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European Nuclear Safety Regulators Group

Report of the European Nuclear Safety Regulator's Group

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EXECUTIVE SUMMARY

During the reporting period, European Nuclear Safety Regulators Group's (ENSREG) priorities were maintaining a high level of nuclear safety; carrying out "stress tests", and prompt implementation of its results; ensuring full transparency; and enhancing high levels of safety of the radioactive waste management.

Safety in the European operating nuclear plants remained high: ENSREG is pleased to report that the nuclear safety of the European nuclear plants and activities remained at a high level during the reporting period mid-2011 to mid-2013. There were no events or developments jeopardizing the public health and safety in any of the European countries. As before, the safety of the operating nuclear plants continues to be the highest priority to the national regulators. As an integral part of the high safety culture, continuous improvements for safety remained a focus for all European national regulatory systems.

ENSREG is also pleased to conclude, that in this highly technical area, plant operators, their technical support organisations as well as all national regulators are strongly committed to a continued high level of safety.

"Stress tests" successfully carried out; prompt implementation of its results started: ENSREG is proud to report, that the "stress tests" it organized, were successfully carried out and completed by 26.4.2012. The stress tests were the largest and most profound in the world, and the approach was followed and adopted by non-European countries as a model of best practice.

Following the severe accidents in the Fukushima Dai-ichi nuclear power plant, the European Council of 24/25 March 2011 requested that all EU nuclear plants should be reviewed on the basis of a comprehensive and transparent risk and safety assessment (stress tests). The European Council invited ENSREG and the European Commission to develop the scope and modalities for the stress tests with the full involvement of Member States, making full use of available expertise (notably from the Western European Nuclear Regulators Association (WENRA)).

The stress tests and peer review focused on three topics which are directly derived from the preliminary lessons learned from the Fukushima accident: Natural hazards, including earthquake, tsunami and extreme weather, loss of safety systems and severe accident management. The stress tests and peer review assessed these topics in a three step process.

The first step required the operators to perform an assessment and make proposals following the ENSREG specifications. The second step was for the national regulators to perform an independent review of the operators' assessments and issue requirements, whenever appropriate. The last step was a peer review of the national reports submitted by regulators.

In March 2012 a series of country reviews began. Each country subject to the peer review was visited by a team of eight peer reviewers for three to four days. Complementary discussions were held in order to obtain appropriate answers to the questions left open after the topical review as well as clarification on important issues. A plant selected by the review team was also visited in each country.

The 15 European Union countries with nuclear reactors as well as Ukraine and Switzerland performed the stress tests and were subject to the peer review. The operators submitted their final assessments by 31 October 2011 and the regulators submitted their final national reports within deadline by 31 December 2011. The peer review started on 1 January 2012. There were over 70 reviewers from 24 European countries participating in the peer review.

Observers from several non-EU countries (Canada, Croatia, Japan, UAE and USA) as well as the International Atomic Energy Agency (IAEA) also attended. The report was approved by ENSREG and the EC on 26 April 2012. As agreed, an ENSREG action plan was developed to monitor implementation of the recommendations. As part of the ENSREG action plan each national regulator generated a country-specific action plan.

The peer review concluded that all countries have taken urgent and significant steps to improve the safety of their plants, with varying degrees of practical implementation. In spite of differences in the national approaches, the peer review showed an overall consistency across Europe in the identification of strong features, weaknesses and possible ways to increase plant robustness in light of the preliminary lessons learned from the Fukushima accident. As a result of the stress tests, significant measures to increase robustness of plants have already been decided and/or are further considered. Such measures include provisions of additional mobile equipment to prevent or mitigate severe accidents, installation of hardened fixed equipment, and the improvement of severe accident management, together with appropriate staff training measures. In many cases, important modifications are being prepared. ENSREG emphasizes that needed modifications and upgrades to nuclear power plant safety systems must be done without undue delays and with a very high quality. Namely, hasty modifications may easily lead to counterproductive results; instead of increasing safety, hasty designs, manufacturing and installation of equipment, penetrations, operating procedures etc. may in actual accident situation and conditions easily malfunction and make the accident even worse.

Details about national situations, as well as recommendations to national regulators, can be found in the country reports[1].

The main results of the European peer review can be summarized as follows:

- ENSREG recommended that WENRA, involving the best available expertise from Europe, develop guidance on natural hazards assessments, including earthquake, flooding and extreme weather conditions, as well as corresponding guidance on the assessment of margins beyond the design basis and cliff-edge effects.

- ENSREG underlined the importance of periodic safety reviews. In particular, ENSREG highlighted the necessity to re-evaluate natural hazards and relevant plant provisions as often as appropriate but at least every 10 years.

- As the Fukushima accident highlighted the importance of the containment function to avoid widespread contamination of radioactive materials from a plant, ENSREG emphasized urgent implementation of the recognized measures to protect containment integrity that national regulators should consider.

- ENSREG pointed out that national regulators should consider necessary implementation of measures allowing prevention of accidents and limitation of their consequences in case of extreme natural hazards.

One of the important results of the public interaction is a strong demand for a European initiative on off-site emergency preparedness. This subject was not part of the mandate of the peer review. However, ENSREG recognizes importance of off-site emergency preparedness in Europe, as a follow-up of the Fukushima accident.

National regulators and ENSREG are pro-actively implementing the action plans. However, ENSREG recognized that learning all lessons from Fukushima accident will take many years. ENSREG continues to closely follow the activities taking place in Fukushima Dai-ichi and

[1] http://www.ensreg.eu/EU-Stress-Tests/Country-Specific-Reports

contaminated off-site areas in order to learn and share all lessons for further improving the safety.

To this end, ENSREG wishes to acknowledge the current high level nuclear safety culture in Europe which is also reflected by the fact that performing such a peer review was a challenge and required very significant resources from the participating countries, all taking place on voluntary, good cooperative basis between the plants and national regulators.
Full transparency was ensured: Enhancing transparency and an opportunity for public involvement have been ENSREG's objectives from the beginning. In pursuit of these objectives, the national reports have all been made public in English and most in the national language. The final peer review report with the country review annexes is also available publicly[2]. ENSREG hosted public meetings in January and May 2012 to inform the stakeholders and seek comments. Suggestions were collected on a public website and were later considered during the peer review process. Comments related to specific countries or reactors were forwarded to the responsible national regulators. Overall the public input has improved the stress test peer review process. Comments received in the public meeting influenced the structure of the final report. Also, ENSREG's national regulators held public meetings in their own countries.

In line with ENSREG's initiative to improve transparency, the Group established a dedicated EU website to provide the public and other stakeholders with coordinated and easy access to information on nuclear safety. The project was commenced during the first Work Programme and the website was launched in January 2010.

The website includes information on ENSREG, nuclear regulatory organisations in each Member State, profiles of each country, basic information about the nuclear fuel cycle and radioactive waste, and describes how safety is ensured in nuclear power plants and in the management of spent fuel and radioactive waste. There is also a section dedicated to the EU Stress Tests and Follow-up. Members of the public are continuously informed on the process (e.g. quarterly updates and revision of relevant subpages). Relevant documentation is published on the website. Stakeholders also have the opportunity to participate in consultations via the ENSREG website.

The Nuclear Safety Directive and the Waste Directive establish legally binding obligations on Member States in relation to information to the public. ENSREG prepared recommendations on the implementation of Article 8 of the Nuclear Safety Directive and on the implementation of Article 10 of the Waste Directive.

ENSREG is committed to continuously improving co-operation with other groups working in the field (e.g. the Transparency Working Group of the European Nuclear Energy Forum – ENEF and Working Group on Public Communication of Nuclear Regulatory Organisations of the OECD's Nuclear Energy Agency - NEA) as well as to improve transparency and communication aspects with stakeholders and the general public at large.

High level of safety of the radioactive waste management was enhanced: On 19 July 2011, the Council of the EU (Council) adopted the Directive 2011/70/EURATOM establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste (the 'Waste Directive'). Setting up a legislative framework, the Directive ensures that Member States provide appropriate national arrangements to protect workers and the general public against harmful effects of ionizing radiation, as well as to ensure the provision of necessary public information and participation in relation to spent fuel and radioactive waste management. The Waste Directive enhances the role and independence of national regulatory authorities, confirming license holders have prime responsibility for the safety of spent fuel and radioactive waste management facilities and/or activities.

[2] http://www.ensreg.eu/NODE/513

ENSREG worked in two significant areas in assisting the smooth implementation of the Waste Directive:

- to provide guidance for Member States on the structure and format of the national reports required under Article 14(1), taking account of the experience in producing the three yearly reports to the Joint Convention; and

- to provide guidance and progress the scheduling and resourcing of self-assessments and peer reviews required under Article 14(3) of the Directive.

The guidelines, by providing a common structure of reporting, also now facilitate the Commission to compile and submit a report to the Council and the European Parliament on progress made with the implementation of the Directive.

