nuclear Engineering Network
ERA	European Research Area
EU	European Union
EULEP	European Late Effect Project
EURADOS	European Radiation Dosimetry Group
FASSETT	Framework for Assessment of Environmental impact
FP	Framework Programme
FPMP	Framework Programme Monitoring Panel
FIS	EURATOM (Fission Programme)
FISA	Fission Safety
HLLLW	High-Level Long-Lived Waste
IAEA	International Atomic Energy Agency
ICRP	International Commission on Radiological Protection
INTAS	International Association for Promotion of Co-operation with Scientists from the Independent States of the former Soviet Union
ISTC	International Scientific and Technical Centre
JRC	Joint Research Centre
LWR	Light water reactor
OECD/NEA	Organisation for Economic Cooperation Development/Nuclear Energy Agency
PHARE	Poland and Hungary Assistance for the Reconstruction of the Economy
PLINIUS	Platform for Improvements in Nuclear Industry and Utility Safety
RERF	Radiation Effects Research Foundation
RTD	Research and Technological Development
RISCOM	Enhancing transparency and public participation in nuclear Waste management
RISKGOV	Comparative analysis of Risk Governance for radiological and chemical discharges of industrial installations
RODOS	Real-time, On-line, DecisiOn Support
SO	Scientific Officer
SME	Small and Medium sized Enterprises
STC	Euratom Scientific and Technical Committee
TACIS	Technical Assistance to the Commonwealth of Independent States
TRUSTNET	Concerted action on the governance of hazardous activities
VVER	Russian abbreviation for Water Moderated Water Cooled Energy Reactor
WP	Work Programme

## **6.2 INFORMATION PROVIDED TO THE EXPERTS BY THE PROGRAMME MANAGEMENT**

### **List of official documents for the Panel**

- Official Journals:
  - L 361 pages 143-156 Council decision 94/920 Euratom of 15 Dec. 1994 adopting the Nuclear Fission Safety Programme (1994-98).
  - L 115 pages 31-37 Council decision 94/268 Euratom of 26 April 1994 adopting the Euratom Framework Programme 1994 to 1998.
  - L 26 pages 1-33 Decision 182/1999/EC of the EP and the Council of 22 Dec. 1998 adopting the 5<sup>th</sup> EC Framework Programme 1998-2002.
  - L 26 pages 34-45 Council decision 1999/64 Euratom of 22 Dec. 1998 adopting the 5<sup>th</sup> Euratom Framework Programme 1998 to 2002.
  - L 64 pages 142-153 Council decision 1999/175/Euratom of 25 Jan. 1999 adopting the R&T Euratom programme “Nuclear energy 1998-2002”.
- Guidelines for the Monitoring 2001 of programmes (24 Oct. 2001).
- Nuclear Fission and Radiation protection - Projects selected for funding 1999 - 2001. (Draft Nov. 2001).
- “Self assessment Fiches” suggested for the 2001 Monitoring (Draft).
- 2000 External Monitoring Report of the Nuclear energy - Fission Programme.
- Nuclear energy Information Package (Work Programme, Calls, Guide for Proposers, Forms and instructions) – Revised version.
- Guidelines for the Evaluation of Proposals – Specific programme for research and training (Euratom) in the field of Nuclear energy (1998-2002).
- List of Projects “Nuclear Fission Safety Programme 1994-1998” (list of ongoing projects at Jan. 2001).
- Strategic Issues related to a 6<sup>th</sup> Euratom Framework Programme (EUR 19150 EN).
- Report on the Customer Satisfaction Workshop on the proposal preparation process. Energy, Environment and Sustainable Development (EESD). (Brussels, June 29, 2000).
- Five Year Assessment Report related to the Specific Programme: Nuclear energy covering the period 1995-1999 (June 2000).

