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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

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1. EXECUTIVE SUMMARY

The purpose of this Communication is to provide updated information on the status of the decommissioning and nuclear waste management programme (DWM programme) of nuclear installations which are managed by the Joint Research Centre (JRC) of the European Commission. The update covers the period since the last Communication (2008-2012)[1] as well as the forecast for the future. In the last four years, the programme has gained momentum and achieved solid progress in a number of key activities.

The most significant activities of the programme are located at the JRC-Ispra site (Italy), as it hosts most of the shutdown nuclear installations of the JRC. On the other JRC nuclear sites of Karlsruhe (Germany), Petten (the Netherlands) and Geel (Belgium) the decommissioning activities are for the time being relatively limited, as all three sites have nuclear installations in operation.

JRC-Ispra has focussed on designing and building its own pre-decommissioning waste characterisation, treatment and conditioning installations at its site. The total waste volumes at JRC-Ispra after decommissioning will, once conditioned, have to be stored on-site until interim or final waste deposit sites will be available in Italy. For this reason the JRC is constructing an on-site interim storage facility. Meanwhile most of the nuclear materials which are obsolete have been either shipped off-site or are in the process of being transferred to third parties.

At the three other sites, pre-decommissioning activities have continued for the dismantling of out-of-use equipment from past research work and the removal off-site of obsolete nuclear fuel and other nuclear materials.

Based on the updated planning, the four sites have revised their budget estimates with a focus on 2014-2020, the period of the new EC Multiannual Financial Framework (MFF), but with also a forecast for the expenditures remaining after 2020. The consolidated estimate for the whole JRC DWM programme after 2013 amounts to 989,2 M€$_{2012}$.

Since the previous Communication the risk mitigation strategy has provided several improvements related to the internal organisation as well as the signature on 27 November 2009 of a Settlement Agreement between the European Atomic Energy Community and the Italian Government. The agreement concerns:

– the transfer of the responsibility for the Ispra 1 reactor decommissioning to the Italian Government as compensation for the Italian liabilities related to previous nuclear research activities on the JRC-Ispra site;

[1] 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 - COM(2008)903 final, 12.01.2009.

– the conditions for transfer of all waste present at the JRC-Ispra site to the future Italian National Repository by the end of the DWM programme;

– the limitation of the risk of later waste reconditioning in case of changes in Italian waste acceptance criteria.

The next key steps will be to undertake actions and agree with the relevant external partners on:

– the schedule for the execution of the Ispra Settlement Agreement, in particular the transfer of the license of the Ispra 1 reactor;

– the regulatory authorisation process in order to better streamline it with the needs of the JRC-Ispra decommissioning projects;

– the total costs for final disposal of the waste, in particular from JRC-Ispra and JRC-Karlsruhe;

– the transfer conditions of the JRC-Petten high flux reactor at its later shutdown and at the end of the dismantling works.

The JRC DWM Steering Committee assesses on a regular basis the decommissioning strategies and the evolution of the expenditure. The JRC also involves the DWM Group of Independent Experts that advises on the technical projects and the budget estimates.

An external expert evaluation conducted in 2011-2012 recognised that significant progress had been made and endorsed the updated planning of the different sites for the future execution of the DWM programme.

2. PURPOSE OF THE COMMUNICATION

The purpose of this Communication is to update the European Parliament and the Council on the progress of the decommissioning and nuclear waste management programme of obsolete nuclear installations managed by the Joint Research Centre of the European Commission. It follows up a similar Communication elaborated in 2008 and issued in 2009[2], as well as earlier Communications in 1999 and in 2004.

3. CONTEXT

Established in 1957 by Article 8 of the Euratom Treaty and originally entirely dedicated to nuclear energy, the JRC has diversified since the 1980's its activities to meet the needs of the policy Directorates-General of the Commission and other Institutions; nuclear activities currently represent roughly one quarter of the activities of the JRC. On the basis of the Euratom 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 DWM programme relates to all JRC nuclear installations at the sites of Ispra, Karlsruhe, Petten and Geel, either already shutdown or staying in operation. In practical terms the JRC has undertaken to decommission obsolete installations up to the total and unconditional release of the installations (i.e. without any radiological restrictions).

The JRC DWM Steering Committee, which meets three times a year, follows up the decommissioning strategies and the evolution of the expenditures.

