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**NUCLEAR ENERGY AGENCY**
**RADIOACTIVE WASTE MANAGEMENT COMMITTEE**

# Working Party on Decommissioning and Dismantling (WPDD)

**Summary Record of the 14th Session of the WPDD**

**Held on 18-20 November 2014**
**NEA Offices, Issy-les-Moulineaux, France**

*This Summary Record is a draft document to be approved by the members of the WPDD at its next annual meeting in October 2014*

For any further information please contact Ivan REHAK (ivan.rehak@oecd.org)

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**NEA/RWMC WORKING PARTY ON DECOMMISSIONING AND DISMANTLING (WPDD)**

**14th Session of the WPDD**

**Summary Record**

The 14th meeting of the RWMC Working Party on Decommissioning and Dismantling (WPDD) was held on 18-20 November 2013, at:

OECD Nuclear Energy Agency Offices,
Le Seine Saint-Germain, 12 Boulevard des Iles, 92130 Issy-les-Moulineaux, France

This meeting included a topical session on *Preparation for Decommissioning During Operation and After Final Shutdown* (19th November 2013). This summary record does not include the Rapporteur's Report on the Topical Session, which report will be included in the next update.

The agenda of the meeting can be found in the Annex.

Presentations alongside this open-access summary record and the list of participants are posted on the WPDD restricted web page: https://www.oecd-nea.org/download/wpdd/wpdd14/index.html.

| *Monday 18 November 2013 (DAY 1)*<br><br>*Plenary Session* | |
|---|---|
| **Item** | **Summary of Discussions and Decisions** |

## 1. OPENING THE MEETING

Mr Juan-Luis Santiago, WPDD Chair, welcomed participants to the 14th session of the WPDD. He introduced new WPDD members present at the meeting.

Mr Kazuo Shimomura, a new NEA Deputy Director – Safety and Regulation, informed on the 127th Session of the Steering Committee for Nuclear Energy (24-25 October 2013, Paris) that included a Policy Debate on Decommissioning. He reported on the OECD NEA activities regarding Fukushima Daiichi accident, and introduced a recent OECD NEA publication *'The Fukushima Daiichi Nuclear Power Plant Accident: OECD/NEA Nuclear Safety Response and Lessons Learnt' (No. 7161, OECD NEA 2013)*, reporting on immediate response by NEA member countries and NEA actions in follow-up to the Fukushima Daiichi accident. He also informed about establishing the International Research Institute for Nuclear Decommissioning, IRID, and invited the RWMC and WPDD to discuss how to support the Institute.

## 2. REVIEW AND ADOPTION OF AGENDA

Mr Ivo Tripputi, WPDD Core Group Member, proposed under the item 16 *'Any Other Business'* to deal with ongoing discussion concerning a proposal for exclusion of some nuclear facilities under decommissioning from the Paris Convention on Nuclear Third Party Liability.

Mr Boby Abu-Eid updated the title of his presentation under the item TS8 as *'Aspects of Preparation for Decommissioning US Commercial Facilities - Regulatory Perspective'*.

***Decision:*** The agenda was adopted in principle as proposed.

## 3. REVIEW AND APPROVAL OF SUMMARY RECORD OF WPDD-13

***Decision:*** The Summary Record of WPDD-13 was approved.

## 4. INTERNATIONAL DEVELOPMENTS

### 4.a IAEA - Decommissioning-related activities over the past year

Mr Vladimir Michal provided an update on current work of the IAEA in the area of decommissioning. He informed on the objectives of the International Decommissioning Network (IDN) and examples of its activities in 2013, on recently issued technical publications, and decommissioning related reports under preparation, on-going regional technical cooperation projects and recently completed national technical cooperation projects. He also reported on the International Project on Evaluation and Demonstration of Safety for Decommissioning of Nuclear Facilities (DeSa), completed in 2011, and further

on the International Project on Use of Safety Assessment in the Planning and Implementation of Decommissioning of Facilities using Radioactive Material (FaSa), to be completed this year. He concluded his presentation with briefing on the *'Connect'* – a concept and software tools for inter-connecting the IAEA networks related to decommissioning, remediation, radioactive waste management and disposal.

