

EN

EN

EN



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 12.1.2009
COM(2008)903 final

**COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE
EUROPEAN PARLIAMENT**

**Decommissioning of Nuclear Installations and Management of Radioactive Waste:
Management of Nuclear Liabilities arising out of the Activities of the Joint Research
Centre (JRC) carried out under the Euratom Treaty**

**COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE
EUROPEAN PARLIAMENT**

**Decommissioning of Nuclear Installations and Management of Radioactive Waste:
Management of Nuclear Liabilities arising out of the Activities of the Joint Research
Centre (JRC) carried out under the Euratom Treaty**

TABLE OF CONTENTS

| | | |
|--------|---|----|
| 1. | Executive Summary | 4 |
| 2. | Purpose of the Communication..... | 5 |
| 3. | Context | 5 |
| 4. | Achievements of the Decommissioning Programme (2004 – 2008) | 5 |
| 4.1. | Ispra (IT) | 6 |
| 4.2. | Karlsruhe (DE)..... | 7 |
| 4.3. | Geel (BE) | 7 |
| 4.4. | Petten (NL)..... | 7 |
| 5. | Overall Evaluation of the Programme (2008)..... | 8 |
| 5.1. | Status of the Programme at Ispra | 8 |
| 5.1.1. | External Review | 8 |
| 5.1.2. | Risk Management | 8 |
| 5.1.3. | Impact on the Budget | 11 |
| 5.2. | Status of the Programme at Karlsruhe, Geel and Petten | 12 |
| 5.2.1. | Karlsruhe (DE)..... | 12 |
| 5.2.2. | Geel (BE) | 13 |
| 5.2.3. | Petten (NL)..... | 13 |
| 6. | Programme Status and Budget as of April 2008 (Summary)..... | 13 |
| 7. | Financial Impact..... | 14 |
| 8. | Opinion of the Group of Independent Experts..... | 14 |
| 9. | Opinion of the JRC's Board of Governors | 15 |
| 10. | Conclusions | 15 |
| | ANNEX 1: Costs and Schedule of the Programme..... | 17 |

1. EXECUTIVE SUMMARY

The purpose of this Communication is to provide an update on the development of the programme for the decommissioning of obsolete nuclear installations and nuclear waste management (D&WM programme) managed by the Joint Research Centre (JRC) of the European Commission, covering the period 2004 – 2008. The activities of the programme are most significant on the JRC-Ispra site in Italy, host to most of the shutdown nuclear installations of the JRC, whilst decommissioning activities are, for the time being, relatively limited at the sites at Geel (Belgium), Karlsruhe (Germany) and Petten (The Netherlands), all of them still operating their nuclear installations.

In the last four years, the programme has gained momentum and achieved solid progress in a number of key programme activities. At Ispra, in the absence of radioactive waste treatment and storage facilities in Italy, JRC-Ispra has focussed on designing and building waste characterisation, treatment and conditioning installations at its site (pre-decommissioning). The total waste at Ispra (12 000 m³), once conditioned, will have to be stored on-site for as long as there are no interim or final deposits in Italy; to this effect, JRC is designing an on-site interim storage facility. Much of the nuclear material has been shipped off-site or is in the process of being transferred to third parties. Meanwhile, pre-decommissioning activities continued at the three other sites, aimed at obsolete facilities and equipment resulting from past research work, and the removal off-site of fuels and nuclear materials.

Both internal and external evaluations conducted in 2008 endorsed the local strategies adopted for the execution of the D&WM programme and recognised the progress that has been made at the sites. However, there are some severe constraints and uncertainties associated with the execution of the programme in Ispra, notably:

- Absence of definitive Italian standards governing the storage of waste ("waste acceptance criteria") that leads the JRC to postpone the conditioning of some waste.
- Uncertainty concerning the cost of final disposal of waste in a future Italian storage site. This represents a potential significant financial risk for the Community for which the JRC is preparing contingency plans.
- Low limiting Italian value for public exposure that impose additional constraints on the management and interim storage of waste with subsequent cost implications.
- Existence of 'Italian liabilities' at the Ispra site, resulting from former Italian nuclear operations at the Ispra site, which increases the workload of the JRC and entails a financial risk for the Community.

In addition to these constraints, the limited number of local nuclear-qualified contractors as well as the Commission's internal procurement and staffing procedures, which sometimes prove to be restrictive given the technically complex nature of the programme, have contributed to the delay of certain projects in Ispra.

