



COMMISSION OF THE EUROPEAN COMMUNITIES

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Proposal for a

COUNCIL DECISION

concerning the Specific Programme to be carried out by means of direct actions by the Joint Research Centre implementing the 7th Framework Programme (2007-2011) of the European Atomic Energy Community (Euratom) for nuclear research and training activities

(presented by the Commission)

EXPLANATORY MEMORANDUM

1. CONTEXT OF THE PROPOSALS

The Commission adopted its proposal¹ for the 7th Framework Programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities (2007 to 2011) on 6 April 2005. The Commission indicated that the activities were to be organised in two Specific Programmes corresponding to “indirect” actions on fusion energy research and nuclear fission and radiation protection and the “direct” research activities of the Joint Research Centre in the field of nuclear energy, and these are the subject of the present proposals. The Commission will be presenting proposals for the associated “Rules for Participation and Dissemination”.

The policy context and objectives are those set out in the Communication “Building the ERA of knowledge for growth”².

The Specific Programmes of the 7th Euratom Framework Programme are designed to address, in combination with the necessary national and industrial efforts, the major issues and challenges in this field of research in Europe.

Financial support at a European level offers opportunities to increase the excellence and effectiveness of research in a way that cannot be achieved at national level. The Specific Programmes of the 7th Euratom Framework Programme represent further consolidation of the European Research Area in this sector, achieving critical mass and structures in new areas of research and by new means, and further supporting the free movement of ideas, knowledge and researchers.

Throughout the implementation of the Specific Programmes, the potential for European level actions to strengthen excellence in research will be utilised to the maximum. This implies identifying and supporting existing excellence in this field wherever it exists across the European Union as well as creating capacities for future research excellence.

Where possible, the impact of the Specific Programmes will be enhanced through complementarities with other Community programmes, such as the Structural Funds. This is in conformity with the approach to be followed in the EC Capacities Specific Programme, since an important aspect of the Euratom Specific Programme for indirect actions will also be the support for research infrastructures, though in this case in the specific area of nuclear science and technology.

2. PRIOR CONSULTATION

In the preparation of current proposals, as for the Framework Programme, the Commission has taken into account the views expressed by the other EU institutions and the Member States, as well as by many stakeholders in a broad consultation, including the scientific community and industry. In addition, the Specific Programme proposals draw from the in-

¹ COM(2005) 119.

² COM(2005) 118.

depth impact assessment undertaken for the 7th Framework Programme proposal³ and the outcome of the five year assessment of the Framework Programme⁴.

3. LEGAL ASPECTS

The present Specific Programme proposals cover the same period as the Framework Programme, 2007-2011, which in turn is based on Article 7 of the Euratom Treaty. In accordance with this Article, second paragraph, research programmes are drawn up for a period of not more than five years. Hence, the present proposals are not for the same duration as the EC Specific Programmes.

The Commission proposes that, unless extenuating circumstances arise, these Specific Programmes will be renewed for the period 2012-2013, in accordance with the foreseen legislative procedure.

4. BUDGETARY IMPLEMENTATION

The “legislative financial statement” attached to this Decision sets out the budgetary implications and the human and administrative resources, and also provides indicative figures for the period 2012-2013.

The Commission intends to set up an executive agency which will be entrusted with certain tasks required to implement the specific programme of indirect actions⁵.

5. A COHERENT AND FLEXIBLE IMPLEMENTATION

5.1. Adapting to new needs and opportunities

It is vital that the implementation of the Specific Programmes is sufficiently flexible to enable them to remain at the forefront of scientific and technological developments in the nuclear field in general and to respond to emerging industrial, policy or societal needs. For the indirect actions, this will be achieved primarily through the work programmes which will be updated on an annual basis with the assistance of the committees of Member State representatives and identify the topics for calls for proposals to be launched. Revisions may be made more rapidly in case of new priorities requiring an urgent response, in particular arising from unforeseen policy needs.

This multi-annual programming will benefit from a wide range of inputs to ensure that the activities supported maintain direct relevance to the evolving research needs of industry and

³ SEC(2005) 430.

⁴ COM(2005) 387.

⁵ Article 54.2 (a) of the Financial Regulation (EC, Euratom) allows the Commission to entrust tasks of public authority to executive agencies. However, Council Regulation (EC) No 58/2003 laying down the statute for the executive agencies to be entrusted with certain tasks in the management of Community programmes, and Commission Regulation (EC) No 1653/2004, on a standard financial regulation for executive agencies pursuant to Regulation (EC) No 58/2003, are EC Regulations which, consequently, would not apply in the Euratom field. The Commission intends to request the Council to extend the scope of these regulations to the Euratom Treaty.

EU policies in the nuclear field. The external advisory group for energy established under the EC Cooperation Specific Programme, with effective multi-disciplinary membership and a balance of academic and industrial views, will provide one of these inputs.

Additional external inputs may also be forthcoming from the technology platforms that it is envisaged could be established in certain thematic domains of the Specific Programmes in the near future.

Other forums and groups, such as European Strategy Forum on Research Infrastructures (ESFRI), may provide the Commission with timely advice on opportunities and priorities with relevance to the Euratom research sector.

5.2. Cross-cutting issues

Overall coherence in the implementation of the 7th Euratom Framework Programme will be ensured by the Commission. The work programmes across the Specific Programmes will be revised in a coordinated way to allow cross cutting issues to be fully taken into account.

The committees of Member State representatives also have an important responsibility in assisting the Commission in the effective coherence and coordination of implementation across and within Specific Programmes. This implies a strong level of coordination within Member States between representatives of different committee configurations.

Particular attention will be paid to those actions cutting across Euratom and EC Specific Programmes, for example the use of advanced reactors in the production of hydrogen, or the development of advanced materials. Where feasible in view of the difficulties posed by the existence of two Framework Programmes coming under separate Treaties, joint calls may be used building on the experience gained in the 6th Framework Programme.