Regarding peer-reviews, ENSREG concluded, as it was the case with the Nuclear Safety Directive that the best way forward was by cooperation with the IAEA Integrated Regulatory Review Service (IRRS) programme. A Memorandum of Understanding between ENSREG and IAEA for international peer review missions to the EU Member States was agreed upon based on an indicative European IRRS programme.

ENSREG emphasised the importance to streamline and make full use synergies between different peer review mechanisms of the IAEA, OECD and others in order to make best use of limited resources.

ENSREG will continue to work along its work programme, reacting swiftly to arising needs such as follow-up activities to the Stress tests or increased international co-operation.

1. INTRODUCTION

1.1. Content of the report

This report is the third report of ENSREG following its establishment in May 2007. It is intended to update the Council and the Parliament on the work undertaken by ENSREG since mid-2011. ENSREG's earlier work is described in its first and second reports[3],[4] which were submitted in July 2009 and in July 2011 respectively.

Chapter 1 provides background information on the arrangements for nuclear safety and radioactive waste management in the European Union, together with a short history of ENSREG. Chapter 2 provides information on the EU Stress Tests and the Follow-Up Process. Chapters 3, 4 and 5 summarise the work undertaken by ENSREG to improve arrangements for nuclear safety, for the safe management of spent fuel and radioactive waste and for transparency in nuclear safety within the European Union. Chapter 6 summarises ENSREG's achievements to date and outlines its proposals for future actions.

1.2. Nuclear Safety in the EU context

The ground for nuclear energy in Europe was laid in 1957 by the establishment of the European Atomic Energy Community (EURATOM). Its main functions consist of furthering cooperation in the field of research, protecting the public by establishing common safety standards, ensuring an adequate and equitable supply of ores and nuclear fuel, monitoring the peaceful use of nuclear material, and cooperating with other countries and international organisations.

There are some 130 nuclear power reactors in operation in the EU (October 2012). Some reactors are being decommissioned while others are having their working lives extended, with several new units planned or under construction. In addition to power reactors, a full range of fuel cycle plants (from enrichment to waste storage and recycling) are in operation in Europe. It is the responsibility of each EU Member State to decide on its preferred choice of energy mix. Currently 14 EU Member States out of 27 use nuclear energy for power generation. Nuclear energy currently generates approximately one third of all electricity in the EU.

Many Member States also operate research reactors and all use radioactive sources in medicine and industry. As a result, all Member States generate radioactive waste to a greater or lesser extent, with the greatest volume coming from nuclear power generation and associated activities. The management of certain types of radioactive waste has reached a mature stage of development, but the establishment of disposal facilities for the higher activity and longer-lived wastes remains a main challenge for the future.

Nuclear safety is of the utmost importance to the EU and its people. The consequences of a major nuclear accident are also potentially ruinous to national economies. It is therefore essential for European society and the economy to avoid the occurrence of any nuclear accidents in the European Union by ensuring the highest possible quality of regulatory oversight and standards of nuclear safety in each and every EU Member State. The aftermath of the Fukushima nuclear accident of March 2011 has renewed both the political

[3] Report of the European Nuclear Safety Regulators Group, July 2009:
http://www.ensreg.eu/sites/default/files/HLG_p%282009-09%29_35.FINAL_.ENSREG%20Report%202009_0.pdf

[4] Report of the European Nuclear Safety Regulators Group, July 2011
http://www.ensreg.eu/sites/default/files/ENSREG%20Report%202011%20final.pdf

and public concern regarding the measures needed to minimise risk and guarantee the most robust levels of nuclear safety.

1.2.1. National Responsibility

Nuclear safety and the safe management of spent fuel and radioactive waste are national responsibilities and each EU country with nuclear power plants and/or radioactive waste management facilities has a national regulatory body and national legislation setting out its requirements governing safety and security. The national nuclear safety regulators of each of the EU countries are listed on the ENSREG website[5] The standards applied in each country are developed based on European law, international requirements and guidance on best practice.

1.2.2. International Safety Conventions

All EU Member States are signatories to the Convention on Nuclear Safety (CNS) and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. The CNS was adopted in Vienna on 17 June 1994, and entered into force on 24 October 1996. Its aim is to legally commit participating states operating land-based nuclear power plants to maintain a high level of safety by setting international benchmarks to which states would subscribe. The obligations of the states cover the siting, design, construction and operation of nuclear power plants as well as the availability of adequate financial and human resources, assessment and verification of safety, quality assurance and emergency preparedness. The CNS obliges states to submit reports on the implementation of their obligations for "peer review" at meetings of the states held at the IAEA, every three years. The 5th Review Meeting of the CNS was held in at the IAEA in Vienna from 4 to 14 April 2011. A second extraordinary meeting was held from 27 to 31 August 2012. The 6th Review Meeting of CNS is due to be held at the IAEA in Vienna in 2014.

The Joint Convention on the Safety of Spent Fuel Management and on the Safety of radioactive Waste Management (Joint Convention) entered into force on 18 June 2001. It applies to spent fuel and radioactive waste resulting from civilian nuclear reactors and applications and to spent fuel and radioactive waste from military or defence programmes, if and when such materials are transferred permanently to and managed within exclusively civilian programmes, or when declared as spent fuel or radioactive waste for the purpose of the Convention by the Contracting Party. The Joint Convention also applies to planned and controlled releases into the environment of liquid or gaseous radioactive materials from regulated nuclear facilities. As in the case of the CNS, the Joint Convention obliges states to submit a report on the implementation of their obligations for “peer review” at meeting of the states held by the IAEA every three years. The 4th Review Meeting of the Joint Convention was held at the IAEA in Vienna from 14 to 23 May 2012. The 5th Review Meeting is due to be held at the IAEA in Vienna in 2015.

1.2.3. European Legislation

On 25 June 2009 the Council of the European Union adopted a new Directive (2009/71/EURATOM) establishing a Community framework for the nuclear safety of nuclear installations that provides binding legal force to the main international nuclear safety principles. The objective of the Directive is to maintain and promote the continuous improvement of nuclear safety. The right of each Member State to use nuclear energy or not in its energy mix is recognised and fully respected.

[5] List of Nuclear regulators in EU countries: http://www.ensreg.eu/members-glance/national-regulators

The content of the Directive was to be transposed into the national laws of the Member States by 22 July 2011 and the first report on the implementation of the Directive must be submitted to the Commission by 22 July 2014.

The European Council, in March 2011, asked the European Commission to “review the existing legal and regulatory framework for the safety of nuclear installations” and to “propose by the end of 2011 any improvements that may be necessary”. Consequently, the European Commission is considering a revision to the Nuclear Safety Directive with a view to address the issues of improved governance and regulatory independence, improved transparency (from regulators and operators) as well as technical issues.

An ENSREG Ad-hoc working group was established as a result of concerns raised by ENSREG members regarding the timing as well as the draft text, dated 28 December 2012, of an EC proposal for a new Nuclear Safety Directive (NSD) at ENSREG's 22nd meeting of 23 January 2013. The European Commission has submitted this draft to the Group of Experts established according to Art. 31 of the Euratom Treaty, in line with the procedures established therein, but have provided an opportunity for ENSREG members to comment on its proposal also. The Ad-hoc group mandate was to review the proposal for a new NSD, to develop an ENSREG position and to provide added value, taking into account comments presented by ENSREG members in the work of the group. The results of this work have been adopted by ENSREG via written procedure and published on ENSREG’s website on the 11 April 2013, consisting of a Summary Report, accompanied by an attachment on 12 ENSREG principles, a document on Technical Input to a Revised Nuclear Safety Directive, as well as an Explanatory Note.

All Member States generate radioactive waste from nuclear power generation or in the course of industrial, medical and research activities, or through decommissioning of nuclear facilities involving the clean-up of contaminated facilities or land. While the development and implementation of policy on the safe management of radioactive waste and spent fuel is the responsibility of individual Member States, the Commission considers that further EU legislation is needed in this area to supplement the Basic Safety Standards Directive as a logical next step after the adoption of the Nuclear Safety Directive.

For this reason, on 19 July 2011 the Council of the European Union adopted a new Directive (2011/70EURATOM) establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste. The Directive applies to all stages of spent fuel and radioactive waste management, where the spent fuel or radioactive waste arises from or is managed within civilian activities. It includes the general principles to be applied, as well as provisions relating to the establishment and elements to be included in national legislative, regulatory and organisational framework. A key element of the national framework is the national programme for the implementation of spent fuel and radioactive waste management policy. The programme must cover all types of spent fuel and radioactive waste of the Member State and must be reviewed and updated regularly, taking into account technical and scientific progress as appropriate as well as recommendations, lessons learned and good practices from peer reviews. The Directive implies regular self-assessment, peer review and reporting to the Commission.

