

# COMPARISON OF NATIONAL POLICIES AND STRATEGIES, LEGAL AND REGULATORY REQUIREMENTS FOR NUCLEAR DECOMMISSIONING IN THE EU

Analysis of answers to a questionnaire conducted in ENSREG WG2 in 2021-22

## Introduction

Decommissioning activities are covered by a range of instruments under Euratom law. Council Directive 2009/71/Euratom and its amendment 2014/87/Euratom establishing a Community framework for the nuclear safety of nuclear installations establishes licensing requirements for a number of activities, inter alia decommissioning works, and is applicable to nuclear facilities including those that are undergoing decommissioning. Besides, Council Directive 2011/70/Euratom on nuclear waste applies, inter alia, to radioactive waste generated during operation and decommissioning of nuclear facilities.

Beyond this shared legal framework, the policy and strategy for nuclear decommissioning activities in Member States is determined by national preferences, and the legal and regulatory requirements concerning decommissioning present many differences among Member States. Those differences can have an economic impact (e.g., the definition of end-state for decommissioning determines cost estimates) and in terms of nuclear safety and environmental protection.

The fifth ENSREG Conference on Nuclear Safety (June 2019) paid special attention to this question. After that, the High Level Group of ENSREG asked WG2 to further investigate on these national differences. A subgroup was constituted in WG2 in March 2021 with the task to undertake a comparison of policy and strategy, legal and regulatory framework for decommissioning in the EU. This subgroup composed a questionnaire which was endorsed by WG2 in June 2021 with the invitation to the Member States to participate in it. As of today, twenty-one Member States, plus the United Kingdom, have provided their answers to this questionnaire with six of them missing. None of those six has significant nuclear activity on their territory.

The answers received to this questionnaire have been compiled, segregated by topics and analyzed. The present study is the compilation of these analysis.

## I. Policy and strategy for decommissioning

The first two questions in the survey referred to overarching issues set in national decommissioning policies, strategies or legal requirements. In first instance, these policies, strategies and laws may call for immediate or deferred dismantling, or they can define such approaches on a case-by-case basis.

It was asked whether such options are defined in a national document (policy, program or legal requirement) and what the content of such document is, with a specification (if relevant) of how these provisions apply to multiple facility sites.

The answers reveal that countries without nuclear power generation apply the general principles for radiation protection and waste management - e.g., waste minimization determining decommissioning strategies-, but generally they have not adopted legislation or

policy to set a preference for immediate or deferred dismantling. Denmark is an exception, with a legal requirement for immediate dismantling. No provisions are established by law in Austria, Greece, Latvia or Portugal (18% of the respondents). The Greek answer clarifies that in practice deferred dismantling is the preferred strategy.

In countries with nuclear power generation, a first distinction can be made among those that determine their decommissioning strategy by enacted legal instruments (laws, decrees) and those that do it through political decisions, commonly announced in national policy documents. The responses from the group that determine decommissioning strategy through legal instruments can be categorized as follows:

- Immediate dismantling is declared by a legal mandate to be the only accepted strategy in France and Italy besides Denmark, as mentioned before (14% of the responses).
- Immediate dismantling is declared per law to be the preferred strategy, but exceptions are possible if they are justified, in Belgium, Finland, Germany, Lithuania, Slovenia, Sweden and The Netherlands (32%)<sup>1</sup>.
- Countries that, also per legal mandate, allow for both immediate or deferred strategies, whereas impose different conditions for each, are Bulgaria, the Czech Republic, Poland and Romania (where entombment is also considered as an option) (18%).

A second set of countries (18% of the responses) are those that announce their preferred strategy in policy documents (typically, their national program), without these being set in a law or decree. These are Hungary, Slovakia, Spain and the United Kingdom. In them, immediate dismantling is declared to be the preferred strategy. In Hungary, the choice was made for deferred dismantling only for the nuclear power plant (Paks), with immediate dismantling for the rest of nuclear facilities. The same occurs in Spain, where deferred dismantling is limited to Vandellós I NPP.

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<sup>1</sup> Please, note that some of the respondents merely explained that their law declares that nuclear facilities must be decommissioned “as soon as possible” or “based on the principle to avoid burdens to future generation”, without specifying on possible exceptions. To the interpreters of the questionnaire, this can be understood as a preference for immediate dismantling, but it does not exclude deferred dismantling if necessary.

