Western European

WENRA

Nuclear Regulator's Association

# Progress towards harmonisation of safety for existing reactors in WENRA countries

Study by

WENRA Reactor Harmonization Working Group

January 2011

RHWG

Reactor Harmonization Working Group

# Table of content

**I INTRODUCTION ..... 3**

**II OBJECTIVE AND CONTENT ..... 4**

**III EUROPEAN OVERVIEW ..... 5**

**III.1 EUROPEAN OVERVIEW: REGULATORY SIDE ..... 5**

**III.2 EUROPEAN OVERVIEW: IMPLEMENTATION SIDE ..... 5**

**III.3 LESSONS LEARNED ..... 6**

**IV CONCLUSION ..... 7**

**Appendix 1: summary of national status towards harmonisation**
**Appendix 2: update of the national requirements to take into account the RLs**
**Appendix 3: implementation of the RLs on the nuclear power plants**

# I INTRODUCTION

One of the aims of the Western European Nuclear Regulators' Association (WENRA) is to develop a harmonized approach to nuclear safety and regulations[1].

To achieve this objective as far as power reactors are concerned, the Reactor Harmonization Working Group (RHWG) was set up. Following a pilot study, the RHWG performed, from 2003 to 2006, a study on the harmonisation of reactor safety in WENRA countries, addressing nuclear power reactors that were in operation in 2006. Harmonisation matters for new projects were not in the scope of this study, they are now being addressed in a separate study.[2]

The following definition for harmonization was used: "*No substantial differences between countries from the safety point of view in generic, formally issued, national safety requirements, and in their resulting implementation on nuclear power plants*".

The safety areas and issues included in the study were selected to cover important aspects of reactor safety where differences in substance between WENRA countries might be expected. They did not seek to cover all topics that could have an impact upon safety or to judge the overall level of safety in existing plants.

A methodology was developed in five main steps:

1. A set of Reference Levels (RLs) identifying the main relevant requirements on reactor safety was developed for 18 safety issues. These Reference Levels were primarily based on IAEA safety standards;
2. Countries assessed themselves against the Reference Levels on both the legal and implementation side and documented their national position;
3. The national positions were scrutinized in peer review panel sessions to validate the self-assessments;
4. Where judged necessary, changes were made to national assessments and, in some cases, Reference Levels were modified;
5. Areas where harmonization was considered necessary on the implementation and/or legal side in each country were identified.

As part of step 2, national self-assessments against the set of RLs were performed. The purpose of these self-assessments was, for each RL, to answer two questions:

i. Is there an equivalent national requirement[3] that meets the substance of the RL?
ii. Have all operating nuclear power plants in the country implemented the RL?

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[1] WENRA terms of reference (26 March 2010)

[2] Safety Objectives for New Power Reactors – Study by WENRA RHWG – December 2009

[3] A national requirement is to be understood as a documented statement in an official, open document/publication that is part of the legal regulatory system and has been formally issued. These requirements are of two types, both of which provide a basis for regulators to exercise their powers and duties, but at different levels:

- a legally binding requirement, such as a law, ordinance or regulation that is mandated and enforced, if necessary with the use of legal sanctions. These requirements are issued by the parliament, government, or regulatory body as authorized; and
- a general recommendation (rule, condition, guideline, principle, standard, etc) that the regulatory body issues formally with reference to a legally binding document, decision, permission, or other formal authorization. These are not legally binding and enforced like regulations; however, they are used for granting licences and regulating licensees' activities.

There were three possible coded results for each question[4] :

A: Yes – already harmonized in substance;

B: No – a difference exists, but can be justified from a safety point of view; or

C: No – a difference exists, and should be addressed for harmonization.

Reference levels codified as 'C' form the basis of national action plans.

The methodology and results of the study are presented in a report published by WENRA in January 2006 "Harmonization of Reactor Safety in WENRA Countries"[5]. The results of the study were also presented during a seminar in Brussels in February 2006. It appeared that the majority of the RLs are implemented in nuclear power plants in WENRA countries, but that a significant amount of work had to be done to align the national requirements with the Reference Levels.

Stakeholders were invited by WENRA to provide comments on this report[6]. The comments received affected each of the 18 safety issues. As a result, the RLs were updated in March 2007. The RLs were again updated in January 2008[7], mainly to take into account the publication of the IAEA document GS-R-3[8]. This constitutes today the latest revision of the RLs.

On the basis of the above described self-assessment validated by the peer review panel sessions, each country set up a national action plan to reach a harmonized situation by 2010, which was made public. WENRA monitored progress with national action plans on an annual basis.

## II OBJECTIVE AND CONTENT

WENRA members committed themselves to reach a harmonised situation for existing nuclear power plants by the year of 2010, using as a minimum the RLs. The aim of this document is to report progress on this way and on the further steps envisaged to fully achieve this commitment.

Sections III.1 and III.2 present an overview of the situation in WENRA countries regarding harmonization of safety of existing reactors as of September 2010 and a perspective for the near future on both the regulatory side – questions (i) – and the implementation side – questions (ii). However, it was not possible to compare directly the current situation with the situation in 2006. The reason for this is that the RLs have undergone substantial modification in 2007 and 2008. For instance, issues E and F have been fully reconsidered in 2007 following stakeholders' comments and issue C has been largely modified in 2008 to take into account a new IAEA publication (GS-R-3).

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[4] It should be noted that an 'A' assessment could be achieved for implementation on NPPs, even when there were no formally issued, public, generic, national requirements.

[5] Report is available on WENRA web site at the following link : http://www.wenra.org/dynamaster/file_archive/060116/b8c660648ecc1fd66a0280b7d0ccd05b/RHWG%20Harmonization%20%20Report%20Final.pdf

[6] As a result of stakeholder consultation, WENRA received 177 specific comments on the reference levels and 65 comments of a more general nature. Most of the technical comments were received from the European Nuclear Installations Safety Standards Initiative (ENISS), a consortium of European nuclear utilities.

[7] Current reference levels for existing reactor are available on WENRA web site at the following link : http://www.wenra.org/dynamaster/file_archive/080121/1c826cfa42946d3a01f5ee027825eed6/List_of_reference_levels_January_2008.pdf

[8] The management system for facilities and activities, July 2006.

Section III.3 presents the lessons learned from the associated national regulatory efforts.

The current situation of each country is described in appendixes:

- appendix 1 summarizes the status of each country towards harmonisation;
- appendix 2 deals with update of the national requirements to take into account the RLs;
- appendix 3 deals with the implementation of the RLs on the nuclear power plants.

# III EUROPEAN OVERVIEW

## III.1 European overview: regulatory side

In 2006, across WENRA countries, approximately only half of the RLs were formally required in the various national requirements ('A' code). The conclusion of the review was that there was a need for a significant number of additional, formally issued, generic national requirements or recommendations.

Since 2006, each country has made a great effort to develop or revise national requirements in order to fill the gap on the regulatory side. In each country, the regulatory body has set up an action plan with specific projects to incorporate the RLs within the national regulatory framework. As this was not a "translation" process but more a "transposition" process, this required large efforts. In many countries, this transposition process lead to revisit existing regulations or to create a new set of regulations. Some countries also extended the applicability of relevant RLs to other nuclear installations.

All countries have reported significant progress in their action plans and although not completed in some cases, the aforementioned gap is now smaller. New or updated regulations as well as guidance documents have been published or draft documents are under review by stakeholders. In some countries however, it could take a few more years to finalise harmonisation on the regulatory side.

The development of national requirements is indeed a complicated process, involving stakeholders' consultation. According to national legal framework and practices, the final approval of the requirements may depend not only on the regulator but also on the national government or parliament. This introduces uncertainties on when the new requirements will come into force.

## III.2 European overview: implementation side

In 2006, it was concluded that the RLs were implemented to a large extent in all WENRA countries, even in the absence, in some cases, of corresponding legal requirements or formally issued recommendations. The reason for this was that, in many countries, the licensees would respond to expectations from the regulatory body even if they were not in legally binding documents or formally issued recommendations, or act on their own under their prime responsibility for safety.

In a majority of countries, the licensees were requested to perform self-assessments against the RLs. In several countries, the regulatory bodies also verify compliance with the RLs as part of their inspection and control process, sometimes through dedicated inspections.

The implementation of the reference levels has made progress in all countries since 2006. However, it will take some additional years for full implementation. For the few RLs not yet implemented:

- if these RLs are incorporated in legally binding documents, their implementation will be required by the end of the transitory period allowed by these documents (usually one to three years or less);
- if these RLs are incorporated in formally issued public recommendations, the licensees will have to justify either that they comply or that they have implemented equivalent safety provisions. In many cases, this is checked through the periodic safety review process.

## III.3 Lessons learned

This harmonisation project included establishment of common Reference Levels, benchmarking of national positions, setting up national action plans, and where necessary revising national requirements and implementing the Reference Levels on nuclear power plants. It has been a unique international voluntary effort and is a step towards harmonisation of nuclear safety in Europe. The study is also believed to be the most extensive joint international use of the IAEA safety standards.

This project has been possible due to:

- the commitment to harmonisation of each WENRA member;
- the human and technical involvement of each national regulatory body;
- the framework based on voluntary cooperation;
- the atmosphere of openness and mutual trust throughout the project.

The project has required much more resources and working time than foreseen at its beginning. Reasons for this are that the benchmarking process was a pioneering effort and that the revision of the regulations was a huge effort given the number of documents to develop or update.

Beyond the documents and reports produced as part of this project, RHWG meetings have enabled a greater understanding of the various national regulations and practices. They also were opportunities to discuss key safety issues. Additional benefits from the participants' point of view have been the building of a strong informal network.

The seminar held in 2006 at the institutional level has made possible a transparent dialogue with stakeholders, not least the European utilities. This dialogue has further improved the quality of the project. The utilities were receptive to the project and this encouraged them to increase the cooperation among them on the technical topics covered by the project. On a national basis, licensees sometimes anticipated future national requirements for example by modifying plant or operating practices.

Some reference levels have generated in-depth discussions about their interpretation, both at an international level during stakeholders' consultation and at a national level between regulators and licensees when drafting requirements or discussing implementation. Some clarifications have already been given and additional work on this topic is ongoing inside WENRA.

The working methodology which has been developed for this project has proven to be fit for purpose and could be used in other domains.

## IV CONCLUSION

Considerable progress has been made since 2006 towards the objective of harmonisation of reactor safety for existing nuclear power plants in WENRA countries. Some work is still going on, with clear steps to complete the action plans for harmonisation. Ensuring completion of national action plan is the responsibility of each national regulator. Each WENRA country will report publicly on it.

The project has already resulted in convergence of national requirements and in safety improvements on some nuclear power plants in WENRA countries.

There has already been discussion on the common understanding of some reference levels and it is now envisaged to further discuss the implementation of some reference level to ensure consistency between WENRA countries in the long term. It is also envisaged to revise the reference levels when necessary to keep them up to date with the state of the art in nuclear safety.

# Appendix 1

# Summary of national status towards harmonisation

| Country | Summary of national status |
|---|---|
| Belgium | The Federal Agency for Nuclear Control (the FANC), constitutes the Belgian Safety Authority. The FANC ensures the overall supervision of all civil nuclear activities in Belgium. The Regulatory body is constituted by the FANC and by Bel V, the technical subsidiary body of the FANC.<br><br>In order to include the Reference Levels into the Belgian regulation which was mainly addressing radioprotection issues, a regulatory project with high priority started from 2007 at the FANC. This project has been conducted in close collaboration with Bel V. It is worth to mention that this regulatory proposal will also transpose articles 6 and 7 (partially) of the European Directive on Nuclear Safety (2009/71/EURATOM) into the Belgian Regulation. It is expected that the final regulatory text could be submitted to the Government for approval early 2011 and will be published in the official journal mid 2011.<br><br>On the practical implementation side, a Consultative Committee composed of high level staff from the Regulatory body and from the operator has been set up for the formal follow-up of the action plan proposed by the operator to address the 35 RLs having been scored a "C" in the benchmarking exercise in 2006 . This committee performs a systematic review of the ongoing actions for each NPP. Formal closure of actions is proposed by the operator to the Regulatory body. The Regulatory Body, taking also into account the follow up performed by Bel V on the NPPs sites, approves the closure of the actions and acts this closure in the meeting report. At present (end 2010) 15 actions have been declared closed. A few actions that require the highest manpower effort (on PSA and Fire protection) are expected to be completed end 2015. |
| Bulgaria | In Bulgaria the process of harmonization with the reference levels for reactor safety involves development and enforcement of new Nuclear Act, new regulations and new regulatory guides.<br><br>The Nuclear Act, the regulations as well as most of the regulatory guides included in the National Action Plan for Harmonization have been adopted and published by the end of 2010. The remaining two regulatory guides will be formally published in the beginning of 2011. |

| Country | Summary of national status |
|---|---|
| Czech Republic | In the 2006 harmonisation efforts started to harmonise Czech national nuclear legislation with the WENRA RLs. Results of the 2006 RHWG report identified that in comparison with Czech legislation there was certain level of inconsistency in 172 RLs (from 288). Based on the results of the RHWG report and in accordance with the agreements in WENRA the SUJB prepared and approved an Action plan in order to harmonize the legislation till 2010. The Action plan included amendment of Decree No. 195/1999 Coll., "on Basic Design Criteria for Nuclear Facilities with Respect to Nuclear Safety Radiation Protection and Emergency Preparedness". Selected parts of WENRA reference levels were planned to be harmonized till the year 2010 by issuing new or updated Regulatory Safety Guides. This is possible because general harmonisation plan includes important change in hierarchy of Czech legislative documents by lifting up the level of Regulatory Safety Guides by publishing them in official Journal.<br><br>The amendment of Decree No. 195/1999 Coll., "on Basic Design Criteria for Nuclear Facilities with Respect to Nuclear Safety Radiation Protection and Emergency Preparedness" was prepared and submitted to stakeholder consultation. This consultation is now close to its end. Five new SUJB Safety Guides have been published, five SUJB Safety Guides are under consultation/decision making process, and six SUJB Safety Guides are drafted or under revision for updating. |
| Finland | The Finnish nuclear energy legislation was revised in 2008. All nuclear safety regulatory guides, YVL Guides, are at the moment under revision. STUK has set an internal time schedule for this revision effort in such a way that all guides will be prepared at least to the level of a final draft before the end of 2010 and, that all new guides will be published before the end of 2011. This overall reform of the YVL Guides is progressing essentially according to the schedule. All WENRA reference levels will be included in the new YVL Guides practically as such. With these measures Finland fulfills the WENRA commitment with regard to harmonisation of safety regulations.<br><br>On the implementation side, all WENRA reference levels are currently implemented at the Finnish nuclear power plants. |

| Country | Summary of national status |
|---|---|
| France | The action plan established by ASN at the end of 2005 to incorporate the remaining WENRA RLs into French regulatory framework was significantly modified following the publication of a new act (the act of 13 June 2006 on transparency and security in the nuclear field, referred to as the "TSN act") and one of its associated implementation decree (Decree No. 2007-1557 dated November 2, 2007) as well as the ASN change of status (ASN became an independent administrative authority).<br>In addition to the already published TSN Act and November 2007 decree, the current roadmap to transpose WENRA RLs consists in ASN publishing or having published:<br>▪ one ministerial order stating the overarching provisions for nuclear installations;<br>▪ 10 ASN decisions and one ASN guide.<br>At the end of 2010:<br>▪ all but one (dealing with pressurized equipments and updating an existing ministerial order) drafts have been written. However, two are still under ASN in-house review process;<br>▪ the draft ministerial order, six draft ASN decisions and one draft ASN guide have been submitted to stakeholder comments (and are available on ASN's web site). New versions are being prepared taking into account comments received;<br>▪ one ASN decision is going to be sent out for stakeholder comments in the first weeks of 2011 and a second one by the end of the first half of 2011.<br>As a result, ASN is expecting to have all these regulations published in 2011 once the ministerial order has been signed by the Government.<br>At the beginning of 2006, although few formal regulations were set to govern the design and operation of French nuclear power plants, most of the RLs were actually implemented. Among the roughly 300 RLs, about 15 needed improvements on their implementation.<br>Mid 2007, EDF completed a self-assessment on the implementation of WENRA RLs. Mid-2010, at ASN's request, EDF completed a second self-assessment. Overall, compared to 2006, implementation of WENRA RLs for existing reactors has improved in France but is still not yet fully completed. The full implementation of all RLs is linked to the updating of the regulations and the transitory measures they will provide. |

| Country | Summary of national status |
|---|---|
| Germany | The applicable national higher-level nuclear rules and regulations in Germany date back to the 1970s and 1980s. Since 2006 several actions were performed to overcome the deficiencies in the 2006 national action plan with 90 "C" assessments and to implement the WENRA RL into national regulation. These actions include an updating of existing ordinances, the development of a new ordinance and mainly the development of new, modular regulations. The WENRA reference level have been systematically considered in that process.<br><br>With the new Safety Criteria for Nuclear Power Plants, the draft of a new higher-level nuclear rules and regulations is now available. The Federal Ministry for the Environment published the draft of the new "Safety Criteria for Nuclear Power Plants - Revision D, of April 2009" on the Internet.<br><br>The Federal Ministry for the Environment and the Länder of Baden-Wuerttemberg, Bavaria, Hesse, Lower Saxony and Schleswig-Holstein have agreed upon a comprehensive consultation procedure as a test phase for the new Safety Criteria. On this basis of practical experience gained from testing, the Federation and the Länder jointly review the rules and regulations by mid-2011. The Federation and the Länder are striving for a unanimous adoption of the nuclear rules and regulations. Publication by the Federal Ministry for the Environment in the Federal Gazette will not take place before the end of the procedure.<br><br>Regarding the implementation of the reference levels 28 "C" assessments had to be considered. Nearly all, except of two reference level (SAMG and PSA for plant modification) have been implemented in the meanwhile in the German NPP. |
| Hungary | In accordance with the Atomic Act the Regulations shall be reviewed and updated as needed at least once in every five years on the basis of scientific achievements as well as domestic and international experience in Hungary. The latest review aimed – among others – at improving and harmonizing the Regulation based on the Reference levels. The technical review was finished at the end of 2009. Now, the draft of the new set of Regulations is under administrative collation. After the issuance of the new Governmental Decree on the Nuclear Safety Requirements of Nuclear Facilities and Related Regulatory Activities (expected in 2011) Hungary fulfils the WENRA commitment on harmonization of nuclear safety.<br><br>On the implementation side, in accordance with the national action plan several tasks have been completed. Due to these activities 13 Reference Levels out of 37 have been implemented. For all other Reference Levels (24), the actions are on-going in line with the action plan. Typically they are related to the LM (Emergency Operating Procedures and Severe Accident Management Guidelines) and O (Probabilistic Safety Analysis) issues. The subtasks of action plan related to the Severe Accident Management Guidelines (SAMG) will be performed unit by unit. In the case of Unit 1 the activities will be completed by the end of 2011. All SAMG activities will be finished by the end of 2014. The actions related to the Probabilistic Safety Analysis will be also finalized by the end of 2014. |

| Country | Summary of national status |
|---|---|
| Italy | The action plan that was defined in 2006 took strictly into account the fact that Italian NPPs (Garigliano - BWR, Latina-Magnox, Trino-PWR and Caorso-BWR) were no longer in operation since many years ago.<br><br>At present they still are, at different stages, in the process of being decommissioned. The main activities that are conducted on the sites are related to waste management (conditioning and site storage), fuel removal - for the NPPs still having fuel in the pools (Trino and Caorso) - as well as dismantling. Taking this specific situation into account, the national action plan for harmonization to the WENRA Reactor Safety Reference Levels was prepared considering only those reference levels that were relevant for the above activities, with the additional intent to wait in order to coordinate such actions with those required in the Action Plan for the harmonization to the waste storage and decommissioning reference levels, which unfortunately are still not in the final issue. In this light, attention was therefore basically addressed to management, organizational, quality and fire protection issues. Other issues are considered not to be a national priority for the time being. They will be reconsidered when concrete development steps toward the construction of new plants will be performed. |
| Lithuania | In Lithuania the process of harmonization with the reference levels for reactor safety involves development and enforcement of new regulations and updating of existing ones. As a result 73 (out of 120) RL's were incorporated into national requirements, 24 RL's are included in to the three new draft regulations, which are still in the stage of approval. Above regulations will be applied to the new build rather than for existing Ignalina NPP.<br><br>By the end of September 2010 Ignalina NPP is in permanent shutdown stage. During the last years of operation 52 out of foreseen 75 RLs levels were implemented. Due to shutdown of Ignalina NPP the remaining RLs are agreed not to be implemented.<br><br>It is planned to take into account WENRA RLs in to regulations devoted to new build as it is relevant. |
| The Netherlands | The present system of regulations is based on IAEA safety standards from the '80 and '90. Since the existing power plant has got the opportunity to be operated until the end of 2033, a revision has been drafted of nuclear safety regulation. It covers the following areas: design, operation and quality assurance. The revision is based on the latest versions of the IAEA safety standards including requirement documents and safety guides. The documents will be called again Nuclear Safety Rules ('Nucleaire Veilgheidsregels', NVR's) and contain adaptations to cover all WENRA RL's and national needs. The documents have been discussed over the last year with the stakeholders. The documents are ready for submission to licensee, which can be expected early 2011. The complete list of new NVR titles can be found in the Dutch report to the 5th Convention on Nuclear Safety.<br><br>The licensee has implemented on a voluntarily basis the latest IAEA safety standards ahead of national regulations. For that reason the implementation of the WENRA RL's was not a great task and was completed in 2009. |