The content of the Directive has to be transposed into national framework of the Member States by 23 August 2013 and the first report on the implementation of the Directive must be submitted to the Commission by 23 August 2015.

1.2.4. International Guidance on Nuclear Safety and the Safe Management of Radioactive Waste

As indicated above, two of the main influences on the development of national nuclear safety and radioactive waste management requirements are the International Safety Conventions

and EU legislation. Another key influence is the international guidance and regulatory methodologies developed under the auspices of international bodies such as IAEA and the OECD's NEA, and other groups such as WENRA.

International Atomic Energy Agency - IAEA
In addition to providing the secretariat for the international conventions described above, the IAEA also seeks to build and strengthen the international safety and security regime through the development of advisory international standards, codes, and guides. In the safety area, they cover nuclear installations, radioactive sources, radioactive materials in transport, and radioactive waste. The IAEA promotes the application of international safety standards for the management and regulation of activities involving nuclear and radioactive materials.

Nuclear Energy Agency - NEA
Nineteen of the 27 EU Member States are also members of the OECD/NEA. The mission of the NEA is to assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for the safe, environmentally friendly and economical use of nuclear energy for peaceful purposes. To achieve this, the NEA works as: a forum for sharing information and experience and promoting international co-operation; a centre of excellence which helps Member countries to pool and maintain their technical expertise; a vehicle for facilitating policy analyses and developing consensus based on its technical work.

WENRA
WENRA is a non-governmental organisation comprised of the heads and senior staff members of all the national nuclear regulatory authorities of European countries with nuclear power plants. The main objectives of WENRA are to develop a common approach to nuclear safety, to provide an independent capability to examine nuclear safety in applicant countries and to be a network of chief nuclear safety regulators in Europe exchanging experience and discussing significant safety issues.

1.3. Establishment of ENSREG

In May 2007, the Council of the European Union (Economic and Financial Affairs), in a set of detailed conclusions, supported the establishment of a High Level Group at EU level aimed at furthering a common approach to the safety of nuclear installations, the management of spent fuel and radioactive waste and the financing of the decommissioning of nuclear installations. Such a High Level Group was established by a decision of the European Commission in July 2007 [6] The group later adopted the acronym ENSREG (European Nuclear Safety Regulators Group). ENSREG is an independent authoritative expert body composed of senior officials from the national nuclear safety, radioactive waste safety or radiation protection regulatory authorities and senior civil servants with competence in these fields from all 27 EU Member States. ENSREG believes that striving for continuous improvement is a vital safeguard against any sense of complacency in the operation of a nuclear facility and nuclear regulatory arrangements, and that it must be at the heart of any organisation's safety culture. It is a continuous leadership challenge. In adopting this as the fundamental principle for the work of ENSREG, it does not imply in any way that ENSREG considers that nuclear facilities in EU Member States are unsafe or that nuclear oversight arrangements are inadequate. ENSREG is committed to encouraging initiatives aimed at improving nuclear safety and radioactive waste management at the EU level where they add value to the activities already undertaken in international and national contexts. It also considers that a vital aspect of its work, as an independent authoritative expert body, is to develop proposals to improve the cooperation and openness between Member States, and the overall transparency on issues relating to the safety of nuclear installations and effective

[6] Commission Decision of 17 July 2007 on establishing the European High Level Group on Nuclear Safety and Waste Management:

radioactive waste management practices within their jurisdiction. In addition ENSREG also provide a platform to share best practice and technological improvements etc.

1.4. Purpose and Structure of ENSREG

All EU Member States that operate nuclear installations follow the basic principles set internationally for assuring nuclear safety and the safe management of radioactive waste and spent fuel. These principles are established in the CNS and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. ENSREG's role is to help to establish the conditions for continuous improvement and to reach a common understanding in these areas. As an independent authoritative expert body, ENSREG is working to:

- improve the cooperation and openness between Member States on nuclear safety and radioactive waste issues;
- improve the overall transparency on nuclear safety and radioactive waste issues; and
- where appropriate, advise the European Commission on additional European rules in the fields of the safety of nuclear installations and the safety of the management of spent fuel and radioactive waste.

ENSREG has established four working groups to undertake its Work Programme.

- Working Group 1 (WGNS) - Improving Nuclear Safety arrangements;
- Working Group 2 (WGRWMD) - Improving Radioactive Waste Management, Spent Fuel and Decommissioning arrangements;
- Working Group 3 (WGTA) - Improving Transparency Arrangements.
- Working Group 4 (WGIC) - International Cooperation).

These working groups meet as necessary and report back to ENSREG, which meets at least twice a year.

1.5. ENSREG Work Programme 2012-2013

ENSREG's central mission is to strive for the continuous improvement in nuclear safety and radioactive waste and spent fuel management and their regulation, and to promote openness and transparency in those areas. At its meeting on 24 February 2012, ENSREG finalised its Work Programme for 2012 – 2013, building on its achievements since 2007. In light of the above, ENSREG's main activities in 2012-2013 will be focused on:

- completion of the first phase of the stress test exercise, following the specifications developed by ENSREG; mechanisms for follow-up the implementation in the Member States under the authority of national regulators.

- seeking continuous improvement through:

    - pushing forward a programme of self-assessments and peer reviews of Member States nuclear safety regulatory bodies in cooperation with the IAEA;

    - facilitating a consistent and high standard of implementation of the Nuclear Safety Directive by the 27 Member States to include providing guidance on:

        - the framework and methodologies that may assist in addressing the challenges of ensuring suitably qualified staff and knowledge resources in the nuclear field;

  - the information in relation to the regulation of nuclear safety to be made available to the workers and the general public;

  - the format of the reports to the Commission under the Directive.

- facilitating the implementation of the Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste (Waste Directive) in respect to:

  - preparation of Member States reports at EU level,

  - establishment of a coordinated self-assessment and peer review process, and

  - implementation of systems for spent fuel and/or radioactive waste management at national level.

- seeking enhanced openness and transparency by:

  - maintaining a comprehensive ENSREG web-site as providing independent authoritative information on nuclear safety, radioactive waste and spent fuel management, and their regulation in the EU;

  - organising an ENSREG led European Conference, accessible to all stakeholders, to be held every two years, dedicated to furthering the central mission of ENSREG for continuous improvement.

ENSREG has set up Working Groups covering three areas, namely:

- Working Group 1 (WGNS) – Improving Nuclear Safety arrangements;

- Working Group 2 (WGRWMD) – Improving Radioactive Waste Management, Spent Fuel and Decommissioning arrangements;

- Working Group 3 (WGTA) – Improving Transparency arrangements.

The details of the Work Programmes that underpin the main ENSREG activities for 2012-2013, with corresponding deliverables and milestones, were elaborated by each of ENSREG's Working Groups and approved by ENSREG.

At its meeting on 19 November 2012 ENSREG approved the formation of a fourth working Group (WG4: International Cooperation). This new working group is about to start its activities, dealing with ENSREG's international nuclear safety cooperation and assistance activities. This group shall not only give, via ENSREG, strategic advice to the Council and the Commission but shall also address all international activities that ENSREG decides to be important.

2. EU STRESS TESTS AND FOLLOW-UP

2.1. EU Stress Tests Process

General context

Following the severe accidents which started in the Fukushima Dai-ichi NPP on 11 March 2011, the European Council of 24/25 March 2011 requested that a comprehensive safety and risk assessment, in light of preliminary lessons learned, be performed on all EU nuclear plants. The request of the Council included "stress tests" performed at national level complemented by a European peer review. This was the first time that such a multilateral exercise covering over 140 reactors in all EU countries operating nuclear power plants was considered. The Council invited ENSREG and the European Commission to develop the scope and modalities for the stress tests with the support of WENRA. WENRA drafted the preliminary stress tests specifications in April. Consensus on these specifications was achieved by ENSREG and the European Commission on 24 May 2011.

Stress tests and peer review organisation

The stress tests and peer review focused on three topics which are directly derived from the preliminary lessons learned from the Fukushima disaster and confirmed by the IAEA missions following the accident and reports from the Japanese Government. Natural initiating events, including earthquake, tsunami and extreme weather, the loss of safety systems and severe accident management are the main topics for review. The stress tests and peer review assess these topics in a three step process. The first step required the operators to perform an assessment and make proposals for safety improvements, following the ENSREG specifications. The second step was for the national regulators to perform an independent review of the operators' assessments and issue requirements, whenever appropriate. The last step was a European peer review of the national reports submitted by regulators.

The objectives of the peer review were to assess the compliance of the stress tests with the ENSREG specifications, to check that no important issues have been overlooked and to identify strong features, weaknesses and relevant proposals to increase plant robustness in light of the preliminary lessons learned from the Fukushima accident. The 15 European Union countries with nuclear power plants as well as Switzerland and Ukraine performed the stress tests and were subject to the peer review. The operators submitted their final assessments -by 31 October 2011 and the regulators submitted their final national reports by 31 December 2011. The peer review phase started on 1 January 2012.