The following issues are of particular importance, and specific arrangements for a coordinated approach are foreseen:

- *International cooperation*: This is an important aspect of the Euratom programme and a strategic approach will be taken to promote actions in this respect and to address specific issues where there is a mutual interest and benefit.
- *Research infrastructures*: There needs to be close collaboration with the EC Capacities programme to ensure support for key nuclear research infrastructures with more general research applications.
- *Link with Community policy*: Arrangements for effective coordination within the Commission services will be put in place, in particular to ensure that activities continue to meet the needs of developments in EU policies. For this purpose, the multi-annual programming may draw on the help of user groups of different Commission services associated with the policies concerned.
- *Dissemination and knowledge transfer*: The need to foster the uptake of research results is a strong feature across the Specific Programmes, with a particular emphasis on transferring knowledge between countries, across disciplines and from academia to industry, including through the mobility of researchers.

- *Science in society*: This activity in the EC Capacities programme also has parallels in activities in the nuclear sector, and there is a clear potential for mutually beneficial cross-fertilisation in areas such as governance and stakeholder issues, especially those associated with the local acceptance of controversial facilities.

6. SIMPLIFICATION AND MANAGEMENT METHODS

A significant simplification will be achieved in the implementation of the 7th Framework Programme, following the ideas presented in the Commission Working Document of 6 April 2005 and the extensive dialogue on the basis of this document. Many of the proposed measures are to be presented in the Rules for Participation and Dissemination, notably to reduce “red tape” significantly and simplify the funding schemes and reporting requirements.

Within the fission part of the Specific Programme for indirect actions, improvements will be proposed that are comparable with those foreseen for actions in the collaborative part of the EC programme.

7. CONTENT OF THE SPECIFIC PROGRAMMES

7.1. Nuclear research and training activities (indirect actions)

This Specific Programme covers the following two thematic priorities:

(i) **Fusion energy research**: to develop the knowledge base for, and to realise ITER as the major step towards, the creation of prototype reactors for power stations that are safe, sustainable, environmentally responsible and economically viable. This thematic priority includes the following areas of activity:

- The realisation of ITER
- R&D in preparation of ITER operation
- Technology activities in preparation of DEMO
- R&D activities for the longer term
- Human resources, education and training
- Infrastructures
- Responding to emerging and unforeseen policy needs.

(ii) **Nuclear fission and radiation protection**: to promote the safe use and exploitation of nuclear fission and other uses of radiation in industry and medicine. This thematic priority includes the following areas of activity:

- Management of radioactive waste
- Reactor systems
- Radiation protection

- Support for and access to research infrastructures
- Human resources and training including mobility.

In general, this Specific Programme represents strong elements of continuity with previous framework programmes building on the demonstrated added value of European support of this type. There are, in addition, important novelties in this Specific Programme which require specific consideration for the implementation:

- A strengthened approach to the coordinating of national research programmes in the field of nuclear fission and radiation protection.
- The joint implementation of ITER in an international framework, the establishment of a Euratom Joint Undertaking for ITER, and a further strengthening of the co-ordination of the integrated European fusion energy research activities.
- A more targeted approach to international cooperation within each theme is foreseen with specific cooperation actions to be identified in the work programmes in line with the strategic approach for international cooperation foreseen.
- A component to allow a flexible response to emerging needs and unforeseen policy needs will be supported under each of the themes and the implementation will build on the experience of the Scientific Support for Policy and New and Emerging Science and Technology schemes introduced in the 6th Framework Programme, as well as the Future and Emerging Technology scheme in the ICT area.

During the lifetime of this Specific Programme, and the foreseen extension to 2013, opportunities for the creation of effective Joint Undertakings may arise, for example in the field of radioactive waste management⁶. The Commission services will submit proposals for the creation of such undertakings to Council at the appropriate time.

7.2. JRC (direct actions)

The JRC will implement its mission in taking into account the internal evolution within Commission services, as well as the European and worldwide context in the nuclear field.

To this end, the strengthening of JRC relations with Member States research organisations will be systematically sought.

In connection with the Lisbon agenda and upon request of most of JRC stakeholders, the JRC will make a significant effort on training and knowledge management. The JRC will pursue its R&D activities in areas linked to waste management and environmental impact.

In nuclear safety, the most important changes are an answer to the Community policy developments, new needs expressed by Commission services and to the Community involvement in international initiatives, such as Generation IV.

⁶ See the Explanatory Memorandum to the Commission's revised proposal for the "Nuclear Package", COM(2004) 526, 8.9.2004.

The JRC is involved in nuclear safety for 30 years, but the international context has significantly changed these very last years and the non-proliferation dimension is becoming more important. However, internal evolution of Commission Services also relies on JRC continuous support in more traditional areas.

8. BUILDING THE ERA OF KNOWLEDGE FOR GROWTH

Achieving the necessary rapid progress towards a knowledge economy and society requires a new ambition and effectiveness in European research. All actors across the European Union – national governments, research establishments, industry – have their role.

All Specific Programmes implementing the 7th Framework Programmes (EC and Euratom) are designed to maximise the leverage and impact of European-level research spending within the available budget. Key features are: the focus on the thematic priorities in the corresponding Specific Programmes with activities and means of implementation designed to meet these objectives; a strong element of continuity; a consistent focus on supporting existing excellence and creating the capacity for tomorrow's research excellence; a streamlined and simplified management to ensure user friendliness and cost effectiveness; and an inbuilt flexibility such that the Framework Programme can respond to new needs and opportunities.

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(Text with EEA relevance)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Atomic Energy Community, and in particular Article 7 thereof,

Having regard to the proposal from the Commission⁷,

Having regard to the opinion of the European Parliament⁸,

Having regard to the opinion of the European Economic and Social Committee⁹,

Whereas:

- (1) In accordance with Article 7 of the Treaty, Council Decision No xxx/Euratom concerning the 7th framework programme of the European Atomic Energy Community for research and training activities, (2007-2011) (hereinafter referred to as ‘the Framework Programme’) is to be implemented through specific programmes that define detailed rules for their implementation, fix their duration and provide for the means deemed necessary.
- (2) The Joint Research Centre, hereinafter referred to as ‘the JRC’ should implement the research and training activities carried out by means of the so-called Direct Actions under a JRC Specific Programme implementing the Euratom Framework Programme.
- (3) In implementing its mission, the JRC should provide customer driven scientific and technical support to the EU policy making process, ensuring support to the implementation and monitoring of existing policies and responding to new policy demands. In order to achieve its mission the JRC carries out high quality research.