| Country | Summary of national status |
|---|---|
| Romania | The WENRA Reactor Safety Reference Levels have been incorporated into the Romanian regulatory framework through the following regulations:<br>- Requirements on Fire Protection in Nuclear Power Plants (2006) – incorporating RLs in Issue S;<br>- Requirements on Periodic Safety Review for nuclear power plants (2006) – incorporating RLs in Issue P;<br>- Requirements on Probabilistic Safety Assessment for nuclear power plants (2006) – incorporating RLs in Issue O;<br>- Nuclear Safety Requirements on the Design of Nuclear Power Plants (2010) – incorporating RLs in Issues E, F, G & N;<br><br>The revision of the set of 13 regulations on quality management systems, covering activities related to all the phases of the lifetime of nuclear installations, started in 2007, takes account of the latest IAEA Requirements and Guides on Management Systems (GS-R-3, GS-G-3.1 and GS-G-3.5). The external consultation process for the new regulations has been finalised and they are due to be published in the first half of 2011. These new regulations cover all reference levels in Issue C;<br><br>A regulation on commissioning and operation of NPPs is currently under drafting and will incorporate the remaining RLs. The intention is to have it published before the end of 2011.<br><br>The compliance with the requirements in the reference levels is currently re-assessed by the licensee as part of the periodic safety review that is ongoing. This assessment has been required by CNCAN. The assessment of the licensee's implementation of the RLs has been assessed by CNCAN in support of the benchmarking performed within RHWG in 2005 and also as part of the assessment of the implementation of the regulations issued. |

| Country | Summary of national status |
|---|---|
| Slovakia | Based on the national benchmarking there were 85 RLs to be harmonized in total.<br>National action plan for WENRA RLs implementation counted on a "one-step" approach, i.e. all RLs to be harmonized would be implemented into various levels of national legal documents (atomic act, decrees and safety guides) at once and the set of new revisions would be sent for official approval process as a batch.<br>This "one-step" approach had been followed since 2007, when intensive works on the revision of the atomic act and decrees were launched. In May 2010 the final draft of these documents were finalized and sent for comments to other state ministries and authorities according to Slovak national legal procedure.<br>Part of the RLs was incorporated directly in the Atomic act and the rest of these were incorporated into the seven existing decrees.<br>The new revision of the Atomic Act has been sent for official legal approval process within the country in August 2010. The new revisions of the seven regulations are finalised and are expected to be sent for official legal process in the end of September 2010.<br>The official approval process of both atomic act as well as of the set of regulations is expected to be finished by the end of 2011.<br>By amendment of the Atomic Act and the above-mentioned list of regulations all of the RLs will be incorporated into the Slovak legislation. |
| Slovenia | The renovation of the national legal system after adopting the "2002 Act" went on by issuing the number of regulations. These regulations cover all WENRA Reference Levels, except Reference level D – Training. The new, updated version of Regulation JV4 are now going through the process of adoption. Practically all WENRA requirements are included in the domestic safety regulation which is on power and in use. The 5 requirements from the domain of Training (WENRA Ref. Level D) will be incorporated in the appropriate regulation during the year 2011.<br>During the period 2006-20010 improvements have been achieved in WENRA requirements implementation in Krško NPP. Open issues allocated during the benchmark exercise have been implemented almost completely.<br>Implementation is not confirmed yet for issues related to plant staff, (sufficiency and changes assessment, long term planning, management and supervision of contractors work), quality management system (QMS) (role in organizational changes and way of implementation of QMS), SAR update with relevant decommissioning data and PSA use to assess significance of operational occurrences.<br>Entire implementation of these WENRA reference levels will be confirmed during the year 2011. |

| Country | Summary of national status |
|---|---|
| Spain | After the identification of the specific needs for national harmonization in 2006, the Spanish Nuclear Safety Council (CSN) has strengthened with the maximum priority the development of technical standards, regulations, safety guides and instructions, in accordance with the Action Plan for the harmonization in WENRA. As part of the regulatory efforts in the field of nuclear safety, within the framework of the mentioned action plan, the CSN has issued ten CSN Safety Instructions, three more will be published soon after the consultation/decision making process, two additional instructions are in drafting phase, and other one is being reviewed; CSN Safety Guides have been also reviewed or issued. These works, which are scheduled to finish at the beginning of the year 2011, fulfill the commitments of Spain with regard to harmonization of nuclear safety for existing reactors in Europe. |
| Sweden | Sweden is not fully able to satisfy the WENRA agreement to align the national safety requirements with all the reference levels by the end of 2010. This has mostly to do with circumstances outside the control of the Swedish Radiation Safety Authority, such as change of plans caused by the merger of SKI and SSI, and phasing in to legal changes. However, it can also be concluded that rather few gaps remain to be handled. After the final benchmarks in 2007, 46 gaps remained on the legal side. 34 of these will be closed through an ongoing revision of the safety regulations for nuclear installations (SSMFS 2008:1). This revision is planned to be finalised in 2011.<br><br>The remaining 12 gaps on the legal side (regarding issues E, K and S) will be dealt with in a foreseen revision 2012 of SSM´s regulations on design and construction of power reactors (SSMFS 2008:17). This revision is depending on consultations with other Swedish authorities and some ongoing technical investigations of the bases for making some other changes to these regulations. In addition, SSM will have to decide whether to update SSMFS 2008:17 to apply also on new reactors, after a recent change of the Act on Nuclear Activities effective from 1 January 2011.<br><br>On the implementation side eleven gaps remain, related mostly to analysis of certain events and conditions. These are all addressed in the ongoing modernization programs of the NPPs. The final measures were planned to be completed 2013. There is a possibility that single measures in the design extension envelope (issue F) will be completed for all reactors 2015. |

| Country | Summary of national status |
|---|---|
| Switzerland | In Switzerland, the legislation for the use of nuclear energy and on radiological protection is enacted exclusively at the federal (national) level. The main provisions for authorisations and regulation, supervision and inspections are established in the Nuclear Energy Act and the Radiological Protection Act. The legal rules and principles are put in concrete terms in the Nuclear Energy Ordinance, Radiological Protection Ordinance and in about 10 further ordinances. The main basis for implementation and enforcement are the Guidelines of the Swiss Federal Nuclear Safety Inspectorate (ENSI).<br><br>In 2006, many WENRA reference levels were not covered by the Swiss regulation. At that time, the enactment of the new Nuclear Energy Act (2005) called for a "rewriting" of all ordinances and guidelines. This was a good opportunity to implement the WENRA reference levels.<br><br>Since 2005, 4 new or fundamentally revised ordinances applicable to NPPs have been enacted. Concerning the level of Guidelines the output of new regulations was even more extensive: 2 new ENSI-guidelines were published in 2007, 6 in 2008, 7 in 2009 and 5 in 2010. The process is still underway. Currently, about 80% of the reference levels are covered by the Swiss regulation. Main gaps are in issues E, H and N. Complete harmonization is expected by the end of 2011 (3 new guidelines).<br><br>Concerning implementation, almost all open points were resolved. Currently, 1 reference level (issue O) is still not implemented. The implementation process will be finished in 2011. |
| United Kingdom | In the UK the WENRA reactor safety reference levels (RLs) are considered to be fully incorporated into national requirements. Our technical assessment guides have been revised as necessary to incorporate information from the RLs as well as formally adopt the RLs as relevant good practice (meeting relevant good practice is required by law in the UK). The day-to-day use of these guides, together with sample inspections by the regulator and self assessment activities by the duty holders, give adequate confidence that the RLs are implemented, so far as is reasonably practicable, on operating nuclear power plants. Hence for operating nuclear power plants the UK has achieved WENRA's commitment "by the year 2010 to improve and harmonise our nuclear regulatory systems, using as a minimum the reference levels". |

# Appendix 2

# Update of the national requirments to take into account the RLs

| Country | BELGIUM |
|---|---|

***General presentation of the regulatory system***

The Federal Agency for Nuclear Control (the FANC), created by the law of 15 April 1994 constitutes the Safety Authority.

The FANC ensures the overall supervision of all civil nuclear activities in Belgium. The FANC reviews license applications and submits decisions to the King for granting licenses for the high risk facilities, or grant licences himself for low-risk facilities.

The regulatory body is constituted by the FANC and Bel V. Bel V was created in September 2007, as a subsidiary body of the FANC. According to the law of 22 December 2008, Bel V is given a mandate to perform regulatory missions that are legally delegated by the FANC. These missions include amongst others the systematic and periodic on-site inspections and the technical review of safety analysis performed by the Licensee in the frame of licence application or of modifications to the installations.

A nuclear safety control structure with 3 levels is in place : first by the licensee's Health Physics Department (HPD), then by Bel V which performs by delegation of the FANC a number of inspections and regulatory tasks, and finally by the Safety Authority (FANC).

The FANC in also charge of making proposals for updating the general regulations, transposing the relevant European directives, international treaties, etc. and of maintaining the internal coherence of the general regulations.

***Situation of the national regulations in 2006 with respect to the RLs***

Only a few issues were formally implemented into the Belgian Regulation. The existing nuclear regulation, is mainly targeted to radioprotections issues.

The Safety of nuclear installations was treated in the Safety report of the nuclear installation. The Safety report is a legally binding document for the Licensee, in the sense that the operating License (granted by the King) contains an obligation to conform to the provisions of the Safety report. Considering that the Safety report was not a general regulation adopted according the Belgian legislative mechanisms nor was a public document, the Safety report has not been considered as a legal text, and only a minority of the WENRA issues was considered as legally implemented in the Belgian regulation.

***Actions started to incorporate RLs in national regulations***

A FANC regulatory project with high priority started in 2007 and continued in 2008. This project has been conducted in close collaboration with Bel V.

As no other existing regulation dealt with Nuclear Safety, the WENRA issues were drafted in a regulation proposal with the same structure as the Reference Levels, which appeared on the base of analysis as being of a rather universal structure. .

End 2008, a first part of the text was ready and submitted for comments to the licensee. The second part of the text has been submitted mid 2009 to the licensee. The comments of the licensee were reviewed by the FANC and Bel V from mid 2009 and the text was amended when considered appropriate. Beginning 2010, the regulatory proposal was submitted to the Scientific Council, which is an independent advisory committee to the FANC.

As no similar regulation was available, the opportunity was taken to select some reference levels to be applicable to other facilities (mainly fuel cycle facilities and research reactors) and activities as

well. The regulatory proposal was finally structured in this sense, i.e. in two parts: A first part applicable to all fuel cycle facilities (including NPPs and final waste repositories) and a second part applicable only to the nuclear power plants.

It is worth to mention that this regulatory proposal will also transpose articles 6 and 7 of the new European Directive on Nuclear Safety (2009/71/EURATOM) into the Belgian Regulation.

***Status of the national regulations in September 2010 and envisaged further actions***

In July 2010, the regulatory proposal has been submitted for comments to the concerned official Belgian advisory bodies (like Health Council, Ministry of Labour,...), to the European Commission in the frame of Art. 33 EURATOM and to the concerned operators. Comments are awaited for end November, and it is expected that the final text could be submitted to the Government for approval by the end of 2010 or early 2011 and will be published in the official journal mid 2011.

Envisaged further actions :

Similar projects are on track in order to transpose the Reference levels developed by the WENRA Waste and Decommissioning Working Group. These projects will complete the proposed regulation in Nuclear Safety developed on the basis of the RHWG reference levels. Other regulatory projects related to final disposal of radioactive waste and, in the more far future, to other specific nuclear installations will complete this regulation.

| Country | BULGARIA |
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***General presentation of the regulatory system***

In the Republic of Bulgaria, the Parliament has the authority to adopt legislative acts, while the Government adopts the secondary legislation for implementation of the laws. The rules and regulations are promulgated by a governmental decree. Each governmental authority issues instructions or guidance to provide directions concerning the implementation of the legislation.

A process of revision and update of the national nuclear legislation took place in the past years, which resulted in adoption of a new **Act on the Safe Use of Nuclear Energy** (ASUNE) in 2002 and renewal of the secondary legislation on its application in 2004. Act on Amendment and Supplement to the Act on Safe Use of Nuclear Energy was promulgated on 12 October 2010.

The ASUNE is the basic legislative act in the use of nuclear energy. It stipulates the state regulation of the safe use of nuclear energy and ionizing radiation, and the safety of radioactive waste and spent fuel management. The responsibilities of the licensees for ensuring nuclear safety and radiation protection are specified there as well. According to the Act, the Nuclear Regulatory Agency (NRA) is the regulatory body for nuclear safety in Bulgaria. The NRA Chairman is an independent specialized authority of the executive power and is vested with competencies for state regulation of the safe use of nuclear energy and ionizing radiation, and the safety of radioactive waste management and spent fuel management.

The secondary legislation comprises 19 regulations on the application of the ASUNE requirements regarding the safety of nuclear power plants (NPPs) and the sources of ionizing radiation.

By the virtue of the regulations, the NRA Chairman is authorized to issue Regulatory Guides with reference to the legally binding requirements. To achieve a comprehensive regulatory framework, a Plan for Development of Guides on Implementation of the ASUNE Regulations had been established in 2005.

***Situation of the national regulations in 2006 with respect to the RLs***

Taking advantage of the process of renovation of the nuclear legislation, a significant part of the RLs (about 240) had been incorporated in the new regulations, specifically in the following ones:

- Regulation for providing the safety of nuclear power plants;
- Regulation for the procedure for issuing licenses and permits for safe use of nuclear energy;
- Regulation of the conditions and procedure for notification of the NRA about events in nuclear facilities and sites with sources of ionizing radiation;
- Regulation for emergency planning and emergency preparedness in case of nuclear and radiation accident;
- Regulation of the conditions and procedure for acquiring professional qualification and for the procedure for issuing licenses for specialized training and certificates for qualification for use of nuclear energy.

***Actions started to incorporate RLs in national regulations***

The RLs, which imply more detailed requirements or guidance, were planned to be considered in Regulatory Guides (RGs). The national Action plan composed in 2006 as a result of the benchmarking activity with the reactor harmonization RLs reflects these measures. Even though the system of RGs had undergone some changes since 2006, the differences of type "C" identified during the benchmarking process have been addressed in the developed guides.

| ***Status of the national regulations in September 2010 and envisaged further actions*** |
| --- |
| The following RGs have been developed to cover the identified differences:<br>- RG on deterministic safety analysis<br>- RG on the use of PSA in support of the plant safety management<br>- RG on protection against internal fires<br>- RG on NPP operation<br>- RG on management system for facilities and activities<br>The first three of the listed guides have been already formally published, while the last two guides are expected to be published by the end of 2010. |

| Country | CZECH REPUBLIC |
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***General presentation of the regulatory system***

Existing Czech legal framework for regulation of activities related to peaceful utilization of nuclear energy is implemented since 1997. The basis for this legislation was acts and regulations of former Czechoslovak Commission for Nuclear Energy developed since 1974.

The Act No. 18/1997 Coll., on Peaceful Utilization of Nuclear Energy and Ionizing Radiation ( Atomic Act ) and Related Decrees, the Act No. 552/1991 Coll., on State Inspection and Monitoring in the Wording of Act No. 166/1993 Coll., the Act No. 500/ 2004 Coll., on Administrative Proceedings ( the Administrative Code ) with later modifications stay as the basis of Czech nuclear legislation system. This set of laws defines the safety principles or criteria, details the procedures to be applied to obtain the necessary authorizations, and the mechanism for inspections and evaluations. Basic principles determine that the responsibilities derived from the usage of nuclear energy remain with the licensee holder.

In accordance with constitutional law the State Office for Nuclear Safety (SÚJB) is fully competent authority for regulation in all areas of peaceful utilisation of nuclear energy and ionising radiation. It is in charge of regulatory supervision of safety of nuclear, radiation and transport safety, radiation protection, nuclear safeguards and of emergency preparedness in case of radiation accidents. The SUJB is an independent body of state state administration , by law reporting directly to the Government. The SÚJB use its own part of state budget approved by the Parliament of the Czech Republic. The SÚJB is headed by a Chairperson appointed by the Government as a body. In practice SÚJB Chairperson reports to the Government through the Prime Minister.

By law the SÚJB is entitled to issue Regulations to complete and clarify requirements established by appropriate acts of Parliament, such as Atomic Act. Based on experience with use of existing Czech nuclear legislation a comprehensive novelization of Atomic Act has actually started.

The following decrees the most significant for regulation of new reactors licensing:

- **No. 214/1997 Coll.,** on Quality Assurance in Activities Related to the Utilization of Nuclear Energy and in Radiation Activities, and Laying Down Criteria for the Assignment and Categorization of Classified Equipment into Safety Classes, (Actually updated as No.:132/2008 Coll.)
- **No. 215/1997 Coll.,** on Sitting of Nuclear Facilities and Very Significant Ionizing Radiation Sources,
- **No. 106/1998 Coll.,** on Nuclear Safety and Radiation Protection Assurance during Commissioning and Operation of Nuclear Facilities (update is prepared in the frame of the Harmonization process initiated by WENRA)
- **No. 195/1999 Coll.,** on Basic Design Criteria for Nuclear Facilities with Respect to Nuclear Safety Radiation Protection and Emergency Preparedness (update is prepared in the frame of the Harmonization process initiated by WENRA)
- **No. 144/1999 Coll.** on Physical Protection of Nuclear Materials and Nuclear Facilities and their Classification, amended in Decree of the SÚJB No. **500/2005** Coll.
- **No. 307/2002 Coll**, on Radiation Protection,
- **No. 318/2002 Coll**. on Details of Emergency Preparedness of Nuclear Facilities and Workplaces with Ionizing Radiation Sources and on Requirements on the Content of On-Site Emergency Plan and Emergency Rule, amended in Decree SÚJB No. **2/2004** Coll.
- **No. 132/2008 Coll.** on provision of technical safety for classified equipment.
- **No. 185/2003 Coll.** on Decommissioning of Nuclear Facility or Category III. or IV. Workplace.

A set of the Regulatory Safety Guides was issued during last years to complement basic provisions

given in Atomic Act and subsequent regulations. The whole set is available in the printed version and electronically on SUJB web pages. The strategy for development of these guides has considerably changed in last years. Mainly with the view of fundamental change in structure of the Czech nuclear legislative pyramid - introducing a new status to the Regulatory Safety Guides. Based on new provisions prepared for comprehensive amendment of Atomic Act these would be newly published in official Gazette and by this considered as official part of the legal pyramid in nuclear area. This arrangement would allow, where appropriate, to declare requirements of the regulator in specific areas but preserving the right of the licensee to propose an alternative procedure or solution. Actually a complete revision of guides focused to nuclear safety is under way. Both above mentioned measures would allow to complete implementation of WENRA reference levels to national legislative pyramid in full.

***Situation of the national regulations in 2006 with respect to the RLs***

In the 2006, the coverage of the RLs in the Czech national legislation was evaluated with respect to (at that time) existing legislation (Laws and Decrees).

Results of the 2006 RHWG report identified that there is considerable of RLs (172 from 288) have to be addressed to reach harmonization (C or B categories). The picture was evidently better for implementation of RLs at the plants, only 16 in "C" category (from 288).

***Actions started to incorporate RLs in national regulations***

Based on the results of the RHWG report and in accordance with the agreements in WENRA the SUJB prepared and approved an Action plan in order to harmonize the legislation till 2010.

The Action plan included the amendment of the Decree No. 195/1999 Coll., "on Basic Design Criteria for Nuclear Facilities with Respect to Nuclear Safety Radiation Protection and Emergency Preparedness". Selected parts of WENRA reference levels are planned to be harmonized till the year 2010 by issuing of new or updated Regulatory Safety Guides

***Status of the national regulations in September 2010 and envisaged further actions***

The formal part of the harmonisation process is in some delay. The reason is formal - Atomic Act needs to undergo procedural/formal amendments. Remediation of this is possible only through Act of Parliament. The process is possible to start only after 2010 summer parliamentary elections. On the other hand all of the technical content of changes/amendments to individual regulations and guides is being prepared in line with Action plan.