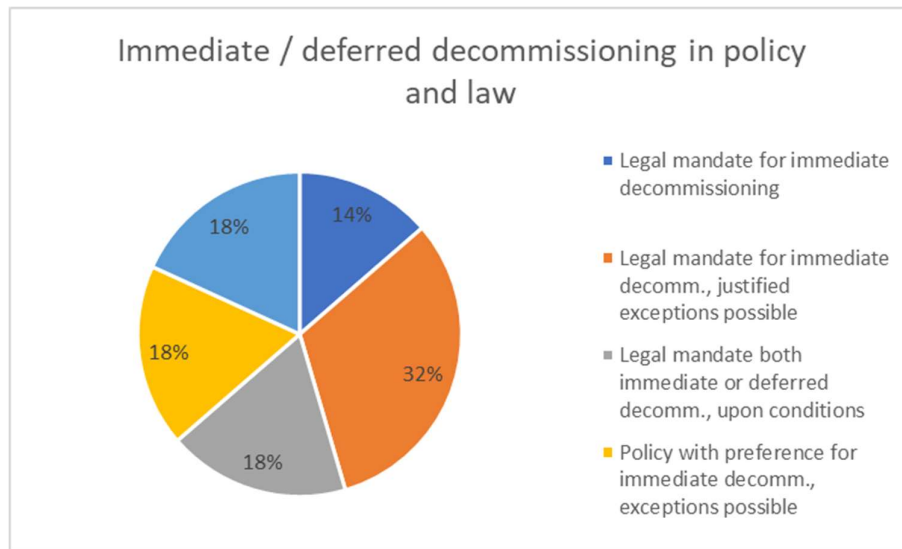


Figure 1: Immediate vs deferred decommissioning in the EU

With regard to the differences between one and multiunit sites, countries generally do not make a particular distinction. The Belgian answer clarifies that no differences are made. Separate licenses are required for the decommissioning of each unit in Bulgaria; also the German answer acknowledges the fact that, if there is more than one nuclear facility in the site, in general each facility is regulated by its own license.

A second question inquired the desired end-state for decommissioning reflecting requirements or intentions for future use. The question was whether national documents (legal requirements or policy documents) specify such end-states, and if so, whether end-state criteria (e.g. dose constraints) are defined.

The answers to this question reflect that the concepts of “green field” and “brown field” are generally understood, but not defined in the laws. Apparently, Lithuania is the only country where the definitions of “green field” and “brown field” are explicitly set in the legal text. By contrast, the term “release” is more widely defined in national laws, and the respondents often use this term to describe their situation.

As regards the alternatives of “green field” vs “brown field”, the answers can be categorized as follows:

- Denmark, Germany, Greece and Italy (18% of the respondents) set an obligation for green field in the law (the term used is “release”). The German answer specifies that the remaining structures in the site can be converted into a different facility, regulated accordingly by a new license (e.g.: a storage facility for spent fuel is licensed in the site where there used to be a nuclear power plant; therefore, the site as a whole cannot be released from regulatory control).
- National law sets a preference for green field, but exceptions are possible (this can be described as “release with specific restrictions”), in 27% of the cases: France, Hungary, Lithuania, Spain, The Netherlands and the United Kingdom -in this case, the answer specifies that part of the site can be delicensed and released for other uses-.
- In half of the countries consulted, the law does not require to reach green field, either because in practical terms the end-state is defined case-by-case, or because there is an

explicit acceptance of brown field for some facility: Austria, Belgium, Bulgaria (brown field determined for Kozloduy NPP), Finland, Latvia (brown field determined for Salaspils research reactor), Poland, Portugal, Sweden, Slovakia, Slovenia (brown field determined for Krško NPP) and Romania. The Belgian response clarifies that “It is not necessary that all constructions have been removed in order to be able to release the installation, as long as they have been completely decontaminated”.

## II. Licensing procedures involving different regulators

It is a common situation that, considering the number of topics involved during decommissioning activities (nuclear safety, environmental protection, public and workers' health, etc.), different licensing procedures involving different regulators are required. A question was made inquiring whether this is the case in the respondents' countries; what regulators are involved and which one of them is tasked with the leading role in the overall process.