⁷ OJ C , , p. .

⁸ OJ C , , p. .

⁹ OJ C , , p. .

- (4) In implementing this programme, emphasis should be given to promoting the mobility and training of researchers, and innovation, in the Community. In particular, the JRC should undertake appropriate training activities in nuclear safety and security.
- (5) The present specific programme should be implemented in a flexible, efficient and transparent manner, taking into account the relevant need of JRC's user and Community polices, as well as respecting the objective of protecting the Community's financial interests. The research activities carried out under the programme should be adapted where appropriate to these needs and to scientific and technological developments and aim to achieve scientific excellence.
- (6) The rules for participation of undertakings, research centres and universities and for the dissemination of research results, for the EC Framework Programme (hereinafter referred as 'the rules for participation and dissemination') relating to direct actions should also apply to the R&D activities carried out under this Specific Programme.
- (7) For the purpose of implementing this programme, in addition to cooperation covered by the Agreement on the European Economic Area or by an Association Agreement, it may be appropriate to engage in international cooperation activities, in particular on the basis of Articles 2h, 101 and 102 of the Treaty, with third countries and international organisations.
- (8) In the context of enlargement and integration activities, the JRC aims at promoting the integration of New Member States' organisations and researchers in its activities in particular on the implementation of the S&T components of the EU acquis, as well as an increased cooperation with those from Accession and Candidate Countries. A progressive opening is also envisaged towards the Neighbouring Countries, specifically on priority topics of the European Neighbourhood Policy.
- (9) Research activities carried out within this specific programme should respect fundamental ethical principles, including those which are reflected in the Charter of Fundamental Rights of the European Union.
- (10) The JRC should continue to generate additional resources through competitive activities; these include participation to the indirect actions of the Framework Programme, third party work and to a lesser extent the exploitation of intellectual property.
- (11) Sound financial management of the Framework Programme and its implementation should be ensured in the most effective and user-friendly manner possible, as well as ease of access for all participants, in compliance with Council Regulation (EC, Euratom) No 1605/2002 of 25 June 2002 on the Financial Regulation applicable to the general budget of the European Communities, Commission Regulation (EC, Euratom) No 2342/2002 of 23 December 2002 laying down detailed rules for implementation of the Financial Regulation and any future amendments.
- (12) Appropriate measures should also be taken to prevent irregularities and fraud and the necessary steps should be taken to recover funds lost, wrongly paid or incorrectly used in accordance with Council Regulation (EC, Euratom) No 1605/2002 of 25 June 2002 on the Financial Regulation applicable to the general budget of the European Communities, Commission Regulation (EC, Euratom) No 2342/2002 of 23 December

2002 laying down detailed rules for implementation of the Financial Regulation and any future amendments, Council Regulations (EC, Euratom) No 2988/95 of 18 December 1995 on the protection of the European Communities financial interests¹⁰, (Euratom, EC) No 2185/96 of 11 November 1996 concerning on-the-spot checks and inspections carried out by the Commission in order to protect the European Communities' financial interests against fraud and other irregularities¹¹ and Regulation (EC) No 1074/1999 of the European Parliament and of the Council concerning investigations conducted by the European Anti-Fraud Office (OLAF)¹².

- (13) The Commission should in due course arrange for an independent assessment to be conducted concerning the activities carried out in the fields covered by this programme.
- (14) The Scientific and Technical Committee and the Board of Governors of the JRC have been consulted on the scientific and technological content of this specific programme,

HAS ADOPTED THIS DECISION:

Article 1

The specific programme related to the direct actions in research and training activities to be carried out by the Joint Research Centre, hereinafter the “specific programme” is hereby adopted for the period from 1 January 2007 to 31 December 2011.

Article 2

The Specific Programme shall establish the activities for the nuclear actions of the Joint Research Centre, supporting the whole range of research actions carried out in trans-national cooperation in the following thematic areas:

- (a) nuclear waste management, environmental impact and basic knowledge,
- (b) nuclear safety,
- (c) nuclear security.

The objectives and the broad lines of those activities are set out in Annex.

Article 3

In accordance with Article 3 of the Framework Programme, the amount deemed necessary for the execution of the Specific Programme shall be EUR 539 million.

¹⁰ OJ L 312, 23.12.1995, p. 1.

¹¹ OJ L 292, 15.11.1996, p. 2.

¹² OJ L 136, 31.5.1999, p. 1.

Article 4

- (1) All research activities carried out under the Specific Programme shall be carried out in compliance with fundamental ethical principles.
- (2) The following fields of research shall not be financed under this programme:
 - research activities that are prohibited in all the Member States,
 - research activities to be carried out in a Member State where such research is prohibited.

Article 5

- (1) The Specific Programme shall be implemented by means of direct actions as established in Annex II to the Framework Programme.
- (2) The rules for participation and dissemination relating to direct actions shall apply to this Specific Programme.

Article 6

- (1) The Commission shall draw up a multi-annual Work Programme for the implementation of the Specific Programme, setting out in greater detail the objectives and scientific and technological priorities set out in the Annex, and the timetable for implementation.
- (2) The multi-annual Work Programme shall take account of relevant research activities carried out by the Member States, Associated States and European and international organisations. It shall be updated where appropriate.

Article 7

The Commission shall arrange for the independent assessment provided for in Article 6 of the Framework Programme to be conducted concerning the activities carried out in the fields covered by the Specific Programme.

Article 8

This Decision is addressed to the Member States.

Done at Brussels,

For the Council
The President

ANNEX - JRC Euratom Programme

1. OBJECTIVE

To provide customer driven scientific and technical support to the EU policy related to nuclear energy, ensuring support to the implementation and monitoring of existing policies while flexibly responding to new policy demands.

