

# Guide

to the

## Commission Recommendation

on the management of financial resources for the decommissioning of  
nuclear installations, spent fuel and radioactive waste

(2006/851/Euratom)



## Objective of the present document and next steps

This guide represents the conclusion of the work performed by the DFG Core Group under the objective of achieving an improved common understanding of the detail and scope of the recommendation on the management of financial resources for the decommissioning of nuclear installations, spent fuel and radioactive waste. (2006/851/Euratom)

The document presents, in a bullet-point format, a guide to the recommendations and the necessary clarifications or additional information as required.

In addition to the guide for each recommendation, the following general clarifications are provided for common improved understanding

- The guide is not intended to cover all issues expressed in the recommendation, only those which have been considered worthy of further clarification by the DFG core group.
- Consistent and clear definition of terminology for the use of the Recommendation shall ensure that stakeholders use the same definitions, even if the application differs due to particular local circumstances (e.g. nuclear installations, nuclear safety, PPP, operator, owner ...);
- Unless otherwise stated, the full recommendation shall apply to both internal and external funds;
- **"national body"** shall mean a body set up or appointed by the MS for the purposes of offering an expert judgement on fund management and decommissioning cost matters. The body shall be independent of the contributors to the fund. The expert judgements it provides shall in no way imply an "approval" and as such all responsibilities shall remain with the operator.
- **"final decommissioning plan"** shall mean a detailed document which is in line with the Decommissioning Strategy. And which reports the detailed steps and activities which shall be undertaken to decommission the NPP.



**Section 3: Decommissioning of nuclear installations**

|

|

## **Recommendation 1**

**All nuclear installations should be decommissioned after permanent shutdown and the management of waste should be properly addressed.**

- Each nuclear installation should be covered by a Decommissioning Strategy which is in line with a Decommissioning Policy.
- The selection of the most appropriate decommissioning strategy will typically be a function of (but not limited to) the following factors,
  - Available waste management routes
  - Stakeholder values
  - Technical complexity and risk
  - Service history of reactor
  - Available skills and experience
  - Local community involvement
  - Legal and regulatory framework
- Waste should be understood as radioactive, toxic and all other forms of waste resulting from decommissioning and operation, including that arising from the former use of the site.
- The term "properly addressed" implies that a waste management strategy is in existence and that waste should be managed considering
  - Exposure to personnel and public
  - Established national, European and international norms and conventions
- In particular, regarding spent fuel, the cost issues associated with both
  - Evacuation from the site
  - Interim storage, treatment and/or disposalare also to be taken into consideration
- The recommendation is designed to address all aspects of spent fuel management and liability. A clear picture should therefore be established as to how the issues of operational spent fuel, the last core, and interim storage and disposal of spent fuel are to be addressed.
- In line with the "polluter pays principle" the operator's involvement in the financing of the management of spent fuel should be detailed.

## **Recommendation 2**

**Decommissioning activities should be carried out without undue risk to the health and safety of workers and the general public.**

- See recitals of the recommendation.
- Notification Art. 37 of Euratom Treaty<sup>1</sup> is to be taken into account.
- Both conventional safety and nuclear safety issues are to be taken into account.

---

<sup>1</sup> Euratom Treaty Art 37 ()



### **Recommendation 3**

**The polluter pays principle should be fully applied throughout the decommissioning of nuclear installations. In this regard, the primary concern of nuclear operators should be to ensure the availability of adequate financial resources for safe decommissioning by the time the respective nuclear installation is permanently shut down.**

- Nuclear operators are to be understood as the "legal entity generating the revenue from the nuclear facility". This is frequently understood to be the "license holder".
- Funds must be available when the need arises (see also Rec 15); eg. The accumulation of funds shall reflect the schedule of decommissioning expenses, in line with the underlying decommissioning strategy and plan. The use of funds may be required to cover preparatory works even before final shut-down.
- For each nuclear facility the binding individual responsibilities must be clearly identified: eg. who contributes to the fund, who manages the fund and what are their corresponding rights and duties.
- There shall be no difference between the concepts of private and/or state owned facilities. In both cases there must always be a contributor to the fund and a manager of the fund.
- In the case of co-ownership of a facility, the ownership and hence the share of liability shall be clearly defined.
- In case of transfer of ownership, the share of the liability or its transfer shall be established . In such cases the quality of the cost assessment is of particular importance.