In the discussion it was noted that the Connect platform serves for sharing presentations, maintaining discussions and generally for exchange of information. Countries with developed nuclear programmes are encouraged to share their information with countries with less developed programmes.

### 4.b EC - Decommissioning-related activities over the past year

Mr Thomas Kirchner informed on the document *'3rd Decommissioning Funding Report (Communication from the Commission to the European Parliament and the Council on the Use of Financial Resources Earmarked for the Decommissioning of Nuclear Installations, Spent Fuel and Radioactive Waste)'*, and its accompanying document *'Commission Staff Working Document: EU Decommissioning Funding Data'*, noting that there is a gradual improvement over the years as for scope and detail of information provided as well as for level of legal implementation. A legal base is currently formed mainly by the *'Commission Recommendation of 24 October 2006 on the Management of Financial Resources for the Decommissioning of Nuclear Installations, Spent Fuel and Radioactive Waste'* and the *'Council Directive 2011/70/EURATOM of 19 July 2011establishing a Community Framework for the Responsible and Safe Management of Spent Fuel and Radioactive Waste'*, while the latter makes some Recommendation's principles binding. The Commission focuses on adequacy of financial resources available when needed for the implementation of national programmes for all types of radioactive waste and spent fuel, at all phases of their management, on *'polluter pays'* principle, on cost estimates and its transparency.

Mr Kirchner also briefed on the Decommissioning Funding Group, established as a group of representatives of the EC Members Countries, with aim to better address decommissioning costing aspects and to achieve agreement of the EC Member Countries on common reporting format concerning requests of above mentioned Recommendation and Directive. He also informed about priorities of the EC Joint Research Centre, and on EU decommissioning funding support of three decommissioning projects: Ignalina 1&2 (Lithuania), Kozloduy 1-4 (Bulgaria), and Bohunice V1 (Slovakia) up to year of 2020.

It was noted that currently no report is available from the round table discussions of the Decommissioning Funding Group. However, a summary report from the next round table to be held in the spring 2014 may be issued. If the summary report is available, WPDD would appreciate to be informed.

***Decision:*** The Secretariat will inform WPDD members in case the report of the EC Decommissioning Funding Group round table to be held in the spring 2014 is available.

## 5. DEVELOPMENTS WITHIN THE NEA

### 5.a RWMC and NEA Steering Committee

Mr Michael Siemann informed about main outcomes of 46th Meeting of the Radioactive Waste Management Committee (RWMC), held on 13-14 March 2013 in Paris. The meeting elected Jean-Paul Minon (Belgium, Belgoprocess) as a new RWMC Chairperson. Mr Siemann noted that the Ad hoc Expert Group on Decommissioning Costs of the NEA Nuclear Development Committee (NDC) has a full support of the RWMC. He

also briefed on 127th Session of the Steering Committee for Nuclear Energy (24-25 October 2013, Paris), as well as on the current effort to find a way of cooperation between the Co-operative Program on Decommissioning (CPD) and the Information System on Occupational Exposure (ISOE), concerning collating and analysing occupational dose data from decommissioning activities. Mr Siemann also noted about his planned participation in the 2nd IAEA International Peer Review Mission on Mid-and-Long-Term Roadmap towards the Decommissioning of TEPCO's Fukushima Daiichi Nuclear Power Station Units 1-4 (25 November – 4 December 2013).

Regarding the Secretariat, Mr Siemann introduced Mr Vladimir Lebedev, a new member of the Radiation Protection and Radioactive Waste Management Division, joining the OECD NEA from Rosatom, Russian Federation. He also informed that Mr Ivan Rehak did not accept 2 year extension of the contract and is leaving the OECD NEA on completion of his current contract in April 2014.

Mr Siemann encouraged WPDD members to participate in *'Symposium on Recycling of Metals Arising from Operation and Decommissioning of Nuclear Facilities'*, April 8-10, 2014 at Studsvik Site, Sweden, co-sponsored by the OECD NEA. Mr Arne Larsson summarized in his presentation basic coordinates of the Symposium.