4. ACHIEVEMENTS OF THE DECOMMISSIONING PROGRAMME (2008 – 2012)

The JRC-Karlsruhe, JRC-Petten and JRC-Geel sites currently carry out research activities in the nuclear field. In Ispra, all installations (reactors and nuclear laboratories) are definitively shut down since several years, with the exception of the cyclotron, the laboratories used for the nuclear safeguards support and the waste management facilities. The DWM programme is therefore more advanced at JRC-Ispra with respect to the other sites.

4.1. JRC-Ispra (Italy)

Currently in Italy there is no centralised national repository or interim storage facility. In addition, transfer of radioactive waste among different regions is regulated by directives issued by regional and local authorities. In this context JRC-Ispra is building several waste treatment and conditioning installations.

The JRC-Ispra DWM programme has five main objectives:

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[2] 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 - COM(2008)903 final, 12.01.2009.

– keeping obsolete installations safe in accordance with the safety standards in force (operations which are known as 'safe conservation')[3];

– constructing or improving of waste characterisation, treatment, conditioning and interim storage installations;

– recovering, treating and reconditioning existing waste;

– conditioning nuclear materials with a view to their storage on-site or their transfer to third parties;

– decommissioning of obsolete installations and managing the resulting waste.

4.1.1. Status of the Programme

The programme is on-going and, following previous expert recommendations, the management structure has been significantly re-organised. The main changes were the appointment of a "Decommissioning Technical Programme Manager" for the overall coordination of the site programme, the creation of a specific sector to support the financial files of the decommissioning projects and the re-organisation of the radiation protection support.

In order to smoothen the procurement of outsourced support by external companies, a more systematic approach was pursued by establishing framework contracts in six lots: programme implementation assistance, engineering, waste management works, dismantling works, radiological laboratory assistance and external radiological measurements.

The whole programme is split in ‘project families (PF)’. The main progress per project family in the period 2008-2012 is as follows:

PF1: waste management facilities realisation

– the storage facility for liquid waste started operation;

– the installations for the radiological characterisation of waste started operation;

– the facility for the conditioning of waste with concrete has been ordered and should be ready to operate in 2015; in parallel an appropriate 5 m3 ‘final waste package’ for the conditioned waste is in the process of qualification;

– the ‘interim storage facility’ for conditioned waste has been designed and licensed; its construction has started in 2011 and should be finalised in 2013.

PF2: waste management

– all the out-of-use alkali metals (15 tons) have been evacuated from the site;

– about 1700 obsolete radiological sources have been evacuated from the site;

– historical technological waste present in various buildings has been sorted (on-going activity, approximately 40% progress achieved), characterised, properly repacked and stored per category in a dedicated ‘transit area’, awaiting its conditioning;

– studies have been performed in order to assess the possibilities to reduce the volume of specific waste through different existing waste reduction processes.

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[3] This means to maintain shutdown 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.

PF3: nuclear materials management

– about 90% of the non irradiated nuclear materials has been removed from the site, their title of ownership transferred, and shipped to the U.S.A. and France for recycling;

– a centralised store has been installed for the temporary storage of the irradiated nuclear materials.

PF4: decommissioning of obsolete installations

– an extensive radiological characterisation study has been performed for all facilities to be decommissioned; this study assessed the possible contaminations in the installations in view of their later decommissioning;

– the old radiochemistry building (2700 m^2) is the first nuclear building on the site to be fully decommissioned and has been released from radiological control.

Despite the significant progress, the JRC-Ispra programme faces delays in comparison with the anticipated schedule in 2008. These delays are currently mainly associated with the complex regulatory authorisation process.

4.1.2. Settlement Agreement and consequences

In order to reduce the risks on the Italian liabilities linked to previous nuclear research activities at the Ispra site, on the long term waste storage capacities on the site and on the waste acceptance criteria, risks which were identified in the last Communication, the European Atomic Energy Community has signed on 27 November 2009 an Agreement with the Italian Government in order to:

– regularise the historical liabilities on the site by transferring the responsibility for the Ispra-1 reactor decommissioning to the Italian Government

– formalise the transfer of all waste on the JRC-Ispra site to the future Italian national repository by the end of the DWM programme;

– limit the risk of later waste reconditioning which could be the result of changes in Italian waste acceptance criteria

The Agreement has however still not been formally executed by the Italian Government. As a consequence of this, the transfer of the license of Ispra-1 reactor to an Italian operator has not yet been completed.