Amendment of the Decree No. 195/1999 Coll., "on Basic Design Criteria for Nuclear Facilities with Respect to Nuclear Safety Radiation Protection and Emergency Preparedness" was prepared and was submitted to stakeholder consultation.

Five new SUJB Safety Guides have been published, five SUJB Safety Guides are under consultation/decision making process, and six SUJB Safety Guides are drafted or under revision for updating.

It is expected that all those Safety guides will be published soon around the end of the 2010 year. The overview of the set of the Guidelines is in following table. The set of Guidelines focused to construction of new plants is planned to complete and issue out of the harmonisation process.

| **1. Plant and system design** | **2. Safety management of a nuclear facility** | **3. Production and Construction** |
|---|---|---|
| **BN-JB-1.1** Requirements to Nuclear Safety, Radiation protection and | **BN-JB-2.1** Requirements to the Organisation, operating Nuclear facility | |

| | | |
|---|---|---|
| Emergency Preparedness of Nuclear Facility | | |
| **BN-JB-1.2** Selection of the Design basis and Beyond Design Basis Events for Nuclear Power Plants | **BN-JB-2.2** Ageing Management on Nuclear Power plants | |
| **BN-JB-1.3** Guideline for Safety Classification of Structures, Systems and Components of Nuclear Facilities | **BN-JB-2.3** Probabilistic Safety Assessment | |
| **BN-JB-1.4** Protection against internal fires on Nuclear Facility | **BN-JB-2.4** Utilisation of operational experience on nuclear facility | |
| **BN-JB-1.5** Approach to the assessment of new types of nuclear fuel in Czech Republic – Licensing requirements to the fuel system and core design | **BN-JB- 2.6** Guideline for the involvement of the Management Systems and Quality Assurance systems | |
| **BN-JB-1.6** Rules and Basis for the Assessment of Computation Codes for the Nuclear Safety Analysis | **BN-JB-2.7** Guideline for the Nuclear Facilities personnel education, training and qualification verification | |
| | **BN-JB-2.8** Maintenance, Operational Surveillance and testing on Nuclear Facility | |
| | **BN-JB-2.9** Requirements to implementation of EOPs and SAMG on Nuclear Facilities | |
| | **BN-JB-2.10** Modifications of Structures, systems, and processes on Nuclear Facility | |

| Country | FINLAND |
|---|---|

***General presentation of the regulatory system***

Legislative and regulatory framework

The current nuclear legislation in Finland is based on the Nuclear Energy Act from 1987. The Act has been changed 17 times during the years it has been in force: most changes are minor and originate from changes to other Finnish legislation. Contrary to these minor changes, nuclear legislation was updated and reformed in 2008 to correspond to current level of safety requirements and the new Finnish Constitution which came into force in 2000. The supporting Nuclear Energy Decree is from 1988 and was also reformed in 2008.

The current radiation legislation is based on the Radiation Act and Decree, both of which are from 1991 and take into account the ICRP Publication 60 (1990 Recommendations of the International Commission on Radiological Protection). Section 2, General principles, and Chapter 9, Radiation work, of the Act are applied to the use of nuclear energy.

Based on the Nuclear Energy Act, the Government issued in 2008 the following regulations:

- Government Decree on the Safety of Nuclear Power Plants (733/2008)
- Government Decree on the Security in the Use of Nuclear Energy (734/2008)
- Government Decree on Emergency Response Arrangements at Nuclear Power Plants (735/2008)
- Government Decree on the Safety of Disposal of Nuclear Waste (736/2008).

These new Government Decrees establish the mandatory nuclear safety (and security) requirements in Finland. The main reason for publishing them was the need to update safety requirements and to create a basis for the overall revision of Finnish regulatory guides (YVL Guides). It was also essential to examine the Decrees to verify the constitutionally appropriate legislative level of requirements. As a result of this examination, all requirements having principal nature were transferred from the Decrees to the Nuclear Energy Act and some requirements presented earlier in YVL Guides were transferred to the Decrees.

The Nuclear Safety Directive (Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations) affects slightly Finnish nuclear legislation. Also, international peer reviews concerning physical protection and waste management, both carried out in 2009, cause some amendments to legislation and/or other regulations. All these changes are currently under preparation.

Provision of regulatory guidance

According to the Section 7 r of the Nuclear Energy Act, STUK has a mandate to specify detailed safety requirements concerning the implementation of safety level in accordance with the Act. The safety requirements of STUK are binding on the licensee, while preserving the licensee's right to propose an alternative procedure or solution to that provided for in the regulations. If the licensee can convincingly demonstrate that the proposed procedure or solution will implement safety level in accordance with this Act, STUK may approve this procedure or solution.

The procedure to apply new guides to existing nuclear facilities is such that the publication of an YVL Guide does not, as such, effect any previous decisions made by STUK. After having heard those concerned, STUK makes a separate decision on how a new or revised YVL Guide applies to operating nuclear power plants, or to those under construction, and to licensee's operational activities. To new nuclear facilities, however, the guides apply as such.

Nowadays the most important references considered in rulemaking are the IAEA safety standards and WENRA reference levels. Other sources of safety information are worldwide co-operation with other countries using nuclear energy (e.g. MDEP, VVER Forum, OECD/NEA). The Finnish policy is to participate in the international discussion on developing safety standards and adopt or

adapt the new safety requirements into national regulations. At the moment STUK has a set of about 70 regulatory guides in force. The regulatory guides have been continuously re-evaluated for updating.

More information about Finnish regulations can be obtained at: http://www.stuk.fi/en_GB/

Overall reform of YVL Guides

After revising the Nuclear Energy legislation in 2008, also the existing YVL guide system has been taken under work. The main objectives of this effort are the following:

- to restructure the guide system better to reflect the various areas of safety; at the same time to limit the total amount of guides and need for cross-referencing between the guides
- to compile requirements concerning related safety issues to the same guide making it easier to use by the licensees and other stakeholders; also they will be coupled to the stage of licensing process
- to rewrite the separate requirements in such a way that each requirement will have its own number, be short and clearly stating who-what-when shall be doing something; requirements are expressed in shall-format , descriptive text is provided only when necessary
- when considering the requirements, special attention is paid for the opportunities to limit unnecessary prescriptiveness
- to update the contents of the regulatory guides, especially with the lessons learnt from the Olkiluoto3 –project.

STUK has set an internal time schedule for this revision effort in such a way that all guides of the new system will be prepared at least to the level of a final draft before the end of 2010 and, that all new guides will be published before the end of 2011.

| **A** Safety management of a nuclear facility | **B** Plant and system design | **C** Radiation safety of a nuclear facility and environment | **D** Nuclear materials and waste | **E** Structures and equipment of a nuclear facility |
|---|---|---|---|---|
| A.1 Regulatory control of the safe use of nuclear energy | B.1 Design of the safety systems of a nuclear facility | C.1 Structural radiation safety of a nuclear facility | D.1 Regulatory control of nuclear non-proliferation | E.1 Manufacture and use of nuclear fuel |
| A.2 Siting of a nuclear facility | B.2 Classification of systems, structures and equipment of a nuclear facility | C.2 Radiation protection and dose control of the personnel of a nuclear facility | D.2 Transport of nuclear materials and waste | E.2 Construction plan of the mechanical components and structures of a nuclear facility |
| A.3 Management systems of a nuclear facility | B.3 Safety assessment of a NPP | C.3 Control and measuring of radioactive releases to the environmental of a nuclear facility | D.3 Handling of spent nuclear fuel | E.3 Regulatory control of the mechanical components and structures of a nuclear facility |
| A.4 Organisation and personnel of a nuclear facility | B.4 Nuclear fuel and reactor | C.4 Radiological control of the environment of a nuclear facility | D.4 Handling of low- and intermediate-level waste and decommissioning of a nuclear facility | E.4 Verification of strength of pressure equipment of a nuclear facility |
| A.5 Construction of a NPP | B.5 Reactor coolant circuit of a NPP | C.5 Emergency preparedness arrangements of a NPP | D.5 Final disposal of nuclear waste | E.5 In-service inspections of the mechanical components and structures of a nuclear facility |
| A.6 Operation and accident management of a NPP | B.6 Containment of a NPP | | | E.6 Buildings and structures of a nuclear facility |
| A.7 Risk management of a NPP | B.7 Preparing for the internal and external threats to a nuclear facility | | | E.7 Electrical and I&C equipment of a nuclear facility |
| A.8 Ageing management of a nuclear facility | B.8 Fire protection of a nuclear facility | | | E.8 Oversight of inspection organisations |

The re-structured system of regulatory YVL Guides

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| ***Situation of the national regulations in 2006 with respect to the RLs*** |
| There were 41 WENRA reference levels which were not included in the STUK's YVL Guides at the time when the reference levels were published and the self-assessments made. |
| ***Actions started to incorporate RLs in national regulations*** |
| Finland made an action plan how these missing reference levels will be included in the national regulatory requirements by the end of year 2010. Some of the missing reference levels have already been taken into account in updating the existing YVL Guides but some are still waiting for the overall reform of the YVL Guides which is currently ongoing at STUK (see above). Considering the WENRA reference levels published in 2007 and 2008, the Finnish policy is to include all of them in the revised regulatory guide system. This is confirmed already during the work through a systematic approach to earmark all the reference levels to certain guides. |
| ***Status of the national regulations in September 2010 and envisaged further actions*** |
| STUK has set an internal time schedule for this revision effort in such a way that all guides of the new system will be prepared at least to the level of a final draft before the end of 2010 and that all new guides will be published before the end of 2011. All reference levels will be included in the new YVL Guides practically as such. |

| Country | FRANCE |
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***General presentation of the regulatory system***

➢ *Law and regulations issued by the government*

The legislative base governing the safety of nuclear installations in France is the act of 13 June 2006 on transparency and security in the nuclear field, referred to as the "**TSN act**", which fundamentally recasts the legal framework applicable to nuclear activities and their regulation. The TSN act introduces an integrated system based on a broader conception of nuclear safety, covering accident prevention and mitigation as well as protection of the health of persons and the environment, including during normal operation. The TSN act also establishes a nuclear safety authority (ASN, www.asn.fr), an independent administrative authority with responsibility for regulating nuclear safety and radiation protection and informing the public in these areas.

The government retains the power to set forth by decree or order any general regulations applicable to nuclear activities, after consulting formally ASN on these drat texts. It also takes a limited number of major individual decisions concerning nuclear facilities, notably for licensing their creation and dismantling.

**Decree No. 2007-1557** sets forth the framework according to which new procedures will apply; it encompasses the full lifetime cycle of nuclear facilities (from the creation and commissioning licences up to final shutdown and dismantling. This decree describes in detail the applicable procedures for adopting general regulations and making individual decisions relating to nuclear facilities.

General technical regulations set forth by **ministerial orders** deal currently with five major topics (see paragraph above on the status in 2006). All were issued before the change of regulatory framework initiated by the TSN act and they will progressively by superseded by a new ministerial order and a set of ASN technical regulatory decisions (see paragraph below on regulation updating).

➢ *ASN decision and guidance*

ASN may complement (in particular implementation modalities) laws, decrees or orders by **technical regulatory decisions**, which are legally binding once validated by the relevant Minister, and takes individual decisions concerning nuclear activities (e.g., licences for commissioning nuclear facilities…) and sets forth individual requirements.

ASN used to issues basic safety rules (**RFS**) on various technical subjects concerning nuclear facilities (for example the use of PSA) ; these rules are recommendations, not legally binding, defining the safety objectives and describing practices which ASN considers satisfactory for achieving the objectives. A licensee may decide not to comply with the provisions of a RFS, providing he can demonstrate that the safety objectives defined by the rule can be achieved by the alternative means which he proposes to implement. Nowadays, ASN issues **guides**, not legally binding, that supersedes some of the RFS, clarify ASN's expectations or interpretation or regulations (e.g. criteria for event reporting) or provides recommendations.

➢ *Other documents*

Finally, there are ministerial letters, which were issued to the operator for each type of reactors before construction and aimed at defining the regulatory position on the main safety options.

***Situation of the national regulations in 2006 with respect to the RLs***

At the beginning of 2006, nuclear safety regulations in France, especially legally binding regulations, were seldom :

- one decree (N° 63-1227) dealt primarily with administrative processes to create, operate and dismantle nuclear facilities and another one (No 95-540) dealt with water intake and effluent discharge control ;
- general technical regulations set forth by ministerial orders dealt with five major topics: quality management (order of 10 August 1984), pressurised equipment (order of 26 February 1974 for the construction of PWR main primary system ; in service inspection of PWR main primary system and the main secondary systems were covered by the order of 10 November 1999), external nuisances and risks resulting from INB operation (order of 31 December 1999), water intake and effluent discharges to the environment (order of 26 November 1999).

From a more technical point of view, about 40 basic safety rules (RFS) – not binding but stating accepted practices – were published by ASN on various topics, some of them specific to NPP, other covering the whole range of nuclear facilities.

As only one utility (EDF) was operating all French NPP, much of the technical rules governing the design and operation of these NPP were set in ASN letters to EDF, usually letters accepting or amending EDF's proposals. EDF has also implemented safety provisions on its own.

As a consequence, only one third of WENRA RLs were actually covered by French safety regulations in force at the beginning of 2006.

***Actions started to incorporate RLs in national regulations***

France national action plan to update national regulation by transposing WENRA RLs was prepared since the end of 2005 and finally endorsed by ASN in June 2006. The plan was to write 5 new ministerial orders (safety policy and management, safety approach for PWRs, design of PWR, operation of PWRs, emergency preparedness and response) and a few associated guides. These text would also update two existing ministerial order (order of 10 August 1984, order of 31 December 1999). The initial schedule was to engage in stakeholder consultation mid-2007 and have regulations published in the second half of 2009.

An unexpected major change in France nuclear safety regulatory regime happened mid-2006 (publication of a new act : TSN act) then at the end of 2006 with the first meeting of ASN 5 commissioners, which meant the entry into force of the TSN act.

Following the publication of the TSN act (June 2006) and its associated decree on Basic Nuclear Installation regulation principles (November 2007), the initial ASN regulatory project and associated schedule related to WENRA activities underwent a major update in 2008. Two points are too be highlighted :

- one issue, not fully resolved today is the clear cut between provisions to be set forth in ministerial orders vs those to be in ASN's (regulatory) decisions. Provisions currently in draft ASN's decisions may be later transferred to the draft order (or vice-versa). ASN still plans to have all WENRA reference level addressed in the order(s) and decisions, or where relevant in published ASN guidance.
- another issue was to decide whether some reference levels are applicable only for reactors or for all types of nuclear facilities. The choice made was to privilege as much as possible provisions applicable to all nuclear facilities.

As a consequence, WENRA RLs will be transposed by :

1) some provisions of the TSN Act and November 2007 decree (already published);
2) one ministerial order stating the overarching provisions;
3) 10 ASN technical regulatory decisions dealing with:

a) ASN decision on safety policy and management of nuclear facilities;
b) ASN decision on Modifications of nuclear facilities;
c) ASN decision on Periodic Safety Reassessment of nuclear facilities;
d) ASN decision on Safety Analysis Report of nuclear facilities;
e) ASN decision on general operating rules (RGE) of nuclear facilities;
f) ASN decision on operation of nuclear facilities;
g) ASN decision on design of PWR;
h) ASN decision on emergency management ;
i) ASN decision on fire;
j) ASN decision on nuclear pressurized equipment (which will mostly supersede current ministerial order);

A very limited number of ASN Guide, mainly one Safety Policy.

***Status of the national regulations in September 2010 and envisaged further actions***

All the regulation/technical regulatory decisions drafts have been written, except the one on nuclear pressurised equipments (but current regulation enables consistency with WENRA RLs).

The status of the regulations development, as of September, 2010 is presented hereafter :

| | ASN preliminary in-house formal review | Stakeholder consultation | Updating of the draft | ASN in-house formal review | Issuance of the regulations |
|---|---|---|---|---|---|
| Ministerial order | ✓ | ✓ | In process | | |
| ASN decision on safety policy and management of nuclear facilities | ✓ | ✓ | | | |
| ASN decision on Modifications of nuclear facilities | ✓ | ✓ | In process | | |
| ASN decision on Periodic Safety Reassessment of nuclear facilities | ✓ | ✓ | In process | | |
| ASN decision on Safety Analysis Report of nuclear facilities | In process | | | | |
| ASN decision on general operating rules (RGE) of nuclear facilities | ✓ | ✓ | | | |
| ASN decision on operation of nuclear facilities; | ✓ | ✓ | | | |
| ASN decision on design of PWR | In process | | | | |
| ASN decision on emergency management | ✓ | ✓ | In process | | |
| ASN decision on fire | | | | | |
| ASN decision on nuclear pressurized equipment | | | | | |

Once stakeholder consultation is over, ASN will update the draft to take into account comments received (if major technical issue were highlighted, ASN would consult its standing experts groups to get advice on the most appropriate way to handle the issue) and have the final text signed by its

commissioner.

Once the ASN decision is signed by the commissioners, it then has to be validated (or rejected) by the Government which has a 2 months period to do so.

Mot of ASN decision provisions are closely related to general provision set forth in the ministerial order as they actually give details on the regulatory requirements. ASN current priority is to work closely with the Government to dispose of the comments received and have the order signed by the Government as soon as possible.

Taking into account these final steps, the ministerial order may be signed by the end of 2010 but more likely in the first half of 2011. ASN's plan is to issue its decisions once the order is signed, during the first half of 2011.

| Country | GERMANY |
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***General presentation of the regulatory system***

The Republic of Germany is a federal state. The responsibilities for legislation and law enforcement are assigned to the organs of the Federation and the *Länder* according to their scope of functions. Specifications are given by provisions of the Basic Law of the Federal Republic of Germany.

The Federal Government has the legislative competence for the use of nuclear energy for peaceful purposes according to Article 73 para 1 number 14 in conjunction with Article 71 of the Basic Law.

According to Section 24 para 1 of the Atomic Energy Act in conjunction with Article 87c, 85 of the Basic Law, the Atomic Energy Act and the statutory ordinances based thereon are executed - with some exceptions - by the *Länder* on behalf of the Federation. In this respect, the *Länder* authorities are under the oversight of the Federation with regard to the legality and expediency of their actions.

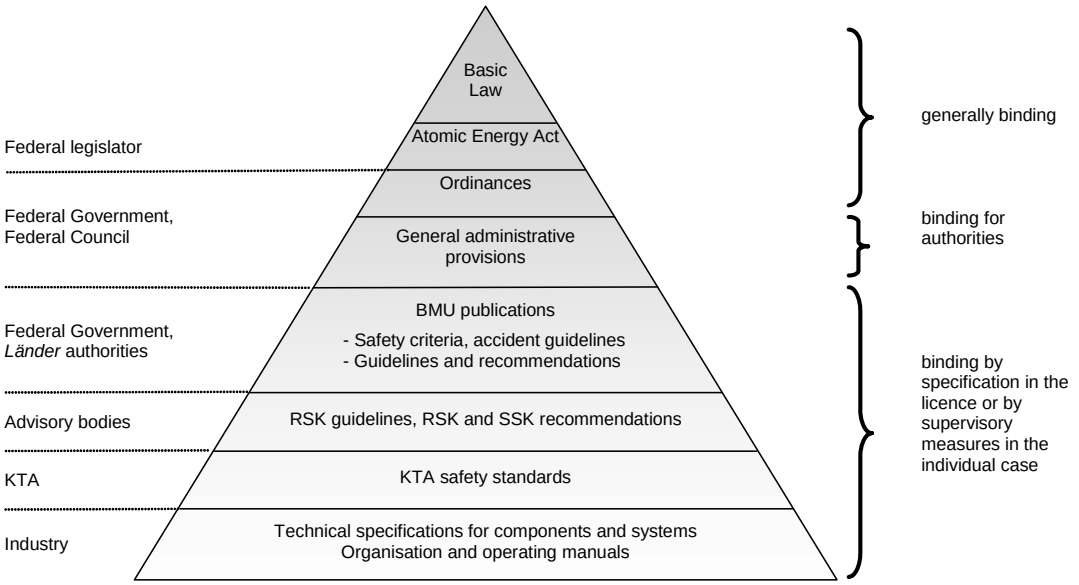
The competent supervisory and licensing authorities report to the Federation on law enforcement on demand. The Federation has the right to require the submission of reports and documents and may, in the individual case, issue binding directives to the *Land* authority. The Federation may assume the competence for the subject matter, i.e. the decision in the cause, by exercising its right to issue directives. The competence to execute the duties, i.e. the execution of the decision towards the applicant or licensee, remains with the competent *Land* authority.