### **Other documents**

The Panel has been provided with many other documents given by either the Unit members during interviews or during the general meeting of the FPMP

### 6.3 OTHER: BASIC STATISTICS FOR THE YEAR 2001

		<b>AM *</b> <b>25.09.00</b>	<b>MCFI</b> <b>10.01.01</b>	<b>3rd call</b> <b>22.01.01</b>	<b>AM</b> <b>26.03.01</b>	<b>MCFI**</b> <b>13.06.01</b>	<b>AM**</b> <b>24.09.01</b>	<b>Total</b>
1.	Time to contract (from deadline to EC signature) (first and last contract)	23/08/01 28/09/01	No contrats signed	30/08/01 14/12/01	30/08/01 07/12/01	Planned for March 02	Planned for March 02	
2.	Number of eligible proposal received:	10	5	124	18	5	10	172
	KEY ACTION	2	2	96	12	4	6	122
	GENERIC ACTIVITIES	8	3	18	5	1	4	39
	RESEARCH INFRASTRUCTURES			10	1			11
3.	Number of proposals recommended for funding:	6	0	83	14	3	8	114
	KEY ACTION	1	0	67	11	3	5	87
	GENERIC ACTIVITIES	5	0	6	2	0	3	16
	RESEARCH INFRASTRUCTURES			10	1			11
4.	Success rate	60%	0%	63,7%	77,8%	60%	80%	
5.	Number of contracts signed to date	6	0	75	14	Under preparation	Under preparation	95
6a.	Financial contribution requested	1.017.491	589.349	87.177.939	1.842.581	341.572	401.761	91.370.693
	KEY ACTION	192.406	272.044	69.890.337	1.038.671	217.200	231.329	71.841.987
	GENERIC ACTIVITIES	825.085	317.305	11.463.137	606.194	124.372	170.432	13.506.525
	RESEARCH INFRASTRUCTURES			5.824.465	197.716			6.022.181
6b.	Financial contribution planned	555.400	0	49.330.234	978.606	217.200	220.418	51.301.858
6c.	Financial contribution committed	555.400	0	49.330.234	978.606	217.200	220.418	51.301.858
<b>7. Total funding of projects (EC + contractor's contributions) of received proposals and signed contracts</b>								
<b>a</b>	<b>Received proposals</b>	2.084.481	589.349	148.168.760	3.075.403	341.572	654.744	154.914.309
	KEY ACTION	192.406	272.044	127.276.284	2.200.786	217.200	256.329	130.415.049
	GENERIC ACTIVITIES	1.892.075	317.305	14.602.237	663.187	124.372	398.415	17.997.591
	RESEARCH INFRASTRUCTURES			6.290.239	211.430			6.501.669
<b>b</b>	<b>Signed contracts</b>	1.342.669	0	91.003.009	2.344.100	Under preparation	Under preparation	94.689.778
	KEY ACTION	47.000	0	82.431.059	2.004.547	Under preparation	Under preparation	84.482.606
	GENERIC ACTIVITIES	1.295.669	0	4.334.981	128.123	Under preparation	Under preparation	5.758.773
	RESEARCH INFRASTRUCTURES			4.236.969	211.430	Under preparation	Under preparation	4.448.399

\* Proposals received in 2000 but selected and financed in 2001

\*\* Proposals received in 2001 but will be financed by 2002 budget.

8. Number of participations in projects selected for funding per country

		<b>AM *</b> <b>25.09.00</b>	<b>MCFI</b> <b>10.01.01</b>	<b>3rd call</b> <b>22.01.01</b>	<b>AM</b> <b>26.03.01</b>	<b>MCFI**</b> <b>13.06.01</b>	<b>AM**</b> <b>24.09.01</b>	<b>Total</b>
<b>EC countries</b>	A	1		5	1			7
	B	3		46	8		1	58
	D	2		113	11		2	128
	DK			8	1			9
	E			59	6	1		66
	EL			3	1		2	6
	F	1		124	6		1	132
	FIN			28	2			30
	IRL			3				3
	I			35	3			38
	NL	1		40	2			43
	P			2				2
	S			42	2			44
	UK	4		79	3		3	89

<b>OTHER</b>	BG			2				2
	BY			1				1
	CH			29	2			31
	CZ			26	6	1		33
	HU			22	1			23
	LT							
	LV				2			2
	NO			5				5
	PL			6				6
	RO			4	2			6
	RU			7	1			8
	SI			4	1			5
	SK			17		1		18
	UA			6				6
	US			2				2

\* Proposals received in 2000 but selected and financed in 2001

\*\* Proposals received in 2001 but will be financed by 2002 budget.