The combined effects of external and internal factors, such as procurement procedures, have slowed some key activities of the Ispra programme, and added to the predicted cost (+6%) and timescale of the programme (+8 years for delivery to a national final storage centre). To deal with the increased uncertainty JRC has adopted a risk mitigation strategy. The actions foreseen include enhanced contacts with the Italian stakeholders, more reliance on turnkey contracts and streamlining of procurement channels. In terms of contingency planning, if the uncertainty concerning the waste acceptance criteria persists, JRC will have to refocus the Ispra programme on safe conservation, and postpone the conditioning of waste until a final disposal option is secured.

JRC has discussed extensively its decommissioning strategy involving industry experts and the Group of Independent Experts advising JRC on the programme, all of which have contributed to and endorsed the strategic choices made.

2. PURPOSE OF THE COMMUNICATION

The purpose of this Communication is to update the information supplied to the European Parliament and the Council on the development of the programme for the decommissioning of obsolete nuclear installations and nuclear waste management (D&WM programme¹) managed by the Joint Research Centre (JRC) of the European Commission. It follows on from the communications issued in 1999 COM(1999)114 and in 2004 SEC(2004)621.

3. CONTEXT

Established by Article 8 of the Euratom Treaty and originally entirely dedicated to nuclear energy, the JRC subsequently diversified its activities to meet the needs of the other Directorates-General of the Commission and other Institutions. Nuclear activities currently make up 30% of the activities of the JRC. On the basis of the Treaty the JRC has to manage its nuclear liabilities and decommission its installations once they have been definitively shut down. To this end, a budget heading has been created in agreement with the European Parliament and the Council.

The D&WM Programme relates to all JRC nuclear installations, even if many of them continue to be in operation, in particular in Geel, Karlsruhe and Petten. The shutdown nuclear installations are predominantly in Ispra. In practical terms the Commission has undertaken to decommission obsolete installations up to the total and unconditional release of the installations; i.e. without any radiological restrictions. This will allow the installations to be used for non-nuclear purposes.

4. ACHIEVEMENTS OF THE DECOMMISSIONING PROGRAMME (2004 – 2008)

As explained above, the Geel, Karlsruhe and Petten sites carry out R&D activities in the nuclear field, whereas at Ispra, with the exception of the Cyclotron and the laboratories used to support the JRC Safeguards programme, all the installations (reactors and hot laboratories) have been definitively shut down for a number of years. The Decommissioning Programme is

¹ D&WM: Decommissioning and Waste Management

therefore more advanced at Ispra and hence this Section has more detail on Ispra than on the other sites.

4.1. Ispra (IT)

The situation in Italy is different from that in the other JRC host countries in that there is no service provider for the treatment of radioactive waste in Italy, nor a national repository either for interim or final storage of the waste. For this reason JRC-Ispra must build several waste treatment and conditioning installations at its Ispra site. In accordance with Italian law, this waste must be capable of being put in interim storage for a period which is still to be determined, but which may be as long as 50 years.

The definition of the Ispra Programme has taken this particular requirement into account and the JRC has adopted its strategy accordingly.

The Ispra Programme has five main objectives, to be carried out in the following order:

- keeping obsolete installations safe in accordance with the safety standards in force, operations which are known as 'safe conservation'²;
- constructing or refurbishment of waste characterisation, treatment, conditioning and interim storage installations;
- conditioning nuclear materials with a view to their storage on-site or their transfer to third parties;
- recovering, treating and reconditioning existing waste;
- decommissioning obsolete installations and managing resulting waste.

The main focus of the Programme since 2004 has been to create waste characterisation and treatment installations. At the end of 2007, the following installations were completed:

- the Liquid Waste Treatment plant;
- the plant for decontaminating solid waste by abrasive blasting;
- the solid waste physical and radiological characterisation installation allowing the contents and the radiological composition of the waste drums to be monitored;
- the monitoring installation for waste which is very slightly radioactive or non-radioactive, which can be recycled using traditional industrial distribution channels;

In addition, the following operations have been carried out or are in the process of being completed:

- 20 tonnes of unirradiated fuel have been sent to the United States and France;

² This means to maintain shut-down installations in a safe and secure condition, to respond to the ageing of installations or changes in national and international safety rules; it precedes the decommissioning of the installations.