The peer review was managed by a Board that consisted of seven senior regulators from EU countries and an EC senior manager. Each national regulator was invited to nominate one expert for each of the three topical areas. Most of the experts were experienced regulators. Knowledgeable scientists or consultants designated by regulators also participated. The European Commission also nominated experts. There were over 70 reviewers from 24 European countries participating in the peer review. Observers from several non-EU countries (Canada, Croatia, Japan, UAE and USA) as well as the IAEA also attended.

The peer review itself started with a desktop review of the national reports. Each reviewer had access to all the reports and could generate written questions to the national regulators. Over 2000 questions were generated. Following the desktop review, all peer reviewers met in Luxembourg in February 2012 for a two week topical review. The review was structured by the three topics of the stress tests: natural hazards, loss of safety systems and severe accident management. Each of the 17 countries subjected to the peer review had to make a presentation to each of the three topical teams, to answer the written questions as well as additional questions asked during presentations. In depth discussions on the results of the

topical reviews were then performed within each of the teams until a consensus was reached. In March 2012 a series of country reviews began. Each country subjected to the peer review was visited by a team of eight peer reviewers for three or four days. Complementary discussions were held in order to obtain appropriate answers to the questions left open after the topical review as well as clarification on important issues. A plant selected by the review team was also visited in each country. The reports drafted during the topical reviews were completed using additional information obtained during the visits. They were discussed within the teams in order to reach a consensus and finalised. The national regulator had the opportunity to make remarks but the final decision belonged to the review team. The 17 country reports are annexed to final ENSREG Peer Review Report that was endorsed in April 2012.

2.2. EU Stress Tests Outcome

The peer review concluded that all countries had taken significant steps to improve the safety of their plants, with varying degrees of practical implementation. In spite of differences in the national approaches and degree of implementation, the peer review showed an overall consistency across Europe in the identification of strong features, weaknesses and possible ways to increase plant robustness in light of the preliminary lessons learned from the Fukushima accident. As a result of the stress tests, significant measures to increase robustness of plants have already been decided or are being considered. Such measures include provision of additional mobile equipment to prevent or mitigate severe accidents, installation of hardened fixed equipment, and the improvement of severe accident management, together with appropriate staff training measures. In many cases, important modifications are being prepared for the near future. Details about national situations, as well as recommendations to national regulators, can be found in the attached country reports.

The peer review also identified four main areas of improvement to be considered at the European level, as presented in the following paragraphs.

European guidance on assessment of natural hazards and margins
Overall, the compliance with the ENSREG specification was good with regard to design basis for earthquake and flooding. However, there was a lack of consistency identified with respect to natural hazards where significant differences exist in national approaches and where difficulties were encountered with beyond design margins and cliff-edge effects assessments. Therefore, the peer review Board recommended that WENRA, drawing on expertise from Europe, develop guidance on natural hazards assessments, including earthquake, flooding and extreme weather conditions, as well as corresponding guidance on the assessment of margins beyond the design basis and cliff-edge effects.

Periodic Safety Review
The peer review demonstrated the positive contribution of periodic safety reviews as an efficient tool to maintain and improve the safety and robustness of plants. In the context of the peer review, this finding is especially relevant for the protection of installations against natural hazards. Therefore the peer review Board recommended that ENSREG underlines the importance of periodic safety review. In particular, ENSREG should highlight the necessity to re-evaluate natural hazards and relevant plant provisions as often as appropriate but at least every 10 years.

Containment integrity
The Fukushima accident highlighted once again the importance of the containment function, which is critical, as the last barrier to protect the people and the environment against radioactive releases resulting from a nuclear accident. This issue was already extensively considered, as a follow-up of previous accidents, and possible improvements were identified. Their expeditious implementation appears to be a crucial issue in light of Fukushima accident. Therefore urgent implementation of the recognized measures to protect

containment integrity is a finding of the peer review that national regulators should consider. The measures to be taken can vary depending on the design of the plants. For water cooled reactors, they include equipment, procedures and accident management guidelines to:

− depressurize the primary circuit in order to prevent high-pressure core melt;

− prevent hydrogen explosions;

− prevent containment overpressure.

Prevention of accidents resulting from natural hazards and limiting their consequences

The Fukushima accident has also shown that defence-in-depth should be strengthened by taking into account severe accidents resulting from extreme natural hazards exceeding the levels taken into account by the design basis and current safety requirements applicable to the plants. Such situations can result in devastation and isolation of the site, an event of long duration, unavailability of numerous safety systems, simultaneous accidents of several plants including their spent fuel pools, and the presence of radioactive releases. Therefore necessary implementation of measures allowing prevention of accidents and limitation of their consequences in case of extreme natural hazards is a finding of the peer review that national regulators should consider. Typical measures which can be considered are bunkered equipment to prevent and manage severe accident including instrumentation and communication means, mobile equipment protected against extreme natural hazards, emergency response centres protected against extreme natural hazards and contamination, rescue teams and equipment rapidly available to support local operators in long duration events. Such possible measures, as identified by the peer review, are detailed in the final report.

Finally, it should be mentioned that performing such a peer review was a challenge and required very significant resources from the participating countries. In that sense, it should be considered as an exceptional exercise, which cannot be reproduced frequently. Notwithstanding, it was judged very positively by most of the participants and is expected to contribute to enhancing safety in Europe and in each European country.

2.3. EU Stress Tests Follow-up

Full understanding of the Fukushima accident will be a long term process extending over several years, possibly a decade. The peer review has demonstrated the benefit of sharing between national regulators the results of the stress tests and ideas for strengthening safety and robustness of plants. In the spirit of continuous improvement for safety, a follow-up of the actions resulting from the present stress tests as well as future assessments would be beneficial. Such a follow-up should be organised in the frame of the existing arrangements, rather than creating new ones.

The national European regulators and the European Commission as ENSREG have endorsed the peer review report and the recommendations that finalised the stress test review and published a joint statement dated 26 April 2012, which concluded that follow-up activities would occur through an action plan. The ENSREG Action Plan[7], finally approved in August 2012, will assist in assuring that the conclusions from the stress tests and their peer review result in improvements in safety across European nuclear power plants. It will also assist, through further peer review, in ensuring that the recommendations and suggestions from the stress test peer review are addressed by national regulators and ENSREG in a consistent manner.

[7] http://www.ensreg.eu/node/417

The Action Plan specified the need for country specific action plans (National Action Plans) to be made publicly available by the end of 2012 and for these Action Plans to be peer reviewed via a common discussion at a dedicated ENSREG-workshop to share lessons learned on the implementation of post-Fukushima safety improvements. It also specified fact-finding follow-up site visits in order to better prepare for the peer review workshop. This ENSREG-workshop to discuss the National Action Plans took place in Brussels on 22-26 April 2013. Stakeholders had the opportunity to put questions and to file comments regarding the Peer Review of National Action Plans from 25 February to 20 March 2013 via the ENSREG website. The outcomes of the workshop will be presented to the public in the next ENSREG conference. Furthermore, ENSREG decided to publish Quarterly Updates on the stress tests follow-up on this website.

2.4. Public Participation in EU Stress Tests Process

The EU Council of March 2011 requested that all necessary information be provided to the public and that the outcome of the stress tests and any necessary subsequent measures to be taken should be made public. Being aware that full transparency, combined with this opportunity for public involvement, would contribute to the stress tests being recognised by European citizens, ENSREG decided that national regulatory authorities should be guided by the "principles for openness and transparency"[8] as adopted by ENSREG in February 2011 and that these principles should also apply to the stress tests[9]. The means of ensuring full transparency and also providing an opportunity for public involvement were finalised in October 2011[10].

In pursuit of these principles and objectives, the national reports have all been made public in English and most in the national language. Finally, also all operator reports have been linked to the ENSREG website in their original version. The final peer review report with the country review annexes is also available publicly. The ENSREG and the peer review Board hosted a public meeting in January 2012 to inform the stakeholders and seek comments. Suggestions were collected on a public website in January 2012 and were later considered during the peer review process. Comments related to specific countries or reactors were forwarded to the responsible national regulators. Overall the public input has improved the stress test peer review process. Comments received in the public meeting influenced the structure of the final report. An additional public meeting was held on 8 May 2012 in Brussels to present the results and answer questions. Again, an opportunity to submit comments via the internet was provided between 26 April and 6 May 2012, at the European Commission's Joint Research Centre website.

At the national level, regulators decided how to engage the public.

The ENSREG Action Plan, finally approved on 1 August 2012, again shows a clear commitment to openness and transparency. It stipulates that all National Action Plans and the ENSREG action plan shall be made available to the public in accordance with national legislation and international obligations, provided that this does not jeopardize other interests such as security recognised in national legislation or international obligations. The links to the National Action Plans have been provided on the ENSREG website. Furthermore, it stipulates that the results of the regulatory workshop to discuss contents and status of implementation of the National Action Plans will be made public and will be discussed in the subsequent ENSREG conference.