2. APPROACH

The mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of Community policies. The JRC mission also underlines the need for the JRC to undertake high quality research activities in close contact with industry and other bodies and to develop networks with public and private institutions in the Member States. In all of the activities of the JRC both dimensions are present, but their respective importance varies from direct support to Commission Services to basic research undertaken in a wide European or international perspective.

The nuclear activities of the JRC aim at satisfying the R&D obligations of the Euratom Treaty and supporting both Commission and Member States in the field of safeguards and non-proliferation, waste management, safety of nuclear installation and fuel cycle, radioactivity in the environment and radiation protection.

The objective of this Specific Programme is to develop and assemble knowledge, to provide crucial scientific/technical data and support for safety/security and reliability, sustainability and control of nuclear energy, including aspects related to innovative/future systems. The participation in the indirect actions of the Framework Programme will strive to maximise complementarity with the institutional work programme, as outlined in section 3 below.

One of today's major concerns in the nuclear field is the loss of knowledge, expertise and especially technology and engineering for handling radioactive material and radiation fields. The JRC will continue to act as a European reference for the dissemination of information, training and education for young scientists.

3. ACTIVITIES

3.1. Nuclear waste management, environmental impact and basic knowledge

3.1.1. Spent fuel characterisation, storage and disposal

The management of spent fuel and nuclear high level waste involves transport conditioning, storage and geological disposal. Major objective is to prevent the release of radionuclides to the biosphere over a very long time scale. The design, assessment and functioning of the engineered and natural barrier system over the relevant time scales are key components for the achievement of these objectives and depend inter alia on the fuel behaviour.

The JRC aims at obtaining data for the long-term behaviour of spent fuel and developing methods for the reliable assessment of the engineered systems with the

emphasis on the integrity of the waste packages and the benchmarking of risk-oriented decision criteria.

Laboratory experiments on fuel behaviour under representative conditions will provide relevant input to the models for long-term predictions and allow their validation. JRC will also participate in the various European efforts for safe waste disposal solutions and actively support transfer of knowledge between different countries.

3.1.2. Partitioning, Transmutation and Conditioning

The major challenges of this programme remain both the optimisation of fuel partitioning to separate selected long-lived radionuclides as well as the fabrication and characterisation of safe and reliable fuels or targets for actinide transmutation.

The study of these alternative waste management strategies continues to gain high attention, because they would considerably reduce the long-term hazard of the waste disposal. For the transmutation, both fast and thermal reactors are considered along with dedicated actinide burning facilities. Most proposed concepts for future reactor systems incorporate such selective radionuclide separation.

Strong reduction of the long-lived radionuclide amount and substantial volume reductions in waste facilities will entail that development of inert matrices for HLW conditioning will represent in the long term a key improvement in nuclear waste management.

The JRC will operate new facilities for advanced partitioning and for the production of fuels and targets (the Minor Actinide Laboratory) in this area. It will also conduct irradiation tests on targets and fuels, as well as to produce basic nuclear data for transmutation. Finally, the chemical durability of the matrices for conditioning of actinides will be determined from corrosion and leaching studies.

3.1.3. Basic actinide research

The basic research activities aim at providing basic knowledge to underpin the understanding of physical processes in nuclear fuel (from production of energy to waste management) and are closely linked to training and education activities. The basic research actions will focus on thermo-physical properties of materials, surface properties of actinide bearing systems and fundamental physical and chemical properties.

The JRC facilities like the Actinide User Laboratory will continue to host scientists, in particular from European universities.

3.1.4. Nuclear data

The proposed designs for dedicated minor actinide burners and advanced concepts for nuclear energy production result in new demands for nuclear data with significantly improved accuracy.

JRC will perform measurements of nuclear data for nuclear waste management. New technological developments have led to significant improvements in the

measurement capabilities. JRC also fosters an important effort in the development of basic nuclear theory for the modelling of reactions not accessible experimentally.

Radionuclide metrology complements this work with measurements for improved nuclear decay data of fissile materials and fission products. Accurate experimental data are also needed to validate theories and models on which radiation protection regulations are based.

3.1.5. Medical applications from nuclear research

A number of medical applications have resulted from JRC's nuclear facilities and expertise. These emerge from research on new isotope production, development of clinical reference materials and support to new cancer therapies. The JRC aims to make these new applications available for implementation by hospitals and pharmaceutical industry.

3.1.6. Measurement of Radioactivity in the environment

JRC is applying its expertise in trace analysis to verification of radioactive discharges and emissions from nuclear installations. Work also includes studies on speciation, migration patterns in the biosphere and radio-toxicology of actinides. In view of the new limits for radionuclides in food ingredients, JRC will develop analytical techniques and produce corresponding reference materials. Inter-laboratory comparisons will be organised with the monitoring laboratories of the Member States to assess the comparability of the reported monitoring data and to support the harmonisation of the radioactivity measurement systems.

3.1.7. Knowledge Management, Training and Education

It is important for the new generations of nuclear scientists and engineers, to maintain and deepen the knowledge of nuclear research through the experiments, results, interpretations and skills acquired in the past. This applies especially to domains where three decades experience in analysis of reactor performance and safety was concentrated in complex analytical tools such as models and computer codes. The JRC will contribute in making this knowledge readily available, properly organised and well documented and in supporting higher education activities in Europe. Furthermore, the JRC will contribute to the development of better communication on nuclear issues, in particular in relations with public acceptability and more globally of strategies for overall energy awareness.

3.2. Nuclear safety

3.2.1. Nuclear reactor safety

To maintain and improve the safety level of both Western and Russian type of nuclear power plants advanced and refined safety assessment methodologies and corresponding analytical tools have to be extended and validated. Targeted experimental investigations will be carried out to enable the validation and verification of the safety assessment tools and to improve the understanding of the underlying physical phenomena and processes. The JRC is fully involved in the international efforts for an advanced nuclear reactor safety.

3.2.2. *Nuclear fuel safety in power reactors operating in the EU*

Fuel safety concentrates on prevention and mitigation of the consequences of hypothetical accidents. The two main aspects in this research concern: mechanical integrity of the fuel assemblies during reactor lifetime, and fuel response to transient conditions and to severe reactor accident conditions up to core melt down.