4.2. JRC-Karlsruhe (Germany)

The radioactive waste produced at JRC-Karlsruhe is sent to a German utility HDB ('Hauptabteilung Dekontaminationsbetriebe') located on the same site, which is responsible for its conditioning and interim storage. An additional characterisation and re-conditioning campaign for waste drums disposed of to HDB before 1995 is on-going. This extra effort is needed to meet the final waste acceptance criteria of the German final repository (Konrad) established in 1995.

A new approach has been introduced by the German regulatory authority ('Bundesamt für Strahlungschutz' or BfS) for fixing the financial contribution to the final disposal of waste, following an orientative schedule for the construction, operation and final closure of the repository. According to repartition keys fixed for all German waste producers, JRC-Karlsruhe pays its share (1,4 %) of the on-going construction of the disposal site and will have to contribute later to the operation and closure costs.

The main progress by JRC-Karlsruhe over the period 2008-2012 has been as follows:

– the dismantling of an important number of disused equipment and the clean-up of historical waste;

– the completion of the inventory of the ownership of the obsolete nuclear materials present at JRC-Karlsruhe;

– the performance of tests in order to assess the feasibility of conditioning obsolete irradiated nuclear material that cannot be disposed of to HDB.

JRC-Karlsruhe has obtained the license for the construction of new scientific nuclear laboratories, meeting latest safety standards. The scientific activities which involve higher levels of radioactivity will be transferred to the new laboratories once they are constructed. The remaining laboratories with low level of radioactivity will be pooled together, which will allow the later decommissioning of the remaining vacant part of the laboratory buildings.

4.3. JRC-Petten (the Netherlands)

The radioactive waste that is produced on the Petten site is transferred to the conditioning and interim storage facilities of the Dutch waste organization COVRA ('Centrale Organisatie voor Radioactief Afval') in Vlissingen.

Since 2005 the operating licence of the high flux reactor (HFR) has been transferred from the JRC to the Dutch company NRG (Nuclear Research and consultancy Group), which previously operated the reactor under a JRC licence. This has clarified the responsibilities vis-à-vis the national safety authorities as the operator and the licence holder became a single body. Nevertheless, the Community will continue to own the HFR (under a long term lease contract with the Dutch Government), and has the liability for its later decommissioning. The Member States participating to the supplementary research programme on the HFR (the Netherlands, Belgium and France) contribute with a yearly fee to the future decommissioning of the reactor.

For about ten years, the obsolete spent nuclear fuel which was a historical property of the JRC has been regularly shipped away from the site, partially to the US, partially to COVRA. The last shipment was undertaken in March 2011.

In 2007, a contract was also signed with NRG concerning the removal and transfer of ownership of historic high level radioactive waste originated from experiments and from the fuel cycle.

4.4. JRC-Geel (Belgium)

The radioactive waste produced on the JRC-Geel site is transferred to the conditioning and interim storage facilities of Belgoprocess in Dessel.

In 2002 JRC-Geel finished the initial phase of its decommissioning programme, which consisted of the dismantling of one accelerator and the decommissioning and release from radiological control of former nuclear laboratories.

Since then, JRC-Geel has established specific contracts for the gradual removal of its obsolete nuclear materials.

4.5. Expenditure over the period 2008-2012

In the earlier Communication to the Council and the European Parliament, a budget forecast from 2008 on was presented. Specifically for the period 2008-2012, the budget for the total JRC DWM programme was estimated at 124 M€$_{2003}$, which corresponds to 146 M€, inflation corrected.

The accountancy of the procurements made over the period 2008-2011 and forecasted for 2012 shows that a total of 133 M€ of credits have been consumed. This is about 9% lower than the previously estimated figure.

Although the lower consumption is partially attributable to cost savings, it is mainly the result of non-expenditures from postponed projects of the JRC-Ispra programme, as mentioned here above.

5. OVERALL EVALUATION OF THE FUTURE PROGRAMME

In the last two years, the four concerned JRC sites have re-assessed the DWM projects and associated costs for the period after 2013. The outcomes of these in-depth re-assessments have been submitted to an overall review by external experts (see section 4.6).