In the discussion it was explained that the Ad hoc Expert Group on Decommissioning Costs of the NEA Nuclear Development Committee (NDC) does not overlap the mandate of the WPDD Decommissioning Cost Estimation Group, since NDC addresses economic aspects in the nuclear energy, *inter-alia* focuses on economic analysis of nuclear energy back-end and on decommissioning funding.

**5.b CPD**

Mr Ivo Tripputi, CPD MB Chair, presented an overview of current status of the Co-operative Programme on Decommissioning. A new CPD agreement for the next five year period (2014-2018) was modified in two aspects: 1. CPD and TAG Chairmen and Vice-Chairmen are elected for five year period instead of previous three year period; 2. An extent of shared information is solely determined by the Participant presenting the information.

Mr Tripputi informed about two Technical Advisory Group (TAG) meetings organized in 2013: TAG 54, held in Heringsdorf, Germany, 13th -17th May, hosted by EWN, with a topical session on *'General Project Management Good Practice'* and a technical visit to Greifswald NPP; and TAG 55, held in Tokai, Japan, 21st – 25th October, hosted by JAEA, with technical visits to Fukushima Daiichi NPP, JRTF, AVRF, and Tokai 1 NPP.

Since TAG Chairman Mr Jan Carlsson announced his retirement, TAG 54 meeting has elected a former TAG Vice Chairman Mr Robert Valthéry (Belgium, Belgoprocess) as the new TAG Chairman, and Mr Manuel Ondaro (Spain, Enresa) as the new TAG Vice Chairman.

TAG 56 meeting will be held on 19th–23rd May 2014 at Sellafield site, UK, with a topical session on *'Radioactive Waste Containers'*, and TAG 57 meeting on 13th– 17th October 2014, being hosted by JRC Ispra, Italy. AVR (Germany), Bohunice (Slovakia) and Belgoprocess (Belgium) have offered hosting the TAG 58 meeting for May 2015; a final decision on venue has not been made yet.

The CPD Task Group on Site Restoration will have completed their report on technical aspects of site restoration by the end of January 2014 (see also item 6.d). Since TAG intend to update old CPD reports, they will seek an approval of CPD Management

Board to launch a new task group on recycling of metals.

## 6. PROGRAMME OF WORK OF THE WPDD

### 6.a Task Group on R&D and Innovation Needs for Decommissioning

Mr Gérard Laurent, Task Group Chairman, provided an overview of the *'Report on R&D and Innovation Needs for Decommissioning'*. The Report addresses five themes: 1.Characterization and survey prior to dismantling, 2.Segmentation and dismantling, 3.Decontamination and remediation, 4.Materials and waste management, and 5.Site characterization and environmental monitoring. For each theme the Report describes current R&D status with number of references and internet links, suggests specifics topics for future R&D work and summarizes areas for potential international co-operation.

Since WPDD-12, the authors implemented comments, reviewed and updated the Report, which was then circulated to WPDD members for their comments.

In the discussion the quality of the Report was highly appreciated as an excellent information base suitable not only for researches, but also for regulators, implementers and project managers. Since R&D progresses rapidly, the Report has to be released to public domain as soon as possible and it will require an update after some time. It was proposed to organise a workshop on R&D. It was also noted that the IAEA intends to use a Wiki-platform for sharing the R&D type of information that allows to reflect flexibly on a constant progress in this area.

***Decision:*** WPDD members are invited to comment the *'Report on R&D and Innovation Needs for Decommissioning'* by 31st January 2014. The WPDD Core Group will implement comments and is authorised to approve the Report. The Secretariat will make the Report publicly available from WPDD web site.