In this context the JRC is involved in the current fuel development strategy aimed at improving safety and reducing civil and military stockpiles of plutonium. The JRC will make use of the HFR to test fuel behaviour and properties. Measurements of performance-affecting properties will also be carried out.

3.2.3. *Safe Operation of Advanced Nuclear Energy Systems*

New reactor strategies are considered worldwide as an open research topic, with e.g. the Generation IV Roadmap scenario, inspired by a comprehensive assessment including public concerns, such as improved safety, reduced wastes and improved resistance to proliferation.

It is essential for the JRC to be part, directly and in co-ordinating European contributions in this world-wide initiative in which the principal research organisations are involved. This includes primarily safety and safeguard aspects of innovative nuclear fuel cycles, in particular characterisation, test and analysis of new fuels. The development of safety and quality goals, safety requirements and advanced evaluation methodology for reactors will be addressed. This information will be systematically disseminated to interested Member States authorities and Commission services, in particular through regular co-ordination meetings.

3.3. **Nuclear security**

3.3.1. *Nuclear Safeguards*

The JRC activities in this area consist of technical support to Commission services under the Euratom Treaty and to IAEA (International Atomic Energy Agency) under the Non-Proliferation Treaty. The goal will be to implement increased automation and better tools for information analysis to reduce both inspector workload and burden on the nuclear industry.

Although the JRC has over 30 years experience in supporting the Euratom and Non-Proliferation Treaties, technical innovations and improvements are continue to be required to implement the evolving safeguards policy. While evolving to cope with these objectives, the JRC activity will continue to include verification and detection as well as containment and surveillance technologies, measurement methods of nuclear material, production of nuclear reference materials, and provision of training, in particular for IAEA and Commission inspectors.

3.3.2. *Additional Protocol*

The Additional Protocol aims to assure the absence of undeclared nuclear operations. Its implementation requires a number of techniques different from those involved in verifying nuclear material accountancy. It requires an overall description of a country's nuclear activities, provision for more extensive site declarations and more

varied inspection requirements. These can include off-site monitoring and monitoring activities outside the facility boundaries and environment particle analysis as a tool to detect undeclared nuclear activities.

The JRC objectives are to move towards real-time follow-up of nuclear material transfers and integrated information analysis. JRC will particularly work on the development and validation of information analysis tools and on a methodology based on systems analysis.

3.3.3. *Open source Information collection on Nuclear Non Proliferation*

With the aim to support Commission services and to collaborate with IAEA and Member States authorities, the JRC will continue to systematically collect and analyse information from a variety of sources (internet, specialised literature, data bases) on nuclear non-proliferation issues (possibly extending into other WMD - Weapons of Mass Destruction - and delivery systems). This information will be used to produce country reports where the evolution of nuclear activities and of import and/or export of nuclear direct and dual use equipment and technology in selected countries will be closely followed. The information from these open sources will be corroborated with satellite imagery. To underpin this work, JRC will further develop multilingual web search, knowledge management and data mining technologies.

3.3.4. *Combating illicit trafficking of nuclear materials, including nuclear forensic analysis*

The detection and the identification of illegally transported or stored nuclear material constitute a major line of defence against the illicit trafficking. Nuclear forensic science provides clues on the origin of the seized material. Establishing appropriate response plans for handling cases of detection remains an important issue. In the field of nuclear forensics and illicit trafficking JRC will increase its collaboration with national authorities and international organisations (ITWG, IAEA, etc.)

Ethical aspects

During the implementation of this specific programme and in the research activities arising from it, fundamental ethical principles are to be respected. These include, *inter alia*, the principles reflected in the Charter of Fundamental Rights of the EU, including the following: protection of human dignity and human life, protection of personal data and privacy, as well as animals and the environment in accordance with Community law and the latest versions of relevant international conventions and codes of conduct, e.g. the Helsinki Declaration, the Convention of the Council of Europe on Human Rights and Biomedicine signed in Oviedo on 4 April 1997 and its Additional Protocols, the UN Convention on the Rights of the Child, the Universal Declaration on the human genome and human rights adopted by UNESCO, UN Biological and Toxin Weapons Convention (BTWC), International Treaty on Plant Genetic Resources for Food and Agriculture, and the relevant World Health Organisation (WHO) resolutions.

Account will also be taken of the Opinions of the European Group of Advisers on the Ethical Implications of Biotechnology (1991-1997) and the Opinions of the European Group on Ethics in Science and New Technologies (as from 1998).

In compliance with the principle of subsidiarity and the diversity of approaches existing in Europe, participants in research projects must conform to current legislation, regulations and ethical rules in the countries where the research will be carried out. In any case, national provisions apply and no research forbidden in any given Member State or other country will be supported by Community funding to be carried out in that Member State or country.

Where appropriate, those carrying out research projects must seek the approval of the relevant national or local ethics committees prior to the start of the RTD activities. An ethical review will also be implemented systematically by the Commission for proposals dealing with ethically sensitive issues or where ethical aspects have not been adequately addressed. In specific cases an ethical review may take place during the implementation of a project.

The Protocol on protection and welfare of animals annexed to the Treaty requires that the Community pays full regard to the welfare requirements of animals in formulating and implementing Community policies including research. Council Directive 86/609/EEC on the protection of animals used for experimental and other scientific purposes requires that all experiments be designed to avoid distress and unnecessary pain and suffering to the experimental animals; use the minimum number of animals; involve animals with the lowest degree of neurophysiological sensitivity; and cause the least pain, suffering, distress or lasting harm. Altering the genetic heritage of animals and cloning of animals may be considered only if the aims are ethically justified and the conditions are such that the animals' welfare is guaranteed and the principles of biodiversity are respected.

During the implementation of this programme, scientific advances and national and international provisions will be regularly monitored by the Commission so as to take account of any developments.

LEGISLATIVE FINANCIAL STATEMENT

1. NAME OF THE PROPOSAL : SPECIFIC PROGRAMME TO BE CARRIED OUT BY MEANS OF DIRECT ACTIONS BY THE JOINT RESEARCH CENTRE IMPLEMENTING THE 7TH FRAMEWORK PROGRAMME UNDER THE EUROPEAN ATOMIC ENERGY COMMUNITY (EURATOM) FOR NUCLEAR RESEARCH AND TRAINING ACTIVITIES (2007 TO 2011).

