Research RTD, 7th Euratom Framework Programme 2007-2011: specific programme through direct actions by the Joint Research Centre JRC

2005/0189(CNS) - 21/09/2005 - Legislative proposal

PURPOSE: The establishment of a specific programme setting up direct actions in the field of nuclear research and training activities for the Joint Research Centre (JRC) within the context of the Euratom Treaty

PROPOSED ACT : Council Decision

CONTENT: The European Commission is presenting two “specific programmes” in follow up to the adoption in April 2005 of its proposal for the 7th Framework Programme of the European Atomic Community (Euratom) for nuclear research and training activities. The Euratom framework programme is to last from 2007 to 2011. The first specific programme of the Euratom Treaty, being discussed here, concerns “direct” research activities of the Joint Research Centre relating to nuclear energy. The second, which is the subject of a separate Commission proposal (2005/0190), concerns “indirect” actions on fusion energy research, nuclear fission and radiation protection.

Background:

The specific programmes of the 7th Euratom Framework Programme have been designed to address the major challenges facing European nuclear research. Financial support at a European level offers European nuclear researchers the kind of opportunities that can not be achieved at a national level. The specific programmes represent a further consolidation of the European Research Area by achieving a critical mass of knowledge in new areas of research. In addition, European funded RT&D supports the free movement of ideas, knowledge and researchers. An emphasis on flexibility will allow researchers to respond to emerging industrial as well as social needs. Flexibility aside, the Commission also promises to streamline management methods by significantly cutting red tape as well as simplifying the funding and reporting requirements.

Specific programme – Direct Actions of the Joint Research Centre concerning nuclear energy:

The stated objective of the JRC specific programme in the field of nuclear energy is to provide scientific and technical support to the European Union for the preparation and enactment of its energy policies. The work of the JRC will help to secure the effective implementation of the Communities energy policies by guaranteeing the EU institutions a scientific back-up for its energy strategy as well as offering an extensive monitoring system of existing policies. The JRC is committed to undertaking 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. Other JRC activities include offering advice and support to both the Commission and the Member States on nuclear safeguards, nuclear non-proliferation, and waste management, the safety of nuclear installations and fuel cycle analysis, environmental radioactivity and radiation protection issues. Bearing these factors in mind, the Commission proposes dividing the special programme into three activities; the first focuses on nuclear waste management, environmental impact and basic knowledge; the second, deals with nuclear safety and the third, nuclear security.

Concerning the first activity, nuclear waste management, environmental impact and basic knowledge, the following topics will be given priority research:

- *Spent fuel characterisation, storage and disposal*. The JRC will, *inter alia*, seek to obtain data pertinent to the long-term behaviour of spent fuel as well as developing methods for the reliable assessment of the engineered systems. Emphasis will be given to the integrity of the waste packages and benchmarking risk-orientated criterias for decision making.

- *Partitioning, Transmutation and Conditioning*: The major challenge here is optimising fuel partitioning and to separate selected long-lived radio nuclides. The study of this alternative waste management is given high consideration given that it could considerably reduce the long-term hazardous nature of nuclear waste disposal. The JRC will operate new facilities for advanced partitioning and for the production of fuels and targets in this area.

- *Basic actinide research*: The basic research activity related to this research will focus on trying to understand the physical processes of nuclear fuel. Focus will be given to thermo-physical properties of materials, surface properties of actinide bearing systems and fundamental physical and chemical properties. The JRC will continue to host scientists from across European universities in its facilities such as the Actinide User Laboratory.

- *Nuclear Data*: The JRC will perform measurements of nuclear data for waste management purposes

- *Medical applications from nuclear research*: A number of medical applications are the result of work carried out at the JRC's nuclear facilities. The JRC will seek to apply these new applications in hospitals as well as extending its scope to the pharmaceutical industry.

- *Measurement of radioactivity in the environment*: Currently, the JRC is conducting on-going research into tracing radioactive discharges and emissions from nuclear installations. Work includes studies on speciation, migration patterns in the biosphere and the radio-toxicology of actinides. The JRC proposes to continue this work to developing analytical techniques and producing scientific studies on 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 radioactive measurement system.

- *Knowledge management, training and education*: Under this heading the JRC will seek to maintain and deepen the understanding of nuclear research based on past research and experiments. The JRC will continue to contribute towards disseminating nuclear knowledge by offering well documented archives and by offering support to European universities. The JRC will, in addition, seek to offer enhanced communication to the wider public on energy related issues.

Under the second heading, Nuclear Safety, the JRC will be expected to focus on the following subjects:

- *Nuclear reactor safety*: Under this heading the JRC will be expected to maintain as well as improve upon the safety levels of both Western and Russian type nuclear power plants. In order to validate and assess safety the JRC will carry out targeted experimental investigations. The JRC will remain fully involved in international efforts for an advanced nuclear reactor safety.

- *Nuclear fuel safety in power reactors operating in the EU*: There are two key topics, which concern researchers under this heading, namely, the mechanical integrity of fuel assemblies during a reactor's life-time and the fuel response to transient conditions and a severe reactor accident including a core melt-down. The JRC is therefore, focusing on fuel development strategy with an emphasis on safety ad reducing civil and military plutonium stockpiles. The JRC will make the best use of the HFR to test fuel behaviour and properties. Measurement of performance-affecting properties will also be carried out.

- *Safe Operation of Advanced Nuclear Energy Systems*: The JCR will continue its essential, collaborative work with the Generation IV Roadmap, which is a global initiative to improve safety, reduce waste and halt proliferation.

Under the third heading, Nuclear Security, the following policies will be prioritised:

- *Nuclear Safeguards*: Within the context of the Non-proliferation Treaty, the JRC will continue to offer technical support to both the European Commission as well as the IAEA. The main objective of this sub-heading will be to increase automation and discover more efficient tools relating to information analysis. They will also be a growing effort to reduce inspector workload.

- *Additional Protocol*: The purpose of the Additional Protocol is to guarantee the absence of undeclared nuclear operations. The techniques used to implement its provisions are different to those needed for verifying nuclear material accountancy. These can include, for example, off-site monitoring and monitoring activities outside the facility boundaries as well as environment particle analysis as a tool to detect undeclared nuclear activity. Under this sub-heading, therefore, the JRC will attempt to move towards real-time follow-up of nuclear material transfers.

- *Open source Information collection on Nuclear non-Proliferation*: The JRC will systematically collect and analyse information from a variety of sources, such as the internet, specialised literature and data bases. Country Reports will be prepared on the basis of the information gathered.

- *Combating illicit trafficking of nuclear materials, including nuclear forensic analysis*: The detection and identification of illegally transported or stored nuclear material acts as a major line of defence in the fight against illicit trafficking. Nuclear forensic science provides clues as to the origin of seized material. Establishing appropriate response plans for handling cases of detection remains a relevant issue. Hence, the JRC's continuing collaboration with national and international organisations in finding a lasting response to this issue.

Lastly, both at the implementation level and the research level, the JRC is committed to respecting fundamental ethical principles based, *inter alia*, on those reflected in the Charter of Fundamental EU Rights.

For further information concerning the financial implications of this measure, please refer to the financial statement.