- 1 500 radioactive sources which were withdrawn from service are in the process of being transferred to a third party;
- alkaline metals are in the process of being removed;
- modification and refurbishment of hot cells is under way to enable the irradiated nuclear materials which are still present at the site to be conditioned.
- physical and radiological characterisation of the six main obsolete installations (reactors and hot laboratories) is under way.
- other operations have been carried out for maintenance purposes or to meet new regulatory requirements.

Some pre-decommissioning activities have been carried out, including the demolition of the cooling tower of the Ispra-1 reactor, the pipeline taking liquid waste to the former treatment plant, demolition of several secondary buildings, the removal of equipment and the preparation of more than 1200 tonnes of metals and other materials for evacuation.

Finally, the waste treatment and interim storage area has been restructured and refurbished to accommodate the new installations. An interim storage building for up to 12 000 m³ of conditioned waste, corresponding to the total estimated waste at Ispra, is in the process of being designed.

4.2. Karlsruhe (DE)

Unlike Ispra, JRC-Karlsruhe is able to remove most of its radioactive waste to an interim storage managed by the research centre Forschungszentrum Karlsruhe GmbH, which is responsible for collecting, treating and conditioning of radioactive waste in the region with a view to its final disposal at a future national centre.

Since 2004, JRC-Karlsruhe has succeeded in the removal of waste accumulated from past research work and decommissions equipment which has become obsolete, such as glove boxes used to handle hazardous materials. On average, twenty glove boxes have been decommissioned every year.

4.3. Geel (BE)

In 2004, JRC-Geel finished the initial phase of its decommissioning programme, which consisted of the clean-up of the radiochemistry laboratory. Since 2004 the site has also removed some unirradiated nuclear materials ahead of schedule.

4.4. Petten (NL)

In addition to carrying out research and development activities in non-nuclear energy fields, the Institute of Energy (IE) owns the High Flux Reactor (HFR) which is used for research on the safety of reactors: handling of fuel and components, safety of future reactors (Generation IV). Since 2004 the JRC has transferred the operating licence of the HFR to the company NRG (NL) which already operated the reactor under a JRC licence. This has enabled responsibilities vis-à-vis the national safety authorities to be clarified, as from now on the operator and the licence holder are a single body. Nevertheless, the JRC will continue to own

the HFR, whilst its operating costs, including a contribution towards its final decommissioning, are paid for by its end users.

Since 2004 the JRC-Petten has sent back to the United States a batch of 420 fuel elements which constituted inherited liabilities. Furthermore, in 2007 the ownership of a batch of highly-irradiated historical materials was transferred to NRG. There were no other financial operations under the programme budget and no other action is planned prior to the final shutdown of the reactor which will not be before 2016.

5. OVERALL EVALUATION OF THE PROGRAMME (2008)

In early 2008, the JRC undertook to evaluate the decommissioning programme at its sites to verify progress in the implementation of the D&WM programme between 2004 and 2008. The result of the evaluation was to allow the JRC to re-adjust the programme strategy and associated cost and schedule.

5.1. Status of the Programme at Ispra

5.1.1. External Review

In addition to its internal review, JRC asked an industrial company specialising in the management of nuclear projects and decommissioning, to carry out a review of the Ispra programme. This review was carried out in the first half of 2008 with the aim to identify those elements of the current D&WM programme that control the overall risks to the programme in terms of cost and timescale.

The review has provided an overall endorsement for the choice of decommissioning strategy and technical approach to the D&WM programme at Ispra. The chosen strategy is deemed consistent with current best practice in decommissioning that favours an early approach to decommissioning consistent with the availability waste storage or disposal facilities, safety requirements, and budgetary constraints.

However, the external review confirms the findings of the internal review concerning a number of constraints and difficulties which imply significant risks and cost/timescale uncertainties for the programme and recommends that actions are taken to mitigate these risks. These risks and uncertainties and a strategy for their mitigation are described below.

5.1.2. Risk Management

In 2003 the D&WM programme of the JRC-Ispra was drawn up on the basis that a national storage centre for radioactive waste would open in 2012. As a result of doubts about the centre chosen in 2003, an Italian site is now expected to be opened in 2020 at the earliest, for final storage of category 2 waste (short-lived and low to medium activity), while a facility for only interim (not final) storage of category 3 waste (long-lived and high activity) might become available on the same site.

The JRC-Ispra programme is therefore being developed within a national context which is made difficult in particular in view of the absence of definitive standards governing the storage of waste, and also unduly strict national regulations. The programme is further constrained by local market conditions and Commission internal rules.