The vast majority of the respondents answered that different authorities are involved during authorization of decommissioning actions (e.g., depending on the national regulatory framework, granting of a license, issuing a permit). In Austria, the national regulatory framework requires authorization from only one regulator, which can be a different authority depending on the type of practice (provided there is no environmental impact assessment).

Environmental impact assessment was stated the predominant topic where a different regulatory body than the nuclear or radiation protection regulatory body is involved during authorization, human health and labor being the next frequent topics mentioned.

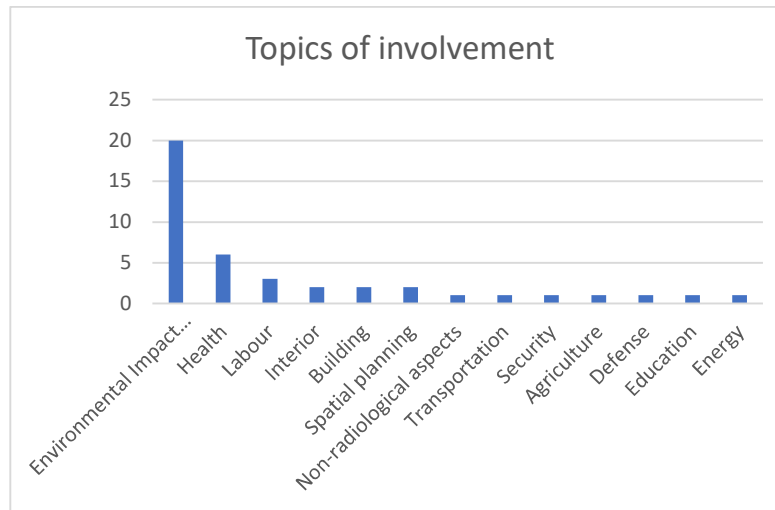


Figure 2: Topics stated where a different regulatory body is involved in the licensing/authorization process for decommissioning actions apart from the nuclear/radiation protection authority.

The processes of involvement vary, ranging from expressing advice, opinions or recommendations on a subject matter that is taken into consideration by the leading regulatory body up to issuing of specific licenses for different topics; the latter being the case mainly for the environmental impacts of a planned decommissioning project.

In approximately 63% of the responses (Belgium, Bulgaria, Czech Republic, Denmark, Hungary, Latvia, Lithuania, Poland, Portugal, Romania, Slovakia, Sweden, The Netherlands, UK) regulatory bodies independent from the government have the leading role in providing decommissioning licenses. In 38% of the cases a government body authorizes decommissioning actions (Austria, France, Finland, Germany, Greece, Italy, Slovenia and Spain). No difference is found in the answers from countries with operating nuclear power plants, countries with operating research reactors or those only using radioactive materials for industrial, medical or research purposes.

A second question posed was whether the timing for release of the authorizations is established by law.

The timeframes in which a regulatory body must come to a decision to authorize decommissioning actions scatter widely:

- 20 days for a first assessment of the application, and 30 days for final decision in Portugal,
- 1-2 months in Slovakia (6 months in special cases),
- 60 days in Latvia, although a decision can be made to extend the review period up to 4 months,
- 90 days in Slovenia,
- 6 months in Austria (but suspension of the procedure is possible), Czech Republic, The Netherlands and Spain (counted after the opinion of other involved regulatory bodies is received, but suspension of the procedure is possible),
- 9 months in Poland,
- 11 months in Hungary,
- 2 years in Lithuania (counted after all application documents are received, 90 days for permits),
- 3 years in France (extension by 2 years is possible for complex decommissioning projects),
- none in Belgium, Germany, Italy (but for other authorities to provide their opinion), Romania and Sweden.
- The answer from the UK refers to a “reasonable period of time (taking into account the nature and complexity of the application for consent)” for the regulatory body to provide its response.
- For Denmark, no time limit is stipulated in legislation. Normal, administratively set timeframe is one month, but for more complex decommissioning tasks, timeframes are presented to the applicant on an ad-hoc basis.

A tendency can be seen from these answers that countries with nuclear power plants foresee longer timeframes, if any, for the authorization process.