[8] "Principles for Openness and Transparency" HLG_p(2011-14)_57

[9] (Annex I to the Declaration of ENSREG of May 2011, reference HLG_p(2011-15)_66, http://www.ensreg.eu/sites/default/files/EU%20Stress%20tests%20specifications_0.pdf

[10] Transparency of "Stress Tests", Working Paper, Transparency aspects in the implementation, reporting and follow-up of the "stress tests" (HLG_p(2011-16)_80): http://www.ensreg.eu/sites/default/files/HLG_p(2011-16)_80%20Working%20Paper%20-%20Transparency%20of%20Stress-Tests.pdf

Again, stakeholders had the opportunity to put questions and to file comments regarding the Peer Review of National Action Plans from 25 February to 15 March 2013 via the ENSREG website. The Peer Review Workshop Report has been published recently and presented by the Workshop President at the ENSREG Conference on 11/12 June 2013 [11]

[11] http://www.ensreg.eu/node/1343

3. SAFETY OF NUCLEAR INSTALLATIONS

3.1. Activities in the support of the effective implementation of the Nuclear Safety Directive

On 25 June 2009, the Council of the EU (Council) adopted the Directive 2009/71/EURATOM establishing a Community framework for the nuclear safety of nuclear installations (the 'Directive').

The general objective of the Directive is to maintain and promote the continuous improvement of nuclear safety and its regulation. It further aims to ensure that Member States provide for appropriate national arrangements to protect workers and the general public against the dangers arising from ionising radiations from nuclear installations.

The Directive enhances the role and independence of national regulatory authorities, confirming licence holders have the prime responsibility for nuclear safety. Member States are also required to encourage a high level of transparency of regulatory actions and to guarantee regular independent safety assessments.

The Directive was to be transposed into national legislation according to the documented communications by the EU member states by 22 July 2011. The Directive requires, in Article 9(1), that Member States produce a national report to the Commission on the implementation of this Directive for the first time by 22 July 2014, and every three years thereafter.

ENSREG identified that it had two significant roles in assisting the smooth implementation of the Directive:

- to provide guidance for Member States on the structure and format of the national reports required under Article 9(1), taking account of experience in producing the three yearly reports to the Convention on Nuclear Safety; and
- to progress the scheduling and resourcing of self-assessments and peer reviews required under Article 9(3) of the Directive.

This work was incorporated into the ENSREG Work Programme, which had been revised following the adoption of the Directive.

3.1.1. Format of and Guidance for Member States reports under Article 9(1) of the Nuclear Safety Directive

Article 9(1) of the Directive requires that "Member States shall submit a report to the Commission on the implementation of this Directive for the first time by 22 July 2014, and every three years thereafter, taking advantage of the review and reporting cycles under the Convention on Nuclear Safety".

ENSREG considered that it would be appropriate to assist Member States in the preparation of these reports by providing guidance on the type of information and material that it may be useful to include in the reports. This will facilitate the most efficient and effective reporting of the implementation by Member States of their obligations under the Directive.

The guidelines, by providing a common structure of reporting, could also enable the Commission to meet their obligations under the requirement of Article 9(2) of the Directive to submit a report to the Council and the European Parliament on progress made with the implementation of the Directive.

In January 2010 and May 2011, ENSREG endorsed the principles that Member States reports should:

- fully address the requirements of the Directive;
- inform the Commission, Council and European Parliament on implementation of the Directive;
- be consistent in format and size to enable them to be compiled by the Commission; and
- clearly identify how nuclear regulation in Europe is carried out and provide open and transparent information for the public.
- be concise, providing the necessary information to address the specific obligations of the Articles of the Directive, including their implementation;
- be independent while drawing information from existing sources (e.g. National Reports to the CNS and the Joint Convention, where these are available);
- be written in such a way as to make it also understood by an informed non-expert audience; and to be
- consistent across Member States to enable the European Commission to compile its report to the Council and European Parliament

Based on these principles, the Guidance document for National Reports was developed using the structure:

I Introduction

II General principles

A Basic Considerations

B General suggestions on the structure and format of the National Report

C General suggestions on the content of the National Report

D Member States without nuclear installations

III Detailed suggestions on the content of the National Report

A Introduction

B Summary

C Reporting Article by Article, with detailed Guidance on Articles 4 to 8

Annex A Potential approaches to the assessment of resources of the regulatory authority - Article 5(3)

Appendix Relevant Articles of the CNS and Joint Convention

In October 2011, ENSREG endorsed the Draft Guidelines and agreed to a trial process to test its usability and practicability. UK, Ireland and Germany volunteered to develop example reports by May 2012. These trial reports, which consisted of implementation experience and were not intended to represent the final Member State full scope report, were shared within a subgroup and evaluated to identify necessary amendments to the draft Guidelines. Taking this experience into account, the guidance was revised and the Final Draft Guidelines were delivered to ENSREG.

In November 2012, ENSREG accepted the "Draft ENSREG Guidelines regarding Member States Reports as required under Article 9.1 of Council Directive 2009/71/EURATOM" for their application to produce the first Member States reports in 2014. ENSREG also noted that

the Guidelines should be revisited by ENSREG to incorporate experience after the first Member States reports have been submitted. ENSREG reconfirmed that the reporting required under Article 9.1 should demonstrate how the Member States are addressing the objectives of the Directive by fulfilling their obligations under the Directive and illustrate their national approaches.

ENSREG reminded Member States that the Guidelines have no legal status, nor do they set out to interpret, modify or extend the obligations of the Directive, the text of the Directive prevails. The use of these Guidelines is voluntary and Member States have the right to submit their National Report in any format, length and structure they believe necessary to describe how they comply with the obligations under the Directive. The Guidelines are generic in nature and drawn up to promote a mutual understanding of the structures and measures taken in individual Member States in regards to nuclear safety. To achieve this, they may extend beyond the legal obligations set out in the Directive.

3.1.2. Self-assessments and Peer Reviews - Article 9(3) of the Nuclear Safety Directive

Article 9(3) of the Directive requires that "Member States shall at least every 10 years arrange for periodic self-assessments of their national framework and competent regulatory authorities and invite an international peer review of relevant segments of their national framework and/or authorities with the aim of continuously improving nuclear safety. Outcomes of any peer review shall be reported to the Member States and the Commission, when available."

ENSREG agreed that, to satisfactorily meet both the obligations and spirit of Article 9(3) of the Directive, the best way forward is by cooperation with the IAEA Integrated Regulatory Review Service (IRRS) programme. ENSREG further agreed that self-assessments should be based on IAEA IRRS practices, noting that IRRS missions look beyond the scope of the CNS and the Joint Convention obligations and Full Scope IRRS missions are beyond the scope of the Directive.

ENSREG delegated responsibility for assigning the work related with the development of an overall EU IRRS programme to a small coordination group which would provide the contact point required by IAEA for facilitating and progressing the work. Annual meetings are conducted between this coordination group and the IAEA, the last one having taken place on September 18th, 2012.The need for continuous cooperation was highlighted.

An indicative European IRRS programme has been established which includes schedules for EU Member States to carry out self-assessments and IRRS missions for the years 2011 to 2021. This programme is updated as and when needed and at least annually.

In order to implement the EU IRRS programme, a European pool of suitable experts has been established. This ensures an effective level of EU Member States participation in the IAEA IRRS programme both within Europe and worldwide, and contributes to harmonisation of European regulatory practices. In accordance with this programme, IRRS missions were conducted in Sweden, Slovak Republic, Greece and Finland in 2012.

Based on these discussions with the IAEA, a Memorandum of Understanding between ENSREG and IAEA for organizing international peer review missions in the EU Member States was prepared and signed in 2011 by the ENSREG Chairman and by the relevant Deputy Director General of the IAEA.

The IAEA identified the need for additional resources in order to implement such a programme. A mechanism for financing these resources was proposed by the Commission and the IAEA and, within the constraints of the Commission's financial rules, financing has

been granted. In the event that the Commission is no longer able to guarantee such financing, a solution to establishing alternative funding will need to be considered.

The European Commission and the IAEA have signed an agreement (ENER/11/NUCL/SI2.588650) on “Cooperation in the Field of Nuclear Safety – Integrated Regulatory Review Services in the EU”, with the objective of enhancing the efficiency of the EU IRRS missions with feedback of experience from previous IRRS missions.

Within this agreement, nine consultancies were organized by the IAEA at the end of 2012.