The constraints on the development of the programme, and the action taken by the JRC to mitigate them, can be summarised as follows:

A: Absence of definitive standards governing the storage of waste (or waste 'acceptance criteria' or WAC). This is mainly linked to the fact that a national repository for the disposal of radioactive waste has not yet been decided upon. Until these criteria are definitive, the risk for the JRC that the waste must be reconditioned later persists. The subsequent financial risk would be very high.

- *JRC action: To mitigate this risk, the JRC has intensified its contacts with the Italian authorities in view to obtaining their commitment regarding the waste that could be conditioned at Ispra accordingly to the provisional acceptance criteria for category 2 waste³. An initial positive reaction has been received from the Italian Ministry. The Commission continues its contacts at political level in order to arrive at a formal agreement on final storage and WACs. In the interim, the JRC modified the project of the waste interim storage building at Ispra, to receive only category 2 waste since no WAC exist for the category 3 waste. In addition, the JRC contemplates to condition only category 2 waste that need to be retrieved for reasons of safety (e.g. bituminised drums) and wait until the issuing of final WAC or a formal commitment from the Italian administration for conditioning other category 2 waste and, essentially, category 3 waste. This re-orientation of the strategy heavily impacted on the programme since the design of the interim store has been reviewed to accommodate only category 2 waste and its opening is now foreseen in 2012 instead of 2009. A further consequence of the afore-mentioned constraints regards the containerisation of waste for interim storage, which is hampered by the unavailability of waste containers compliant with new Italian regulations; this is causing the JRC to design its own (qualified) containers.*

B: Absence of thresholds for the release of waste. In Italy the principle of releasing very slightly radioactive materials is allowed. This principle allows materials which do not pose any radiological risk for the population to be recycled. The release thresholds are granted on a case-by-case basis and for each radionuclide (in any case the maximum value is fixed at 1 Bq/g and the actual value can range from 1 to the order of 0.1 Bq/g). The Ispra site received this authorisation in July 2008 limited to the waste and material already produced during the facilities operation. Therefore it is now possible to release this type of waste.

- *JRC action: The JRC shall require a similar authorisation once applications for the decommissioning licence of each facility will be forwarded to the competent authorities.*

C: Low limiting value for public exposure. In Italy the dose constraint for exposure of the public to ionising radiation from nuclear activities including decommissioning, treatment and interim storage of waste is the lowest of all the European countries (10 µSv/year, i.e. between 15 and 100 times lower than the corresponding constraints set in other European countries), unless a special derogation is granted by the administrative authorities. It is also low

³ Category 2 waste (medium-low radioactive waste, short period of life) represent 95% of the radioactive waste at Ispra.

compared to the proposals found in the 2007 ICRP recommendations⁴. This low dose constraint places a serious restriction on the planned decommissioning operations.

- *JRC action: The JRC reinforced the interim waste storage building at the site to lower the outside radiation exposure; this has added costs, albeit moderate, to the programme. In the future, the present dose constraint could cause problems for other decommissioning operations and lead to further costs.*

D: Existence of 'Italian liabilities' at the Ispra site. Some of the installations and historical waste at Ispra belong in whole or in part to Italian bodies.⁵ These installations and waste constitute the 'Italian liabilities', which are estimated at several tens of millions of € The JRC has drawn up its own list of what constitutes the liabilities, but the list and its related costs have not yet been accepted by the Italian parties involved. The absence of an agreement between the parties concerned is affecting the implementation of the programme and adding uncertainty concerning the financial burden borne by the Community budget.

- *JRC action: The JRC provided all available documentation to the Italian stakeholders, in order to arrive at a settlement with the related projects. The Commission continues its contacts at political level in order to arrive at a formal agreement on Italian liabilities.*

E: Uncertainties governing the programme, including the cost of final disposal of waste.

With the absence of a final disposal centre, the fees for final disposal is unknown and so are the parameters used to compute this cost⁶. This uncertainty influences the choice of waste treatment and conditioning procedures⁷, and hence affects the schedule and cost of the programme.

- *JRC action: JRC is putting in place contingency planning to cater for the event that the uncertainty concerning the waste acceptance criteria persists, in which case the JRC will have to refocus the Ispra programme on safe conservation, and postponing the conditioning of waste until a final disposal option is secured. In addition, in order to contain the programme's uncertainties, JRC will improve the modelling of the risks and the impacts on the programme and devote more effort to the forward planning of future phases of the programme.*

F: Limited number of local nuclear-qualified industrial firms to provide for site works: this affects the results of calls for tenders, which tend to receive few, expensive bids; this makes it often necessary to republish the calls with revised requirements or amendments to the procurement procedure.