### 6.b Decommissioning Cost Estimating Group (DCEG)

Mr Björn Hedberg, Task Group Chairman, presented the main outcomes of the 6th plenary meeting of the DCEG (18-19 June 2013). The plenary meeting held a topical session on *'Risk Analysis in Decommissioning Costing'*, a topical session on *'Learning Curves'* from repeated industrial procedures, and special presentations on the main cost drivers evolution over time, on application of software tools for the Earned Value Management System, and on update on work concerning decommissioning cost calculation of Swedish NPPs. The plenary meeting also discussed two on-going projects: *'Methodology for International Peer Reviews of Decommissioning Cost Studies'* and *'The Practice of Cost Estimation in Decommissioning'*. Reports of both projects are drafted. The report on the Methodology for International Peer Reviews is planned to be completed before the 7th plenary meeting of the DCEG. The Group will continue working on the Practice of Cost Estimation and will launch the work on the risk analysis in decommissioning costing.

In the discussion the DCEG was encouraged to work more on the IAEA-EC-NEA collaborative basis, since a constant improvement of transparency, auditability and traceability of decommissioning costs is of interest of all three international organisations. Project on *'International Structure for Decommissioning Costing of Nuclear installations (ISDC)'* is an excellent example of synergic work of these organisations.

### 6.c Task Group on Radiological Characterisation and Decommissioning

Mr Arne Larsson, Task Group Chairman, presented an overview of completed project on *'Status Report on Radiological Characterisation for Decommissioning'* – the main

objective of the Report, mode and scope of the work, structure and content of the Report, and its main outcomes. The project fully met targets defined in the Terms of References, as for the work scope and schedule. The Task Group also organized the Workshop on Radiological Characterisation for Decommissioning, held at Studsvik site, Sweden, 17th - 19th April 2012, attended by over 120 participants from 23 countries, and four international organisations.

Based on Task Group's experience of effective and collaborative work, Mr Larsson proposed to continue working, notably on a leaflet on radiological characterisation for decommissioning to disseminate main messages of the Report, and to study aspects of optimisation of characterisation in a waste disposal perspective.

In the discussion it was appreciated that the Report describes a general approach and also discusses specific requirements on characterisation for decommissioning in each phase of nuclear facility lifecycle, although it does not focus on technical details. It was noted that well prepared Data Quality Objective Plan is crucial for effective performance of characterisation. Statistical characterisation methods, reducing number of samples and measurements as well as a project cost and time, and characterisation of subsurface contamination were proposed as potential future topics of the Task Group for further consideration.

***Decision:*** The existing Mandate of the Task Group is extended by 31st December 2015. Task Group Chairman will discuss topics of further work within the Task Group and submit a proposal to WPDD Core Group by 31st May 2014. The Task Group will seek the information on the further progress of on-going ISO project on elaboration of the 'Methodology for sampling and characterization of sites, soils, buildings and infrastructures contaminated with radionuclides or chemical products for remediation purposes' (see item 11).

### 6.d Nuclear Site Restoration

Mr Peter Orr, Chairman of the CPD Task Group on Site Restoration, presented the progress of the work of CPD Task Group. Having collated information through country- and project- oriented questionnaires, the group analysed information and is finalising a draft report addressing technical aspects of site restoration. The report will contain a review of national and site factors influencing site restoration, actions avoiding or minimising site restoration problems, considerations on integral site management (incl. non-radioactive contaminants, ground water, off-site contamination, waste disposal permitting), good practices leading to effective delivery (project management, techniques, tools, software), followed by technical case studies. The report will be completed by 31st January 2014.

The WPDD-12 meeting organized a topical session on Nuclear Site Restoration and decided to work on a draft report on strategic aspects of site restoration (see WPDD-12 Record [NEA/RWM/WPDD(2012)9], item 13). Therefore, the WPDD Core Group and the Secretariat proposed to establish a WPDD Task Group on Nuclear Site Restoration (NSR) aiming to produce a report on strategic aspects of the subject. Mr Orr presented a proposal of the Mandate of the WPDD Task Group, having been prepared in cooperation with the Secretariat.

***Decision:*** WPDD meeting approved to establish the WPDD Task Group on Nuclear Site Restoration (NSR) and approved the Mandate of the Task Group [NEA/RWM/WPDD(2013)3]. WPDD members are invited to the Task Group, nominations are to be sent to the Secretariat by 3rd March 2014.