**PART B:**

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

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

These responses have been prepared by officials in the Fission programme and represent their personal views on the recommendations of the annual monitoring report. These views have not been adopted or in any way approved by the Commission and should not be relied upon as a statement of the views of the Commission or DG Research.

	<b>Recommendation</b>	<b>Commission Services' Response</b>	<b>Time point / indicator for accomplishment</b>
<b>1</b>	<p><b>General recommendations for the whole ERA/FP</b></p> <p>An important step before ERA became a reality in Nuclear Fission and Radiation Protection is to map the situation, in both the Members states and in the Applicant Countries (AC) that should comprise:</p> <ul style="list-style-type: none"> <li>- mapping of competencies, even outside the nuclear fission community where expertise to solve some problems exist,</li> <li>- mapping of large instruments for nuclear research,</li> <li>- mapping of stakeholders.</li> </ul> <p>The commission should launch as soon as possible as part of the 6<sup>th</sup> FP.</p>	<p>A first step in this direction was made in 2001 when a first mapping exercise was performed with the help of the programme committee. The outcome of this exercise was, however, not very clear.</p> <p>A possible second step could be to map the research activities in the areas of nuclear fission and radiation protection in the Member States and the Associated States. Again the programme committee should be the right forum for such an exercise. As this is a large task it should preferably be carried out in two steps, one overview study followed by a more detailed study.</p> <p>The pros and cons of such a study, as well as its feasibility and usefulness should be discussed in the programme committee at one of its next meetings, eventually leading to:</p> <ul style="list-style-type: none"> <li>- the definition of ToR for the study,</li> <li>- the realisation of the study and,</li> <li>- the implementation of the results and recommendations of the study.</li> </ul>	<p>Discussion in the programme committee and definition of a study during autumn.</p> <p>First step, if accepted to be performed until March 2003.</p>

	<b>Recommendation</b>	<b>Commission Services' Response</b>	<b>Time point / indicator for accomplishment</b>
	Such mappings should show, where in the Nuclear science, the expertise may be lost and where in opposite the expertise is being maintained or increased. Specific actions of training and education must be urgently promoted in 6 <sup>th</sup> FP to restore the expertise endangered.	The above mentioned study shall indicate / confirm the need for the definition and, if applicable, the implementation of specific actions of training and education” .	
	Progress to ERA requires increasing networking that will facilitate organisation of research in Programmes. Transition from a Project structure to a Programme structure implies an increase in 6 <sup>th</sup> FP projects clustering. Next calls for proposal must clearly identify this need.	It is the intention of the Commission to use the new instruments, Networks of Excellence and Integrated Projects for most of the sub-areas of the programme in order to proceed towards ERA, thereby increasing the clustering of the research. It is a main task of the Commission services to promote this development and to inform the research actors. A first step is the invitation to submit Expressions of Interest for the new instruments. The second step will be the clear definition of the first call for proposals	EoI assessment in July 2002 Call for proposals at the end of the autumn 2002
	The mechanisms for the creation, financing and efficient functioning of future ERA tools, like networking of “Centre of Competence”, “Centre of Excellence” or “Virtual Centre” must be defined as soon as possible.	This work is in progress centrally in DG Research	Autumn 2002 (??) 4 <sup>th</sup> quarter 2002
	Due to very different nuclear development in the Member states and Accessing States, a common view on safety should have a high level of priority. Regulators must be more involved in some projects or in sharing results.	This issue has two aspects; Firstly the Commission (DG TREN) is in the process of preparing a Communication to propose to implement common European safety standards. Secondly in the research, DG Research should strive for a continued strong participation of the Associated States and for an increased participation of the regulators.	This is a continuous activity. No special actions planned