It needs to be pointed out that some respondents interpreted this question differently as the authors of the questionnaire intended. The respondents from Bulgaria, Greece and Finland interpreted that the question referred to the timeframe for the validity of the authorization, *id est*, that the authorization needs to be renewed after a certain period of time during conduct of decommissioning.

### III. Planning of decommissioning works

Planning or preparing for decommissioning ideally takes place already at the planning stages for a new nuclear installation. As the end of operation for a facility approaches, the plans for decommissioning should become more detailed and comprehensive. These plans may include elaborating an overarching decommissioning plan, defining and coordinating the sum of all foreseen decommissioning tasks. Individual decommissioning tasks may require more detailed planning in separate documents.

The respondents were asked to describe the legal and regulatory provisions for planning for decommissioning with respect to the preparation and contents of the different types of decommissioning plans (initial plan, overarching plan and detailed plans).

In respect of the initial plan, most answers indicate that requirements are set out for the preparation of an initial decommissioning plan or alike in the stage preceding the construction of a new nuclear installation or the start of a new regulated activity. Approaches might differ in terms of procedure and phasing, however a plan must be approved in any case before the construction starts.

Some countries expressly address cases where an initial plan was not prepared and approved. This applies in particular to those Member States where no future nuclear activity is foreseen and legacy installations need to be dealt with (such as Denmark or Greece). Another notable example is Romania, where a requirement was set out to prepare decommissioning plans for all those installations that did not have it before construction and before the issuance of the relevant regulation.

The initial plan is frequently subject to a requirement for review and update during the operation stage. In 12 cases (Belgium, Bulgaria, Finland, France, Hungary, Italy, Latvia, Lithuania, Poland, Romania, Slovenia, Spain and The Netherlands, 59 % of the respondents), the countries indicated that they set out a requirement for regular review and update of these plans with a maximum period (see Figure 3).

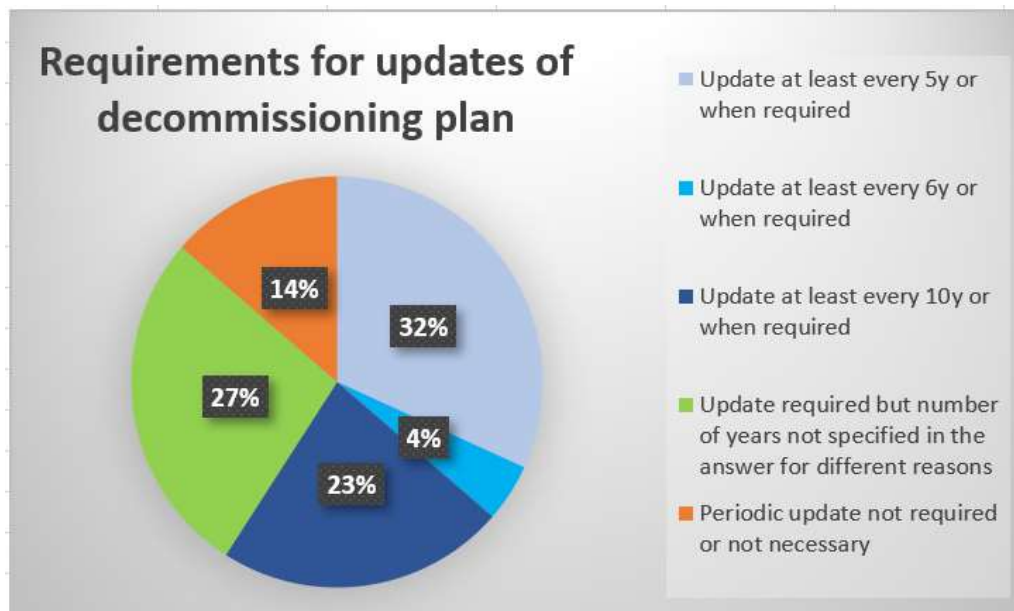


Figure 3: Requirements for updates of decommissioning plans

On the plans' content, most of the countries indicated that they set out formal requirements providing this information.

Half of the respondents described in detail the list of contents required for this initial decommissioning plan, while all of them provided a detailed answer to the question regarding the preparation and contents of the overarching plan and the detailed plans.