3.2. Safety Evaluation of the Ukrainian NPPS – Technical Opinion on the EC-IAEA Ukraine Joint Project

In June 2010, the Working Party on Atomic Questions (WPAQ) of the Council of the EU was informed by the EC of the main conclusions of the IAEA final report, of the EC-IAEA-Ukraine Joint Project, entitled the “Safety Evaluation of Ukrainian Nuclear Power Plants”. Immediately after that meeting ENSREG was requested by WPAQ to provide a ‘technical opinion’ on the IAEA report.

This technical opinion is proposed to be used for monitoring the implementation of the Memorandum of Understanding (MoU) on cooperation in the field of energy between the European Union and Ukraine signed on 1 December 2005. This MoU in turn, implemented the EU-Ukraine Action Plan, approved in February 2005 by the EU-Ukraine Cooperation Council in the framework of the Partnership and Cooperation Agreement. The MoU defines four roadmaps for bilateral co-operation, one of which is the Road Map for Nuclear Safety.

Having followed the implementation of this roadmap from its inception, the WPAQ formed the view that, given its expertise, ENSREG was best placed to provide this “technical opinion in a European context”.

Following a first response from ENSREG, this request was clarified by the Council such that the technical opinion would serve as part of the monitoring process and would remain relevant even after Ukraine’s accession to the Energy Community.

WPAQ clarified, that the approach developed for the EU enlargement process in 2000/2001 is also appropriate to be applied to Ukraine. The most essential elements with regard to achieving a "high level of nuclear safety" (as referred to in doc.13789/00) require that the on-going and currently planned nuclear safety improvement programmes in Ukraine are implemented and timely completed under due regulatory supervision.

The issue has further been elaborated by ENSREG’s nuclear safety experts. ENSREG at its plenary meeting 12-13 May 2011 endorsed the approach proposed by its experts for providing the technical opinion to support the WPAQ in its regular monitoring of continuous improvement of nuclear safety in Ukraine based on EU expertise.

Correspondingly, ENSREG asked European safety experts involved in safety reviews for screening former and current assistance and cooperation projects under the Technical Assistance to the Commonwealth of Independent States (TACIS) and International Nuclear Society Council (INSC) programmes for Ukraine. These projects resulted in safety significant findings that still have to be addressed. Therefore ENSREG’s technical opinion considers safety assessments by European safety experts, in particular a review of the current Ukrainian Complex Consolidated Modernisation Program (CCSUP) and related documentation.

This safety modernisation program has been prepared by the Ukrainian operator NAEK for the three VVER reactor types, operational in Ukraine, and addresses nuclear safety

measures for each of the 15 reactors currently operating. The program is intended to be completed by 2017.

Results of the European expert's investigation requested by ENSREG have been summarized in a Technical Report "On Nuclear Safety Improvement in Ukraine" (Status: December 2011). The report was discussed and accepted at a meeting of ENSREG's safety experts in January 2012.

Based on all this information ENSREG´s Technical Opinion was drafted followed by further discussion at the WG on Nuclear Safety and finally endorsed in March 2012 by ENSREG in a silent procedure. On 29 June 2012 the Chairman of ENSREG reported their opinion to the Chairperson of WPAQ.

ENSREG´s technical opinion could generally conclude that recommendations on necessary safety improvements made by different national and international safety experts are reasonably addressed in the new safety modernisation program CCSUP.

ENSREG also highlights the importance

- to implement the CCSUP in a timely manner,
- to keep the modernisation program as a living tool, in order to be able to amend and update new safety measures, and
- to monitor periodically the status of implementation and amendment of the CCSUP, indicating for this monitoring specific recommendations and challenges.

According to the objective set out in Article 1 of the EU Directive 2009/71 to maintain and promote the continuous improvement of nuclear safety and its regulation, the implementation of such safety upgrade measures and the monitoring process contribute to continuous improvement. In implementing this objective Ukraine should be supported in a comprehensive manner by the EU.

3.3. External Dimension of Nuclear Safety

In January 2011, ENSREG received a request from the European Commission in the domain of cooperation with nuclear regulatory bodies in third countries. This request is related to two Council Regulations that were adopted in 2006-2007 and to the objectives and scope of the new Instrument for Nuclear Safety Cooperation (INSC). This instrument requires that the European Atomic Energy Community finance measures to support the promotion of a high level of nuclear safety, radiation protection and the application of efficient and effective safeguards of nuclear material in third countries. This cooperation includes the promotion of an effective nuclear safety culture at all levels, mainly through support provided to regulatory bodies and technical support organisations and the reinforcement of the regulatory framework.

The scope of ENSREG's activities would include advising the European Commission on the high-level, policy, definition of its cooperation activities with regulatory bodies in third countries. In order to achieve this objective the European Commission has requested that ENSREG advises the Commission on the following topics:

- Assessment of needs in third countries and potential effectiveness and opportunity of cooperation with their regulatory bodies;
- Prioritisation of needs and definition of strategic objectives of cooperation with regulatory bodies in third countries;

- Preliminary definition of high-level programming instruments (Strategy Papers and Multi-annual Indicative Programmes), with respect to the envisaged activities of cooperation with the regulatory bodies in third countries;
- Availability of resources in the EU Member States to implement the proposed strategy for cooperation with regulatory bodies in third countries; and
- Policy for the promotion of international cooperation in nuclear safety, including through relevant international organisations (mainly IAEA).

The European Commission assumes that "ENSREG aims at developing a common understanding among European nuclear safety regulators concerning the safety of nuclear installations and spent fuel and radioactive waste management, and the objectives of the EU nuclear cooperation with third countries and their regulatory bodies". Therefore the European Commission considers it reasonable to seek advice from ENSREG in the process of providing such assistance.

ENSREG agreed in principle with the European Commission request for assistance. The type of advice requested, practicalities of the Group's envisaged role, resources needed have to be further clarified.

In 2012, the EU Member States Regulators and the European Commission agreed to discuss and elaborate a common proposal for acceptable procedures on how to develop and implement the new INSC and other related instruments especially for the cooperation with regulatory bodies in third countries.

One of the cornerstones should be ENSREG with a specific working group on international cooperation. This process has to be finalized by mid-2013. The Working Group on Nuclear Safety (WGNS) drafted first versions of the Mandate and Terms of Reference for a separate ENSREG working group on international cooperation (WGIC). This draft document could not be completed in 2012, as the necessary clarification of the future INSC processes and relevant boundary conditions remains to be resolved.

Nevertheless, the draft document was put forward for information of ENSREG at its meeting of 27 September 2012. At the ENSREG meeting of 19 November 2012 WGNS updated the information and proposed the setting up of WG4 “International Cooperation”. ENSREG approved the formation of WG4 “International Cooperation”. It will be the task of the new working group, to finalize the draft document on the mandate and the ToR, which will be approved by ENSREG and the European Commission.

4. SAFE MANAGEMENT OF SPENT FUEL AND RADIOACTIVE WASTE

4.1. Activities in the support of the effective implementation of the Waste Safety

On 19 July 2011, the Council of the EU (Council) adopted the Directive 2011/70/EURATOM establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste (the 'Waste Directive'). This new Directive is the European Union (EU) response to the need to establish Europe-wide binding legislation governing the responsible and safe management of spent fuel and radioactive waste. It follows the adoption of Directive 2009/71/EURATOM establishing a Community framework for the nuclear safety of nuclear installations (the 'Safety Directive'). It sets up a legislative framework defining essential requirements and principles for the responsible and safe management of spent fuel and radioactive waste in the EU. It is anchored in the Fundamental Safety Principles of the IAEA and the obligations of the international Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste management (Joint Convention) to which the Euratom Community and its Member States are parties. The Waste Directive includes additional obligations compared to those international instruments, such as the need for the Member States to adopt national programmes for implementation of national policies for management and disposal of spent fuel and radioactive waste.

The general objective of the Directive is to ensure responsible and safe management of spent fuel and radioactive waste in order to avoid imposing undue burdens on future generations. It further aims to ensure that Member States provide for appropriate national arrangements to protect workers and the general public against the dangers arising from ionising radiation, as well as to ensure the provision of necessary public information in relation to spent fuel and radioactive waste management.

Similar to the provisions in the Safety Directive, the Waste Directive enhances the role and independence of national regulatory authorities, confirming licence holders have the prime responsibility for the safety of spent fuel and radioactive waste management facilities and/or activities. In addition, the Waste Directive emphasizes that each Member State is ultimately responsible for managing and disposing of spent fuel and radioactive waste generated in it. Also, Member States are to provide a national framework with arrangements for a high level of safety in spent fuel and radioactive waste management, integrating all stages in spent fuel and radioactive waste management from generation to disposal, i.e. "cradle-to-grave" approach. The national framework shall provide for the establishment of a national programme for the implementation of spent fuel and radioactive waste management policies, subject to review and update on a regular basis.

The Directive has to be transposed into the national framework by 23 August 2013. It also requires, in Article 14(1), that Member States produce a national report to the Commission on the implementation of this Directive for the first time by 23 August 2015, and every three years thereafter.