## 7. COUNTRY UPDATES ON DECOMMISSIONING

Short country reports were provided by delegates from each country. Written reports following the pattern table were also submitted by:

- Canada
- Czech Republic
- Germany
- Japan (also presentation)
- Korea (Republic of)
- Norway
- Slovak Republic
- Sweden
- Switzerland
- United Kingdom
- USA

## 8. SUMMARY OF DAY 1

Mr Juan-Luis Santiago, WPDD Chairman, appreciated the IAEA and EC work in decommissioning and the progress of WPDD and CPD activities. He encouraged for more co-operation between the IAEA, EC and NEA in decommissioning related projects, and invited WPDD members to the new WPDD Task Group on Nuclear Site Restoration.

## 9. SPECIAL PRESENTATION: R&D DECOMMISSIONING PROGRAMME FOR FUKUSHIMA

Mr Hiroshi Rindo briefed on the Revised Mid-and-Long-Term Roadmap towards Fukushima Daiichi NPP Decommissioning. He informed on development of decontamination technologies for inside part of reactor buildings, on work concerning the survey of the reactor containment, and on remote technologies to identify locations of leaks. He also reported on radioactive waste management plan, pointing at basic features of the wastes and main steps of waste treatment and disposal. He highlighted the main decommissioning challenges in the Mid-and-Long-Term Roadmap.

Then Mr Rindo presented a background and a mission of the International Research Institute for Nuclear Decommissioning (IRID), established in August 2013. He introduced the areas of future R&D focus (fuel debris retrieval, spent fuel retrieval, and radioactive waste treatment and disposal), a proposed network of international cooperation with the IRID, and a mode of co-operation amongst R&D stakeholders in Japan. Finally, he presented a mission and planned activities of the JAEA's Technology Safety Research Centre for Decommissioning of Fukushima Daiichi, established in April 2013. He completed his presentation by a set of reference links to Governmental bodies and organisations related to decommissioning.

## 10. SPECIAL PRESENTATION: THE IAEA INTERNATIONAL PEER REVIEW OF THE ROADMAP TOWARDS DECOMMISSIONING OF FUKUSHIMA DAIICHI NPP

Mr Vladimir Michal informed on the first mission of the IAEA International Peer Review of the Roadmap Towards Decommissioning of Fukushima Daiichi, which was held on 15th -22nd April 2013 on request of METI. The main objective of the first mission was an initial review of the Roadmap and a review of several specific short-term issues and recent challenges. The objective of the second planned mission will be more detailed and holistic

review of the Roadmap and mid-term challenges including a review of agreed specific topics. Mr Michal presented topics covered by the first mission review, he reported on a mission programme and gave examples of the Acknowledgements and Advices summarized in the Mission Report available at http://www.iaea.org/newscenter/news/2013/fukushimareport.html.

The Mid-and-Long-Term Roadmap was revised and updated in June 2013, taking also into account the first mission Advices. The second mission will be organized from 25th November to 4th December 2013. Mr Michael Siemann will be a member of the second mission team as an OECD NEA representative.

In the discussion it was noted that there is a space for international organisations to provide more advice on safety and technical aspects concerning management of vast amounts of waste and on off-site remediation activities.

## 11. SPECIAL PRESENTATION: DEVELOPMENTS OF CHARACTERIZATION STANDARDS AT THE INTERNATIONAL LEVEL

Mr Jean-Guy Nokhamzon informed on the on-going ISO project on elaboration of the *'Methodology for sampling and characterization of sites, soils, buildings and infrastructures contaminated with radionuclides or chemical products for remediation purposes'* as a future comprehensive decommissioning characterisation standard employing besides others a geostatistical sampling approach. Mr Nokhamzon focused on the outcomes achieved at the latest meeting (ISO/TC85/SC5) held in Atlanta, 10th -13th June 2013. He presented a proposed characterisation strategy diagram, a table of contents of the proposed standard with focus on chapter *'Strategy applied to the remediation of contaminated sites and soils'*, covering steps from definition of characterisation objectives, historical and functional analysis, through 2D and 3D characterisation program, data processing, meeting characterisation objectives, up to remediation program. The standard is planned to be completed and published by December 2015.