#### **Recommendation 4**

**The financial resources available should be aimed at covering all aspects of decommissioning activities, from technical decommissioning of the installation to waste management.**

- This recommendation is focused on the fact that waste management costs are also to be considered as part of the decommissioning activities (as are the spent fuel costs, cf. remarks previously made in Rec.1).
- The focus of this recommendation is to ensure that all required decommissioning activities (as defined by the recommendation) are covered by financial resources.

**Section 4: Institutional and procedural aspects**



### **Recommendation 5.1**

**Without prejudice to the provisions of Article 41 of the Treaty and the Regulations in force with regards to its implementation, persons and undertakings should report on the planned decommissioning funding regime in the context of the procedure provided for under Article 41 of the Treaty concerning the construction of new nuclear installations.**

- Articles 40 and 41 of the Euratom Treaty require a utility which plans to make investments in a nuclear facility (new facility, or significant change in an existing facility) to prepare a formal submission of information. Decommissioning investments are part of such a notification.
- This notification requires a description of the investment projects together with information pertaining to the planned decommissioning funding regime (amount, plan for constituting the assets in the fund, modalities of fund management...).
- In this context, the decommissioning funding submission concerns only new nuclear installations.

## **Recommendation 5.2**

**In the review of the proposed decommissioning funding regime the Commission will — subject to the requirements of Article 44 of the Treaty — consult the Decommissioning Funding Group.**

- This recommendation concerns only new nuclear facilities (significant investments and their potential impact on decommissioning funding should be covered by the regular update of the cost estimates and if necessary the fund accumulation trajectory).
- The recommendation also concerns waste management funding regimes in line with the definition of "decommissioning" provided by the Recommendation: it includes radioactive waste and spent fuel management.
- The recommendation does not cover any Art. 37 notification which should be performed by Member States.
- This is the most important recommendation concerning the DFG as it explicitly refers to and attributes a role to the DFG; It provides the basis for the work of the group; The Terms of Reference and criteria on which the DFG should give its opinion shall be worked out within the DFG based upon a proposal from the Commission.

**Recommendation 6.1**

**Where not already provided for, Member States should set up or appoint a national body capable of providing an expert judgment on fund management and decommissioning cost matters. This body should be independent as regards the contributors to the fund.**

- The national body should possess both technical and financial expertise to perform its functions. In the case of a missing expertise, the national body should hire this from outside (ex. advice on fund management from banking or accountancy sector).
- The national body shall be fully independent of the contributor to, and the manager of, the fund.
- The national body may be an existing body with an additional mandate/task as long as the above requirements are respected.

## Recommendation 6.2

**The national body should annually review the financial resources gathered and periodically, at least every five years, the decommissioning cost estimates. Any shortfall between cost estimates and resources gathered should be addressed in good time.**

- The review of financial resources should be performed against:
  - a cost assessment, prepared considering a defined decommissioning strategy and plan.
  - a trajectory for the constitution of the assets of the fund, defined to match the expected full cost of decommissioning (eg: payments collected during a certain period of time, or assets constituted when the plan is put in operation).
- The national body shall review the trajectory for the constitution of assets considering its ability to match the identified full cost when needed. It should consider the underlying assumptions of inflation or discounting rates, and the anticipated rate-of-return from the fund.
- Decommissioning cost estimates and the means to address any shortfall of the fund are of particular importance in the case where the nuclear installation is handed over to a national body, to a state owned company or transferred to another private organisation.
- The roles of involved parties must be clearly defined in the case of transfer of ownership in order to maintain the polluters pay principle. The national body must control and supervise any such transfer and no sale should be approved until such time as the decommissioning funding is evaluated and established to be satisfactory. This is also valid in the case of a transfer to a national organisation.
- If a shortfall should be identified in the value of the fund, in comparison to the trajectory planned for the assets' constitution, this shortfall should immediately give rise to the definition of corrective measures (additional payments, update of the trajectory eg by raising the fees...), which should be implemented in the short-term, especially in the case of a substantial shortfall (eg: a rise in the estimated decommissioning cost, contrary to a temporary loss on the markets a long time before the schedule of decommissioning, for which a period of time of a few year could be tolerated to regularise the situation).
- If a shortfall appears during the decommissioning operations (that is to say when the build up of the fund is typically complete), additional payments should be made immediately.
- If a shortfall appears concerning waste/spent fuel management operations (time period could be long after the shut down of the plant), best practice (the polluter pays principle) would suggest that the operator should fund the shortfall. Provisions must be foreseen in the case where such a solution is not possible.
- The review of the fund by the national body does not imply an "approval" of its fitness for purpose and as such all responsibilities shall remain with the operator.
- The same principle of operator liability shall exist for both the internal and the external funds. There are however differences in implementation between internal and external funds.
- In an external fund, the national body ensures that the responsibilities for payments to the fund and the responsibility for fund management are separated, whereas, in an internal fund, both responsibilities lie with the operator.
- The objective of the work from the national body should be to ensure that the value of the fund provides a complete coverage of the full decommissioning liability.
  - The concept of an over-coverage margin might be worthy of consideration to buffer normal market fluctuations in the value of the fund; alternatively additional payments could be considered in case of insufficiency (for external funds: from the operator or from the fund manager depending upon the liability).