In its proposal "A Budget for Europe 2020" (COM(2011)500 final), the Commission proposed to allocate for the DWM programme for 2014-2020 an amount of 208 M€$_{2011}$ (or 212,1 M€$_{2012,}$ which corresponds to 234,3 M€ in current prices). The final agreed budget may be lower, depending on the outcome of the negotiations on the Multiannual Financial Framework for 2014-2020.

Accordingly, the breakdown table for the respective sites has been updated (see ANNEX 1) and is commented here below. The main issues related to the programme together with the actions to be taken are also addressed.

5.1. JRC-Ispra (Italy)

JRC-Ispra has performed a re-evaluation of its decommissioning and waste management programme. All on-going and future projects have been re-assessed with a realistic estimate of the related costs. The time schedule for the implementation of the various projects is integrated in a 'master plan'.

JRC-Ispra has currently started to elaborate detailed decommissioning plans per nuclear installation.

JRC-Ispra budget 2014-2020 and beyond 2020 (see ANNEX 1)

The budget table for Ispra in ANNEX 1 summarizes the forecasted cost breakdown as estimated in 2008 and the current update, all values inflation corrected (in M€$_{2012}$).

In the 2008 forecast, a progressive raise of decommissioning budget had been expected over the period 2014-2020, linked to the start of the effective dismantling of the major nuclear installations and the treatment of the waste. The current figures are significantly lower: a total budget of 172,9 M€$_{2012}$ is currently allocated for 2014-2020. Some projects will be postponed after 2020 and the termination of the programme is anticipated for 2030 (instead of 2028 in the 2008 forecast). This re-scheduling increases the total estimated necessary budget beyond 2020. Still needed will be 332,7 M€$_{2012}$, covering the residual decommissioning projects (197,0 M€$_{2012}$) and a reserve (135,7 M€$_{2012}$) for the future fees for the final disposal of the waste and for possible changes in waste acceptance criteria according to the terms of the Settlement Agreement.

In comparison with the 2008 forecast, the total remaining budget needed for the termination of the JRC-Ispra programme (2014-2020 plus after 2020) increases with 8 %, from 468,3 M€$_{2012}$ to 505,6 M€$_{2012}$. This is partially the result of the non-expenditures for projects not realised in the period 2008-2012 (see section 3.5) and the re-assessment of the future projects, but it is also explained by the extended costs for the safe conservation of the installations over a longer period of time.

Any further shift of the whole programme would lead to supplementary expenditures estimated between 5 and 7 M€$_{2012}$ per year, to deal with the extended safe conservation of the installations.

JRC-Ispra programme: identified issues and actions

The main issues related to the JRC-Ispra programme and related actions can be summarised as follows:

(1) The roadmap for the execution of the terms of the Settlement Agreement has to be set by the Italian Government.

The 'Settlement Agreement' with the Italian Government has been signed in 2009. The implementation of this agreement is essential to lower the uncertainties of the Ispra decommissioning programme. Although it had been foreseen to transfer the license of the Ispra-1 reactor within one year following the signature of the Agreement, this phase has not yet been executed.

EC and JRC actions: Contacts are on-going between the European Commission and the Italian Government. Awaiting the execution of the Agreement, the JRC has already put in place an accountancy system to calculate the specific expenses for the safe conservation of the Ispra-1 reactor.

(2) The regulatory authorisation process has to be better streamlined with the needs of the JRC-Ispra programme.

Although significant progress has been made over the last years, the JRC-Ispra programme faced some delays in comparison with the anticipated schedule in 2008. The current delays are mainly attributed to the complex authorisation process.

JRC actions: Contacts have been taken with the Italian safety authorities in order to anticipate better the necessary time schedules related to the assessment of the safety files. In parallel, JRC identified specific organisational measures in order to improve the process.

(3) The remaining uncertainties on future JRC-Ispra waste volumes and on the related cost for final disposal have to be reduced.

The expected waste volumes from the future decommissioning activities are based on best estimates. Moreover, due to the situation in Italy, the disposal tariffs are not yet known. The combination of the uncertainty on the total waste volumes and the uncertainty on the disposal tariffs could lead to significant changes of the current reserve included in the budget plan beyond 2020.

JRC actions: JRC-Ispra has started to establish detailed decommissioning plans for most of the shutdown installations. These plans will include more detailed inventories and will reduce the uncertainty on waste volumes. In parallel the contacts with Sogin (Società Gestione Impianti Nucleari), which has been entrusted by law to realise and operate the future Italian National repository, have been intensified.