Within the framework of nuclear procedures, other legal regulations, such as the immission control act, water law and construction law, also have to be considered. Legal regulations on assessing the environmental impact are usually part of the nuclear licensing procedure.

In Germany, decisions of the public administration, so-called administrative acts, can be appealed before the administrative courts by the party concerned, e.g. by applicants and licensees and also by third parties of the public concerned (guarantee of recourse to the courts according to Article 19 para 4 of the Basic Law). An action is brought against that authority which issued the notice/administrative act, i.e. the respective competent *Land* authority. This also applies to the case that the *Land* took a decision due to a directive issued by the Federation. The parties concerned may also take legal actions in case of failure of the authorities to act. So, e.g., the plant operators may claim for granting of licences applied for or the residents for issuance of a regulatory order to cease operation of a nuclear installation.

***Situation of the national regulations in 2006 with respect to the RLs***

The figure presents the hierarchy of the national regulations, the authority or institution issuing them and their degree of bindingness.




*Acts, ordinances and administrative provisions:* The **Basic Law** includes provisions on the legislative and administrative competencies of the Federation and the *Länder* regarding the use of nuclear energy. Moreover, fundamental principles are established that are also applicable to the nuclear law.

With the basic rights, in particular the right to life and physical integrity, it determines the standard to be applied to the protective and preventive measures at nuclear power plants which is further specified in the above hierarchy levels of the pyramid. The principle of proportionality and guaranty of property, laid down in the Basic Law, must also be considered.

The **Atomic Energy Act** was promulgated on December 23, 1959, right after the Federal Republic of Germany had officially renounced any use of atomic weapons. Since then, it has been amended several times. The purpose of the Atomic Energy Act after the amendment of 2002 is to end the use of nuclear energy for the commercial production of electricity in a structured manner and to ensure on-going operation until the date of discontinuation, as well as to protect life, health and property against the hazards of nuclear energy and the detrimental effects of ionising radiation and, furthermore, to provide for the compensation for any damage and injuries incurred. It also has the purpose of preventing the internal or external security of the Federal Republic of Germany from being endangered by the utilisation of nuclear energy.

The Atomic Energy Act includes the general national regulations for protective and preventive measures, radiation protection and the disposal of radioactive waste and irradiated fuel elements in Germany and is the basis for the associated ordinances.

Further to purpose and general provisions, the Atomic Energy Act also comprises surveillance regulations, general regulations on competencies of the administrative authorities, liability provisions and provisions on the payment of fines.

With respect to the protection against the hazards from radioactive materials and to the supervision of their utilisation, the Atomic Energy Act requires that the construction and operation of nuclear installations is subject to regulatory licensing. Prerequisites and procedures for licensing and performance of supervision are specified, including the regulations for consulting experts (Section 20 of the Atomic Energy Act) and charging of costs (Section 21 of the Atomic Energy Act). According to Section 7 of the Atomic Energy Act, a licence is required for the construction, operation or any other holding of a stationary installation for the production, treatment, processing or fission of nuclear fuel, or for essentially modifying such installation or its operation.

However, most of the regulations laid down there are not exhaustive and are further specified both regarding the procedures and the substantive legal requirements by ordinances and regulatory

guidance instruments.

In addition to the Atomic Energy Act, the **Radiation Precautionary Act** of 1986, which came about in the wake of the reactor accident at Chernobyl, specifies the tasks of environmental monitoring also in the case of events with significant radiological effects.

For more details regarding the legal regulations, the Atomic Energy Act includes authorisations for issuing **ordinances** (cf. listing in Section 54 para 1 of the Atomic Energy Act). These ordinances require approval by the *Bundesrat* (Federal Council). The *Bundesrat* is a constitutional body of the Federation in which the governments of the *Länder* are represented.

The table presents the current ordinances on protective and preventive measures relevant to the scope of this report.

| | **Brief description on the legislative content** |
|---|---|
| StrlSchV | **Radiation Protection Ordinance**<br>Principles and limits of radiation protection, requirements on organisation of radiation protection, personal monitoring, environmental monitoring, accident management, design against incidents and accident planning values |
| AtVfV | **Nuclear Licensing Procedure Ordinance**<br>Application documents (one safety analysis report), involvement of the public, safety specifications (operational limits and conditions for safe operation), procedures and criteria for major modifications (public participation) |
| AtSMV | **Nuclear Safety Officer and Reporting Ordinance**<br>Position, duties, responsibilities of the nuclear safety officer, reporting of special events in nuclear installations |
| AtZüV | **Nuclear Reliability Assessment Ordinance**<br>Checking of personal reliability for protecting against the diversion or major release of radioactive material |
| AtDeckV | **Nuclear Financial Security Ordinance**<br>Financial security pursuant to the Atomic Energy Act |
| AtKostV | **Cost Ordinance under the Atomic Energy Act**<br>Fees and costs in nuclear procedures |

Ordinances may include additional authorisations for issuing **general administrative provisions**. General administrative provisions regulate the actions of the authorities, thus only having a direct binding effect for the administration. However, they have an indirect effect if serving as a basis for concrete administrative decisions.

*Regulatory guidelines published by BMU:* After having consulted the *Länder*, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) prepares regulatory guidelines. These are, among others, safety criteria, accident and other guidelines and recommendations. In general, these are regulations passed in consensus with the competent licensing and supervisory authorities of the *Länder* on the uniform application of the Atomic Energy Act. The recommendations of the BMU, however, describe its view on general questions related to nuclear safety and the administrative practice, and serve as orientation for the *Länder* authorities regarding the enforcement of the Atomic Energy Act. The regulatory guidelines are not binding for the *Länder* authorities in contrast to the general administrative provisions. Their relevance is also given by the right of the BMU to issue binding individual directives for particular cases to the *Länder* authorities.

Currently, about 60 BMU regulatory guidelines exist in the field of nuclear technology. Regarding the scope of this report these are regulations pertaining to

- general safety requirements for nuclear power plants ("Safety Criteria"),
- details on the design basis accidents to be considered in the design of pressurised water reactors (since 1982 for the last three nuclear power plants built of construction line 4),
- accident management measures to be planned by the plant operators with regard to postulated severe accidents,
- reporting criteria for reportable events at nuclear power plants and research reactors,
- periodic safety reviews for nuclear power plants,
- technical documents to be prepared regarding construction, operation and decommissioning of nuclear power plants,
- documents to be supplied with the application for a licence,
- procedures for the preparation and performance of maintenance and modification work in nuclear power plants, and
- qualification of the personnel in nuclear installations.

*Recommendations of the RSK or the SSK; RSK guidelines:* The BMU requests the Reactor Safety Commission (RSK) and the Commission on Radiological Protection (SSK) for advice on important issues related to licensing and supervisory procedures, development of rules and regulations or safety research. Depending on the issues to be discussed, Länder authorities, plant operators or the industry also participate in the discussions. The results of these discussions are statements or recommendations for the BMU. After own verification, the BMU implements the results in the respectively appropriate manner.

The so-called RSK guidelines play a special role. In the last version of these guidelines of 1996, the RSK compiled the fundamental safety requirements for nuclear power plants with pressurised water reactors. The nuclear licensing authorities of the *Länder* have taken the RSK guidelines as an assessment basis within the framework of the regulatory guidance instruments for plants whose licences on the site and safety concept were to be granted after entry into force of the RSK guideline and made them binding for the plant operator by the licence permit. For plants that were granted a licence before, the RSK guidelines were referred to for assessing the adequacy of the further development of plant safety.

*KTA safety standards:* The Nuclear Safety Standards Commission (KTA) was established at the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. It is made up of the five interest groups: representatives of the manufacturers, the plant operators, the federal and *Länder* authorities, the expert organisations and representatives of general concerns, e.g. of the unions, the industrial safety and the liability insurers.

The regulatory powers of the legislator and administrative action by the competent authorities are not restricted by the KTA process. It is possible to formulate necessary requirements, guidelines and recommendations and to implement them on the basis of the Atomic Energy Act regardless of the consensual formulation of KTA safety standards.

On the basis of the regular reviews and, where required, amendment of the issued safety standards at intervals of no more than five years, the standards are adjusted to the state of the art in science and technology. In themselves, KTA safety standards are not legally binding. However, due to the nature of their origin and their high degree of detail, they have a far-reaching practical effect.

Until today, the KTA has issued a total of 91 safety standards and 3 draft standards. 12 draft standards are in preparation and 50 safety standards are in the process of being revised. The

following draft safety standards relevant to the scope of this report are in preparation :

- [KTA 1203] "Requirements for the Emergency Manual“,
- [KTA 1402] “Management Systems for the Operation of Nuclear Facilities",
- [KTA 1403] “Ageing Management in Nuclear Power Plants",
- [KTA 3206] “Demonstration of Break Preclusion for Pressure Retaining Components in Nuclear Power Plants“

*Revision of the nuclear rules and regulations*

The applicable national higher-level nuclear rules and regulations date back to the 1970s and 1980s. In science and practice there is consensus that the modernisation and further development of the higher-level nuclear rules and regulations is necessary. The drafting process for the development of the new rules and regulations started in September 2003.

This was the starting point for the RHWG benchmarking, which showed the high number of RL needed to be adressed for harmonization: 90 RL with a “C” assessment and 26 with a “B”.

***Actions started to incorporate RLs in national regulations***

Since 2006 several actions were performed to overcome the deficiencies in the 2006 national action plan and to implement the WENRA RL into national regulation. These actions include an updating of existing ordinances, the development of a new ordinance and mainly the development of new modular regulations. The activities can be summarized as follows:

- First draft of National Action Plan, Nov. 2006, published on BMU-homepage (harmonization planned via new “Safety Requirements for Nuclear Power Plants” by end of 2007);
- Revision D of “Safety Requirements for Nuclear Power Plants” available since April 2009. Pilot phase with test application until 10/2010 is ongoing;
- Update of “Nuclear Safety Officer and Reporting Ordinance” (AtSMV).

***Status of the national regulations in September 2010 and envisaged further actions***

The applicable national higher-level nuclear rules and regulations date back to the 1970s and 1980s. In science and practice there is consensus that the modernisation and further development of the higher-level nuclear rules and regulations is necessary. This view is also shared by the Federation and the *Länder*.

The drafting process for the development of the new rules and regulations started in September 2003.

With the new *Safety Criteria for Nuclear Power Plants*, the draft of a new higher-level nuclear rules and regulations is now available. The Federal Ministry for the Environment published the draft of the new “Safety Criteria for Nuclear Power Plants - Revision D, of April 2009” on the Internet.

The new Safety Criteria are to ensure the integration of existing rules, current practice, international requirements and new scientific findings, and to replace the *Safety Criteria for Nuclear Power Plants, as of 1977*, the *RSK guidelines for pressurised water reactors*, as of 1981 with updates of 1996, and the *accident guidelines* of 1983.

Against this background, the Federal Ministry for the Environment and the *Länder* of Baden-

Wuerttemberg, Bavaria, Hesse, Lower Saxony and Schleswig-Holstein have agreed upon a comprehensive consultation procedure for further action with the *Länder*, power utilities and science.

The agreed procedure aims to contribute to gain practical experience in the application of the new Safety Criteria and evaluate it in a process agreed between the Federation and the *Länder* (see below). The test phase started on 1 July 2009 and will end on 31 October 2010. On this basis of practical experience gained from testing, the Federation and the *Länder* jointly review the rules and regulations by mid-2011. The Federation and the *Länder* are striving for a unanimous adoption of the nuclear rules and regulations. Publication by the Federal Ministry for the Environment in the Federal Gazette will not take place before the end of the procedure.

The Federation and the *Länder* will apply the new Safety Criteria for Nuclear Power Plants on a trial basis and in parallel to the higher-level rules and regulations relevant so far in nuclear procedures. This application takes place in nuclear licensing procedures and modifications procedures requiring approval (including PSR, reportable events and hazard assessment) in order to gain experience with the application of all modules. In this respect, all modules of the draft of the new Safety Criteria relevant for the procedures to be selected are applied:

- MODULE 1 "Safety Criteria for Nuclear Power Plants: Fundamental Safety Criteria";
- MODULE 2 "Safety Criteria for Nuclear Power Plants: Criteria for the Design and Operation of the Reactor Core";
- MODULE 3 "Safety Criteria for Nuclear Power Plants: Events to be Considered for Pressurised and Boiling Water Reactors";
- MODULE 4 "Safety Criteria for Nuclear Power Plants: Criteria for the Design of the Reactor Coolant Pressure Boundary, the Pressure Retaining Walls of the External Systems and the Containment System";
- MODULE 5 "Safety Criteria for Nuclear Power Plants: Criteria for Instrumentation and Control and Accident Instrumentation";
- MODULE 6 "Safety Criteria for Nuclear Power Plants: Criteria for Safety Demonstration and Documentation";
- MODULE 7 "Safety Criteria for Nuclear Power Plants: Criteria for Accident Management";
- MODULE 8 "Safety Criteria for Nuclear Power Plants: Criteria for Safety Management";
- MODULE 9 "Safety Criteria for Nuclear Power Plants: Criteria for Radiation Protection";
- MODULE 10 "Safety Criteria for Nuclear Power Plants: Criteria for the Design and Safe Operation of Plant Structures, Systems and Components";
- MODULE 11 "Safety Criteria for Nuclear Power Plants: Criteria for the Handling and Storage of the Fuel Elements";
- MODULE 12 "Safety Criteria for Nuclear Power Plants: Criteria for Electric Power Supply"

The new "Safety Criteria for Nuclear Power Plants" are intended to be an element of Germany to fill existing gaps in the nuclear rules and regulations.

| Country | HUNGARY |
|---|---|

***General presentation of the regulatory system***

The Hungarian Parliament approved the current Act on Atomic Energy in December 1996 (the Act on Atomic Energy) which entered into force on July 1, 1997. The Act on Atomic Energy accounts for all legislative, authority-related and operational experience gained during the construction and operation of Paks NPP, it considers the technological development achieved since the issue of the previous Act on Atomic Energy, all international obligations, and also integrates the requirements of the Convention. The Atomic Act has reinforced the distributed regulatory system, which delegates the responsibilities for nuclear safety, radiation protection and environmental protection related to nuclear facilities to different authorities.

The Hungarian Atomic Energy Authority's scope of competence comprises nuclear safety licensing (at the levels of the facility, systems and components) and supervision of nuclear installations, registration and supervision of radioactive materials, licensing of transportation and packaging, licensing of nuclear exports and imports, evaluation and co-ordination of research and development, performance of authority-specific tasks related to nuclear emergency preparedness, approval of the emergency response plans of nuclear installations, and maintenance of international relations. It is also the duty of the Authority to perform the tasks generated by the treaty concluded with the International Atomic Energy Agency dealing with the non-proliferation of nuclear weapons, along with the registration and supervision of nuclear substances.

In 2003 the Parliament amended the Atomic Act CXVI of 1996, and according to this decision a dedicated minister (currently the Minister of National Development) appointed by the Prime Minister became the supervisor of the HAEA.

In 2005, a revised set of Nuclear Safety Requirements (Regulations) was issued as attachment to the Governmental Decree 89/2005(V.5) on the Nuclear Safety Requirements of Nuclear Facilities and Related Regulatory Activities. The Nuclear Safety Requirements consist of seven volumes. The first four volumes address the NPPs:

- Volume 1: Regulatory Procedures for NPPs,
- Volume 2: Management System of NPPs,
- Volume 3: Requirements of Design of NPPs,
- Volume 4: Requirements of Operation of NPPs.

Additionally to the legally binding requirements, the Director General of the HAEA issues guidelines containing recommendations on how the requirements should be implemented in the regulatory processes.

More information can be found on the web site of the HAEA: www.haea.gov.hu.

***Situation of the national regulations in 2006 with respect to the RLs***

The benchmark - performed in 2006 - showed that most of the reference levels were covered by the Regulations. 37 Reference Levels were evaluated as C (a difference exists, and should be addressed for harmonization). They were identified

- mainly within the issue E (Design Basis Envelope for Existing Reactors), LM (Emergency Operating Procedures and Severe Accident Management Guidelines) and O (Probabilistic Safety Analysis) and
- a few were related to issue A (Safety Policy), F (Design Basis Envelope for existing reactors), J (System for Investigation of Events and Operational Experience Feedback) and

S (Protection against internal fires).

***Actions started to incorporate RLs in national regulations***

The Nuclear Safety Requirements (Regulations) were used for the benchmarking of the Reference Levels in 2006. Most of the reference levels were covered by the Regulations, but based on the result of the benchmarking an action plan was established in order to make the Regulations complete.

The Regulations shall be reviewed and updated as needed at least once in every five years on the basis of scientific achievements as well as domestic and international experience.

The last review aimed – among others – to improve the Regulation based on the Reference levels.

***Status of the national regulations in September 2010 and envisaged further actions***

The review started in 2006 and finished at the end of 2009. The bases of the review were the WENRA reference levels (and the action plan), the recently issued IAEA standards, lessons learned from the use of Hungarian regulations and recommendations from the international reviews. Now, the draft of the new set of Regulations is under administrative collation:

- Volume 1. – Regulatory procedures of Nuclear Facilities
- Volume 2.– Management System of Nuclear Facilities
- Volume 3.– Design of NPPs
- Volume 4.– Operation of NPPs
- *(Volume 5.– Design and Operation of Research and Training Reactors)*
- *(Volume 6.– Design and Operation of Spend Fuel Storage Facilities)*
- Volume 7.– Siting
- Volume 8.– Decommissioning
- Volume 9.– Terminology

The new set of Regulation will cover all Reference Levels.

| Country | ITALY |
|---|---|

***General presentation of the regulatory system***

The Regulatory System related to nuclear installations, presently in force Italy, is the result of an evolution of rules and standards that begun in the early '60s and that took the experience of licensing and operation of nuclear power plants of different types and generation into account. The Italian regulatory system is made up of three types of rules of different legal force depending on their origin; the first two types are the most relevant for this study: legislation by the Parliament and Decrees by Government or Ministries and Technical guides; the third type of rule is mainly made up by industrial standards.

**Main legislation and ministerial decrees**

In the Italian system the source of legally binding rules must be either an act of Parliament (statute) or a Legislative Decree; the Government can issue governmental or ministerial decrees binding in law. An important feature of legally binding rules concerning Safety and Radiation Protection is that contravention to obligations by operators and/or users constitutes a misdemeanor and entails a penal sanction; compliance can be enforced by means of criminal proceedings after due process of law.

The main corpus making up, inter alia, the Italian system are itemized below, as regards Statutes and Legislative acts:

- Act no. 1860 of 31 December 1962 published in the Italian Official Journal no. 27 of 30 January 1963, the basic Atomic Law on the peaceful uses of nuclear energy.
- The Presidential Decree no. 185 of 1964: "Safety of plants and protection of workers and general public against the risk of ionising radiation associated to the peaceful use of Nuclear Energy" replaced in 1996 by the Legislative Decree no. 230/1995.
- Legislative Decree no. 230 of 17 March 1995 published in the Supplement to Italian Republic's Official Journal no. 136 of 13 June 1995, implementing six EURATOM Directives on radiation protection (EURATOM 80/836, 84/467, 84/466, 89/618, 90/641 and 92/3).
- Presidential Decree no. 1450 containing requirements and procedures for the acquisition of the operational personnel licences (1971).
- Presidential Decree no. 519/1975 "Civil responsibilities in the field of nuclear safety".
- Legislative Decree no. 241 of 31 August 2000, implementing the 96/29/EURATOM directive regarding "Health protection of the population and workers against the risks deriving from ionising radiations".

Several Acts of legislative force were issued for the institution of the Regulatory Body and for its subsequent re-organisations. The first one was Act no. 933 (1960), establishing the National Committee for Nuclear Energy (CNEN), and the last one was Law no. 133 (2008) instituting the Institute for Environmental Protection and Research (ISPRA).

The mandate of ISPRA is more generally addressed to Environmental Protection issues; one ISPRA Department has the mission to discharge the Regulatory Body responsibilities coming from the above-mentioned Laws. In this frame, the Institute performs licensing and inspection activities for any civil Nuclear Installation, performs inspections related to Physical Protection and Safeguards, provides technical support for setting up regulations, for planning and implementing Radiological Emergencies measures.

**Technical guides**

The issue of technical guides, previously carried out by the Directorate for Nuclear Safety and Health Protection, is now assigned in Law to ISPRA by article 153 of the Legislative Decree no. 230/1995. The guides contain recommendations and address to the implementation of rules of good practice. They "de facto" assume a mandatory nature during the regulatory assessment activity when the level of compliance of the application is verified. Twenty eight technical guides have been issued on Safety and Radiation Protection matters ranging from procedural to detailed technical guidance. They are publicly available and have been always issued after consultation of all the stakeholders.