Approaches to planning for decommissioning at the end the operations of a nuclear installation may be grouped in three, although minor differentiation might still be noted:

1. Setting of an overarching decommissioning plan followed by detailed plans
2. Setting of an overarching plan with sufficient details
3. Phased detailed planning

In the first case (some examples are Denmark, Italy, Lithuania or Sweden) the licensee is required to submit an overarching plan (also 'final' or 'overall' plan) to obtain a general license for decommissioning. The individual permits are issued for actual decommissioning activities specified in detailed plans (also called 'work packages').

In the second case (e.g. Austria, Belgium, Finland, France, Hungary or Slovenia), the licensee is required to submit a plan (named often 'final' plan) with sufficient details to obtain an authorization to carry out the decommissioning activities.

In the third case (e.g. Bulgaria or Slovakia) the licensee may submit a decommissioning plan with sufficient details to cover a phase of the process. Generally, the plan must provide general information on the overall process until the end state of the installation.

Czech Republic refers to a mixed approach, where both options are possible: large decommissioning projects require a phased detailed planning, while less complex projects are based on an overarching licence.

Where requirements are set out for the content of initial decommissioning plans, other requirements (typically more detailed) are set for the overarching and detailed decommissioning plans.

While the scope of plans appears overlapping in all countries, it is difficult to make a direct comparison of the answers.

#### IV. End of operation and transitional phase

A transitional period can take place between the operational stage and the decommissioning of the facility. In this period there may be a need for conducting operations (e.g., removal of fuel, post-operational cleanout, etc.) in preparation for the actual dismantling works. This may serve to bring the facility in a state which enables a safe decommissioning process.

The respondents were asked to describe their legal and regulatory framework for the transition from operation to decommissioning with respect to activities required or allowed to be performed under an operating license; activities defining the end of operations under the operating license; requirements for a separate license for a transitional period; time limits for completion of the operational or transitional activities; and requirements for the state of a facility before start of decommissioning.

The answers can be described in two sets, namely the sixteen countries with nuclear power generation and the six non-nuclear countries that answered to the questionnaire.

Among countries having nuclear power generation, four models can be described:

- The most reported situation is that during the transition period the operating license remains in force. Operations performed during this period aiming to prepare decommissioning should not result in a significant modification to the facility or its authorized operating conditions, i.e., such modifications can only be minor or non-significant. France, Germany, Belgium, Italy, The Netherlands and Romania apply this principle strictly and report that any decommissioning activity that is not expressly covered by the operating license will require decommissioning license. Other countries applying this principle are Lithuania, Slovakia<sup>2</sup> or Sweden.
- In a second set of countries (Finland, Spain) activities aiming to prepare for decommissioning after final shut-down can be performed both under the operating license (e.g. the removal of the fuel from the reactor pools) or under the decommissioning license.
- In other countries, activities performed during this transition period require a specific license which is different from the (general) operating license. This is the case in Hungary or Slovenia. In Bulgaria<sup>3</sup>, a license for storage of spent fuel is needed after final shutdown of a nuclear power plant.
- In the UK the same site licence can remain in place from the start of installation, throughout operations and until decommissioning is complete.