5.2. JRC-Karlsruhe (Germany)

The JRC-Karlsruhe project plan has been re-evaluated based on the experience with on-going technical realisations and based on the evolution of the fees and contributions for the waste treatment, storage and disposal in Germany.

There is for the moment only a global assessment of waste volumes which will arise from the future decommissioning activities.

JRC-Karlsruhe budget 2014-2020 and beyond 2020 (see ANNEX 1)

The available budget for 2014-2020 is 37,9 M€$_{2012}$.

About half of this budget (45 %) is expected to be allocated to fees to HDB for the reconditioning of historical waste and to BfS for the German waste repository (Konrad), as explained above (see section 3.2). The latter are expenditures to be paid earlier than originally foreseen, for future waste. As this anticipated provision was not included yet in the 2008 forecast for 2014-2020, other projects are re-scheduled during this period to comply with the available budget.

The re-evaluation does not affect however the total remaining budget of the programme (2014-2020 plus after 2020), which stays at 368,2 M€$_{2012}$.

JRC-Karlsruhe programme: identified issues and actions

A reduction of the uncertainties linked to the waste volumes and the related cost for final disposal has to be pursued.

An important part of the budget 2014-2020 will cover the financial contribution of JRC-Karlsruhe to the construction of the German repository. After the construction, the expenditures will be reduced and will relate to the costs for operation, and finally, for the closure and long-term safety of the repository. The uncertainties related to these expenditures make it difficult to plan the budget on a yearly basis.

Action JRC: JRC-Karlsruhe will investigate whether the planning for the financing of the repository fees can be improved.

5.3. JRC-Petten (the Netherlands)

The decommissioning plan for the high flux reactor in Petten (prepared in 2005) has been updated and assessed with more detail in 2011. The planning foresees:

– preliminary waste evacuation before shutdown and administrative preparation work;

– after the shutdown a transition phase which would take about 3,5 years to allow the cooling and removal of the fuel;

– the effective dismantling phase.

The current reference for the shutdown is 2021, although this date is only used for planning reasons. The effective closure is not confirmed yet and depends mainly on the schedule for the construction of a new reactor for medical isotope production (the “PALLAS” reactor).

JRC-Petten budget 2014-2020 and beyond 2020 (see ANNEX 1)

The 2012 budget update takes into account the calculations of the revised decommissioning plan. The re-evaluation leads to an increase of the total budget estimate for the decommissioning of the high flux reactor (HFR) by about 20% to 72,6 M€$_{2012}$. This increase can be explained by the more comprehensive assessment undertaken by JRC-Petten, with due consideration of all overhead costs during the decommissioning phase.

The estimate does not include uncertainties related to:

– the ensuring of the safe conservation of the HFR during the post operational phase between the shutdown of the reactor and the transfer of the license,

– the later demolition of the buildings and remediation of the site,

which could have an impact on the overall JRC budget. There are also no major provisions taken in the total budget to compensate for possible delays or unknowns.

In the budget forecast from 2008, an assumption was made for the start of the decommissioning of the HFR and 2015 was taken as reference date (working hypothesis). In the current update this reference date is shifted to 2021. This explains the budget shift for the period 2014-2020 mainly to the period after 2020. Some preliminary expenditure is however foreseen in anticipation of the shutdown of the reactor, mainly for the radiological characterisation in view of the future decommissioning.

As the date for the final shutdown is not fixed yet, an anticipation or delay will have an inevitable impact on the budget breakdown as currently planned.

As mentioned in section 3.3, the supplementary programme contributes to a dedicated decommissioning fund for the HFR. The contribution is fixed at minimum 800 k€ per year and end of 2011, the total amount on this fund reached 13,9 M€.

JRC-Petten programme: identified issues and actions

The uncertainties on the JRC-Petten programme and the actions taken to mitigate them can be summarised as follows:

– After the future shutdown of the reactor, it is foreseen that at the end of a transition phase the license will be transferred from NRG back to the European Commission. It is important that the liabilities of both parties, European Commission and NRG and the conditions for acceptance of the plant at the transfer of the license are clearly defined.

– The site agreement between the Community and the Dutch Government foresees in a restitution of the plant by the European Commission to the situation it had been when handed over. This means that there is no explicit mention on which party will take the responsibility for the demolition and site remediation.