**Latest changes**

After public announcements by the Italian government about the intention of adopting a new energy policy, including the construction of new nuclear power plants, a new Law has been issued in July 2009 n. 99 delegating the Government to issue legislative decrees regulating the siting of nuclear installations (in particular NPPs and long term waste storage facility) and to update the licensing procedures for construction and operation. The same Law establishes also new Agency for Nuclear Safety. It has to be implemented on the basis of specific decrees still to be issued. The Agency will be staffed by experts of the Nuclear Department of ISPRA and of the ENEA. Until the new Agency is fully implemented, its role continues to be performed by the Nuclear Department of ISPRA. The Agency will be charged of regulation and control in nuclear safety, radiation protection, safeguards and physical protection.

On February 2010 Legislative Decree n.31 has been issued, establishing in general terms the following procedures:

- for identification of suitable area and certification of sites
- for certification of operators
- for issuing a single authorization act for construction and operation.

The main authorizations will be granted through a concerted act by Ministry of Economic Development, Ministry of Environment, land and sea, and Ministry of Infrastructures, based upon the binding technical advise of the Nuclear Safety Agency.

In order the new regulatory system to become operative, implementation decrees are required mainly related to the Nuclear Safety Agency (Statute, Management nomination, organization, assignment of resources and headquarters location); moreover, a Nuclear strategy document justifying the nuclear option has to be issued according to the new Laws.

Of course, in case of restart of concrete nuclear program, due to the new licensing process defined by the Law, a process of updating technical guides will be needed and the reference levels defined by WENRA will be systematically considered.

***Situation of the national regulations in 2006 with respect to the RLs***

More than 100 RLs were found as not present in the Italian regulations but no modification was established to be needed due to status of the Italian NPP (being decommissioned) and due to the fact that no new plant construction was foreseen.

In any case the differences have been systematically traced.

***Actions started to incorporate RLs in national regulations***

The action plan that was defined in 2006 took strictly into account the fact that Italian NPPs (Garigliano - BWR, Latina-Magnox, Trino-PWR and Caorso-BWR) were no longer in operation since many years.

At present they still are, at different stages, in the process of being decommissioned. The main activities that are conducted on the sites are related to waste management (conditioning and site storage), fuel removal - for the NPPs still having fuel in the pools (Trino and Caorso) - as well as dismantling.
Taking this specific situation into account, the national action plan for harmonization to the WENRA Reactor Safety Reference Levels was prepared considering only those reference levels that were relevant for the above activities, with the additional intent to coordinate such actions with those required in the Action Plan for the harmonization to the waste storage and decommissioning reference levels. In this light, attention was therefore basically addressed to management, organizational, quality and fire protection issues. Other issues are considered not to be a national priority for the time being, they will be at the moment. They will be reconsidered when concrete development steps toward the construction of new plants will be performed.

The action plan was based on a two steps approach:

- Adopt reactor safety reference levels for which equivalent legal requirements in Italy are not available, after having evaluated their relevance for decommissioning and waste management, by issuing specific requirements to the existing facilities (letters to the licensee, or conditions to the new licenses);
- Issue the new regulations as proposed in the action plan on the basis of the final reference levels in the area of waste storage and decommissioning, by revising existing technical guides or issuing new ones.

In particular, new technical guides were foreseen to be issued on the following topics:

1) Management of nuclear facilities
2) Classification, conditioning and safe storage of radioactive waste
3) Safety Requirements on decommissioning of nuclear facilities
4) Fire protection of nuclear facilities

***Status of the national regulations in September 2010 and envisaged further actions***

This programme had to be confirmed in the frame of the definition of the Action Plans related to Waste storage and Decommissioning safety reference levels, which are still not finalized. Some drafting efforts have been however already done and such drafts are already used as review guidance.

| Country | LITHUANIA |
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***General presentation of the regulatory system***

In compliance with the Law on Nuclear Energy and the Statute of VATESI approved by Government, as well as other legal documents, The State Nuclear Power Safety Inspectorate (VATESI) is the main regulatory and oversight institution of nuclear safety, which sets safety requirements, controls whether they are complied with, issues licenses and permits, performs safety assessments and other functions. VATESI mission is to perform the state regulation and oversight of safety at nuclear facilities in order to protect the public and environment against harmful effects of ionizing radiation.

VATESI competence covers state regulation and oversight of safety at nuclear installations, state regulation and oversight of nuclear waste management at nuclear installations; oversight of use of nuclear materials and technologies for peaceful purposes (the IAEA and EURATOM safeguards), state regulation and oversight of physical protection of nuclear installations and materials, emergency preparedness, state regulation and oversight of transportation of nuclear fuel cycle materials.

The main legal document governing nuclear energy is the Law on Nuclear Energy passed by Parliament in 1996. Other laws directly related to regulation of nuclear energy are:

- Law on Nuclear Waste Management;
- Law on Radiation Safety;
- Law on control import, export and transit of strategic commodities;
- Law on Civil protection;
- Law on Construction.

VATESI has a responsibility to issue two types of regulations: Requirements and Rules. Requirements establish the requirements that must be met to ensure safety, Rules - define the way how Requirements could be fulfilled. Both Requirements and Rules are mandatory for licensee. The application of standards is voluntary except the cases when regulations define specific standards to be applied. If the standard is voluntary accepted by licensee its application becomes mandatory.

The set of draft laws including new issue of Law on Nuclear Energy, linked to regulatory system, assurance of nuclear and radiation safety, licensing were developed presented to Parliament for approval. In the draft laws some changes are foreseen in licensing process due to plans to build a new NPP. The special new Law on Nuclear Safety will be devoted for assurance of nuclear safety and licensing of nuclear facilities. The approval of the laws is expected by the end of 2010. or in the beginning of 2011

***Situation of the national regulations in 2006 with respect to the RLs***

A set of legal documents was assessed. According to benchmarking results 173 of RLs were covered in substance by legal acts, 25 RLs were not fully covered, but the differences can be justified from a safety point of view, and 93 RLs should be addressed for harmonization.

***Actions started to incorporate RLs in national regulations***

Following a commitment to harmonize the regulatory requirements for nuclear safety with WENRA RLs VATESI has performed corresponding assessment and the Action plan for implementation of RLs into regulations was prepared in 2006. The action plan was updated in 2008 taking into account the final edition of WENRA RLs. According to the plan 14 nuclear safety regulations had to be issued in period of 2008-2010 years to cover 120 RLs, which were foreseen to be implemented in legal basis.

***Status of the national regulations in September 2010 and envisaged further actions***

By the end of September 2010 three new VATESI regulations were issued covering 73 from 120 RLs:

- Requirements on the Operational Experience Feedback in the field of Nuclear Energy (2 RLs)
- Requirements for deterministic safety analysis of Ignalina NPP (9 RLs)
- Requirements for management systems in nuclear facilities (29 RLs)
- The main requirements for assurance of safety of nuclear power plants with RBMK-1500 type reactors (33 RLs)

By the end of September 2010 seven preliminary drafts of new regulations covering 34 RL's were passed for internal VATESI review:

- Requirements for staff management in nuclear facilities (4 RLs)
- Requirements for probabilistic safety analysis (17 RLs)
- Rules for design of reactor containment systems for NPP (3 RLs)

Above listed drafts will be further developed taking into account their significance after shut down of Ignalina NPP and development of new NPP project.

Since the regulatory requirements system is periodically updated it is necessary to perform the monitoring and control the status of RL`s implementation. The order on implementation of WENRA RL's in the set of regulations is approved by Head of VATESI, which will help to keep track of implemented RL's and control further implementation of remaining 23 RLs and all RLs in the regulatory system, which is mostly important for regulation of potential new built and is being planed to be implemented in 2011-2012 (before corresponded regulation become actually needed)..

| Country | THE NETHERLANDS |
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***General presentation of the regulatory system***

**Nuclear Energy Act**

The basic legislation governing nuclear activities is contained in the Nuclear Energy Act

('Kernenergiewet' or Kew). It is a framework law. (1) The *registration* of fissionable materials and ores is regulated. (2) A licence is required in order to *transport*, *import, export*, be in *possession* of or *dispose* of fissionable materials and ores. (3) Licences are also required for *building, operating and decommissioning* nuclear installations (Section 15b), as well as for nuclear driven ships (Section 15c). The Act distinguishes between construction licences and operating licences.

**Environmental Protection Act**

According to this Act and the associated Environmental Impact Assessment Decree, the licensing procedure for the construction of a nuclear facility includes a requirement to draft an Environmental Impact Assessment (EIA) report. In certain circumstances, an EIA is also required if an existing plant is modified (e.g. change in fuel enrichment, decommissioning).

**General Administrative Act (Awb)**

The General Administrative Act sets out the procedure for obtaining a licence and describes the participation of the general public in this procedure (i.e. objections and appeals).

**Decrees**

A number of Decrees have also been issued containing additional regulations and these continue to be updated in the light of ongoing developments. Important examples of these in relation to the safety aspects of nuclear installations are:

- the Nuclear Installations, Fissionable Materials and Ores Decree (Bkse);
- the Radiation Protection Decree (Bs);
- the Transport of Fissionable Materials, Ores and Radioactive Substances Decree (Bvser);
- the Environmental Impact Assessment Decree.

**Regulations and guides issued by regulatory body: the Nuclear Safety Rules (NVRs)**

The Nuclear Energy Act (Article 21.1) provides the basis for a system of more detailed safety regulations concerning the design, operation and quality assurance of nuclear power plants. These are referred to as the Nuclear Safety Rules ('Nucleaire VeiligheidsRegels', NVRs). The regulations of the NVRs apply to an installation, as far as they are referenced in the licence. The NVRs are based on the Requirements and Safety Guides in the IAEA Safety Standards Series (SSS) from the '80 and '90.

The documents contain adaptations ('amendments' as they were termed) to the IAEA standards, but the character of the original IAEA standards is largely maintained. The amendments were formulated include the RLs and to adjust the documents to the circumstances and needs in the Netherlands.

For more detailed information on the regulatory framework, please see the Dutch report to the Convention on Nuclear Safety.

***Situation of the national regulations in 2006 with respect to the RLs***

The Netherlands system of regulations is based on IAEA standards from the '80 and '90. The

IAEA revised its standards very significantly from 2000. The Netherlands started late in revising its standards accordingly due to possible closure of the single NPP (Borssele). Several more modern safety subjects are not covered in the Dutch regulations: out of the 18 WENRA safety issues six are badly covered. Other safety issues are sometimes very well covered.

***Actions started to incorporate RLs in national regulations***

In the action plan from 2006 a NVR revision project was announced in line with the latest editions of the IAEA standards, including amendments where necessary. The action plan was limited to the areas of NPP design and operation plus Quality assurance. The planning was to finish the project by the end of 2008/beginning 2009.

***Status of the national regulations in September 2010 and envisaged further actions***

The following IAEA Requirements and Safety Guides have been considered in the NVR revision project and are now ready for publication by end of 2010:

1. Safety of Nuclear Power Plants, Design. Amended Requirements NS-R-1, 2000
2. Safety of Nuclear Power Plants, Operation. Amended Requirements NS-R-2, 2000
3. Site evaluation for nuclear installations. Amended Requirements NS-R-3, 2003
4. The management system for facilities and activities, Amended Requirements GS-R-3, 2006
5. Software for computer based systems important to safety in nuclear power plants. Amended Safety Guide NS-G-1.1, 2000
6. Safety assessment and verification for nuclear power plants. Amended Safety Guide NS-G-1.2, 2001.
7. Instrumentation and control systems important to safety in nuclear power plants. Amended Safety Guide NS-G-1.3, 2002.
8. Design of fuel handling and storage systems in nuclear power plants. Amended Safety Guide NS-G-1.4, 2003.
9. External events excluding earthquakes in the design of NPPs, Amended Safety Guide NS-G-1.5, 2003.
10. Seismic design and qualification for nuclear power plants. Amended Safety Guide NS-G-1.6, 2003.
11. Protection against internal fires and explosions in the design of NPPs, Amended Safety Guide NS-G-1.7, 2007
12. Design of emergency power systems for NPPs, Amended Safety Guide NS-G-1.8, 2004
13. Design of reactor coolant systems and associated in NPPs, Amended Safety Guide NS-G-1.9, 2004
14. Design of reactor containment systems of NPPs, Amended Safety guide NS-G-1.10, 2004
15. Protection against internal hazards other than fires and explosions in the design of NPPs, Amended Safety Guide NS-G-1.11, 2004
16. Design of the reactor core for NPPs, Amended Safety Guide NS-G-1.12, 2005
17. Radiation protection aspects of the design of NPPs, Amended Safety Guide NS-G-1.13, 2005
18. Fire safety in the operation of nuclear power plants. Amended Safety Guide NS-G-2.1, 2000.
19. Operational limits and conditions and operating procedures for nuclear power plants. Amended Safety Guide NS-G-2.2, 2000.
20. Modifications to nuclear power plants. Amended Safety Guide NS-G-2.3, 2001.

21. The operating organisation for nuclear power plants. Amended Safety Guide NS-G-2.4, 2002.
22. Amended Safety Guide NS-G-2.5, 2002(?)
23. Maintenance, surveillance and In-service inspection of NPPs, Amended Safety Guide NS-G-2.6, 2002
24. Radiation protection and radioactive waste management in the operation of NPPs, Amended Safety Guide NS-G-2.7, 2002
25. Recruitment, qualification and training of personnel for NPPs, Amended Safety Guide NS-G-2.8, 2002
26. Commissioning for NPPs, Amended Safety Guide NS-G-2.9, 2003
27. Periodic safety review of NPPs, Amended Safety Guide NS-G-2.10, 2003
28. A system for the feedback of experience from events in nuclear installations, Amended Safety Guide NS-G-2.11, 2006

Furthermore 22 other safety guides will be adopted (without amendments) by the end of 2010:

a. Application of the management system for facilities and activities. Safety Guide GS-G-3.1, 2006.
b. The management system for nuclear installations. Safety Guide GS-G-3.5, 2009.
c. External human induced events in site evaluation of nuclear power plants. Safety Guide NS-G-3.1, 2002.
d. Evaluation of seismic hazards for nuclear power plants. Safety Guide NS-G-3.3, 2003.
e. Meteorological events in site evaluation for nuclear power plants. Safety Guide NS-G-3.4, 2003.
f. Flood hazards for nuclear power plants on costal and river sites. Safety Guide NS-G-3.5, 2004.
g. Geotechnical aspects of site evaluation and foundations for nuclear power plants. Safety Guide NS-G-3.6, 2005.
h. Deterministic safety analysis for nuclear power plants. Specific Safety Guide SSG-2, 2010.
i. Development and application of level 1 probabilistic safety assessment for nuclear power plants. Specific Safety Guide SSG-3, 2010.
j. Development and application of level 2 probabilistic safety assessment for nuclear power plants. Specific Safety Guide SSG-4, 2010.
k. Safety assessment for facilities and activities. GSR Part 4, 2009.
l. Format and content of the safety analysis report for nuclear power plants. Safety Guide GS-G-4.1, 2004.
m. Ageing management for nuclear power plants. Safety Guide NS-G-2.12, 2009.
n. Evaluation of seismic safety for existing nuclear installations. Safety Guide NS-G-2.13, 2009.
o. Conduct of operation at nuclear power plants. Safety Guide NS-G-2.14, 2008.
p. Severe accident management programmes for nuclear power plants. Safety Guide NS-G-2.15, 2009.
q. Preparedness and response for nuclear or radiological emergency. Safety Requirements GS-R-2, 2002.
r. Arrangements for preparedness for a nuclear or radiological emergency. GS-G-2.1, 2007.
s. Decommissioning of nuclear power plants and research reactors. Safety Guide WS-G-2.1, 1999.

t. Decommissioning of facilities using radioactive material. Safety Requirements WS-R-5, 2006 (later).
u. Decommissioning of nuclear fuel cycle facilities. Safety Guide WS-G-2.4, 2001 (later).
v. Safety assessment for the decommissioning of facilities using radioactive material. Safety Guide WS-G-5.2, 2009 (later).

| Country | ROMANIA |
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***General presentation of the regulatory system***

The legal basis for the regulation of nuclear safety in Romania is provided by the Law on the Safe Deployment, Regulation, Licensing and Control of Nuclear Activities (Law 111/1996).

CNCAN is empowered by the Law to develop regulations in order to detail the general legal requirements as well as any other regulations necessary to support the licensing and control activities. All the regulations issued by CNCAN are mandatory and enforceable. The regulations are developed in observance of relevant international standards and good practices.

***Situation of the national regulations in 2006 with respect to the RLs***

The Romanian regulations benchmarked as part of the WENRA harmonisation study are listed below:

- Nuclear Safety Requirements (NSR) - Nuclear Reactors and Nuclear Power Plants (1975), which contains provisions concerning licensing basis documentation, site evaluation criteria and design criteria for NPPs.
- Requirements for prevention and extinction of fires, applicable in the nuclear activities (1976);
- Nuclear Safety Requirements on Emergency Plans, Preparedness and Intervention for Nuclear Accidents and Radiological Emergencies (1993);
- Regulation on granting practice permits to operating, management and specific training personnel of Nuclear Power Plants, Research Reactors and other Nuclear Installations (2004);
- The set of regulations on Quality Management Systems for nuclear installations (NMC series, 2003) which contain provisions related to the quality assurance and safety of operation, maintenance, in-service inspection, testing, modifications, training of personnel, procurement activities, etc.
- Technical Prescriptions for Design, Execution, Assembling, Repair, Verification and Operation of Pipes under Pressure and of Elements of Pipes from Nuclear Plants and Facilities (NC2-83) issued by the State Inspectorate for Boilers, Pressure Vessels and Hoisting Installations (ISCIR).

Since the completion of the benchmarking, CNCAN has published the following regulations:

- Requirements on Containment Systems for CANDU Nuclear Power Plants (2005);
- Requirements on Shutdown Systems for CANDU Nuclear Power Plants (2005);
- Requirements on Emergency Core Cooling Systems for CANDU Nuclear Power Plants (2006);
- Requirements on Fire Protection in Nuclear Power Plants (2006).
- Requirements on Periodic Safety Review for nuclear power plants (2006).
- Requirements on Probabilistic Safety Assessment for nuclear power plants (2006).

Information on the results of the benchmark and on the action plan for endorsing all reference levels and for ensuring their implementation has been provided in the 4$^{th}$ national report of Romania under the Convention on Nuclear Safety.

***Actions started to incorporate RLs in national regulations***

The updating of the national regulations started immediately after the completion of the

benchmark. Several new regulations have been already issued, while the revision of the regulations available at the time of the benchmarking is in progress. Progress has also been made with regard to the implementation side, for the issues that need to be addressed for harmonisation. The revised action plan (according to the last version of the reference levels) has been included in the national report for the 4th Review Meeting under the Convention on Nuclear Safety.

New regulations on siting and on design and construction of NPPs have been issued and the external consultation with the stakeholders has been completed. These regulations have been notified to the European Commission (EC) and it is expected that they will be formally published by the end of the year (2010). The regulation on design and construction of NPPs includes requirements that cover all reference levels in Issues E, F, G and N.

The revision of the set of 13 regulations on quality management systems, covering activities related to all the phases of the lifetime of nuclear installations, started in 2007, takes account of the latest IAEA Requirements and Guides on Management Systems (GS-R-3, GS-G-3.1 and GS-G-3.5). The external consultation process for the new regulations has been finalised and they are due to be published by the end of 2010. The new regulations cover all reference levels in Issue C.

A regulation on commissioning and operation of NPPs is currently under drafting and will incorporate the remaining RLs. The intention is to have the external consultation with stakeholders completed before the end of 2010.

The compliance with the requirements in the reference levels is assessed by the licensees as part of the periodic safety review that is currently ongoing. This assessment has been required by CNCAN.

***Status of the national regulations in September 2010 and envisaged further actions***

The reference levels in Issues C, E, F, G and N have been covered by new regulations on management systems for nuclear facilities and activities and respectively by new regulations on design and construction of NPPs (due to come into force before the end of 2010), while the remaining RLs will be covered by a regulation on commissioning and operation of NPPs, which is currently under drafting (intended for official publication in late 2010 / early 2011).

| Country: | SLOVAKIA |
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***2006 Status in the country***

Based on the national benchmarking there were 85 RLs to be harmonized in total. Act No. 541/2004 Coll. on Peaceful Use of Nuclear Energy (Atomic Act) and a set of 13 regulations were in force in 2006.

***Regulatory system in the country:***

Pursuant to Atomic Act, the supervision of peaceful use of nuclear safety is performed by Nuclear Regulatory Authority (UJD) within its competencies. UJD is a central state administration body ensuring the performance of state regulatory activities in the field of nuclear safety of nuclear installations, including supervision of the management of radioactive waste, spent fuel and other fuel cycle phases, as well as of nuclear materials, including their control and records.