In the discussion it was highlighted that the project of the future ISO standard is not a duplication of existing MARSSIM methodology. The former describes characterisation procedures for further performance of decommissioning and remediation activities, while the latter addresses procedures and techniques to be performed for the site release as the last phase of decommissioning project.

## 12. OPENING DAY 3

Mr Juan-Luis Santiago, WPDD Chairman, reminded that the Russian Federation has become a member of the OECD Nuclear Energy Agency since 1st January 2013, and thanked presenters Mr Evgeny Komarov, Ms Tatyana Berezovskaya, Mr Vladimir Zimin, and Mr Leonid Sukhanov for attending the meeting to give a general information on decommissioning scene in Russia. He also welcomed invited presenter Mr Jörg Feinhals from Germany who would present considerations on material clearance and site release.

## 13. DECOMMISSIONING IN THE RUSSIAN FEDERATION

### 13.a Decommissioning legal framework and funding

Mr Evgeny Komarov briefed on location and number of NPPs, research reactors, other reactors, RW/SNF storage facilities and sites, and radiochemical production sites in Russia. He presented a hierarchical structure of a legal and regulatory framework for decommissioning and main legal provisions, notably federal acts on use of nuclear energy and on radioactive waste management, and governmental decrees on decommissioning

licensing and on financing the decommissioning and radioactive waste management related activities. Rosatom prefers a deferred dismantling strategy for facilities containing induced activity, defines the 'final isolation sites' in case of 'non-retrievable' radioactive waste, and recommends immediate dismantling in all other cases. Another option is a conversion of the facility to other use. Decommissioning liability is estimated as USD 100B and 70 percent of facilities/sites are legacy ones. Mr Komarov also introduced the decommissioning funding scheme and the use of funds, and addressed key challenges in decommissioning in Russia. He underlined a need for defining a long-term decommissioning strategy taking in to account an inventory of facilities, a legal and regulatory framework, and a prioritisation of decommissioning projects.

**13.b Decommissioning costing**

Ms Tatyana Berezovskaya presented a methodology of cost estimation of decommissioning and site remediation activities for facilities and sites of Rosatom and its affiliates. Costing approach is based on cost estimation for typical facility and on applying correction factors for similar ones. Costs for treatment of waste arising from decommissioning are included. Assumed end stage is a 'brown field'. A conceptual description of cost estimation methodology for facilities with nuclear reactors (power, research, others), storages, and production facilities were presented. Finally, examples of estimated decommissioning costs averaged per unit reactor power were given for specific types of power reactors and research reactors.

**13.c Decommissioning of nuclear power plants**

Mr Vladimir Zimin informed on a mission of the 'All-Russian Research Institute for NPP Operation' (VNIIAES), which provides a scientific and technical support to operational NPPs to enhance their safety and efficiency, as well as a consultancy and technical support in the area of decommissioning and radioactive waste management. He presented a schedule of final shutdown of the first generation nuclear power reactors in Russia. In addition to country's legal and regulatory framework, he briefed on current decommissioning guides. Mr Zimin introduced main decommissioning concepts: deferred dismantling, immediate dismantling and on-site disposal, and he presented decommissioning plans (immediate dismantling) for Novovoronez 1&2 NPP (shutdown 1984,1990) and Beloyarsk 1&2 NPP (shutdown 1983,1989). The former has obtained a decommissioning license, the turbine hall equipment have been dismantled, and the Decommissioning Demonstration Centre has been established on the site. Mr Zimin addressed infrastructural and societal challenges arising from transition process from operation to decommissioning (e.g. loss of job opportunities, impact on local economy). He completed his presentation with considerations on an effective decommissioning concept resulting to economical/industrial renewal of the site.