- In the case of a financial crisis, and provided that the decommissioning operations are not foreseen to begin within the short-run, a short period of time, might be tolerated to regularise the situation.
- In such situations, the national body would typically have the discretion to decide the nature and time frame of any regularisation measures to be implemented.
- Regarding "relevant flexibility (under discretion of the national body) in case of a long-term perspective", see "private pensions and policy responses to the financial and economic crisis": OECD report, April 2009)
- Particular issues related to external funds:
  - With respect to external funds the anticipated rate of return is an assumption of the assets' constitution strategy, which should be reviewed by the national body. The assumption should be prudent, given the objective of realising the full cost of decommissioning when needed. If these assumptions are revised during the build up period of the fund this will impact upon the payment schedule of the operators into the fund.
  - Performance of the fund should be monitored and corrective actions implemented in the case of continued performance of the fund below the objectives.
  - For external funds two independent sources of risk are identifiable. The **market risk** and the **risk associated with the performance of the fund manager**. While market underperformance risk should be covered by the operator, the poor performance of the fund manager might not be considered to fall under the operator's liability. Such shortfalls should be addressed to the fund manager.

**Recommendation 6.3**

**Member States should report annually on the conclusions of the proceedings of the relevant national body mentioned above to the Commission.**

- Annual reporting should address the status of the fund with respect to the current overall costed liability of decommissioning.

**Section 5: Decommissioning Funds**



**Recommendation 7**

**Nuclear installations should set up adequate decommissioning funds on the basis of the revenues obtained from their nuclear activities during the designed lifetime.**

- "Designed lifetime" should be understood as relating to the full exploitation period of the nuclear unit.
- The party responsible for the build up of the fund assets should be clearly defined. The time frame for this build-up could extend over the whole expected exploitation period. Shorter periods are however, not excluded, and are in fact a means of safeguarding against unforeseen cases such as early closure.
- Contingencies for the cases of early closure and plant life extension should be considered in the planning of the fund.
- The assets' build-up trajectory must be immediately reassessed and adjusted in the case where a decision is taken to reduce the exploitation period of the facility.
- In any case, the funding responsibility should in principle remain upon the operator, according to the polluter-pays principle. Should the reason for closure be politically motivated, the financial liability/responsibility may fall on other parties e.g. the state.
- Although recommendation 7 is addressed to nuclear installations, an operator may call upon revenues from other non-nuclear activities as contributions to the fund.

## **Recommendation 8**

**A segregated fund with appropriate control on prudent use should be the preferred option for all nuclear installations. The review of the national body provided for in this Recommendation should play a key role in ensuring proper management and use of the funds.**

- Definition of a segregated fund is given in sect.2 (e) of the recommendation.
- With regard to the protection of the fund, the establishment of a "segregated" fund does not in itself constitute sufficient protection. Additional legally binding protective measures should be put in place to protect the fund against such cases as the bankruptcy of the operator.
- Although a segregated fund is recommended as the preferred option, Member States may retain already existing non-segregated funds associated with existing facilities. Where such situations arise Member States should ensure that such funds are assessed by the National Body provided for in this Recommendation, in respect of their financial adequacy and their availability when needed.
- Internal and external funds are considered to be equally suitable and the second sentence of this recommendation shall apply to both internal and external funds
- Given that an external fund is defined as a "fund managed by a dedicated body independent in its decisions from the contributors to the fund" (see Section 2 (c)), the combination of an external fund and a non-segregated fund must be, by definition, an excluded combination. (The management of the fund by a body different from the contributor implies that the fund is identified separately (i.e. a segregated fund, see (see Section 2 (e)). )
- Should the operator be involved in any way in the management of a fund, the fund must be considered as an internal fund, on the basis that, the operator would then be able to influence the decisions of the fund and as such the fund would no longer be independent from its contributors (see definition in Section 2 (c).
- In the context of this recommendation the term "prudent use" should be better understood as meaning "prudent management".
- Prudent management should aim to achieve a fully adequate financial value for the fund at the time when the fund is required. With a view to achieving this situation
  - Low-risk assets should be eligible.
  - High-risk assets could also be permissible, with constraints on their prudent risk exposure and their level of diversification.