Concerning the nuclear safety, the basic legal framework is laid down by the Act No. 541/2004 Coll. on Peaceful Use of Nuclear Energy (Atomic Act). Since 1st December 2004, this new Atomic Act has abrogated former Atomic Act No. 130/1998 Coll. as well as all of 13 regulations issued on the former Atomic Act No. 130/1998 Coll. basis. A new set of regulations that work out the new Atomic Act provisions in detail was accepted and approved by the Slovak Government Legislative Council in August 2005.

There are regulation on special materials and equipments, on small quantities of nuclear materials, on details of the notification of events, on periodical safety assessment, on nuclear safety requirements, on the provision for physical protection, on professional qualification, on management of nuclear material, radioactive waste and spent fuel, on safeguards, on emergency planning, on shipment of radioactive materials, on requirements for quality system documentation, as well as details concerning quality requirements for nuclear installations, details concerning quality requirements for classified equipment and on documentation needed for certain decisions

The Atomic Act regulates rights and obligations of natural and legal persons in peaceful use of the nuclear energy, nuclear material, radioactive waste, physical protection, shipment of nuclear material, radioactive waste and spent fuel, licensing procedure of the nuclear installations, nuclear safety, emergency planning, quality assurance system, staff training, civil liability for nuclear damage, shut-down of a nuclear installation for other than safety concerns, inspections, sanctions. However, radiation protection is not within the scope of this Atomic Act but remains within the competencies of Public Health Authority subordinated to the Ministry of Health as stated in Act No. 272/1994 Coll. Besides acts and regulations as legally binding, the UJD also formally issues Safety Guides, which contains methods suggested by the UJD to address special topics related to nuclear safety. Safety Guides composes of non-binding provisions but they may be important as criteria within the licensing procedure.

The licensing procedure consists of three major stages: siting, construction commencement, and permanent operation. Before granting a license for permanent operation, the regulatory authority carries out control under the approved programs for hot and cold testing and grants approval for fuel loading, physical start up, energy start up and trial operation. The basic condition essential to licensing in terms of nuclear safety is to prepare and submit a Safety Analysis Report and other prescribed safety documentation and to meet the conditions of the regulatory authority's preceding licensing procedures and decisions. Under the nuclear installation licensing procedure, International Atomic Energy Agency standards and recommendations are used and applied. More information on the Slovak legislative and regulatory system can be found on the UJD web site: www.ujd.gov.sk.

***Actions were started to incorporate RLs in national regulations:***

National action plan for WENRA RLs implementation counted on a "one-step" approach, i.e. all RLs to be harmonized would be implemented into various levels of national legal documents

(atomic act, decrees and safety guides) at once and the set of new revisions would be sent for official approval process as a batch.

***Status in 2010:***

This "one-step" approach had been followed since 2007, when intensive works on the revision of the atomic act and decrees were launched. In May 2010 the final draft of these documents were finalized and sent for comments to other state ministries and authorities according to Slovak national legal procedure.

Based on the national benchmarking there were 85 RLs to be harmonized in total. Part of the RLs was incorporated directly in the **Atomic act** (Act No. 541/2004 Coll. on Peaceful use of nuclear energy and on amendment and alterations of several acts) and the absolute majority of these were incorporated into the following **decrees**:

1. UJD Decree No. 48/2006 Coll. on details of notification of operational events and events during transport, as well as details of investigation of their reasons.
2. UJD Decree No. 49/2006 Coll. on Periodic Assessment of Nuclear Safety.
3. UJD Decree No. 50/2006 Coll. on details concerning the nuclear safety requirements for nuclear installations in respect of their siting, design, construction, commissioning, operation, decommissioning and closure of repository, as well as criteria for categorization of classified equipment into safety classes.
4. UJD Decree No. 52/2006 Coll. on professional competency.
5. UJD Decree No. 55/2006 Coll. on Details in Emergency Planning for the Event of an Incident or an Accident.
6. UJD Decree No. 56/2006 Coll. on details concerning requirements for quality system documentation of authorization holder, as well as details concerning quality requirements for nuclear installations, details concerning quality requirements for classified equipment and details concerning the scope of their approval
7. UJD Decree No. 58/2006 Coll. on Laying Down Details on the Scope, Contents, and Manner of Maintaining Documentation of Nuclear Facilities Necessary for Individual Decisions.

The new revision of the Atomic Act has been sent for official legal approval process within the country in August 2010. The new revisions of the above listed regulations are finalised and are expected to be sent for official legal process in the end of September 2010.

By amendment of the Atomic Act and the above-mentioned list of regulations all of the RLs will be incorporated into the Slovak legislation.

| Country | SLOVENIA |
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***General presentation of the regulatory system***

The present Slovenian legislative and regulatory framework governing nuclear and radiation safety has a long-standing history which has its roots in former Yugoslav legislation. While at the beginning the legislation has focused mostly on the ionising radiation safety (act of 1965 and of 1976) in the 80's it incorporated also all basic provisions related to nuclear safety (act of 1984 and more than 10 regulations).

In the Republic of Slovenia the main act in the area of nuclear and radiation safety is the Act on Ionising Radiation Protection and Nuclear Safety (Off. Gaz. RS, 67/2002 – hereinafter referred to as »2002 Act«). As defined in the first Article of this act, its main purpose is »to regulate ionising radiation protection, with the aim of reducing the detrimental effects on health and reducing to the lowest possible level radioactive contamination of the environment due to ionising radiation resulting from the use of radiation sources, while at the same time enabling the development, production and use of radiation sources and performing radiation practices«

The 2002 Act entered into force on October 1, 2002. From that day two previous Acts ceased to apply, namely:

- Act on Radiation Protection and the Safe Use of Nuclear Energy (1984 Act), and
- Act on Implementing Protection Against Ionising Radiation and Measures on the Safety of Nuclear Facilities (1980 Act).

The 2002 Act was amended in 2003 and 2004. The 2002 Act allows for the regulations issued on the basis of the 1984 and 1980 Acts to apply until new regulations, which are to be adopted pursuant to provisions of the 2002 Act, are issued. Based on the 1984 Act only a part of one regulation is still in force.

Based on the 2002 Act 7 governmental decrees and 21 ministerial regulations (ten regulations issued by the minister of the environment, nine issued by the minister of health and two issued by the minister of the interior) were adopted and issued until 2010. All these regulations are legally binding.

A detailed list of the already adopted implementing regulations and those under preparation can be found at the SNSA web page http://www.ursjv.gov.si, but is not yet fully available in the English translation.

The comprehensive legislative and regulatory framework, which governs the areas related to nuclear and radiation safety, consists of the national legal frame and of those international instruments (multilateral and bilateral treaties, conventions, agreements/arrangements) to which Slovenia is a party.

Besides the main principles (among others also "primary responsibility for safety", "the causer-pays principle", "justification", "optimisation", "ALARA" and "the preparedness principle") the 2002 Act includes, with respect to nuclear and radiation safety area, also provisions on:

- reporting an intention to carry out radiation practices or to use radiation source;
- licensing of the radiation practice or use of radiation source;
- classification of facilities (nuclear, radiation and less important radiation facilities);
- licensing procedures with respect to siting, construction, trial operation, operation and decommissioning of nuclear, radiation and less important radiation facilities;
- radioactive contamination and intervention measures;
- radioactive waste and spent fuel management;
- import, export and transit of nuclear and radioactive materials and radioactive waste and spent fuel;
- physical protection of nuclear materials and facilities;
- non-proliferation and safeguards;

- administrative tasks and inspection;
- penal provisions.

It also includes provision on competent regulatory body. In nuclear and radiation safety the competencies are divided among two regulatory bodies, namely the Slovenian Nuclear Safety Administration (SNSA) which is accountable for nuclear safety and safety of industrial radiation sources and Slovenian Radiation Protection Administration (SRPA), accountable for radiation protection of patients, medical surveillance of exposed workers, surveillance of workplaces, dosimetry and dose registers and education in the area of radiation protection.

In the licensing process, the key document governing the technical and safety measures for the construction and operation of the nuclear facility is the Safety Analysis Report (SAR).

Further information on Regulatory body and legislative framework can be found at the same above mentioned web site.

***Situation of the national regulations in 2006 with respect to the RLs***

The act on nuclear safety (ZVISJV) has been already developed and adopted in Slovenian legal system. Old regulations, developed under the old Nuclear Act, were still on power except the regulation for operator training and licensing, which was already adopted (2005). This was the legal basis against which the benchmark exercise performed and Action Plan developed in 2006.

Some works have been dedicated to development of remaining new regulation, but in that time drafts were in very early stage.

***Actions started to incorporate RLs in national regulations***

The renovation of the national legal system after adopting the "2002 Act" went on by issuing the number of regulations.

Among them in the period 2006-2010 the following two new regulations were prepared and finally adopted at the end of 2009:

- Rules on radiation and nuclear safety factors (JV5) and
- Rules on operational safety of radiation and nuclear facilities (JV9)

These regulations cover all WENRA Reference Levels, except Reference level D –Training.

It should be mentioned that in these new regulations various grace periods for implementation of some of new requirements are foreseen.

The domain of WENRA Ref. Level D is part of the Regulation JV4 which was adopted during 2005, before the WENRA issued its reference levels. According to the WENRA benchmark exercises 5 of 10 WENRA requirements are not covered by the existing JV4 regulation. To overcome this SNSA have prepared the updated version of Regulation JV4 which includes the corresponding WENRA requirements. The new, updated version of Regulation JV4 are now going through the process of adoption. It is expected that it will be approved by the end of year 2010.

The table of concordance between the WENRA reference levels and Slovenian regulations are available on SNSA site:

http://www.ursjv.gov.si/fileadmin/ujv.gov.si/pageuploads/si/Porocila/Primerjava_WENRA_ZVISJV_JV5_JV9.pdf

English translation will be provided in the first months of 2011.

| ***Status of the national regulations in September 2010 and envisaged further actions*** |
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| Practically all WENRA requirements are included in the domestic safety regulation which is on power and in use. The 5 requirements related to Training (issue D RLs) will be incorporated in the appropriate regulation during the year 2011. |

| Country | SPAIN |
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***General presentation of the regulatory system***

The nuclear regulatory framework rests on different laws and regulations such as the Nuclear Energy Act (Law 25/1964) as amended, the Law on the creation of the Nuclear Safety Council (Law 15/1980) as amended by law 33/2007 and the Electricity Industry Law (Law 54/1997). These set of laws define the nuclear regulatory framework establishing general safety principles or criteria, the processes applicable to obtain the necessary authorisations, and the mechanism for the regulatory inspections and control. Basic principles determine that the responsibilities derived from the usage of nuclear energy rests in the licensee of the installation. The Nuclear Safety Council (CSN) is the sole competent Authority for Nuclear Safety and Radiation Protection, independent from the Government and in charge of performing the regulatory inspections and control and supervision of nuclear and radioactive installations. The CSN reports to the Parliament. Electricity Industry law regulate the operation of the electricity industry and is applicable in certain areas to the nuclear industry. Law 33/2007 has amended the CSN creation law 15/1980. This amendment updates the legal framework for faults and penalties, and assigns to the CSN a stronger role in the enforcement procedure among other things.

The Government issue decrees to complete and develop the requirements established by laws. The following decrees are the most significant:

Royal Decree 1836/1999 as amended in 2008. Regulation on Nuclear and Radioactive Installations: this regulation establishes the licensing system for sitting, construction, commissioning, operation and decommissioning.

Royal Decree 783/2001 Regulation on protection of public and workers against the risks of ionising radiations (revision 2001): it includes the basic criteria and measures for radiation protection, as established in the Directive 96/29 issued by the EURATOM board in this matter.

Decree governing the coverage of nuclear risks (1967), as amended: it develops the Nuclear Energy Act in the field of the responsibility of the licensee, establishing the system for coverage for civil liability derived from such responsibility.

Royal Decree 413/1997 governing the occupational protection of outside workers potentially exposed to ionising radiation due to their intervention in the controlled zone (1997): this regulation transposes the contents of EURATOM Directive 90/641, which regulates the obligations of the operator, the outside undertakings and the outside workers, in order to assure the protection of the outside workers intervening in the controlled zone of nuclear installations.

Royal Decree 1546/2004 approving Basic Nuclear Emergency Plan, as amended by Royal Decree 1428/2009: it defines the co-ordinated action of the different Public Organisations in case of a nuclear accident. It defines the emergency plans for each province having a nuclear installation.

A Ministerial Order of the Ministry of Industry, Tourism and Trade, issues the authorisation for operation (license) to each NPP. The CSN report is the base for the nuclear safety and radiation protection issues of the authorisation. The authorisation is valid (usually) for a period of 10 years and includes the appropriate limits and conditions under which the plant must operate. These limits and conditions are legally binding. The licensing documents (such as safety analysis report, technical specifications for operation, operations requirements, dose calculations manual, emergency plan, etc.) also referred to in the Royal Decree 1836/1999 and in each authorisation are legally binding documents for the licensee.

The regulatory framework is such that the CSN is empowered to issue instructions, technical complementary instructions, circulars and safety guides.

**CSN Instructions**

The CSN Instructions (with the same legal status than governmental regulations) and Complementary Technical Instructions are both legally binding. The Instructions are technical

standards on nuclear safety or radiation protection, directed to all installations. The CSN Instructions are published in the National Official Gazette.

The Complementary Technical Instructions usually develops a license condition established within the authorisation for operation to each licensee. They are directed specifically to each licensee.

**CSN Safety Guides**

The CSN Safety Guides containg methods suggested by the CSN to address special topics related to nuclear safety and radiation protection. These guides are not binding in a prescriptive way unless endorsed by the license. The user may apply methods and solutions different from those contained in the guides, as long as they are duly justified.

The Safety Guides covers the main areas of responsibility of CSN, such as nuclear power plants, research reactors, fuel cycle installations, environmental radiological surveillance, radioactive installations and equipment, transport of radioactive materials, radiation protection, security and waste management.

***Situation of the national regulations in 2006 with respect to the RLs***

As stated in the 2006 RHWG report "Harmonization of Reactor Safety in WENRA countries", the harmonisation of the RLs is partially claimed through the legislation such as the Laws and the Royal Decree 1836/1999 on the regulation of nuclear and radioactive installations, the licence for operation of each plant and the limits and conditions included thereon.

As of 2006, the CSN instructions published so far were mainly in relation to radiation protection issues. For nuclear safety issues, the CSN had elaborate almost no legally binding requirements as defined in the 2006 RHWG report. There were only CSN orders and/or letters to the licensees requesting the compliance with different issues.

The results for Spain of the 2006 RHWG report highlighted that for a significant number of RLs (>150) there was a need to issue regulations or CSN Instructions to reach harmonisation (C categories) as far as the regulatory requirements were concerned.

***Actions started to incorporate RLs in national regulations***

Based on the results of the RHWG report and in accordance with the commitment established in WENRA the CSN set up, in 2006, an action plan for the development of CSN instructions and guides in order to be harmonised in 2010.

The action plan contemplates that fifteen CSN Instructions were going to be developed and that one existing CSN Instruction (IS-10) on notification of events need to be updated. In addition, 3 existing CSN Safety Guides were subject to revision and a new one was going to be elaborate.

***Status of the national regulations in September 2010 and envisaged further actions***

The CSN action plan progress adequately. As of September 2010 of the fifteen new instructions envisaged, the CSN has already developed, approved and published in the Official National Gazette ten of them; three other instructions are under consultation/decision making process and two instructions are in drafting. One is under revision for updating.

As regard to the safety guides the one to be review is complete and publish.

The titles of the ten CSN Instructions already published follows:

- Instruction IS-11 on Training and qualification for NPP control room staff. Published in Official State Gazette Number 100, dated 26 of April 2007

- Instruction IS-12 on defining the qualification and training requirements of non-licensed staff and non-licensed off-site personnel of nuclear power plants. Published in Official State Gazette Number 113, dated 11 of May 2007
- Instruction IS-15 on the requirements for the surveillance of the maintenance efficiency. Published in the Official State Gazette Number 281; dated 23 November 2007.
- Instruction IS-19 on the requirements for the NPP management system. Published in the Official State Gazette Number 270; dated 8 of November 2008.
- Instruction IS-21, on the requirements applicable to plant design modifications. Published in the Official State Gazette Number 43; dated 19 of February 2009.
- Instruction IS-22, on the requirements for management of aging and the plant operation beyond design. Published in the Official State Gazette Number 166; dated 10 of July 2009
- Instruction IS-23 on the in-service inspection of nuclear power plants. Published in the Official State Gazette Number 283; dated 24 of November 2009.
- Instruction IS-25 on the requirements and criteria for the probabilistic safety assessments and its applications on NPPs. Published in the Official State Gazette Number 153; dated 24 of June 2010.
- Instruction IS-26 on the basic safety requirements applicable to nuclear installations. Published in the Official State Gazette Number 165; dated 8 of July 2010.
- Instruction IS-27 on the general design criteria for NPPs. Published in the Official State Gazette Number 165; dated 8 of July 2010.

One safety guide is already updated:

- GS.1.10 periodic safety reviews of NPPs.

State of development of Instructions and Guides under drafting and or consultation/decision making process:

CSN instructions:

- 3 new CSN Instructions are under consultation/decision making process (on technical specifications for operation, emergency operating procedures, and on fire protection);
- 2 new CSN Instructions are in drafting (on operating experience and on accident analyses);
- In addition, 1 existing CSN Instruction (IS-10) on notification of events is under revision. It is in consultation phase.

CSN Safety guides:

- Revision of GS 1.6 on "notification of events to the CSN" is in drafting phase;
- Revision of GS 1.1 on "training of licensed personnel" is in consultation phase;
- In addition, a new safety guide on fire protection is been elaborated and is in consultation phase.

The publication of the three instructions and the safety guide that are in the consultation phase will be soon. For those instructions and safety guides that are in drafting phase its publication will take longer and might take place at the beginning of year 2011.

| Country | SWEDEN |
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***General presentation of the regulatory system***

Since 1 July 2008 Sweden has a new integrated regulatory body for nuclear safety and radiation protection; the Swedish Radiation Safety Authority (SSM). SSM is a merger of the two earlier regulatory bodies; the Swedish Nuclear Power Inspectorate (SKI) and the Radiation Protection Authority (SSI). SSM has taken over all the missions and tasks of the two earlier authorities. After the formation of SSM, a new series of regulations SSMFS was created. In this series all regulations formerly issued by SKI and SSI have been re-issued as SSM regulations. There are now 53 such regulations in force from 1 February 2009 (see: www.ssm.se). Also as a consequence of the formation of SSM, the Government has appointed a special investigator to review and propose changes in the nuclear legislation and possibly introduce the concept of Radiation Safety into the legislation. Decisions about this are expected earliest 2011.

The following five Acts constitute the basic nuclear legislation of Sweden:

- The Act (1984:3) on Nuclear Activities,
- The Radiation Protection Act (1988:220),
- The Environmental Code (1998:808),
- The Act (2006:647) on Financing of the Management of Residual Products from Nuclear Activities,
- The Nuclear Liability Act (1968:45).

With exception for the Nuclear Liability Act, all Acts are supplemented by ordinances and other secondary legislation which contain more detailed provisions for particular aspects of the nuclear safety and radiation protection regime.

General obligations in cases of accidents which can threaten life and the environment are included in the Act (2003:778) on Protection against Accidents and The Ordinance (2003:789) on Protection against Accidents.

The following former SKI regulations, now SSM regulations, were referred to in the reactor harmonisation study. General Recommendations on how to interpret the regulations have been issued in direct connection to the regulations and are included in the respective SSMFS publication. The licensees have to follow these recommendations or take other measures which are justified to be equal from the safety point of view.

**Regulations and General Recommendations concerning Safety in Nuclear Facilities (SSMFS 2008:1)**: Basic requirements on design, safety management, physical protection, emergency preparedness, assessment and reporting of safety, operations and maintenance, management of nuclear materials and waste, and decommissioning.

**Regulations and General Recommendations concerning Mechanical Components in certain Nuclear Facilities (SSMFS 2008:13):** Requirements on measures, control- and inspection activities on mechanical components to be taken during plant modifications, maintenance and in-service inspections.

**Regulations and General Recommendations concerning Design and Construction of Nuclear Power Reactors (SKIFS 2008:17):** Requirements on design principles, withstanding of

failures, conditions and events, and requirements on the design and operation of the reactor core.

**Regulations and General Recommendations concerning the competence of Operations Personnel at Reactor Facilities (SSMFS 2008:32):** Requirements on competence analysis, training and authorisation as well as requirements on simulators for operational training.