	<b>Recommendation</b>	<b>Commission Services' Response</b>	<b>Time point / indicator for accomplishment</b>
	<p>To make visible the EAV in different areas of the Programme, handbooks of the best practices and of the best tools to use should be issued in certain areas. This will help to improve safety based on common basis.</p>	<p>The Commission services appreciate the usefulness of "handbooks" of best practices and tools in particular in areas that are mature from a research point of view. It will be an effective tool for the dissemination of the results of the research. It is also an important part of the total knowledge management, that is an important component of the new instruments. The realisation of such handbooks will be carried out in the areas where such an approach will be particularly advantageous, as a part of the project work.</p>	<p>To be brought up in a case by case approach during the contract negotiations</p>
<b>2</b>	<b>Specific recommendation to Unit J 4 for management</b>		
	<p>Maintain the high quality of management</p>	<p>This is our ambition. The high quality of management can, however, only be assured through a high quality of knowledgeable staff. This is a key issue for the replacement of some staff shortly.</p>	
	<p>Launch actions to fulfil the general above recommendations to make ERA a reality.</p>	<p>See earlier comments</p>	
	<p>Prepare the Nuclear community to ERA by dissemination of specific documents</p>	<p>See earlier comments</p>	
	<p>In calls for 6<sup>th</sup> FP make clear the new challenges to be fulfilled to progress to ERA and try to explain it in simple terms</p>	<p>See earlier comments</p>	
	<p>Give clear definitions of the different instruments to bring people to work together.</p>	<p>See earlier comments</p>	

	<b>Recommendation</b>	<b>Commission Services' Response</b>	<b>Time point / indicator for accomplishment</b>
	Set up an Editorial Committee for dissemination of results	This is an interesting idea that will be investigated. It should also be seen in the context of a publishing policy for the unit and the directorate.	To be evaluated until end of 2002
	Try to connect fellowships attribution to project	In the new instruments the training component will be important. In this context the modalities for connecting the fellowships to projects will be investigated.	End of 2002.
<b>3</b>	<b>Recommendations addressing the evaluation and monitoring methodology</b>		
	The two levels monitoring, which allows to extend the scope of monitoring, must continue	Not specific for the nuclear fission and radiation protection programme	
	The "Self-Assessment of Programme Implementation", which is a valuable document bringing together the information disseminated in many other documents, must continue. It marks a change from a "constrained monitoring", as it was before, to an "open monitoring" giving the opportunity to the Unit J 4 of a closer collaboration with independent experts.	Not specific for the nuclear fission and radiation protection programme	
	The simplification of administrative forms for proposals is a recurrent recommendation of monitoring. Try again to improve it.	Not specific for the nuclear fission and radiation protection programme	

	<b>Recommendation</b>	<b>Commission Services' Response</b>	<b>Time point / indicator for accomplishment</b>
	<p>Scientists do not perceive the objectives of intermediates reports clearly enough. A more clear explanation is needed and a simpler form used. Some projects co-ordinators request a " guide to explain the guide".</p>	<p>For FP6 the roles of the intermediate reports will be better defined generally by DG Research, and more specifically during the contract negotiations.</p> <p>For the remaining intermediate reports of FP5 it will be the task of the Scientific Officers to explain the objectives</p>	
	<p>Do not increase the number of general documentation given to the Panel.</p>	<p>Not specific for the nuclear fission and radiation protection programme</p>	
	<p>Give to the Panel a glossary explaining acronyms and new terms and carefully check that definitions are clearly elucidated.</p>	<p>Such a glossary will be prepared before the next monitoring</p>	<p>November 2002.</p>