- *JRC action: JRC is adapting its purchase channels in order to shorten deadlines and arouse more interest on the part of companies responding to calls for tenders.*

⁴ ICRP Publication 103, Volume 37, Nos. 2-4 2007, p.116-117 (Public Exposure-prolonged exposure):“The dose constraint should be less than 1mSv and a value of no more than about 0.3mSv would be appropriate”

⁵ ENEA and ENEL

⁶ The question of the fee for final disposal is still open: should the fee be based on the volume of the waste or the space occupied inside the repository could impact on the JRC waste management strategy

⁷ For example, depending upon the fee for final storage, incineration of the waste could be foreseen instead of compaction and grouting

Overall, however, JRC-Ispra is moving away from small/medium-size service contracts towards turnkey solutions.

G: Commission's internal procurement procedures, which sometimes prove to be too restrictive given the technically complex nature of the programme, e.g. by allowing too little room for effective negotiation of the offers.

- *JRC action: the JRC intends to make the best possible use of the Commission procurement rules and staffing rules in order to cope with large and risky industrial operations and in particular to negotiate with contractors based on a wide range of technical options for providing turnkey solutions against functional requirements. Moreover, JRC-Ispra is reinforcing its decommissioning team with additional industrial management capability.*

5.1.3. Impact on the Budget

The total budget for the Ispra programme was reviewed in 2007 with a view to better mitigate the risks and uncertainties associated with the further execution of the programme (cf 5.1.2) whilst responding to changes, adopted or planned, affecting the programming and cost of the decommissioning projects.

As a result, the total revised budget for the Ispra programme amounts to €76Mio₂₀₀₃, i.e. +€7.4Mio₂₀₀₃ or +5.9% in comparison with the forecast for 2004. The programming of financial commitments was revised accordingly.

The main factors driving the cost variations are as follows:

- The cost of implementing the waste management installations should decrease by €6Mio₂₀₀₃ (-11%), with the effect of an increase in the cost of installations for the treatment of fluids and solid waste being more than offset by a decrease in the cost of the waste interim storage building, which now only accommodates class 2 waste, as well as the execution of services on-site instead of constructing fixed installations (super-compaction, cementation). The cost of these services is reported under waste management hereafter.
- The estimated cost for recovering and managing historical waste present at the site has been re-evaluated as a result of market response to call for tenders and requirements for the acceptance of waste packages at the future national centre. The increase is €31Mio₂₀₀₃ (+75%).
- The management of the waste treatment installations and the provision of the aforementioned services (super-compaction, cementation) will be entrusted to external providers. The cost amounts to €6Mio₂₀₀₃.
- The cost of management (removal and interim storage) of nuclear materials has proved to be considerably higher than expected. The estimated cost has been re-evaluated at €24Mio₂₀₀₃ (+109%), of which €6Mio₂₀₀₃ relate to the price already paid for transferring the ownership of unirradiated nuclear materials to third parties.
- The extension of the programme (+ 8 years) following the delay in opening a storage centre in Italy, and the difficulties linked to purchases will prolong the costs of

maintaining and monitoring the installations until 2028. The estimated additional cost of this item is €28Mio₂₀₀₃ (+35%).

- Dismantling nuclear installations (reactors and hot laboratories) has also been re-evaluated at €10Mio₂₀₀₃ (+10%) to take into account the increase in waste packages linked to the regulatory requirements governing the resistance of the containers to corrosion for 50 years.
- The cost of final disposal of waste packages at the future storage centre in Italy is reduced by €27Mio₂₀₀₃ (-15%) due to the reduction in uncertainties concerning the volume of conditioned waste. However, it should be remembered that the storage costs in question have not been confirmed formally. They nevertheless are among the highest costs currently incurred in the Member States.
- Other cost adjustments are the result of including the costs of additional services for the installations (performed by outside companies), and deducting an Italian contribution on account of the 'Italian liabilities' at the site. The combination of these two items translates into a reduction of €6Mio₂₀₀₃; this being a very conservative estimate.
- For staff, the estimated cost is reduced by €32Mio₂₀₀₃ (-30%). This is the result of the intention to sub-contract more work to outside companies, which has led to some of the cost increases previously described.