2. ABM/ ABB FRAMEWORK

Policy Area(s) concerned and associated Activity/Activities:

Direct Research

3. BUDGET LINES

3.1. Budget lines (operational lines and related technical and administrative assistance lines (ex- B..A lines)) including headings :

10 01 05 Support expenditure for operations of Direct research policy area10 03 Directly financed research operating appropriations

(final budgetary nomenclature for FP7 will be established in due course).

3.2. Duration of the action and of the financial impact:

2007-2011 subject to the approval of new financial perspectives framework

3.3. Budgetary characteristics (*add rows if necessary*) :

Budget line	Type of expenditure		New	EFTA contribution	Contributions from applicant countries	Heading in financial perspective
10 01 05	Non-comp	Non-diff	YES	NO	YES	No [1a]
10 03	Non-comp	diff ¹³	YES	NO	YES	No [1a]

¹³ Non-differentiated appropriations hereafter referred to as NDA.

4. SUMMARY OF RESOURCES

4.1. Financial Resources

4.1.1. Summary of commitment appropriations (CA) and payment appropriations (PA) ¹⁴

EUR million (to 3 decimal places)

Expenditure type	Section no.		2007	2008	2009	2010	2011	Total
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Operational expenditure¹⁵

Commitment Appropriations (CA)	8.1	a	280,916	358,377	477,708	493,220	527,103	2.137,324
Payment Appropriations (PA)		b	112,366	227,626	354,780	440,367	1.002,185 ¹⁶	2.137,324

Administrative expenditure within reference amount¹⁷

Technical & administrative assistance (NDA)	8.2.4	c	177,503	190,795	197,945	203,300	184,645	954,188
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TOTAL REFERENCE AMOUNT

Commitment Appropriations		a+c	458,419	549,172	675,653	696,520	711,748	3.091,512
Payment Appropriations		b+c	289,869	418,421	552,725	643,667	1.186,830 ¹⁸	3.091,512

Administrative expenditure not included in reference amount¹⁹

Human resources and associated expenditure (NDA)	8.2.5 d		4,986	5,085	5,187	5,291	5,397	25,946
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¹⁴ These figures refer to the expenditure for the entire Euratom Framework Programme - see COM(2005) 119.

¹⁵ Expenditure that does not fall under Chapter xx 01 of the Title xx concerned.

¹⁶ Payment appropriations refers to 2011 and following years

¹⁷ Expenditure within article xx 01 05 of Title xx.

¹⁸ Payment appropriations refers to 2011 and following years

¹⁹ Expenditure within chapter xx 01 other than articles xx 01 05.

Administrative costs, other than human resources and associated costs, not included in reference amount (NDA)	8.2.6 e							
		0,148	0,151	0,154	0,157	0,160	0,770	

Total indicative financial cost of intervention

TOTAL CA including cost of Human Resources	a+c +d +e	463,553	554,408	680,994	701,968	717,305	3.118,228
TOTAL PA including cost of Human Resources	b+c +d +e	295,003	423,657	558,066	649,115	1.192,387 ²⁰	3.118,228

²⁰ Payment appropriations refers to 2011 and following years

Co-financing details

If the proposal involves co-financing by Member States, or other bodies (please specify which), an estimate of the level of this co-financing should be indicated in the table below (additional lines may be added if different bodies are foreseen for the provision of the co-financing):

EUR million (to 3 decimal places)

Co-financing body		Year n	n + 1	n + 2	n + 3	n + 4	n + 5 and later	Total
.....	f							
TOTAL CA including co-financing	a+c +d+ e+f							

4.1.2. Compatibility with Financial Programming

- Proposal is compatible with existing financial programming. (Commission's February 2004 Communication on the financial perspectives 2007-2013 COM (2004) 101).
- Proposal will entail reprogramming of the relevant heading in the financial perspective.
- Proposal may require application of the provisions of the Interinstitutional Agreement²¹ (i.e. flexibility instrument or revision of the financial perspective).

4.1.3. Financial impact on Revenue

- Proposal has no financial implications on revenue
- Proposal has financial impact – the effect on revenue is as follows:

Certain associated states may contribute to a supplementary funding of the framework programme through association agreements.

²¹ See points 19 and 24 of the Interinstitutional agreement.

EUR million (to one decimal place)

Budget line	Revenue	Prior to action [Year n-1]	Situation following action					
			[Year n]	[n+1]	[n+2]	[n+3]	[n+4]	[n+5]
	a) Revenue in absolute terms							
	b) Change in revenue	Δ						

(Please specify each revenue budget line involved, adding the appropriate number of rows to the table if there is an effect on more than one budget line.)

4.2. Human Resources (officials) – see detail under point 8.2.1.

Annual requirements	2007	2008	2009	2010	2011
Total number of human resources ²²	1.944	1.944	1.944	1.944	1.944

This figure does not include the short term staff but covers the officials authorised on the JRC staff table.

5. CHARACTERISTICS AND OBJECTIVES

5.1. Need to be met in the short or long term

The nuclear activities of the JRC aim at satisfying the R&D obligations of the Euratom Treaty and to provide customer driven scientific and technical support to the EU policy related to nuclear energy, ensuring support to the implementation and monitoring of existing policies while flexibly responding to new policy demands.

²² Figures indicated in the table refer only to the staff financed by the establishment plan for all direct actions under the responsibility of DG JRC. Therefore these figures do not comprise the posts of the establishment plan from the operating budget and the posts from the establishment plan for indirect actions - see documents COM(2005) 440, 441, 442, 443, 444.

5.2. Value-added of Community involvement and coherence of the proposal with other financial instruments and possible synergy

The nuclear activities of the JRC aim at satisfying the R&D obligations of the Euratom Treaty and supporting both Commission and Member States in the field of safeguards and non-proliferation, waste management, safety of nuclear installation and fuel cycle, radioactivity in the environment and radiation protection.