***Situation of the national regulations in 2006 with respect to the RLs***

During the reactor harmonisation study in the years 2003-2006 much work was done at SKI to revise and develop regulations. Several of the WENRA reference levels under discussion and benchmarking were entered into the general safety regulations and regulations on design and construction which came into force 1 January 2005. This meant that there were only a limited number of C-differences remaining from the benchmarks to be dealt with.

The situation on the legal side 2006 showed a total number of 38 C-differences distributed over issues C (7), D (1), E (3), F (5), H (1), J (2), K (3), LM (6), O (3), P (1) and S (6). It should be noted that a number of reference levels were clarified and updated during 2007 as a result of the consultations with stakeholders and the new IAEA Safety Requirements GS-R-3. This mostly affected safety issues C, E and F. New benchmarks were made against these levels. The finally revised set of reference levels was published in January 2008.

***Actions started to incorporate RLs in national regulations***

Most of the C-differences remaining in the end of 2007 have been closed by a revision of SSMFS 2008:1 prepared during 2009. This revision will require a few other changes in the regulations after the Parliament decision of a change in the Act on Nuclear Activities performed in June 2010. However, these changes have nothing to do with the reference levels. The revision of SSMFS 2008:1 is expected to come into force 2011. A more exact date cannot be predicted for the moment.

Work to revise SSMFS 2008:17 is planned to begin 2011 and is expected to be finalised in the end of 2012.

***Status of the national regulations in September 2010 and envisaged further actions***

For the moment there are 12 remaining C-differences to deal with. Six are connected to issue E, one to issue K and five to issue S.

The remaining 12 C-differences on the legal side will be dealt with in a planned revision of SSM´s regulations on design and construction of power reactors (SSMFS 2008:17). This revision is depending on consultations with other Swedish authorities and some ongoing technical investigations of the bases for making some other changes to these regulations. In addition, the planned revision will also be affected by the mentioned Parliament decision to change the Act of Nuclear Activities. One part of this bill, which will come to effect January 1, 211, is to make it legal to replace the 10 existing reactors with new ones; given that there will be no governmental changes after the election to parliament in late September 2010. With the new bill SSM have to decide whether to update SSMFS 2008:17 to apply also on new reactors.

In conclusion, Sweden is not fully able to satisfy the WENRA agreement to align the national safety regulations with all the reference levels by the end of 2010. To a certain extent this has to do with circumstances without SSM´s control such as the merger of SKI and SSI and the decided

changes in the nuclear law. However, it can also be concluded that only very few C-differences remain to be handled, such as some assumptions for the deterministic safety analysis and rules about fire protection systems and equipment. Such rules were earlier issued by another Swedish authority.

| Country | SWITZERLAND |
|---|---|

***General presentation of the regulatory system***

The legislation for the use of nuclear energy and on radiological protection is enacted exclusively at the federal (national) level (art. 90 and 118 Federal Constitution). The main provisions for authorisations and regulation, supervision and inspections are established in the Nuclear Energy Act (Kernenergiegesetz, 2005) and the Radiological Protection Act (Strahlenschutzgesetz, 1994). The legal rules and principles are put in concrete terms in the Nuclear Energy Ordinance (Kernenergieverordnung, 2005), Radiological Protection Ordinance (Strahlenschutzverordnung, 1994) and in about 10 further ordinances. The main basis for implementation and enforcement are the Guidelines of the Swiss Federal Nuclear Safety Inspectorate (ENSI).

More information about Swiss regulation can be obtained at: http://www.ensi.ch

***Situation of the national regulations in 2006 with respect to the RLs***

In 2006, many WENRA reference levels were not covered by the Swiss regulation.

At that time, the enactment of the new Nuclear Energy Act (2005) called for a "rewriting" of all ordinances and guidelines. This was a good opportunity to implement all the WENRA Reference Levels.

***Actions started to incorporate RLs in national regulations***

Since 2005, about 10 new or fundamentally revised ordinances have been enacted. Concerning the level of Guidelines the output of new regulations was even more extensive: 2 new ENSI-guidelines were published in 2007, 6 in 2008, 7 in 2009 and 5 in 2010. The process is still underway. This intensive phase of guideline drafting falls within the period where the authorities have to examine three applications for a general licence for new nuclear power plants.

Working out the new guidelines ENSI takes into consideration the WENRA Reference Levels (cf. Memo "Grundlagen der Aufsicht, AAU1192"). There is an explanatory report to each guideline; in this report it has to be demonstrated that the relevant WENRA Reference Levels are implemented in the guideline. If not, this has to be justified.

***Status of the national regulations in September 2010 and envisaged further actions***

Most of the WENRA reference levels are covered by the Swiss regulation.

New Ordinances (applicable to NPP):

| No. (SR) | Title |
|---|---|
| 732.112.2 | Ordinance on Hazard Assumptions and Evaluation of Protection Measures against Accidents in Nuclear Installations. |
| 732.114.5 | Ordinance on Methodology and Boundary Conditions for Evaluation of Criteria for provisional Taking out of Service of Nuclear Power Plants |
| 732.13 | Ordinance on safety-classified Vessels and Piping in Nuclear Installations |
| 732.134.1 | Ordinance on Qualifications of Personnel in Nuclear Installations |

New Guidelines (applicable to NPP):

| No. | Title |
|---|---|
| G07 | Organisation of nuclear installations |
| G15 | Radiation protection objectives for nuclear installations in normal operation |
| G11 | Safety-classified vessels and piping: Planning, manufacturing and installation |

| | |
|---|---|
| G13 | Radiation protection measuring devices in nuclear installations: Concepts, requirements and testing |
| G14 | Calculation of radiation exposure in the vicinity due to emission of radioactive substances from nuclear installations |
| A01 | Requirements for deterministic accident analysis for nuclear installations: Scope, methodology and boundary conditions for technical accident analysis |
| A04 | Application documents for modifications in nuclear power plants requiring a permit |
| A05 | Probabilistic Safety Analysis (PSA): Quality and Scope |
| A06 | Probabilistic Safety Analysis (PSA): Applications |
| A08 | Analysis of source terms: Extent, methodology and boundary conditions |
| B02 | Periodical reporting for nuclear installations |
| B03 | Reports for nuclear installations |
| B04 | Clearance of materials and areas from controlled zones |
| B06 | Safety-related classified vessels and piping: maintenance |
| B07 | Safety-related classified vessels and piping: Qualification of non-destructive testing |
| B11 | Emergency excercises |
| B12 | Emergency preparedness in nuclear installations |

All ordinances based on the new Nuclear Energy Act entered are in force. Several guidelines are currently being drafted. The process of guideline drafting should be completed by the end of 2013.

| Country | UNITED KINGDOM |
|---|---|

***General presentation of the regulatory system***

The operators of nuclear plants in the UK must, like their counterparts in other industries, conform to the Health and Safety at Work etc Act 1974 (HSW Act). The HSW Act is goal setting in nature and places a fundamental duty on employers to ensure, so far as is reasonably practicable, the health, safety, and welfare at work of all their employees. It also imposes a duty to ensure that members of the public are not exposed to risks to their health or safety because of the activities undertaken. The Health and Safety Executive (HSE), which is the parent body for the Nuclear Installations Inspectorate (NII), enforces the HSW Act.

The Nuclear Installations Act 1965 (as amended) (NI Act) augments the HSW Act, preventing nuclear plants being installed or operated on a site until the HSE has granted a nuclear site licence to a corporate body. A licence is not transferable but a new licence may be granted to another corporate body, subject to the same evaluation process as for an initial licence.

Each licence contains a standard set of 36 licence conditions [(1)] for all plants to provide consistent safety requirements. They are phrased in general terms that make the licensee responsible for developing and applying detailed safety standards and procedures for the plant. Thus, each licensee can adopt arrangements that best suit their business, so long as safety is being properly managed. When considering a licence application, HSE scrutinises the suitability of the proposed organisation and location together with the hazards and risks associated with the proposed activities.

The licensee is responsible for the safety of their plant and must provide NII with a written demonstration of safety. This is known as the 'safety case': this covers all stages in the life of the plant from construction through to decommissioning and must be updated to reflect changing conditions. Under the NI Act, all significant safety-related activities need some form of permission from NII. This 'permissioning regime' prevents licensees from substantially modifying plant or altering operating arrangements without NII involvement. Assessment is the process by which the NII, on behalf of HSE, establishes whether the safety case is adequate and the Safety Assessment Principles (SAPs) are used for that purpose. These principles are published in a public document. NII also has other documents, such as Technical Assessment Guides (TAGs), Technical Inspections Guides (TIGs), and other specific guidance, that have been published or are being added progressively to its web site that inform licensees and the public about how NII assesses licensees' proposals and the requirements that need to be met for permission to be granted.

NII exercises control through primary powers provided by the licence conditions (as explained more fully in reference [(1)], NII may also exercise control through 'derived' powers when licensee's arrangements provide mechanisms for this). Finally, NII inspectors may also use their enforcement powers under the HSW Act to issue Prohibition and Improvement Notices and to prosecute for breaches of that Act. Breaches of licence conditions are offences under the HSW Act.

More information can be found on NII's web site: ( http://www.hse.gov.uk/nuclear/index.htm ).

***Situation of the national regulations in 2006 with respect to the RLs***

For the UK, coverage of the WENRA reactor safety reference levels (RLs) was being claimed through high level legislation such as HSW Act and NI Act, as well as SAPs (1992 version), TAGs and TIGs and the UK action plan at this time called on a variety of such sources to claim whole or partial harmonization. The action plan, however, identified that for a significant number of RLs (>120) there was a short fall that needed to be addressed to reach harmonisation (C categories) as

far as the regulatory requirements were concerned.

***Actions started to incorporate RLs in national regulations***

Revision and reissue of the SAPs in 2006 [2], together with the planned upgrade of the TAGs provided a good opportunity to address the short falls identified in the Action Plan in a coordinated way.

During the revision of Technical Assessment Guide T/AST/005 (TAG 005) [3], the document was amended to formally adopt the RLs as Relevant Good Practice (RGP) as defined by HSE solicitors[4]. HSE's published enforcement policy [5] requires that RGP is met, hence failure to do so could lead to enforcement action. The fact that the RLs are in English is helpful to the UK as they don't have to be re-written; they can be (and are) used as they stand. In addition to including RLs as requirements in the TAG 005 we have a programme of TAG revisions and there is an internal requirement on authors to include those RLs relevant to the technical area. This latter is seen as an aid to clarity and our internal processes rather than necessary to meet the obligation to have the RLs as national requirements. TAG 005 has been through internal review and acceptance and published. In summary:

- The RLs have been formally adopted as national requirements within TAG 005.
- TAG 005 is part of our legal regulatory system; it details how HSW Act 1974 sections 2 and 3 are to be applied in the Nuclear Industry.
- TAG 005 is an official, open publication; it has been formally issued.
- Legal sanction can be applied to enforce compliance by licensees.

Hence the UK approach is judged to meet RHWG's stipulation regarding national requirements.

***Status of the national regulations in September 2010 and envisaged further actions***

The RLs are considered to be fully incorporated into the UK national requirements and no further actions are envisaged.

References:

(1) Nuclear Site Licence Conditions. ( http://www.hse.gov.uk/nuclear/silicon.pdf )

(2) Safety Assessment Principles for Nuclear Facilities. ( http://www.hse.gov.uk/nuclear/saps/saps2006.pdf )

(3) ND Guidance on the Demonstration of ALARP (As Low as Reasonably Practicable). ( http://www.hse.gov.uk/foi/internalops/nsd/tech_asst_guides/tast005.htm )

(4) Assessing Compliance With the Law in Individual Cases and the Use of Good Practice. ( http://www.hse.gov.uk/risk/theory/alarp2.htm )

(5) Enforcement Policy Statement. ( http://www.hse.gov.uk/pubns/hse41.pdf )

# Appendix 3

# Implementation of the RLs on the nuclear power plants

| Country | BELGIUM |
|---|---|

***Situation in 2006 with respect to the implementation of the RLs on the NPPs***

After the publication of the WENRA RHWG report « Harmonization of Reactor Safety in WENRA Countries" (January 2006), each country was expected to develop an action plan to bring the status of the NPPs in conformity with the WENRA RLs.

For the Belgian NPPs, about 35 RLs had been scored a "C" in the benchmarking exercise and hence all these RLs were covered in the Belgian Action Plan. This Action plan was presented to WENRA in November 2006 and published on the FANC website (see http://www.fanc.fgov.be/GED/00000000/000/29.pdf).

The actions covered different safety issues, although the most important actions (concerning work effort) were related to PSA (Issue O) and Fire protection (Issue S).

***Progress made up to September 2010 and envisaged further actions***

A formal structure for the follow-up of the implementation of the actions plan has been put in place in 2007. This "WENRA consultative committee" is composed of managers and senior experts from the FANC and Bel V on the regulatory side and from Electrabel and its engineering office Tractebel Engineering on the operator side.

The Terms of references of this committee precise among others the role of this committee:

MANDATE and OBJECTIVES:

The consultative Committee brings together the regulator (AFCN/FANC), the authorized inspection organization (AVN) *[note: now Bel V]*, the licensee (Electrabel) and its engineering support (Tractebel Engineering) in an effort:

- To continue to achieve a common understanding of WENRA Reference Levels on Reactor Safety, integrating the possible amendments made by WENRA
- To update the self-assessment on the implementation status
- To adjust the existing implementation action plan in order to take into account the WENRA amendments
- To follow-up the implementation of the action plan (implementation side).
- On request of the FANC, to comment the FANC proposals for the legal side.

The activities of the Committee are without prejudice to the roles and responsibilities of the respective organisations participating to it.

Its deliverables will take the form of recommendations.

Once the above mentioned objectives will be achieved, it will be decided whether it is useful to extend the mandate of the Committee. If not, the Committee will be automatically dismissed

DELIVRABLES

The deliverables of the Committee are:

- The meeting reports including:
  - The identification of the tasks and the work process needed to meet the objectives
  - The issue of records of clarifications, positions and statements

- As appropriate, follow-up documents

This committee meets every three months. During the meetings, a review of the ongoing actions is realized. The timing of each action is confirmed or modified, and the action plan schedule is updated accordingly. Formal closure of actions is proposed by operator to the Regulatory body. The Regulatory Body, composed of the FANC and Bel V, taking also into account the follow up of Bel V (verifying the implementation at the 2 plant sites and in the 7 NPPs) , approves the closure of the actions and acts this closure in the meeting report.

Present status of the Action Plan

At present (September 2010) 15 actions have been declared closed. These concern the following Reference Levels:

- A.1.5
- D.1.2, 3.1, and 3.2
- H.7.1
- J.1.2
- L+M.6.1, 6.2, and 6.3
- N.2.8
- O.3.5
- P.2.2
- Q.1.2 and 5.3
- R.2.3

For all other Reference Levels, the actions are on-going. For some actions that require the highest manpower effort (on PSA and Fire protection) the planning runs until 2015.

| Country | BULGARIA |
|---|---|

***Situation in 2006 with respect to the implementation of the RLs on the NPPs***

After the revision of the reference levels in 2007 and the new benchmarks, about 30 actions to address differences of types 'C' and 'B' had been included in the National Action Plan on the implementation side.

The B-differences relate to measures that were under implementation at the time of the benchmarking and have been subsequently completed.

Among the identified differences of type 'C', the prevailing areas are connected with implementation of an integrated management system (issue C), implementation of accident management measures (issue F), implementation of symptom based EOPs and SAMGs (issue LM) and extension of the scope of PSA levels 1 and 2 (issue O).

***Progress made up to September 2010 and envisaged further actions***

A process of implementation of all actions of the National Action plan has been established. Due to the volume and the complexity of some measures however, their implementation will not be completed by the end of 2010. The measures scheduled beyond 2010 relate to the following:

- implementation of an integrated management system;
- verification, validation and implementation of SAMGs;
- prevention of early containment bypass;
- equipment qualification;
- updating and extension of the scope of PSA level 2;
- risk-informed optimisation of in-service inspection programs.

Specific projects and programs for the implementation of these measures have been elaborated and are currently under way.

| Country | CZECH REPUBLIC |
|---|---|

***Situation in 2006 with respect to the implementation of the RLs on the NPPs***

The results of Czech Nuclear Power Plants assessment in the 2006 RHWG WENRA report identified some reference levels that were not implemented. In 2007 RHWG agreed to perform a revision of the matrixes. After this revision (self assessment of the benchmark results) the codifications in some reference levels was changed and consequently the new actions were required or monitored on the implementation side in the following issues:

- D - Training
- F - Design Extension of Existing Reactors
- I - Ageing
- J - Operational Experience Feedback
- K - Maintenance
- L+M - Emergency Operating Procedures and Severe Accident Management Guidelines
- O - Probabilistic Safety Analysis

***Progress made up to September 2010 and envisaged further actions***

Situation of harmonisation on the Dukovany NPP was completely checked by licensee and SUJB during last PSR finished in 2007, corrective actions were checked in 2009 and 2010.

On Temelin NPP, which is in commercial operation from 2004, the PSR was finished in 2010 and the results were handed over to the SUJB for review. The set of corrective actions is the part of the PSR Reports. Simultaneously, the situation on Temelin NPP is well known to SUJB from licensing processes.

Because of the WENRA Reference levels were and will be used as reference requirements for ongoing and future PSRs, the licensee applied it in the review and the corrective actions are planned also according to this factor. The limiting factor for complete harmonisation is a long term planned process of modifications, structured according safety importance of issues and also according real plan of refuelling outages.

The modifications, focused to severe accident management are also limited by problems of low knowledge of the phenomena, influencing plant behaviour in accident conditions and causing difficulties with fixing of final design solution of the problem. Actually 5 of 16 identified RLs were completely unsolved, 6 were solved by realisation of corrective actions, for last 5 the licensee fixed technical solutions and financial resources but he waits for optimal situation in the plan of outages.

| Country | FINLAND |
|---|---|
| ***Situation in 2006 with respect to the implementation of the RLs on the NPPs*** | |
| STUK requested the Finnish NPP licensees to assess the implementation of the reactor safety reference levels in 2006. Based on the licensees' assessments and STUK's own assessment, it was concluded that on the implementation side, Finland had only one reference level which was considered not implemented at the Finnish nuclear power plants. This reference level was related to the evaluation of the licensee's organisational changes (RL B1.2). | |
| ***Progress made up to September 2010 and envisaged further actions*** | |
| The implementation of the reference level B1.2 was verified in connection with enforcement hearings of the revised STUK's Guide YVL 1.4 "Management Systems for Nuclear Facilities" in 2008. The process concerning applying new regulatory guides to existing nuclear facilities in Finland is described in Appendix 1.<br>The current situation is that all the WENRA reference levels are now implemented at the Finnish NPPs. | |

| Country | FRANCE |
|---|---|

***Situation in 2006 with respect to the implementation of the RLs on the NPPs***

At the beginning of 2006, although few formal regulations were set to govern the design and operation of French nuclear power plants, most of the RLs were actually implemented.

Among the roughly 300 RLs, about 15 needed improvements on their implementation :

- they were mainly concerning topic E (verification of the design), O (probabilistic safety analysis) and S (protection against internal fire);
- a few were related to topic B (operating organisation), F (design basis envelope), H (operational limit and conditions), N (safety analysis report) and Q (plant modification).

***Progress made up to September 2010 and envisaged further actions***

Mid 2007, EDF completed a self-assessment on the implementation of WENRA RLs. Mid-2010, at ASN's request, EDF completed a second self-assessment.

In 2010, the main improvements implemented compared to 2006 are stated below.

As for the RLs on issue F (design extension of existing reactors, formerly included in E issue) RLs :

- F4.4 (E5.6) passive autocatalytic hydrogen recombiners have been installed on all French NPP;
- F4.6 (E5.7) concerning the prevention of high pressure core melt, a modification is being implemented to enhance the reliability of the command of the pressurizor relief valves on 900/1300 MWe series within VD3 upgrades and on N4 series within VD1 upgrades;
- F4.7 (E5.9) As part of 900 MWe series VD3 and N4 series VD1, EDF is implementing a device to detect if molten core escapes the vessel to implement appropriate actions stated in its severe accident management guidance. Specifically for Fessenheim NPP, concerning the prevention of containment melt through, ASN directed EDF to increase the depth of basemat before its 40$^{th}$ anniversary PSR.

As for the RLs on issue O (probabilistic safety analysis):

- For N4 series, PSA level 1 was extended to cover beyond design basis accidents as part of VD1 PSR. However, the level 2 PSA is still missing;
- For 1300 MWe series, a level 2 PSA has been completed (a level 2 PSA was already available for 900 MWe series);
- For 1300 MWe series, in the process of their VD3-PSR, EDF has nearly completed one PSA dedicated to fire and one to internal flooding. For St Alban NPP, EDF has established a seismic PSA;
- There is some use of PSA to identify the need for plant modification. An example is their use in the 900 MWe series VD3 PSR and in 1300 MWe series VD3 PSR process.