5.2. Status of the Programme at Karlsruhe, Geel and Petten

5.2.1. Karlsruhe (DE)

JRC-Karlsruhe faces similar constraints as Ispra, insofar as there is no final national storage centre in place yet in Germany. Two projects are under way, one in the previous ore-mine “Schacht KONRAD” for the storage of low-activity waste, and the other in Gorleben for the storage of all waste, including high-activity waste.

The main ongoing change involves the removal of small quantities of irradiated nuclear materials which are non-homogeneous and take various forms. These residues come from various experiments which are normally carried out either in collaboration with other research centres, or on behalf of nuclear operators. JRC-Karlsruhe has tried to negotiate the treatment of part of these plutonium bearing materials in a third party laboratory, but the costs proved to be prohibitive. Only the storage option is currently being considered, but it involves characterising the materials and conditioning them, which also depends on the acceptance criteria for the German storage centres. For these reasons the operations which are awaiting specifications and availability of installations have been postponed. The programme contains a reasonable budgetary provision for solving this problem. This may, however, prove to be inadequate if the requirements for accepting these materials for final disposal are raised.

In 2007 the German Government specified its intentions concerning the KONRAD storage centre which is due to open in 2013. Also since the last communication, the law governing financial contributions from users of German storage centres has been changed as a consequence of a judgment by a Federal court. The advance payments on the contribution from the research centres have been increased considerably, including on a retroactive basis.

For JRC-Karlsruhe, the contribution increased by €1Mio₂₀₀₃ over the period 1977 to 2012. The future opening of KONRAD has led to new standards being drawn up for the acceptance of waste which has already been conditioned.

Additional measures must be taken and monitored by the National Inspection Agency. The additional cost to be borne by the JRC amounts to 7.2 Mio₂₀₀₃.

In addition, JRC-Karlsruhe has to build a new laboratory to fulfil licensing requirements. The future liability associated with this new laboratory is estimated at €10Mio₂₀₀₃

The budget has been revised as a result and now amounts to €427.2Mio₂₀₀₃ (compared with €389Mio₂₀₀₃ for the last communication), that is an increase of 9.7% or €38.2Mio₂₀₀₃. As a result the planning for financial commitments has been reviewed (see Annex 1).

5.2.2. Geel (BE)

Costs and planning will be as provided for in the 2004 forecasts (see Annex 1), i.e. €42.0 Mio₂₀₀₃.

5.2.3. Petten (NL)

Since 1996, the use of the HFR has been accompanied by the establishment of provisions for its decommissioning. These provisions are funded by the Supplementary Programme financed by The Netherlands and France for the scientific use of the reactor. At the end of 2007 they have amounted to €8.2Mio. In view of the uncertainty associated with the future of the HFR, the JRC chose in 2004 not to take these provisions into account for the time being. The total budget for decommissioning at Petten does therefore not change and amounts to €69Mio₂₀₀₃.

6. PROGRAMME STATUS AND BUDGET AS OF APRIL 2008 (SUMMARY)

The table below summarises the progress made in the programme implementation, comparing the 2003 forecast with the actual progress (April 2008), i.e. comparing what was expected to be spent on the programme in 2003 versus the actual spending:

| Mio€2003 | | Budget Total | Forecast 2003 | Actual | % of Total |
|----------------------|-----------------|---------------|---------------|--------------|--------------|
| Geel | SEC 2004 | 41,9 | 6,8 | | 16,1% |
| | COM 2008 | 41,9 | | 6,9 | 16,6% |
| Ispra | SEC 2004 | 638,6 | 165,6 | | 25,9% |
| | COM 2008 | 676,0 | | 119,5 | 17,7% |
| Karlsruhe | SEC 2004 | 389,0 | 30,1 | | 7,7% |
| | COM 2008 | 427,2 | | 43,2 | 10,1% |
| Petten | SEC 2004 | 68,8 | 11,1 | | 16,1% |
| | COM 2008 | 69,1 | | 17,1 | 24,7% |
| Contengencies | SEC 2004 | 6,9 | 0,6 | | 8,4% |
| | COM 2008 | 7,5 | | 0,8 | 11,1% |
| Total | SEC 2004 | 1145,3 | 214,2 | | 18,7% |
| | COM 2008 | 1221,7 | | 187,5 | 15,3% |

The following table summarises the changes between the 2004 values and 2008 values in the D&WM Programme costs (all figures in Mio€₂₀₀₃).