JRC action: the JRC will further investigate and map the possible consequences linked to the situation of the plant at its shutdown as well as at the end of its decommissioning. JRC will seek to elaborate formal agreements with the involved parties.

5.4. JRC-Geel (Belgium)

JRC-Geel has updated the overall decommissioning plan for its nuclear facilities. The plan is based on a detailed physical inventory and includes an estimate of the planned decommissioning activities, amount and type of material and waste produced including the respective costs.

The IRMM has also elaborated a global site development plan, which describes the future refurbishments and constructions. According to this plan, a new modernised nuclear building will be constructed (estimated investment: 10 M€). The facility will take over the activities of the oldest facility on the site, and will allow performing nuclear reference measurements and producing reference materials following the most advanced safety standards.

JRC-Geel budget 2014-2020 and beyond 2020

The 2012 budget update takes into account the calculations of the revised decommissioning plan. Once the new nuclear facility will be built, it is foreseen to decommission the old facility, which should start from 2020 on.

For the period after 2020, an extra provision is foreseen for the future decommissioning of the new nuclear facility (estimated decommissioning cost: 3,4 M€). This explains the increase of the total budget by 8,6% to 42,8 M€$_{2012}$.

This total budget is a best estimate and there are no major provisions taken to compensate for possible delays or unknowns.

5.5. Consolidated budget for all JRC sites

Based on the cost estimates as established for the four JRC sites, the consolidated total JRC budget for the remaining DWM programme has been calculated (see ANNEX 1).

The consolidated table shows a total remaining budget estimate of 989,2 M€$_{2012}$. In comparison with the last Communication, the estimate has increased by 6% (net increase above the inflation). As explained above, the increase is mainly the consequence of the extended safe conservation costs due to the postponement of projects at JRC-Ispra.

Considering solely the period 2014-2020, the available budget of 212,1 M€$_{2012}$ (or 234,3 M€ in current prices) is significantly lower than forecasted in 2008 and as said above, the final agreed figure may be lower, depending on the final outcome of the negotiations on the Multiannual Financial Framework for 2014-2020.

5.6. External Review

Currently a 'Group of Independent Experts' in the field of decommissioning and waste treatment advises the JRC on the management of its DWM programme. It consists of European experts originating from different Member States and meets twice a year.

A team of three international experts originating from this Group of Independent Experts performed a review between April 2011 and April 2012. The four involved JRC sites reported their main achievements and updated re-evaluations for the future of the programme. Based on the review, the experts formulated a series observations and recommendations. The review report concludes:

"*At the request of the JRC, the decommissioning and waste management programme of the four nuclear sites has been reviewed by three external experts from the JRC D&WM Independent Expert Group.*

An assessment was made of the current activities and the future decommissioning plans, including the completeness, coherence and the feasibility of the various projects as well as of the forecasted budgets and the reasons for deviations with previous estimates, as presented in the earlier Communications.

The experts found overall evidences that the activities on the different sites are on track, despite some delays, and that the plans and cost estimates for future decommissioning are established in a coherent way, although several recommendations for improvements were formulated, mainly based on the international experience in the field.

The experts draw the attention that the budget figures are in many cases based on best estimated assumptions, with no or only few provisions to cover the uncertainties. This is in particular the case for the projects planned in the longer term (after 2020).

The experts took note that an agreement was signed with the Italian Government which reduces significantly the risks for the Ispra site in relation to the shared historical liabilities and in relation to the future evacuation of the waste from the site and the waste acceptance criteria, but that it was fundamental that this agreement is also executed.

The experts took also note that the plan for the future decommissioning of the high flux reactor on the Petten site has been re-evaluated more extensively and more in detail, although the date for the permanent shutdown and subsequent decommissioning of the reactor is not fixed yet. The experts encourage that the necessary steps are taken to clarify the liabilities of the involved parties and to fix the conditions of acceptance of the reactor at the start and at the end of the future decommissioning.

As a general remark for this review, the experts emphasise the importance of assessing in detail the expected waste that will be produced during the decommissioning and further investigating the managerial and technical measures which should be taken to limit their volumes. This will at least reduce the pending uncertainties in relation to the costs of their future disposal."

The outcome of the review has been taken into consideration in the updated planning as presented here above; mitigating or remedial actions have been defined (sections 4.1-4.5).