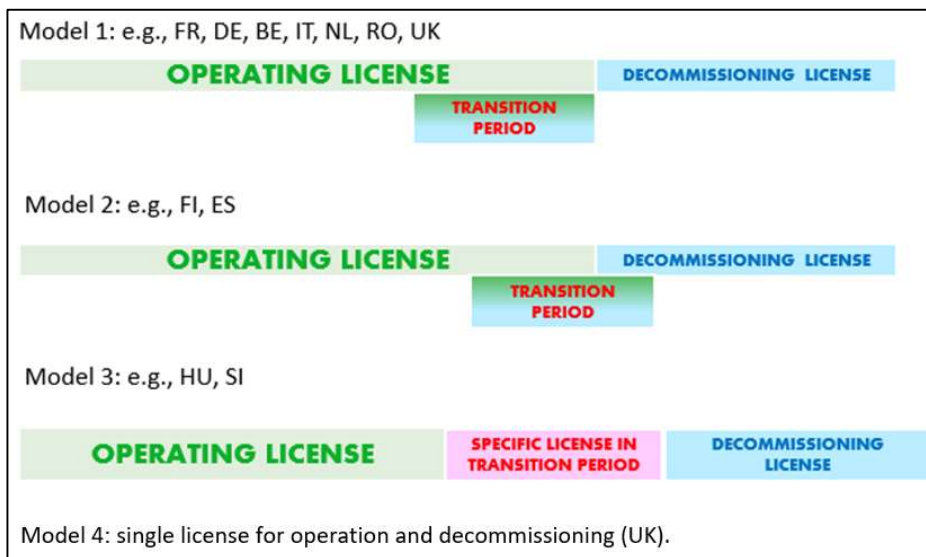


Figure 4: Different models for transition period

<sup>2</sup> For Slovakia: in an amendment to the Atomic Act, a proposal has been done to bring the requirements for all activities performed during this transitional period under a separate section of the law.

<sup>3</sup> In Bulgaria, this license entitles the license holder to remove completely the nuclear fuel from the reactor and to use the facilities of the site for storage. With this purpose, the license holder can request to the Council of Ministers a decision to declare that a radioactive waste management facility shall operate in the site of the former nuclear power plant, for which it will need its own license for operation (now as waste management facility), eventually undergoing environmental impact assessment.



All six respondents without nuclear power generation (Austria, Denmark, Greece, Latvia, Portugal and Poland) explain that their legal and regulatory frameworks do not set out specific requirements for end of operation and transitional period. The Austrian and Greek responses refer to the fact that a decommissioning concept or plan needs to be submitted as part of the application of the operating license.

#### V. Overarching license and specific approvals

Licensing for decommissioning may include an “overarching license” for decommissioning, referring to the overall decommissioning plan and outlining the general limits and conditions for the decommissioning project as a whole. The conduct of specific dismantling tasks (e.g. removal of peripheral systems, removal of biological shielding, reactor internals etc.) may require further licensing or approval. A question was made to the respondents to describe their legal and regulatory framework for licensing or approval for decommissioning with respect to the requirements for, and contents of, two types of licenses: the overarching license and the individual licenses or approvals for specific dismantling tasks.

Regarding the existence and contents of an overarching license:

- Most countries who responded to the survey require an overarching license for decommissioning, i.e. 68% of the respondents, ten of them being nuclear power countries: Austria, Belgium, Denmark, Finland, France, Germany, Hungary, Italy, Spain, The Netherlands, Lithuania, Bulgaria, Greece, Latvia, Poland.
- Slovenia, Sweden and the United Kingdom (14% of the group) employ a life-cycle approach to licensing, which means in practical terms that the overarching decommissioning approval (for which other names may be used, such as ‘decommissioning program’) is part of the application for site license (UK), construction (Slovenia) or operation (Sweden) of the facility.
- Portugal, Romania and Slovakia (14%) do not require an overarching license for decommissioning.
- Czech Republic applies a mixed approach, as already noted.

The contents of this overarching license may be determined by legal requirements and may be further specified based on the contents of decommissioning plans and associated safety assessments/reports as well as pre-identified safety significant (dismantling) tasks.

In respect of individual licenses or approvals for specific dismantling tasks:

- Most countries which require an overarching license for decommissioning do not require licensing for specific dismantling tasks; however, they often impose a regulatory approval of such tasks (Austria, Belgium, Denmark, Finland, France, Germany, Hungary, Italy, Spain, The Netherlands). Lithuania specifies that separate permissions for specific dismantling tasks may also be required, besides the overarching license.  
The contents of such licenses are specified in legislation. Bulgaria, Greece, Latvia and Poland do not specify particular requirements for licensing or approval of specific dismantling tasks.
- Countries which do not require an overarching license for decommissioning (Portugal, Slovakia and Romania) specify requirements for licensing of individual tasks or pre-specified phases of decommissioning. License contents may be determined by legal

provisions and may be further specified based on the contents of decommissioning plans and associated safety assessments.

- Among the countries that have adopted a lifecycle approach (Slovenia, Sweden and the United Kingdom), separate licenses for individual dismantling tasks are not required. Nevertheless, in Sweden a notification may be required concerning specific work packages, as specified in (additions to) licensing conditions. In the UK, where appropriate, regulatory consent to commence particular decommissioning activities may be required through a process of release of regulatory hold points imposed under the license conditions or within the licensee's arrangements.