| Mio€2003 | | Specific Credits | Staff Cost | Total | % of Total |
|----------------------|----------|------------------|------------|--------|------------|
| Geel | SEC 2004 | 39,8 | 2,1 | 41,9 | 3,7% |
| | COM 2008 | 39,8 | 2,1 | 41,9 | 3,4% |
| Ispra | SEC 2004 | 531,3 | 107,3 | 638,6 | 55,8% |
| | COM 2008 | 601,1 | 74,9 | 676,0 | 55,3% |
| Karlsruhe | SEC 2004 | 340,0 | 49 | 389,0 | 34,0% |
| | COM 2008 | 378,2 | 49 | 427,2 | 35,0% |
| Petten | SEC 2004 | 67,0 | 1,8 | 68,8 | 6,0% |
| | COM 2008 | 67,0 | 2,1 | 69,1 | 5,7% |
| Contengencies | SEC 2004 | 0,0 | 6,9 | 6,9 | 0,6% |
| | COM 2008 | 0,3 | 7,2 | 7,5 | 0,6% |
| Total | SEC 2004 | 978,2 | 167,2 | 1145,3 | 100% |
| | COM 2008 | 1086,4 | 135,3 | 1221,7 | 100% |

The total cost of the programme is now €1222 Mio€₂₀₀₃ and has increased since 2004 by 6.7% or €76.3Mio€₂₀₀₃.

7. FINANCIAL IMPACT

There is no additional financial impact foreseen for the period 2008-2013:

In Mio€current

| 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|------|-------|------|-------|-------|-------|
| 28,7 | 32,66 | 26,9 | 26,27 | 32,72 | 30,90 |

The next Communication to the EP and the Council, foreseen for 2011, will define the amounts to be planned for the new Multiannual Financial Framework.

8. OPINION OF THE GROUP OF INDEPENDENT EXPERTS

A Group of Independent Experts in the field of decommissioning and waste treatment was proposed at the start of the programme by the JRC and approved by its Board of Governors to advise it on the management of its D&WM programme. It is made up of European experts originating from different Member States and meets twice a year. Its advice relates to the decommissioning and waste treatment strategy, the available technology, the organisation and management of calls for tender; the management of internal resources, training, and any other aspect relating to the above programme.

The Group has been consulted in particular on the strategic aspects of the programme at Ispra, including, for example, the options for the interim store. JRC has obtained essential advice, and ultimately, full endorsement of the strategy adopted.

The Group has also been consulted on the text of this communication on which it gave a favourable opinion, along with the following comments:

- The question of the Waste Acceptance Criteria for which Italy should give reassurance that waste conditioned today with existing norms will not need to be reconditioned later or at least that the cost arising from such possible reconditioning will not have to be borne by the Ispra D&WM programme.
- The dose constraint for exposure of the public to ionising radiation from nuclear activities including decommissioning, treatment and interim storage of waste which is the lowest of all the European countries (10 µSv/year, i.e. between 15 and 100 times lower than the corresponding constraints set in other European countries, and also low compared to the proposals found in the 2007 ICRP recommendations⁸). The influence of such low limits on the cost of some installations to be set up in Ispra is to be duly taken into account.

9. OPINION OF THE JRC'S BOARD OF GOVERNORS

- The Board of Governors agrees to the submission of the **proposed Communication** to Council and European Parliament on the progress of the Decommissioning and Waste Management Programme and commends the JRC on progress made to date on the original programme.
- The Board of Governors endorses the **revised plan**, including the revised budget and timing, commends the JRC on its efforts to contain the costs of the original programme, and encourages the JRC to continue negotiations with national authorities.
- In view of the underpinning constraints/uncertainties, the Board suggests that an update on progress be made to Council and Parliament within 2 years of the date of the Communication.

10. CONCLUSIONS

Significant progress has been made since the last Communication in 2004. The removal of nuclear materials, the bringing into operation of several waste treatment and characterisation installations and the launch of characterisation for large installations to be decommissioned, are some of the key advances made under the Programme.

The combined effects of external and internal factors, such as procurement procedures, have slowed some key activities of the Ispra programme, and added to the predicted cost (+6%) and timescale of the programme (+8 years for delivery to a national final storage centre).

A number of uncertainties remain, in particular with regard to the situation in Ispra.

⁸ ICRP Publication 103, Vol. 37, N° 2-4-2007, p.116-117 (Public Exposure-prolonged exposure): *"The dose constraint should be less than 1mSv and a value of no more than about 03mSv would be appropriate"*

JRC has engaged in extensive risk management in order to contain these uncertainties. Of paramount importance is the resolution of the waste acceptance criteria which otherwise will block the path towards final disposal. In the event that the uncertainty around the waste acceptance criteria persists, JRC may have to refocus the Ispra part of the decommissioning programme on safe conservation, and postpone the conditioning of waste until a final disposal option is secured.