5.3. Objectives, expected results and related indicators of the proposal in the context of the ABM framework

The focus of the work will be on the following activities, as indicated in the Annex.

1. Nuclear waste management, environmental impact and basic knowledge

2. Nuclear safety

3. Nuclear security

5.4. Method of Implementation (indicative)

Show below the method(s) chosen for the implementation of the action.

Centralised Management

Directly by the Commission

Indirectly by delegation to:

Executive Agencies

Bodies set up by the Communities as referred to in art. 185 of the Financial Regulation

National public-sector bodies/bodies with public-service mission

Shared or decentralised management

With Member states

With Third countries

Joint management with international organisations (please specify)

Relevant comments:

6. MONITORING AND EVALUATION

6.1. General

The JRC supports the annual and multi-annual (i.e. Research Framework Programme) cycles of planning, execution, monitoring and evaluation through an established set of key performance indicators and specific evaluation activities.

The JRC provides scientific and technological support to (mainly Commission) users through a Work Programme with roughly one hundred actions. The methodologies, indicators and criteria are applied across the entire set of actions and across internal JRC budget lines. As a consequence, an evaluation exercise typically covers a large number if not all budget lines of the JRC's Work Programme.

6.2. Monitoring system

On an annual basis following the Commission decision²³ on the reorganisation of the Joint Research Centre and in line with obligations stemming from the Specific Programmes (nuclear and non-nuclear parts), the JRC Board of Governors implements the annual monitoring of the implementation of the JRC Work Programme with its observations on the JRC annual report. An appropriate link with the Annual Monitoring of Indirect Actions is ensured.

6.3. Evaluation

The JRC assesses the output and impact of its actions on an annual basis, using an ex-post methodology applied in a peer review process. The results of this assessment feed directly into the planning for the work programme of the following year. The indicators and criteria used in this periodic action review relate directly to the actions' outputs and the JRC's corporate Key Performance Indicators.

So far the JRC has carried out user satisfaction surveys on a bi-annual basis. The intention under the new Framework Programme is to phase-in a continuous user feedback collection system that will be linked to the annual reviews of actions.

In line with the Commission's rules and good practices concerning its evaluation activities, there will be a mid-term review 3 1/2 years after the start of the Research Framework Programme of seven years duration. This evaluation will be carried out by high-level external experts and it will draw upon the structured information collected in the annual review of the actions as well as on other sources, such as the user satisfaction surveys.

Finally, an ex-post evaluation will be carried out at the end of the seven year Framework Programme.

²³ OJ L 107, 30.4.1996, p. 12 - 96/282/Euratom.

6.3.1. *Ex-ante evaluation*

While the JRC's work programme is updated annually, the research process develops over a longer time scale. Hence, the annual review of actions provides also a strong ex-ante evaluation component.

6.3.2. *Measures taken following an intermediate/ex-post evaluation (lessons learned from similar experiences in the past)*

Past evaluations have shown specificities of JRC operations, which make it necessary to translate the basic internal Commission rules of evaluation (i.e. the assessment of results, effectiveness, efficiency, side-effects, sustainability etc.) into the specific JRC context. These specificities are that:

- (3) The JRC implements its Work Programme with roughly one hundred actions, which in turn support Commission policies
- (4) There are no standard cost-benefit models that could be applied to the operation and the evaluation of the JRC's activities.
- (5) The impact area of the JRC's work is at the level of European policy makers, not European society at large.

It is also not enough for the JRC to measure its output as a scientific organisation, which is a challenge in itself. Combining the aspects of the scientific organisation and the character of a Commission services, the real challenge for the JRC is to measure the impact of its activities, first on the policy makers and then on the policies they devise.

Following the basic lessons emerging in the last Framework Programme, the JRC is designing its activities more and more in such a way that they can be made subject to a meaningful evaluation. Furthermore, to assess the overall output of the JRC it is necessary to integrate the evaluation results of all individual actions. As a consequence, JRC evaluations are now complemented by a set of support activities providing structured information to support

- the annual planning, execution and evaluation cycle and related decision making, and
 - the multi-annual mid-term and ex-post evaluations.
- As a consequence the JRC developed and implemented Periodic Action Reviews (PAR) analysing the output of its individual actions in 2003 and 2004. PAR has multiple objectives:
 - It evaluates JRC Actions according to a well defined methodology;
 - It supports work programme planning for the coming year;
 - It leads to a comprehensive data base supporting various reporting obligations;
 - It builds a semi-quantitative data base for the benefit of future JRC evaluations;

- It allows deriving corporate level indicators from various lower levels including the Action level.

The PAR review mechanism runs on an annual basis and will be further developed in the current Specific Programme.

6.3.3. *Terms and frequency of future evaluation*

The periodic action review and the monitoring of the implementation of the Framework Programme will be carried out annually. The User Satisfaction Survey is presently carried out bi-annually. In the future a more continuous process might be phased in. The mid-term evaluation will be implemented 3 ½ years after the start of the Framework Programme 7. The ex-post evaluation at the end of FP7.

7. ANTI-FRAUD MEASURES

Appropriate measures should also be taken to prevent irregularities and fraud and the necessary steps shall be taken to recover funds lost, wrongly paid or incorrectly used in accordance with Council Regulation (EC, EURATOM) No 1605/2002 of 25 June 2002 on the Financial Regulation applicable to the general budget of the European Communities, Commission Regulation (EC, EURATOM) No 2342/2002 of 23 December 2002 laying down detailed rules for implementation of the Financial Regulation and any future amendments, Council Regulations (EC, Euratom) No 2988/95 of 18 December 1995 on the protection of the European Communities financial interests²⁴, (EC, Euratom) No 2185/96 of 11 November 1996 concerning on-the-spot checks and inspections carried out by the Commission in order to protect the European Communities' financial interests against fraud and other irregularities²⁵ and Regulation (EC) No 1073/1999 of the European Parliament and of the Council concerning investigations conducted by the European Anti-Fraud Office (OLAF)²⁶.

²⁴ OJ L 312, 23.12.1995, p. 1.