## VI. Completion of works: time limits and causes for delay

Delays in implementation or completion of decommissioning can arise for many reasons: the licensing process, tendering procedures, changes of strategies, unexpected findings, interdependencies among onsite multiple units, lack of disposal facilities, etc.

In first instance, the respondents were asked whether the decommissioning authorization in their regimes foresees a time limit for completion of the works.

Among the 16 nuclear power countries responding to the questionnaire, only Bulgaria has a fixed time period of 10 years to complete the decommissioning activities. If the operator fails to perform the activities within this specified period, a new application must be done for extension of the license.

The Spanish response refers that there no legal or regulatory requirement establishing a time limit for completion of works; however, the Spanish national program foresees an estimate of 10 years for planning purposes.

All the other countries have no limits specified in the regulation. The time period estimate is usually specified in the final decommissioning plan and/or authorization for decommissioning.

Slovenia and Czech Republic mention their lack of experience with decommissioning licenses.

As regards the six non-nuclear power countries having provided responses to the questionnaire, no fixed period is set in their legal and regulatory framework, being this timeline generally indicated in their decommissioning plan and/or authorization. Two countries referred to nuances in this respect: Latvia fixes a period of 10 years in their regulation; however, if this period is insufficient, a new license can be issued. Denmark has issued a Parliamentary Resolution for the particular case of the Risø site establishing a period of maximum 20 years.

When they were asked about the major causes for delays in the implementation of decommissioning, 27% of the respondents noted that they could not identify any issue mainly due to lack of experiences (Slovenia, Belgium, Czech Republic, Finland and Portugal).

The issues generally identified are:

- Lack or insufficient funding
- Unexpected findings, mainly related to lack of information
- Lack of infrastructures, including radioactive waste management facilities (treatment, storage, disposal)
- Lack of experience and/or specialists
- Subcontractor management

- Lack of regulatory resources
- Elaboration of licensing documentation and safety demonstration

The following graph shows the distribution of the different issues identified by the survey:



## VII. End of decommissioning and release from regulatory control

Upon completion of decommissioning, achievement of the decommissioning goals should be documented and eventually approved by the regulatory authority. Depending on the desired end state of decommissioning, the process for release of the facility (or site) from regulatory control may be integrated in the decommissioning process or may take place in a separate process.

The respondents were asked to describe their legal and regulatory framework for decommissioning and release from regulatory control with respect to the requirements for documentation and approval of achievement of the end state or for compliance of criteria for release.

In general, the achievement of the completion of decommissioning overlaps with the release of the areas and buildings from regulatory control. Its approval by one or more regulatory bodies is requested by law or by the decommissioning license itself.

All the countries answered that the achievement of the end state must be demonstrated through documentation submitted to the regulatory body. The regulatory body shall approve it in the framework of the process for the release of areas and buildings from regulatory control.

All countries reported that the radiological status of the areas and buildings demonstrating the achievement of the end status is present in the documentation to be submitted to the regulatory body.

Some countries reported on their limits for final release without regulatory control:

- In Bulgaria, the dose limitation may not exceed 300  $\mu\text{Sv/y}$  above the local natural radiation background. Measures for optimization should be taken to reduce the dose below the dose limit. (Limits with regulatory control allowed below 1mSv/y).
- In Belgium, Denmark, Germany and Italy, a dose limit or a dose constraint of 10  $\mu\text{Sv/y}$  is applied.
- Sweden refers to a maximum individual dose to any member of the general public below 100  $\mu\text{Sv/yr}$
- United Kingdom pursues the achievement of the “no danger” criterion (a demonstration that any residual radioactivity, above background radioactivity, which remains on the site, which may or may not have arisen from licensable activities, will lead to a risk of death to an individual using the site for any reasonably foreseeable purpose, of no greater than 1 in a million per year)
- In Romania, the maximum limit of the effective dose may not exceed 0.25 mSv/year above the natural background for a representative person.
- Slovakia refers to the value of 20  $\mu\text{Sv/yr}$  to a representative person.