ANNEX 1: Costs and Schedule of the Programme

All figures in Mio€₂₀₀₃

| Year | Geel | | | | Ispra | | | | Karlsruhe | | | | Petten | | | | Brussels | | | | TOTAL | | | |
|---------|-------------|--------|-------|-------|-------------|---------|---------|--------|-------------|---------|--------|--------|-------------|-------|-------|-------|-------------|-------|--------------------|-------|-------------|-----------|---------|---------|
| | Commitments | | Staff | | Commitments | | Staff | | Commitments | | Staff | | Commitments | | Staff | | Commitments | | Staff & unforeseen | | Commitments | | Staff | |
| | SEC | COM | SEC | COM | SEC | COM | SEC | COM | SEC | COM | SEC | COM | SEC | COM | SEC | COM | SEC | COM | SEC | COM | SEC | COM | SEC | COM |
| | 2004 | 2008 | 2004 | 2008 | 2004 | 2008 | 2004 | 2008 | 2004 | 2008 | 2004 | 2008 | 2004 | 2008 | 2004 | 2008 | 2004 | 2008 | 2004 | 2008 | 2004 | 2008 | 2004 | 2008 |
| Total | 39,832 | 39,832 | 2,104 | 2,104 | 531,336 | 601,133 | 107,311 | 74,887 | 340,001 | 378,201 | 49 | 49,002 | 67 | 67 | 1,819 | 2,071 | | 0,275 | 6,939 | 7,181 | 978,169 | 1.086,442 | 167,174 | 135,245 |
| <2003 | 6,149 | 6,149 | | | 21,36 | 21,36 | 8,789 | 8,471 | 11,611 | 11,611 | | | | | | | | | | | 39,12 | 39,12 | 8,789 | 8,471 |
| 2003-07 | 0,52 | 794 | 0,1 | | 116,511 | 71,473 | 18,921 | 17,964 | 18,113 | 30,66 | 0,415 | 0,882 | 10,9 | 16,66 | 0,156 | 0,408 | | 0,275 | 0,58 | 0,561 | 146,044 | 119,862 | 20,173 | 19,814 |
| 2008 | | 106 | | | 20,975 | 22,333 | 5,2 | 3,4 | 3,533 | 2,927 | 0,15 | 0,165 | | | | | | | 0,264 | 0,307 | 24,508 | 25,367 | 5,614 | 3,872 |
| 2009 | | | | | 24,8 | 25,267 | 5,2 | 3,4 | 3,533 | 2,896 | 0,15 | 0,165 | | | | | | | 0,264 | 0,314 | 28,333 | 28,163 | 5,614 | 3,88 |
| 2010 | | | | | 18,65 | 16,915 | 5,2 | 3,4 | 3,533 | 5,715 | 0,15 | 0,165 | | | | | | | 0,264 | 0,328 | 22,183 | 22,63 | 5,614 | 3,894 |
| 2011 | | | | | 14,65 | 15,056 | 5,3 | 3,4 | 3,533 | 6,505 | 0,15 | 0,165 | | | | | | | 0,269 | 0,336 | 18,183 | 21,561 | 5,719 | 3,902 |
| 2012 | | | | | 19,84 | 19,285 | 5,3 | 3,4 | 3,533 | 6,915 | 0,15 | 0,165 | | | | | | | 0,269 | 0,345 | 23,373 | 26,2 | 5,719 | 3,910 |
| 2013 | | | | | 16,55 | 19,686 | 5,3 | 3,4 | 3,533 | 4,453 | 0,15 | 0,165 | | | | | | | 0,269 | 0,36 | 20,083 | 24,139 | 5,719 | 3,925 |
| >2013 | 33,163 | 32,783 | 2,004 | 2,104 | 278 | 389,758 | 48,1 | 28,05 | 289,079 | 306,519 | 47,685 | 47,130 | 56,1 | 50,34 | 1,663 | 1,663 | | | 4,758 | 4,63 | 656,342 | 779,4 | 104,21 | 83,577 |

NB: Column Year indicates year of consumption; i.e. before 2003 (<2003), during the period 2003-2007, subsequent years until 2013, beyond 2013 (>2013).

Commitment credits are credits spent on equipment, operations and services; Staff credits are credits spent on JRC staff.