As for the RLs on issue Q (plant modifications) :

- Q5.4 : a systematic review of temporary plant modification is now performed at NPP and EDF initiated in 2010 an overall action plan to progressively reduce the number of such modifications.

As for the RLs on issue S (protection against internal fire):

- Fire hazard analysis, developed on deterministic basis, have been performed by EDF and

where sent to ASN for review late in 2009 (application of ministerial order December 31, 1999);

- Probabilistic fire analysis is being performed for 1300 MWe plants as part of their VD3-PSR;
- For 900 MWe plants, modifications related to the level 1 PSA are being implemented as a result of their third PSR.

For the other topics related to issues B, F, H, N and Q, they were mostly related to the update of regulations (see relevant appendix).

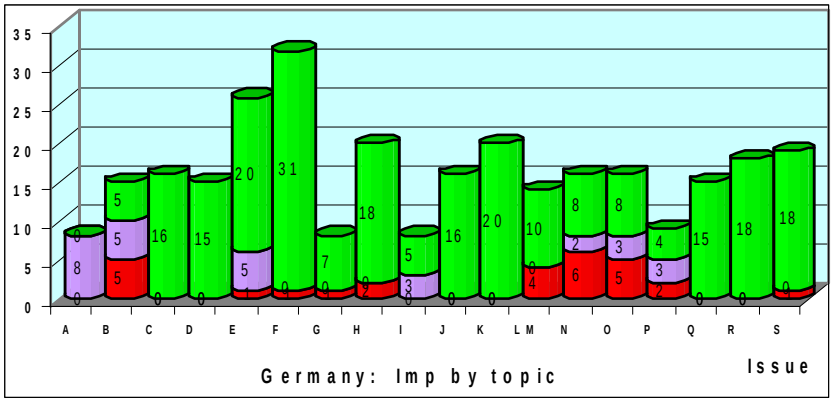
Overall, compared to 2006, implementation of WENRA RLs for existing reactors has improved in France but is still not yet fully completed.

| Country | GERMANY |
|---|---|

***Situation in 2006 with respect to the implementation of the RLs on the NPPs***

On the implementation side for Germany 28 RL were assessed with a "C".

The national graph is shown below. Main areas were issues B "Organisational structure" (5), E "Design Basis Envelope for Existing Reactors" (1), F "Design Extension of Existing Reactors" (1), G "Safety Classification" (1), H "Operational Limits and Conditions" (2), LM "Emergency Operating Procedures and Severe Accident Management Guidelines" (4), N "Contents and updating of Safety Analysis Report" (6). O "Probabilistic Safety Analysis" (5), P "Periodic Safety Review" (2) and S "Protection against Internal Fires" (1).




***Progress made up to September 2010 and envisaged further actions***

Progress in Issue B: An assessment of the existing documentation and approaches with regard to requirements of the reference levels of Issue B has been carried out. The assessment showed that harmonisation is reached.

Progress in Issue E: The reference level has been changed so that beyond design basis accidents are not longer addressed. Thus the WENRA categorization "C" from 2005 is no more valid. Based on the German safety standards a set of plant specific initiating events, as well as technical acceptance criteria are defined. Initiating events are grouped into a limited number of categories. However, initiating events are not explicitly grouped according to their probability of occurrence. Radiological acceptance criteria are assigned in accordance with the radioprotection ordinance for normal operation, anticipated operational occurrences and design basis accidents. The assessment showed that harmonisation is reached with tolerable differences.

Progress in Issue F: The issue has been completely rewritten. The 2005 categorization "C" for one reference level is no longer valid. The assessment of the changed reference level showed that a harmonisation is reached with tolerable differences.

Progress in Issue G: The designer has implemented a classification system. This classification is based on the importance for safety of the SSCs (e.g. for Konvoi power plants the SSCs of the pressure retaining boundary are classified in K1 and conventional systems are classified in K5). For electrical systems and I&C a safety related classification is used according to RSK Guidelines and KTA Standards which comply to international safety standards. The assessment showed that harmonisation is reached.

Progress in Issue H: Adaptation of OLCs to plant modification and new insights gained are part of licensed instructions and also part of the experience feedback systems (internal and external). This is applied in the processes of the integrated management system. Beyond activities in periodic safety reviews there are occasional reviews of OLC. For normal and abnormal operation as well as DBAs OLCs are defined and documented in different parts of the operating manual (e.g. safety relevant limits, operational conditions of the plant). In case of deviations of OLCs procedures to bring the plant back into a safe state are described in the operating manual (e.g. non-availability allowance times, KMA/RMA-Meldungen, etc.). For DBAs there additionally exist safety goal

oriented procedures to bring the plant back into a safe state. All Procedures, including procedures to deal with unclear plant states and conflicting measurements, are part of the training of shift personal e.g. in the simulator training. The assessment showed that harmonisation is reached.

Progress in Issue LM: EOPs for DBA are contained in the operation manual. EOPs for DBAs and selected severe accident conditions are contained in the emergency manual. SAMGs are currently being considered to be developed, so on this point harmonisation is not yet reached.

Progress in Issue N: On the background that safety issue N, footnote 47, opens the approach of an integrated set of documents, an analysis has been carried out to verify, that the existing documentation fulfils the requirements of Issue N.

Progress in Issue O: Level 1 PSAs have been performed for all plants. Level 2 PSAs for the operational state are developed. They are finalized for most plants and will be finalized for the other plants in the next years. Due to the very good results of PSA Level 1 for fire and shutdown states PSA Level 2 for these states are considered to deliver only negligible safety improvements. Therefore a Level 2 PSA for fire and shutdown states is currently not practiced. Furthermore PSA are not used to assess the adequacy of plant modifications.

Progress in Issue P: The compliance with licensing requirements is legally required through § 19.1 of the Atomic Energy Act. The safety significance of deviations from applicable current safety standards and best international practices are evaluated with respect to the impact on the fulfilment of the fundamental safety goals. This approach is named "Schutzzielorientierte Vorgehensweise (protection goal oriented review)". The assessment showed that harmonisation is reached.

Progress in Issue S: A fire analysis is part of each PSA Level 1 and has been developed for all NPPs. The assessment showed that harmonisation is reached.

| Country | HUNGARY |
|---|---|

***Situation in 2006 with respect to the implementation of the RLs on the NPPs***

As it was identified during the benchmark process in 2006, most of the Reference Levels were implemented at the NPP Paks.

37 Reference Levels were evaluated as C (a difference exists, and should be addressed for harmonization). They were identified:

- mainly within the issue E (Design Basis Envelope for Existing Reactors), LM (Emergency Operating Procedures and Severe Accident Management Guidelines) and O (Probabilistic Safety Analysis) and
- a few were related to issue A (Safety Policy), F (Design Basis Envelope for existing reactors), J (System for Investigation of Events and Operational Experience Feedback) and S (Protection against internal fires).

***Progress made up to September 2010 and envisaged further actions***

HAEA established a national action plan in collaboration with the NPP Paks to manage the not implemented Reference Levels in 2006.

The NPP Paks made the last Periodic Safety Review in 2007. During this review the Licensee used the Reference Levels (version January 2006) as one of the international good practices.

After the issuance of latest version of Reference levels (January 2008) the action plan was updated.

In accordance with the schedule many tasks were performed. Due to these activities 13 Reference Levels from 37 were implemented. For all other Reference Levels (24), the actions are on-going in line with action plan. Typically they are related to the LM (Emergency Operating Procedures and Severe Accident Management Guidelines) and O (Probabilistic Safety Analysis) issues. The subtasks of action plan related to the Severe Accident Management Guidelines (SAMG) planned unit by unit. In the case of Unit 1 the activities will be completed by the end of 2011. All SAMG activities will be finished by the end of 2014. The actions related to the Probabilistic Safety Analysis will be also finalized by the end of 2014.

| Country | ITALY |
|---|---|
| ***Situation in 2006 with respect to the implementation of the RLs on the NPPs*** | |
| In the original action plan issue (2006), two issues were identified as not explicitly implemented in Italy, given the specific status of the nuclear power plants. They were referred to the issue C - Quality Management and were addressed to:<br>• the personnel training, requiring operating personnel to understand the safety consequences of the activities,<br>• the need to provide a documented self assessment of managers. | |
| ***Progress made up to September 2010 and envisaged further actions*** | |
| Such requirements have been recently, explicitly required to be included in the Quality Assurance Programmes of the licensees, during the QAP general revision that follows the decommissioning license.<br>When, in 2007, the issue C reference levels were modified into Management System, as a result of the benchmark in Budapest, the lack of requirements proper of an updated Management System was considered justified in Italy, due to the plats' status. Nevertheless, the licensee has issued a Management System Manual, produced to update the requirements on the basis of the most recent standards; the implementing documents are going to be reviewed in the frame of QAP general revision mentioned above. | |

| Country | LITHUANIA |
|---|---|

***Situation in 2006 with respect to the implementation of the RLs on the NPPs***

According to benchmarking results 227 of RLs were covered in substance, 62 RLs were not fully covered, but the differences can be justified from a safety point of view, and 2 RLs should be addressed for harmonization.

***Progress made up to September 2010 and envisaged further actions***

***Status of Ignalina NPP***

The first Ignalina NPP unit was shutdown by the end of 2004. By the end of September 2010 reactor core was defueled, nuclear fuel is still in storage pools located in the unit. In operation are necessary for such state supporting systems.

By the end of 2009 second (the last in Lithuania) Ignalina NPP unit was shutdown and by the end of September 2010 was in permanent shutdown. Some systems, devoted particularly for operation, are already switched off and isolated. Reactor core still contains nuclear fuel, so necessary equipment is still in operation.

***Implementation of RLs***

The plan on implementation of RL's at Ignalina NPP was agreed with VATESI in 2007, where 75 RLs were foreseen to be implemented.

By the end of 2009, 52 out of foreseen 75 RLs levels were implemented.

As the final version of part C "Management system" was issued shortly before planned shutdown of the last (second) Unit by the end of 2009, it was recognized that implementation of 23 RL's from this part is not an urgent issue. Later, taking into account state of Ignalina NPP, VATESI agreed with proposal not to implement the rest RLs.

| Country | THE NETHERLANDS |
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| ***Situation in 2006 with respect to the implementation of the RLs on the NPPs*** | |
| After two 10-yearly PSRs including the IAEA requirements and guides, a lot of safety backfitting has been implemented in the Borssele NPP. The implementation is head of national regulations. In total 15 serious differences had to be addressed; in 2006 5 were not yet finalized. | |
| ***Progress made up to September 2010 and envisaged further actions*** | |
| Implementation of RLs was completed in 2009. | |

| Country | ROMANIA |
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| ***Situation in 2006 with respect to the implementation of the RLs on the NPPs*** | |
| The outcome of the benchmarking was that most of the RLs were actually implemented.<br>The evidence that has been used for benchmarking is heavily relying on documentation that has been approved by CNCAN, having the updated safety analysis report as the major source of information for verification of the implementation. A number of plant's procedures, especially operating procedures and their technical basis' documents, inspection and maintenance procedures, as well as procedures relevant for the control of modifications, have also been checked for more detailed information relevant to specific reference levels. In addition, the industrial standards and codes used for the plant design and various operational programmes (e.g. periodic inspection programme, fire protection programme, etc.) have been consulted. As part of the verification process, CNCAN staff has also conducted inspections and interviews with different technical managers from the plant. For specific issues related to design, the design manuals for various systems and the accident analyses, as well as the probabilistic safety assessments have been consulted for ensuring the accuracy of the information presented during benchmarking.<br>The RLs that were not implemented at the time of the benchmarking are related to the severe accident management programme (issues F, LM), development of PSA Level 2 (issue O) and performance of a PSR (issue P). | |
| ***Progress made up to September 2010 and envisaged further actions*** | |
| The SAMGs (severe accident management guidelines) are currently in process of being customised, work has started on the development of a PSA Level 2 and the first PSR for Cernavoda NPP Unit 1 is ongoing. | |

| Country: | SLOVAKIA |
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***2006 Status in the country (what were the main areas needing improvement):***

In 2006 there were 19 RLs evaluated as "C" in total to be implemented. Most of them were in Issue F – Design extension and LM - EOPS/SAMG.

***Progress made till 2010:***

Works to address all RLs on implementation side were commenced with works on the revision of national legal documents in parallel.

All licensees were informed about the national action plan and were asked to prepare for harmonization on implementation side. All WENRA RLs were used as benchmark criteria during the Periodic safety review after 10 years operation at all NPPs in Slovakia between 2008 and 2010). Licensees prepared their own implementation projects that are subject to UJD regular reviews.

A large project Implementation of hardware modifications for Severe Accidents mitigation commenced in 2008 on all operating NPPs in Slovakia. These modifications might be considered as the most demanding and resource intensive out of all RLs. The project is under continual oversight from UJD inspectors. It is scheduled till the end of 2016.

There is no systematic approach to inspect implementation of RLs from UJD side at the moment. Nevertheless, it is expected that licensees will update its benchmarking till the end of 2010 and during the 2011 UJD will inspect implementation of already implemented RLs.

| Country | SLOVENIA |
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***Situation in 2006 with respect to the implementation of the RLs on the NPPs***

The implementation level of WENRA RL's found out during the benchmarking exercises was much higher than the level of harmonization of Slovenian regulation with WENRA RL's. Only 11 (C category) issues were not in place. Additional 8 issues were categorized as B, meaning that implementation is resolved in a different way or implementation was on the way but not finished.

***Progress made up to September 2010 and envisaged further actions***

During the period 2006-20010 improvements have been achieved in WENRA requirements implementation in Krško NPP. Open issues allocated during the benchmark exercise have been implemented to various degrees.

Issues relates to Ageing Management (I) and Environmental Qualification which have been assessed as B, will be fully implemented by the end of the year 2010.

Implementation is not performed yet completely for plant staff, sufficiency and changes assessment, staff long term planning, management and supervision of contractors work, quality management system (QMS) role in organizational changes and way of implementation of QMS, SAR update with relevant decommissioning data and PSA use to assess significance of operational occurrences. Implementation of these WENRA reference levels will be completed during the year 2011.

| Country | SPAIN |
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***Situation in 2006 with respect to the implementation of the RLs on the NPPs***

The national results for Spain in the 2006 report contained some reference levels that were not implemented (less than 20 "C"). Issues requiring actions for the implementation of the reference levels were: A, B, E, J, K, O, Q and S.

In 2007, the RHWG performed a revision of the matrixes to take into account the updated reference levels on issues C, E and F mainly.

During this revision, (self-assessment of the benchmark results) the codification of some reference levels was changed from "A" to "C" and vice versa. In consequence, new actions were required on the implementation side. In addition some reference levels that in the 2006 report were qualified as "C " were re-qualified as "A", as it was considered after discussions with the licensees that they were already implemented in the plants.

In summary actions were required on the following issues:

- C. Management System
- F. Design Extension of Existing Reactors
- Maintenance, In-service inspection and Functional Testing
- L+M. Emergency Operating Procedures and Severe Accident Management Guidelines
- O. Probabilistic safety analysis
- S. Protection against internal fires.

***Progress made up to September 2010 and envisaged further actions***

For issue C "Management system" a working group was set up between CSN and the licensees in order to develop a guide with the criteria for the application of the management system. The working group held various meetings and the CSN has conducted visits to follow up the implementation status in the plants. As of January 2010, the reference levels of issue "C" are implemented in all plants.

For issue L+M there is a standby situation in one plant (Trillo) because it is not decided yet how will be developed the SAMG guidelines for plants of similar design to the Trillo NPP.

With the new CSN instructions published so far the reference levels of some of the aforementioned issues are now required and the licensees are in the process to implement the reference levels at the NPPs. For those instructions in draft/decision making process, the RFs are yet not implemented in all plants.

| Country | SWEDEN |
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***Situation in 2006 with respect to the implementation of the RLs on the NPPs***

In the fall of 2007, SKI invited the licensees to benchmark the implementation of the reference levels on the NPPs. The result was compared with SKI´s own assessment and showed quite few differences. Most of them had to do with different interpretation of some of the reference levels.

After the revision of the reference levels in 2007 and the new benchmarks, 20 C-differences remained on the implementation side distributed over issue E (5), issue F (4), issue G (1), issue H (1), issue K (1), issue LM (1), issue N (2), issue O (3) and issue S (2). These C-differences had to do with analyses of some events and combination of events, some design issues such as anchoring of isolation valves, prevention of hydrogen explosion and supplementary control posts, environmental qualification, documentation of verification and validation of EOPs and SAMGs, descriptions in SAR of safety management and deterministic fire analysis.

***Progress made up to September 2010 and envisaged further actions***

Orders of SKI to supplement the SARs as well as the large modernisation programmes at the Swedish NPPs ongoing since 2007and planned to be finalised by 2013, have taken care of most of the remaining C-differences.

Eight C-differences remain to deal with after 2010 distributed over issue E (2), issue F (2), issue G (1), issue O (1) and issue S (2). The most important design item remaining is to upgrade the supplementary control posts at some reactors. These actions are planned to be completed 2012. The last outstanding C-differences on the implementation side are scheduled to be completed 2013.

| Country | SWITZERLAND |
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***Situation in 2006 with respect to the implementation of the RLs on the NPPs***

In 2006, the main areas needing improvements were issues K (Maintenance, In-service Inspection and Functional Testing - 5 RLs to be addressed) and O (PSA - 4 RLs to be addressed).

***Progress made up to September 2010 and envisaged further actions***

The majority of open points were resolved in the past years. Examples:

Issue K - Qualification of non-destructive testing:

Reference Levels K/3.2, 3.10, 3.11: Since 2008 the Swiss Association for Technical Inspections (SVTI) has been responsible for the qualification of non-destructive testing in all NPPs. All NPPs fully comply with the Reference Levels mentioned before.

Issue O - PSA:

Reference Level O/1.1: The Level 1 PSA models include all relevant internal and external initiating events considering full power, low power as well as shutdown operation. Level 2 PSAs for full power are fully developed. The Level 2 PSAs for shutdown operational state are fully developed for the Gösgen and Beznau NPP. Those for the Mühleberg and Leibstadt NPP are scheduled for 2010/2011.

Issue LM - Training/SAMG:

Reference Level LM/6.1: Since 2007 all NPPs have their own full-scope-replica simulator. There is no longer any training using simulators which are not plant specific. SAMG have become a part of training for all staff involved. Emergency exercises, simulator training and classroom training are used. All NPPs fully comply with Reference Level LM/6.1.

Issue N - SAR: Inspection / testing / operational feedback / ageing management

Reference Level N/2.8: Inspection, testing, operational feedback and ageing management are addressed in the SAR of each NPP. All NPPs fully comply with Reference Level N/2.8.

In order to ensure the implementation of all RLs, open points identified during the first self assessment performed by the ENSI (then HSK) were directly communicated to the licensees of the NPPs in a special meeting. The oversight of the implementation is performed by ENSI's Inspection Section. For each NPP there is a dedicated ENSI Inspector who coordinates the work according to the applicable oversight processes. The implementation will be finished in 2011.

| Country | UNITED KINGDOM |
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***Situation in 2006 with respect to the implementation of the RLs on the NPPs***

For the UK, the position on the implementation side for the WENRA reactor safety reference levels (RLs) was somewhat better than the position on the regulatory side. [There were less than 20 Cs on the implementation side compared to greater than 120 Cs on the regulatory side].

***Progress made up to September 2010 and envisaged further actions***

Process by Licensees

In the United Kingdom two licensees operate nuclear power plants. British Energy Generation Ltd operates both a fleet of Advanced Gas-cooled Reactors (AGRs) and a Pressurised Water Reactor (PWR). Magnox North Limited operates four gas-cooled Magnox reactors at two sites.

Before the end of 2010 both these licensees will have completed a self assessment and produced a finalised report describing how they comply with the January 2008 WENRA reactor safety reference levels.

Process by Regulator

As noted in the United Kingdom regulatory side appendix, a well developed programme of Technical Assessment Guide (TAG) revisions is in place. During these revisions, RLs relevant to the technical area are included. These TAGs are used during the routine inspection and assessment activities of regulator, the Nuclear Installations Inspectorate (NII). Through this means, confidence that the RLs are implemented is built into the routine activities of the regulator.

Envisaged Further Actions

Taking into account both the licensee and regulator processes, there is adequate confidence that the RLs are fully implemented on operating nuclear power plants in the UK.

The RHWG is currently producing a methodology to develop enhanced common understanding of selected RLs. Future UK participation in the application of this methodology will provide added confidence in the implementation side.