6. INFORMATION OF THE JRC'S BOARD OF GOVERNORS

The Board of Governors has been informed about the proposed Communication of the Commission to the Council and Parliament on the progress of the JRC decommissioning and waste management programme. In this context the Board of Governors:

– expressed its fully support for the efforts of the Commission to implement the highest level of safety and security in its various JRC nuclear sites (Ispra, Karlsruhe, Petten and Geel);

– invited the relevant authorities of the Member States to take all necessary measures and decisions within their respective competence areas to facilitate, particularly as far as the Ispra Settlement Agreement is concerned, the process of nuclear decommissioning on JRC nuclear sites which is a long-term process but which should not be delayed;

– invited the JRC to present a progress report on decommissioning every two years.

7. CONCLUSIONS

Significant progress has been made with the implementation of the JRC DWM programme since the last Communication issued in 2009. The main attention was given to JRC-Ispra, with the finalisation of the decommissioning of a first large installation, the removal of waste and nuclear materials, the launch of several waste characterisation facilities and the start of the construction of the interim storage facility.

The risk mitigation strategy has provided several improvements related to the internal organisation as well as the signature, on 27 November 2009, of a Settlement Agreement between the European Atomic Energy Community and the Italian Government on the Ispra site.

JRC is undertaking actions to contain the remaining constraints which are mainly linked to the schedule for the execution of the Settlement Agreement, the delays caused by the complex authorisation process at JRC-Ispra, the expected waste that will be produced on the different sites and to the costs for their final disposal and related to the transfer conditions of the JRC-Petten high flux reactor after its later shutdown.

Based on the updated evaluation of the programme, the consolidated estimate for the whole JRC DWM programme after 2013 amounts to 989,2 M€$_{2012}$.

The decommissioning strategies and the evolution of the expenditures are monitored on a continuous basis by the JRC DWM Steering Committee and submitted to a periodic expert review.

Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste obliges Member States to establish and notify to the Commission by August 2015 national programmes for the management of spent fuel and radioactive waste under their jurisdiction, from generation to disposal. JRC is of the opinion that establishing national programmes will contribute to reducing uncertainties in respect to waste acceptance criteria and cost estimation.

ANNEX 1: Costs and Schedule of the Programme

	JRC-Ispra		JRC-Karlsruhe		JRC-Petten		JRC-Geel		Total JRC		
	forecasted in 2008	2012 update	forecasted in 2008	2012 update	forecasted in 2008	2012 update	forecasted in 2008	2012 update	forecasted in 2008	2012 update	2012 *update
Year	**(M€$_{2012}$)**	**(M€$_{2012}$)**	**(M€$_{2012}$)**	**(M€$_{2012}$)**	**(M€$_{2012}$)**	**(M€$_{2012}$)**	**(M€$_{2012}$)**	**(M€$_{2012}$)**	**(M€$_{2012}$)**	**(M€$_{2012}$)**	**(current M€)**
2014	35,1	23,9	5,4	5,9		0,5			40,5	30,3	**31,5**
2015	39,5	24,1	5,4	6,0	6,1	0,2			51,0	30,3	**32,2**
2016	34,9	24,5	5,4	5,8	6,1				46,4	30,3	**32,8**
2017	37,2	25,1	5,4	5,2	9,1				51,7	30,3	**33,4**
2018	27,7	25,3	5,4	5,0	9,1				42,2	30,3	**34,1**
2019	47,5	25,3	5,4	5,0	9,1				62,0	30,3	**34,8**
2020	57,9	24,7	4,6	5,0	9,1	0,2		0,4	71,6	30,3	**35,5**
Total 2014-2020	**279,8**	**172,09**	**37,0**	**37,9**	**48,06**	**0,9**		**0,4**	**365,4**	**212,1**	**234,3**
After 2020	**188,5**	**332,7**	**331,2**	**330,3**	**12,1**	**71,7**	**39,4**	**42,4**	**571,2**	**777,1**	
Total (> 2013)	**468,3**	**505,6**	**368,2**	**368,2**	**60,7**	**72,6**	**39,4**	**42,8**	**936,6**	**989,2**	

* The final agreed figure may be lower depending on the final outcome of the negotiations on the MFF 2014-2020.

The updated Communication on the costs of the Programme will be presented to the European Parliament and to the Council after the final adoption of MFF 2014-2020 package.