**Corrigendum to Council Decision 2006/977/Euratom of 19 December 2006 concerning the specific programme to be carried out by means of direct actions by the Joint Research Centre implementing the Seventh Framework Programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities (2007 to 2011)**

*(Official Journal of the European Union L 400 of 30 December 2006)*

Decision 2006/977/Euratom should read as follows:

# COUNCIL DECISION

## of 19 December 2006

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

(2006/977/Euratom)

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 Commission,

Having regard to the opinion of the European Parliament [1],

Having regard to the opinion of the European Economic and Social Committee [2],

Having consulted the Scientific and Technical Committee and the Board of Governors of the Joint Research Centre,

Whereas:

(1) In accordance with Article 7 of the Treaty, Council Decision No 1982/2006/Euratom of 18 December 2006 concerning the Seventh Framework Programme of the European Atomic Energy Community for research and training activities (2007 to 2011) [3] (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 policymaking 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 should carry out research of the highest comparable European quality, including by maintaining its own level of scientific excellence.

(4) In implementing this specific 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) This 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 point h of Article 2, 101 and 102 of the Treaty, with third countries and international organisations.

[1] Opinion delivered on 30 November 2006 (not yet published in the Official Journal).

[2] OJ C 185, 8.8.2006, p. 10.

[3] OJ L 400, 30.12.2006, p. 60. Decision as corrected on p. 21 of this Official Journal.

(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, while ensuring legal certainty and the accessibility of the programme for all participants, 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 [1] and Commission Regulation (EC, Euratom) 2342/2002 [2]laying down detailed rules for the implementation of that Financial Regulation and any future amendments.

(12) Appropriate measures — proportionate to the European Communities' financial interests — should be taken to monitor both the effectiveness of the financial support granted and the effectiveness of the utilisation of these funds in order to prevent irregularities and fraud and the necessary steps should be taken to recover funds lost, wrongly paid or incorrectly used in accordance with Regulation (EC, Euratom) No 1605/2002, Commission Regulation (EC, Euratom) No 2342/2002, Council Regulations (EC, Euratom) No 2988/95 of 18 December 1995 on the protection of the European Communities' financial interests [3], (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 irregularities [4] and Regulation (EC) No 1073/1999 of the European Parliament and of the Council of 25 May 1999 concerning investigations conducted by the European Anti-Fraud Office (OLAF) [5].

(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,

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;

(b) nuclear safety;

(c) nuclear security.

The objectives and broad lines of those activities are set out in the 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 517 million.

*Article 4*

All research activities carried out under the specific programme shall be carried out in compliance with fundamental ethical principles.

*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 multiannual 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.

[1] OJ L 248, 16.9.2002, p. 1.
[2] OJ L 357, 31.12.2002, p. 1. Regulation as last amended by Regulation (EC, Euratom) No 1248/2006 (OJ L 227, 13.8.2006, p. 3).
[3] OJ L 312, 23.12.1995, p. 1.
[4] OJ L 292, 15.11.1996, p. 2.
[5] OJ L 136, 31.5.1999, p. 1.

2. The multiannual 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 shall enter into force on the third day following its publication in the *Official Journal of the European Union*.

*Article 9*

This Decision is addressed to the Member States.

Done at Brussels, 19 December 2006.

*For the Council*

*The President*

J. KORKEAOJA

*ANNEX*

**JRC EURATOM PROGRAMME**

1. **Objective**

To provide customer-driven scientific and technical support for the Community policy related to nuclear energy, ensuring support for 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, aiming at keeping European research at the forefront. 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 the assessment of 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.

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 and to provide access to its infrastructures for other researchers, thus sustaining nuclear know-how in Europe.

Another objective will be further development of collaboration through networking at European and world level. The possibility of the JRC taking part in networks of excellence and integrated projects will be particularly important in this connection.

In addition, the JRC will facilitate a fact-based debate and informed decision-making on the appropriate energy mix to meet the European energy needs (including renewable sources of energy and nuclear power).

3. **Activities**

3.1. *Nuclear waste management, environmental impact*

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 (High level waste) 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. With a view to preventing the possible loss of knowledge and the lack of new scientists and engineers in the area of nuclear technology, the JRC will aim at retaining

the necessary knowledge, ensuring that this knowledge is readily available, properly organised and well documented. In addition, it will encourage the development of new scientists and engineers in the field of nuclear energy including by attracting young scientists and engineers in this field. It will also support 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 play its full role, directly and in coordinating European contributions in this world-wide initiative in which the principal research organisations are involved. This includes exclusively areas that can improve 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 systems will be addressed. This information will be systematically disseminated to interested Member States authorities and Commission services, in particular through regular coordination meetings.

3.3. *Nuclear security*

3.3.1. Nuclear safeguards

The dimension of non-proliferation is growing in importance and it is vital for the security of EU citizens that the necessary capacities continue to be available. 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 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 Bio-medicine 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 to 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.