For most of the respondents (68%), the final state to be achieved is defined in their national law or regulation (e.g., Italy, Latvia and The Netherlands), or in the decommissioning license (Austria, Belgium, Denmark, France, Hungary, Lithuania, Romania, Slovakia, Spain, Sweden, United Kingdom).

In 50% of the countries, the release from regulatory control can be achieved by issuing restrictions on the use of areas and buildings (Austria, Belgium, Bulgaria, France, Latvia, Lithuania, Poland, Romania, Spain, Sweden and The Netherlands). In Denmark and Italy, the release of the areas and buildings can be achieved only by radiological unconditional release.

The percentage is even higher (63%) of countries where the process for the termination of the license is integrated in the decommissioning process (Austria, Bulgaria, Belgium, Germany, Greece, Hungary, Lithuania, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, The Netherlands). By contrast, in Finland, France, Denmark, Italy and the United Kingdom (23%) a separate process is envisaged.

Portugal answered that legislative and regulatory framework for nuclear safety had significant changes in recent years and that a comprehensive national policy and strategy for radioactive waste, spent fuel and decommissioning has yet to be established.

Germany and Austria reported that the maintaining of the documentation after release of the sites must be maintained for 30 years and 7 years respectively. Bulgaria, Czech Republic and Romania reported that documentation keeping is foreseen in national regulatory framework without indicating the period of time. In the Slovak Republic, documentation must be available for at least 10 years, after which it proceeds to the National Archives. It is archived for 30 years. A second question was done regarding the limitations in time (if any) between the end of decommissioning and release from regulatory control.

In most of the countries the legislation does not provide limitations in the time between the end of decommissioning and release from regulatory control.

In France, the decision for delicensing must be issued in a one-year period after the delicensing file is submitted, which can be extended to one more year by the Minister responsible for nuclear safety.

In The Netherlands, the decision to revoke a decommissioning license must be taken within six months from the application.

The United Kingdom reports that no limitations in time are applied, but there could be a period of monitoring/control/quiescence. Such period should not be longer than 300 years.

### Final remarks

Overall, the countries address the same aspects related to regulatory approaches to decommissioning. In greater detail, the answers received to the questionnaire reveal differences in the regulation of decommissioning activities across Europe, which seem to reflect the influence of historical as well as more recent political national circumstances in each MS.

At the level of determination of strategies, some countries opt for a uniform approach, while others accept exceptions to a general principle or handle each decision on a case-by-case basis. Some countries' needs are determined by a single facility (e.g., countries with one research reactor to dismantle).

The different types of authorizations needed reflects one of the more striking aspects in the response to this questionnaire. Although all MS clearly recognize the different stages of works needed in decommissioning activities, they distribute these works under different labels: in particular, the distinction between operating and decommissioning licenses is country-specific, with a variety of situations described. Some other notable differences are the following:

- Level of “freedom” of the operator to decide on the strategy for decommissioning and on the specific steps of the decommissioning works
- Deadlines assigned to the license holder of decommissioning activities to perform its tasks
- Administrative deadlines for the authorities to adopt their decisions
- Number of licenses or other authorizations involved.

The transitional period is key to determine the assumption of responsibilities among the license holder for operation of the NPP, and the one in charge of decommissioning the facility. The question whether the transitional period should be part of an operational or decommissioning license, or even constitute a separate license, can become very relevant, not only for posing important differences in terms of safety at licensing, but also for financial estimates and distribution of costs. On the other hand, in countries where the license holder during the operation of the NPP is also the legal entity entrusted to decommission the facility, the transitional period may be also a critical time during which the license holder faces the challenge of adapting to the changing nature of activities from operation to decommissioning.

The responses to the questionnaire seem to reflect that the major causes for delays in the implementation of decommissioning mostly relate to some of the (project) risks that are also internationally recognized for decommissioning projects.

Concerning completion of decommissioning and release of sites from regulatory control, all countries report on well defined criteria for approval of release, while showing some spread

between countries concerning regulatory procedures related to completion of decommissioning and final release from regulatory control, and hence the time between these final stages.

Overall, the outcome of the survey does not point towards any overarching and common issues in either the regulatory domain or concerning the implementation of decommissioning, which seem to warrant additional considerations towards a harmonized approach. Nonetheless, the survey has demonstrated the usefulness of collecting and sharing experiences for present as well as future reference.