**Recommendation 9**

**New nuclear installations should set up segregated decommissioning funds with appropriate control on prudent use.**

- In the context of this recommendation "prudent use" should be understood as "prudent management".
- The fund should be established at or before the start-up of operation of the new nuclear facility.





**Section 6: Estimation of decommissioning costs**

|

|

### **Recommendation 10**

**In view of the differences in the use of the decommissioning funds gathered, technical decommissioning of the installation, on the one hand, and waste management, on the other, should be addressed separately, on the basis of separate cost calculations.**

- The requirement for identifiably separate costing lines for both decommissioning and waste management does not request nor necessitate the establishment of separate funds.
- Given that MS have different approaches to the management and liability of waste, it is not appropriate for this recommendation to prescribe that which should or should not be considered as part of the operators' operational budget and that which should be addressed by the fund. It is however, imperative that **all** decommissioning and waste related inventories are covered either as operational costs or under the decommission fund (see rec 4). This issue should be controlled by the national body.
- In the context of transparency, the decommissioning funding plan (DFP) should clearly detail what inventories are to be covered by the fund and which should fall under the operator's operational responsibilities.
- In estimating the full decommissioning costs, account should be taken of the **long-run** management costs (eg the issue of “disposal” in the scope for radioactive waste and spent fuel should be addressed).

### **Recommendation 11**

**In order to ensure that adequate financial resources are available, cost calculations should be based upon a prudent choice from the realistically available alternatives and subject to the external supervision and agreement of the national body foreseen in this Recommendation.**

- The term "agreement" of the national body should in no way be understood as a "formal approval" leading to either a partial or full transfer of liability from the operator.
- The publication "The standardised cost structure of decommissioning cost items (NEA-EC-IAEA) - Yellow Book" may be a useful reference for operators in their preparation of costing methodologies and detailed costs of decommissioning. It shall not be a mandatory framework.
- A clear costing methodology, its related assumptions and a detailed cost breakdown should be prepared by the operator and presented for the consideration of the National Body.
- "Prudent choice" in this recommendation should be understood as a conservative balance between risk and cost, taking into account risks, uncertainties and contingencies of the particular site.
- Decommissioning of a nuclear facility must be included as part of an operator's risk management plan.

**Recommendation 12****All cost estimates should be site-specific and based upon best available estimates.**

- In relation to the term "site specific", and within the context of accuracy and transparency, the costings for multiple nuclear unit sites should be broken down to the unit level.
- The concept of a "fleet approach" to costings may be relied upon where appropriate for cost estimation purposes. In such cases it should be demonstrated that the unit or site in question conforms to the set of the fleet.
- For single or multiple sites the specific and particular issues related to the site should be considered separately and in detail.

**Recommendation 13**

**If during implementation, the decommissioning project proves to be more expensive than the approved cost estimates, the operator should cover the additional expenses.**

**This aspect should be carefully addressed should the operator change during or beyond the lifetime of the nuclear installation.**

- The national body has an important role to play in reviewing the adequacy of the fund and the level of the decommissioning liabilities at such times.
- Should the costs of decommissioning increase during the operational life of the facility the operator shall be held responsible for these increased costs and should make a correction to the fund to cover the full liability.
- Member states supported by the National Body, should identify events such as, the change of operator during the operational lifetime, and the end of service, as significant moments in the life of the fund which demand a full reassessment of its adequacy.
- In view of the polluter pays principle and the potential difficulties of redressing shortfalls to past operators some years after the event, it would be pragmatic for member states to consider that in the event of a shortfall the current operator should make immediate financial corrections to the fund at the moment of transfer. In this way the liabilities of the previous operator may be fully discharged to the new operator.
- However, given the difficulties associated with the valuation of long term, uncertain liabilities such as spent fuel and radioactive waste, it may be appropriate that all operators, both past and present, retain their own accumulated share of the liabilities arising from their operations. In such a case the agreed shared liabilities must be fully and transparently detailed.