²⁵ OJ L 292, 15.11.1996, p. 2.

²⁶ OJ L 136, 31.5.1999, p. 1.

8. DETAILS OF RESOURCES

8.1. Objectives of the proposal in terms of their financial cost

Commitment appropriations in EUR million (to 3 decimal places)

(Headings of Objectives, actions and outputs should be provided)	Year 2007	Year 2008	Year 2009	Year 2010	Year 2011	Total
	Total cost	Total cost	Total cost	Total cost	Total cost	Total cost
NUCLEAR WASTE MANAGEMENT, ENVIRONMENTAL IMPACT & BASIC KNOWLEDGE						
NUCLEAR SAFETY						
NUCLEAR SECURITY						
TOTAL COST	101,533	104,581	107,750	110,948	114,265	539,077

8.2. Administrative Expenditure

8.2.1. Number and type of human resources

Types of post		Staff to be assigned to management of the action using existing and/or additional resources (number of posts/FTEs)
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		2007	2008	2009	2010	2011
Officials or temporary staff ²⁷ (XX 01 01)	A*/AD					
	B*, C*/AST					
Staff financed ²⁸ by art. XX 01 02						
Other statutory staff ²⁹ financed by art. XX 01 04/05		1.944	1.944	1.944	1.944	1.944
TOTAL³⁰		1.944	1.944	1.944	1.944	1.944

This presentation reflects the JRC situation where the Staff is primarily “JRC” and - with the exception of staff directly attached to research project – managed as a single group for the nuclear and non nuclear activities. Administrative, technical and support staff may work for both programme the same day on the same site.

The ratio of nuclear to total staff may vary during the period of execution framework programme but respect a ratio of the order of 30 %.

The above staff figures covers statutory staff.

8.2.2. Description of tasks deriving from the action

Tasks derive from the non-nuclear direct research specific programme

²⁷ Cost of which is NOT covered by the reference amount.

²⁸ Cost of which is NOT covered by the reference amount.

²⁹ Cost of which is included within the reference amount.

³⁰ Figures indicated in the table refer only to the staff financed by the establishment plan for all direct actions under the responsibility of DG JRC. Therefore these figures do not comprise the posts of the establishment plan from the operating budget and the posts from the establishment plan for indirect actions - see documents COM(2005) 440, 441, 442, 443, 444.

8.2.3. Sources of human resources (statutory)

(When more than one source is stated, please indicate the number of posts originating from each of the sources)

- Posts currently allocated to the management of the programme to be replaced or extended
- Posts pre-allocated within the APS/PDB exercise for year n
- Posts to be requested in the next APS/PDB procedure
- Posts to be redeployed using existing resources within the managing service (internal redeployment)
- Posts required for year n although not foreseen in the APS/PDB exercise of the year in question

8.2.4 Other Administrative expenditure included in reference amount (XX 01 05 – Expenditure on administrative management)³¹

EUR million (to 3 decimal places)

Budget line (number and heading)	Year 2007	Year 2008	Year 2009	Year 2010	Year 2011	TOTAL
Statutory staff						
xx.01 05 01	132,100	137,665	142,206	145,659	141,128	698,758
External staff						
xx.01 05 02	23,520	30,809	32,971	34,418	19,830	141,548
Other administrative expenses						
xx.01 05 03	21,883	22,321	22,768	23,223	23,687	113,882
Total Technical and administrative assistance	177,503	190,795	197,945	203,300	184,645	954,188

³¹ These figures refer to the expenditure for the entire EURATOM Framework Programme - see COM(2005) 119.

8.2.5 Financial cost of human resources and associated costs not included in the reference amount³²

EUR million (to 3 decimal places)

Type of human resources	Year 2007	Year 2008	Year 2009	Year 2010	Year 2011	TOTAL
Officials and temporary staff (08 0101 and)	4,986	5,085	5,187	5,291	5,397	25,946
Staff financed by Art XX 01 02 (auxiliary, END, contract staff, etc.)						
Total cost of Human Resources and associated costs (NOT in reference amount)	4,986	5,085	5,187	5,291	5,397	25,946

Calculation– *Administrative expenditures*

Have been calculated taking into account the following hypothesis:

- the number of official staff on the ex part A of the budget remains at 2006 level
- expenditures increased by the 2% each year according to the inflation foreseen such as indicated in Fiche 1 REV (working document of commission services related to the financial perspectives),
- the assumption of 108 000 € for each official staff, and 70.000 € for the external staff(2004 prices)

Calculation– *Staff financed under art. XX 01 02*

Reference should be made to Point 8.2.1, if applicable

8.2.6 Other administrative expenditure not included in reference amount³³

EUR million (to 3 decimal places)

³² These figures refer to the expenditure for the entire EURATOM Framework Programme - see COM(2005) 119.

³³ These figures refer to the expenditure for the entire EURATOM Framework Programme - see COM(2005) 119.

	Year 2007	Year 2008	Year 2009	Year 2010	Year 2011	TOTAL
XX 01 02 11 01 – Missions	0,036	0,036	0,037	0,038	0,038	0,185
XX 01 02 11 02 – Meetings & Conferences	0,001	0,001	0,001	0,001	0,001	0,005
XX 01 02 11 03 – Committees ³⁴	0,111	0,114	0,116	0,118	0,121	0,580
XX 01 02 11 04 – Studies & consultations						
XX 01 02 11 05 - Information systems						
2 Total Other Management Expenditure (XX 01 02 11)						
3 Other expenditure of an administrative nature (specify including reference to budget line)						
Total Administrative expenditure, other than human resources and associated costs (NOT included in reference amount)	0,148	0,151	0,154	0,157	0,160	0,770

Calculation - *Other administrative expenditure not included in reference amount*

These figures are estimated on the basis of the 2006 DG RTD requests increased of the 2% for the yearly foreseen inflation. (Fiche 1 REV)

The needs for human and administrative resources shall be covered within the allocation granted to the managing DG in the framework of the annual allocation procedure. The allocation of posts should take into account an eventual reallocation of posts between departments on the basis of the new financial perspectives.

³⁴ CST Euratom.