Furthermore, it requires in Article 14(3) that Member States periodically, and at least every 10 years, arrange for self-assessments and invite international peer reviews. The outcomes of such peer reviews should be reported to the Commission and other Member States and made available to the public.

As with the Safety Directive, ENSREG identified that it had two significant roles in assisting the smooth implementation of the Waste Directive:

- to provide guidance for Member States on the structure and format of the national reports required under Article 14(1), taking account of experience in producing the three yearly reports to the Joint Convention; and

- to provide guidance and progress the scheduling and resourcing of self-assessments and peer reviews required under Article 14(3) of the Directive.

This work was incorporated into the ENSREG Work Programme. The importance of building on the experiences from developing corresponding guidance for the implementation of the Safety Directive was emphasized.

Better use of the Joint Convention in the EU
Taking into account the potential contribution from Member States reporting obligations under the Joint Convention, ENSREG decided to include in the ENSREG Work Programme 2010-2011 a specific task for WG2 to identify synergies between the reporting under Joint Convention and the requirements on Member States to report under the Waste Directive. In response to this task WG2 in November 2011 arranged a seminar to address this issue. The main objective of the seminar was to discuss and identify any added value that the reporting under the Joint Convention could provide for the reporting under the Waste Directive. Another objective was to identify any issues of strategic importance which may need some further consideration at the EU level, either with a view of sharing experiences among Member States or to undertake joint analysis for developing common approaches.

A general conclusion from the seminar was that the synergies between the reporting processes were less than expected. The main reason for this stems from the fact that the purpose and scope of the reporting obligations under the Joint Convention and the Waste Directive are quite different.

ENSREG decided in February 2012 not to continue with the search for common EU learning from either the Nuclear Safety Convention process, or the Joint Convention process and this task was removed from the Work Programme. The outcome from the seminar has, however, been used as input for developing guidance for Member States reports under the Waste Directive (see section 4.1.1).

Implementing Integrated Management Systems
ENSREG decided to include in the ENSREG Work Programme 2012-2013 a specific task for WG2 addressing implementation of integrated management systems at national level with specific emphasis on interdependencies (interactions) among all those involved in long-term management for spent fuel and radioactive waste. An integrated approach was considered to be a precondition for successful planning and implementation of the national programmes for spent fuel and radioactive waste management and thus for achieving the objectives of the Directive.

The efforts so far have been summarized in a non-paper, which has been included as an appendix to the draft guidance document for reporting under the Waste Directive (see section 4.1.1). WG2 has identified a need to further develop the concept of “integrated management systems at the national level” and will elaborate more on this issue during the period of trial use of the guidelines.

4.1.1. Format and Guidance for Member States reports under Article 14 of the Waste Directive

Article 14(1) of the Directive requires that “Member States shall submit a report to the Commission on the implementation of this Directive for the first time by 23 August 2015, and

every three years thereafter, taking advantage of the review and reporting cycles under the Joint Convention".

ENSREG considered that it would be appropriate to assist Member States in the preparation of these reports, to provide guidance on the type of information and material to include in the reports to assist efficient and effective reporting of the implementation under the Directive.

The guidelines, by providing a common structure of reporting, could also facilitate the Commission's report to the Council and the European Parliament on progress made with the implementation of the Directive.

Starting from the approach that ENSREG had agreed for the development of guidelines under the Safety Directive, the work to develop guidance for reporting under the Waste Directive was based on the principles that reports should be:

- concise, providing the necessary information to address the specific obligations of the Articles of the Directive, including their implementation;
- independent while drawing information from existing sources (e.g. National Reports to the Joint Convention, where these are available);
- written in such a way as to make it also understood by an informed non-expert audience; and to be
- consistent across Member States to enable the European Commission to compile its report to the Council and European Parliament

Work started in September 2011. At an early stage it was concluded that the general part of the Article-by-Article section of the guidance under the Safety Directive could be used with modifications, as there are similar objective and reporting principles. But it should also be recognized that there are limited similarities for the Article-by-Article section. The Safety Directive focusses on safe operation of activities/facilities whereas the Waste Directive rather focusses on e.g. policy making and implementation of national programs for management of spent fuel and radioactive waste in the long term.

A draft proposal for guidelines was presented for the consideration of ENSREG in March 2013 as well as a proposal for a way forward. ENSREG endorsed the draft document for trial use by volunteer Member States to test the usefulness and viability of the guidelines. In parallel, some specific issues will be further explored and developed by the working group. Current plans envisage volunteering Member States reporting back by the fourth quarter 2013. The final draft guidelines is tentatively expected to be presented to ENSREG for endorsement during the first quarter of 2014 which will allow sufficient time for Member States to use the guidelines, as appropriate, for the preparation of their first report under Article 14.1 of the Waste Directive. The draft guidance document follows the structure:

I Introduction

II Overarching suggestions

- A Basic Considerations
- B General suggestions on the structure and format of the National Report
- C Reporting on inventories
- D General suggestions on the content of the National Report
- E Member States without nuclear installations

III Detailed suggestions on the content of the National Report

A Introduction

B Developments since the previous report

C Reporting Article by Article

Appendices

Appendix 1 Relevant Articles of the Joint Convention

Appendix 2 Reporting of inventories under the Waste Directive

Appendix 3 National spent fuel and radioactive waste management system

Appendix 4 Potential approaches to the assessment of resources of the regulatory authority

4.1.2. Self-assessments and Peer Reviews - Article 14(3) of the Waste Directive

Article 14(3) of the Waste Directive requires that "Member States shall periodically, and at least every 10 years, arrange for self-assessments of their national framework, competent regulatory authority, national programme and its implementation, and invite international peer review of their national framework, competent regulatory authority and/or national programme with the aim of ensuring that high safety standards are achieved in the safe management of spent fuel and radioactive waste. The outcomes of any peer review shall be reported to the Commission and the other Member States, and may be made available to the public where there is no conflict with security and proprietary information."

By the time the Waste Directive entered into force, ENSREG had already agreed that, to satisfactorily meet both the obligations and spirit of Article 9(3) of the Safety Directive, the best way forward was by cooperation with the IAEA IRRS programme. ENSREG had further agreed that self-assessments should be based on IAEA IRRS practices, and that there was no need to modify the IAEA IRRS self-assessment guidance in order to use it for the purposes of the Safety Directive. Thus, ENSREG decided that the best way forward was to establish an EU IRRS programme, supported by the services by the IAEA. A Memorandum of Understanding between ENSREG and IAEA for international peer review missions to the EU Member States has been agreed upon based on an indicative European IRRS programme.

As was the case for the guidance for reporting under Article 14(1) of the Waste Directive, ENSREG recommended that development of guidelines for self-assessment and Peer review under Article 14(3) of the Waste Directive should, where possible, utilize the work that had been accomplished in developing guidelines for self-assessments and Peer Reviews under Article 9 (3) of the Safety Directive.

It was in this context that it was emphasized that due consideration must be paid to the fact that the scope of the Waste Directive is principally different compared to the scope for the Safety Directive, as accounted for above. Also, the scope for self-assessment and Peer Reviews in the Waste Directive is different compared to the scope of the Safety Directive. The scope of the self-assessment according to the Safety Directive covers the national framework and competent regulatory authorities. The scope of self-assessments according to the Waste Directive includes the national programme and its implementation. Likewise, the scope of inviting international Peer Reviews according to the Safety Directive covers relevant segments of their national framework and/or authorities whereas the scope of self-assessments according to the Waste Directive encompasses the national framework, competent regulatory authority and/or national programme.

At an early stage Member States expressed their concerns about the high resource consumption associated with Peer Reviews and that they preferred to explore possibilities to establish an EU IRRS programme fulfilling requirements on self-assessment and Peer

Review in both the Safety and the Waste Directives, rather than establishing two Peer Review-processes running in parallel.

In order to address these concerns a special task group was set up to explore whether any additional or alternative arrangements could be identified which would be beneficial to satisfy requirements of Article 14(3) of the Safety Directive on self-assessment of National Programme and its implementation and invite international Peer Review of the National Programme.

During the process, IAEA was invited to present the IAEA IRRS-process. The purpose was to explore the potential possibility to address self-assessment of National Programme and its implementation as well as Peer Review of the National Programme in the "EU IRRS process", elements that are not included in the established IAEA IRRS-process. Also the OECD/NEA was invited to present the Peer Review activities carried out by the NEA. In addition, Member States provided information about their experiences from Peer Review activities.

The outcome of the task group work was presented to ENSREG at its 21st meeting, 19 November 2012. ENSREG agreed to the general approach proposed by the working group as well as to the request to launch a preparatory interaction with IAEA, through the IAEA observer in WG2, in order to develop a specific methodology to EU Member States for the purpose of fulfilling the peer review obligations created by both the Safety Directive and the Waste Directive. A letter has been sent to the IAEA to initiate such preparatory interaction.