**Recommendation 14**

**Due attention should be paid to cases arising for historical reasons where a special solution is the most appropriate. This case-by-case approach should be transparent and with the full involvement of the national body provided for in this Recommendation.**

- This recommendation shall only apply to existing historical cases and may not be invoked in the case of new facilities.
- The use of these so called "special solutions" does not exempt an operator or member state from their responsibilities under the recommendation as a whole.
- All operators must establish a full and detailed costing of their decommissioning liabilities and an associated decommissioning funding plan.





## **Section 7: Use of decommissioning funds**

- "Use" should be understood in terms of "use and management"



### **Recommendation 15**

**Financial resources should be used only for the purpose for which they have been established and managed. In this context, due consideration should be given to transparency. All commercially non-sensitive information should be publicly available.**

- The term "purpose for which they have been established" should be understood as "decommissioning" as defined in definition 2. Further, decommissioning funds may only be used for the detailed purpose for which they have been established as defined in the final decommissioning plan and not for any other purpose.
- Such financial resources may however be used for the defined purpose whenever there is an appropriate need, be that before or after final shutdown.
- In respect of the issue of transparency, the national body retains an important function during the decommissioning phase, in monitoring and reviewing that the funds are used correctly
- Member states may wish to address the possible situation where an excess may exist in the fund after decommissioning is complete. In such a case it should be defined what use this balance should be put to or to whom it may or should be transferred.

**Recommendation 16**

**A secure risk profile should be sought in the investment of the assets, ensuring that a positive return is achieved over any given period of time.**

- A secure risk profile implies that
  - Low-risk assets should be eligible.
  - High-risk assets could also be permissible, with constraints on the risk exposure and the level of diversification.
- The fund's asset build-up strategy should take into account reasonable assumptions regarding inflation and the anticipated rate of return.
- The financial resources in the fund should be managed in accordance with these assumptions.
- The management strategy should aim to match the full decommissioning cost and to ensure its availability at the time when it is needed.
- The fund should be subject to a financial risk assessment by the national body to verify that it conforms to the concept of a secure risk profile.

**Recommendation 17**

**As the operator has no influence on the financial management of an external decommissioning fund, the value of the investments should be guaranteed by the State in order to ensure that adequate funds are available when required, even if a nominal loss is made by the independent manager of the invested amounts by the time these financial resources are to be used. In such cases, the funds should not be supplemented with an amount higher than the loss in the investment.**

- This recommendation has been created to address the issue of external funds. By definition the operator has no management control or influence over an external fund.
- It is recognised that where a shortfall exists between the value of the fund and the decommissioning liabilities, that it may be difficult to address this shortfall to the operator. In such a case the entity managing the fund should be held responsible for the shortfall.
- This said, the entity managing the fund may not hold sufficient resources to compensate for the shortfall and in this case the MS should be prepared to guarantee the shortfall.

**Recommendation 18**

**If the management of an internal fund underperforms, the operator should be responsible for ensuring that adequate funds are available when needed.**

- The identification of a shortfall between the value of the fund and the decommissioning liabilities should give rise to an immediate definition of corrective measures that should be implemented in the short-term, in order to ensure that adequate funds are available at the moment when they are needed.
- In this respect, the annual review of the accumulated funds, as well as the review of the cost estimates by the national body, as foreseen in Recommendation 6.2, is of the utmost importance with a view to detecting possible shortcomings at the earliest possible stage.

**Recommendation 19**

**In the case of nuclear installations whose main purpose is other than the sale of products or services, decommissioning should be properly planned and budgeted so as to allow adequate funding to be available for the safe and timely decommissioning of such installations.**

- The facilities addressed here are typically social service facilities such as medical centres, research centres, isotope production facilities and particle accelerators.
- Given that such facilities are typically, albeit not always, under state responsibility, the state may consider financing the decommissioning of such facilities from the national budget.
- Such facilities should nevertheless prepare a final decommissioning plan detailing the scale of their liabilities and associate costs which should be considered by the national body.

**Recommendation 20**

**Budgetary planning should be subject to the review of the national body provided for in this Recommendation. In the absence of such a national body, Member States may request the Commission to provide advice concerning the measures to be taken.**

- Budgetary planning is to be understood as "establishing a financial plan of decommissioning liabilities and their associated financial value".
- In the case where the member state addresses itself to the EC, the EC shall at no time replace the function of the national body.



**End of guide**