5. OPENNESS AND TRANSPARENCY

5.1. ENSREG Website [12]-

One of the key initiatives of ENSREG in its goal to improve transparency was the establishment of a dedicated EU website to provide the public and other stakeholders with coordinated easy accessible information on nuclear safety. The project commenced during the first Work Programme and the website was launched in January 2010. The aim of the website is to improve public accessibility to information already available and to present it in a user-friendly format.

The website includes information on ENSREG, its role, composition, Work Programme and outputs. It lists the nuclear regulatory organisations in each Member State and provides links to their individual websites. Profiles of each country, national regulators, the nuclear activities they regulate and the key national legal instruments are easily accessible through an interactive map on the ENSREG website. The website also includes basic information about the nuclear fuel cycle and radioactive waste, and describes how safety is ensured in nuclear power plants and in the management of spent fuel and radioactive waste. It sets out in detail how safety regulation is achieved at the national, EU and international level. There is a separate section dedicated to transparency and public involvement. Here, members of the public can learn about the type of information that is available from their national regulators and the different means by which they can participate in national stakeholder processes.

There is also a section dedicated to the EU Stress Tests and Follow-up. Members of the public are continuously informed on the process (e.g. Quarterly Updates and revision of relevant subpages). Relevant documentation is published on the website. Stakeholders also have the opportunity to participate in consultations via the ENSREG website (see Chapter 2.4).

Arrangements are in place to update the website with “news” and “documents” as they become available and web statistics are gathered routinely to help inform future improvements to the website. These statistics reveal that the general public makes use of the ENSREG website intensively to gain information on the EU Stress Tests and Follow-up.

5.2. Implementation of Article 8 of the Safety Directive and Art 10 of the Waste Directive

The Nuclear Safety Directive (Directive 2009/71/Euratom established a Community framework for the nuclear safety of nuclear installations) in Article 8 establishes legally binding obligations on Member States in relation to information to the public. These obligations confirm the commitments of the Member States pursuant to already existing national, European and International Law. Also the Waste Directive (Directive 2011/70/Euratom establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste) in Article 10 establishes legally binding obligations on Members States in relation to providing information to the public as well as ensuring effective public participation in the decision-making process regarding spent fuel and radioactive waste management.

ENSREG’s Working Group on Transparency (WGTA) has prepared recommendations for ENSREG on the implementation of Article 8 of the Nuclear Safety Directive and on the implementation of Article 10 of the Waste Directive, taking into account the roles for regulators regarding EU International and legal framework for transparency in the nuclear

[12] www.ensreg.eu

field as well as the Principles for National Regulators on common practices for improving transparency.

5.3. Other Activities

During the past two years ENSREG´s Working Group on Transparency has devoted substantial efforts to transparency aspects of the EU Stress Tests, inter alia by developing the pertinent working papers (see chapter 2.4.).

The group endeavours to continuously improve co-operation with other groups working in the field (e.g. ENEF Transparency Working Group and NEA Working Group on Public Communication of Nuclear Regulatory Organisations) as well as to improve transparency and communication aspects within ENSREG, with stakeholders and the general public at large.

5.4. ENSREG Conference 11-12 June 2013

The Second ENSREG conference took place on 11-12 June 2013 at Brussels in the European Commission premises. The first conference was organised in 2011 and ENSREG estimated that it was relevant to hold a second ENSREG conference every other year.

The Conference described the achievements made since the first conference held in 2011 on the path to improving nuclear safety in Europe and to facilitate dialogue with stakeholders. It provided an update on what ENSREG has been doing since Fukushima to address initial learning points, to explore longer term safety issues and to look ahead to its future challenges. The conference was composed of a formal and opening session followed by four sessions dedicated to particular topics.

The opening session was entitled “WHAT HAS EUROPE LEARNT ABOUT NUCLEAR SAFETY SINCE THE FUKUSHIMA ACCIDENT?”

The high level presentations focussed on the evolution of the institutional framework, political and historical developments, and perspectives for the future in the light of the Fukushima Dai-ichi accident.

The first session was entitled “ENSREG: CHALLENGES FOR THE WAY FORWARD”. In 2012, ENSREG established an Action Plan asking Member States to implement stress tests recommendations through National Action Plans. The presentations described the results of the Workshop on National Action Plans (April 2013) and identified the main findings. Conclusions were drawn related to the most important insights for the future.

Session 2 was entitled “RESPONDING TO NUCLEAR EMERGENCIES”. This session was dedicated to off-site emergency preparedness issues. The main objective was to give an overview of existing responses to nuclear emergencies at the European level and national level.

The title of session 3 was “EU LEGISLATIVE INSTRUMENTS AND INITIATIVES”. The ENSREG Conference tried to respond to the question “What is the state of play of the EU legislative instruments and initiatives related to nuclear safety in light of the Fukushima accident? The European Commission presentation gave an overview of the implementation of existing EU legislative instruments and the development of new instruments in light of the Fukushima accident. The interventions from other participants – ENSREG, European Parliament, European Economic and Social Committee, and FORATOM/ENISS (representing the industry) focused, from one part, on their global perception of the Commission legislative instruments, their relevance and their implementation and, on the

other part, more specifically on the existing safety directive (adopted in 2009) and on the new directive which should review the existing one.

The final and concluding session of the ENSREG conference 2013 was an open discussion on “THE EUROPEAN CONTRIBUTION TO THE FUTURE OF NUCLEAR SAFETY”. The panellists answered to the questions: What are the stakeholders’ expectations in the light of the messages delivered by the Safety authorities during the Euro-conference? What are the goals and challenges for the coming years?

The Conference was transmitted live on the ENSREG website and the results and outcomes were also reported there too. Both before and during the event the audience and general public were encouraged by ENSREG to interact with the event by posing questions either via the ENSREG webpages or in person at the event.

6. CONCLUSION AND FUTURE ACTIVITIES

During the reporting period, ENSREG priorities were to maintain a high level of nuclear safety; carrying out “stress tests”, and the prompt implementation of its results; ensuring full transparency; and enhancing a high level of safety of the radioactive waste management.

Safety in the European operating nuclear plants remained high: ENSREG is pleased to report that the nuclear safety of the European nuclear plants and activities remained at a high level during the reporting period mid-2011 to mid-2013. There were no events or developments jeopardizing the public health and safety in any of the European countries. Where issues were identified these were managed in a safe manner. As before, the safety of the operating nuclear plants continues to be the highest priority to the national regulators. As an integral part of the high safety culture, continued safety improvements remained a firm standard nuclear practice for all European national regulatory systems.

ENSREG is also pleased to conclude, that in this highly technical area, plant operators, their technical support organisations as well as all national regulators are strongly committed to a high level of safety.

“Stress tests” successfully carried out; prompt implementation of its results started: ENSREG is proud to report, that the “stress tests” which it organized, were successfully carried out and completed by 26.4.2012. The stress tests were the largest and most profound exercise of its type in the world.

Full transparency was ensured: Enhancing transparency and an opportunity for public involvement have been ENSREG’s objectives from the beginning. In pursuit of these objectives, the national reports have all been made public in English and most in the national language. The final peer review report with the country review annexes is also available publicly. ENSREG, as well as national regulators, hosted public meetings to inform the stakeholders and seek comments.

ENSREG established a dedicated EU website to provide the public and other stakeholders with coordinated and easy access to information on nuclear safety.

The Nuclear Safety Directive and the Waste Directive establish legally binding obligations on Member States in relation to information to the public. ENSREG prepared recommendations on the implementation of the relevant articles.

ENSREG is committed to continuously improving co-operation with other groups working in the field.

High level of safety of the radioactive waste management was enhanced: On 19 July 2011, the Council of the EU (Council) adopted the Directive 2011/70/EURATOM establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste (the ‘Waste Directive’). ENSREG worked in two significant areas in assisting the smooth implementation of the Waste Directive and provided guidance for Member States on (1) the structure and format of the national reports required and (2) scheduling and resourcing of self-assessments and peer reviews

Regarding peer-reviews, ENSREG concluded, as it was the case with the Nuclear Safety Directive, that the best way forward was by cooperation with the IAEA IRRS programme. A MoU between ENSREG and IAEA was agreed upon.

ENSREG also highlighted its concerns in respect of the high volume of senior regulator resources required to service the many on-going peer review exercises. ENSREG considers

it important to streamline and take full advantage of synergies between the different peer review mechanisms by IAEA, OECD and others for greater efficiency.

ENSREG will continue to work along its work programme, reacting swiftly to arising needs such as follow-up activities to the Stress tests or increased international co-operation.

7. REFERENCES

All documents made publicly available by ENSREG can be obtained from the site https://circabc.europa.eu/faces/jsp/extension/wai/navigation/container.jsp or the ENSREG Website http://www.ensreg.eu/documents