**13.d Activities of the JSC VNIINM in decommissioning**

Mr Leonid Sukhanov informed on the scope of work of the 'A.A. Bochvar Research Institute of Inorganic Materials' (VNIINM), providing besides others uranium and plutonium radiochemistry research, research of materials for nuclear industry, SNF and radioactive waste management research, and development of radioactive waste treatment technologies for nuclear sites. The Institute performs decontamination and dismantling activities of former fuel cycle research facilities (prototype equipment, labs, hot cells) and remediation of their surrounding areas.

Mr Sukhanov described in detail a plan and performance of decontamination, dismantling and remediation of the 'Building B', which had been used as an experimental base of the USSR radiochemical industry. He also informed on decontamination activities

of the 'Large-scale facility U-5' (a prototype of plutonium production plant (1946-1965) later implemented at Mayak site), as well as on current radioactive waste management infrastructure of the Institute.

In the discussion related to above four presentations it was noted that decommissioning cost estimations include also cost estimations of project management activities. The risk analysis is not applied in the cost estimates at the moment; its application is under consideration.

Decommissioning Fund was established in 1999 and contributions to the Fund are based on the price of sold electricity. In addition, the Government established the Federal Target Programme (2008-2015). A new Federal Target Programme will be defined for period 2016-2020, with extension till 2025. Its concept is already approved by Rosatom's Public Council and now is under development. Moreover, Rosatom operates its own fund to support R&D activities in decommissioning and radioactive waste management.

A separate fund for final radioactive waste disposal is also established after the Federal Act on Radioactive Waste Management came into force, and contributions to the fund are based on the volume of produced radioactive waste packages to be disposed.

Rosatom, as facilities' owner, is legally responsible for decommissioning and performs decommissioning through its subsidiary companies and contractors.

After submittal of decommissioning license documentation, the regulator has to decide on consent/refusal within one year.

Concerning preparation for decommissioning and training needs, Rosatom operates decommissioning and radioactive waste management training centres with adequate training programmes and relevant infrastructure. Moreover, these centres focus on R&D of decommissioning technologies and their presentation to stakeholders.

Material clearance is based on 10 microSv concept. Concerning disposal infrastructure, a deep geological repository is planned to be located at Krasnoyarsk region, three LILW disposal facilities are planned at current nuclear sites in 10-20 year perspective.

## 14. POTENTIAL FUTURE WORK OF WPDD

**Invited Presentation: Material Clearance and Site Release: Different Strategies**

Mr Jörg Feinhals presented in detail the structure of clearance levels, and briefed on clearance procedures used in Germany. Radioactivity based clearance levels are predominantly applied, but a direct application of 10microSv model is also an option. Mr Feinhals summarized French approach of zoning (not employing a concept of clearance levels), and pros and cons of this approach as stated by the ASN. He also quoted J. Avérous' conclusions (2004) on cost benefit comparison of clearance strategy vs. VLLW disposal strategy.

Mr Feinhals explained a distinction in conditions for application of clearance and removal procedures, as defined by German regulations. Up to now, two thirds of material from the Greifswald site has undergone a removal as non-contaminated material, and one third of material a clearance procedure as potentially contaminated material. Explanation of distinction between clearance and exemption was also given, as stated in a proposal of the new EC Basic Safety Standards Directive (EC BSS), followed by comparison of the IAEA and EC concepts of material clearance and site release.

Finally, he addressed issues of regulator's license requirements defined on the basis of single case assessment, justification of reduction of decontamination effort by releasing the

site with remaining activity, and legacy aspects. Mr Feinhals concluded his presentation by summarising the scope of EC regulation and guidance concerning the site release.

In the discussion it was noted that the zoning approach and the absence of clearance levels have its basis in the public concern of release of contaminated material by mistake. This concept demands extensive final disposal capacities (VLLW).

**Clearance and/or VLLW disposal: The roles in the optimisation of radioactive waste management for decommissioning**

Mr Claudio Pescatore briefed on the report on *'Release of Radioactive Materials and Buildings from Regulatory Control'* (OECD NEA, 2008) and its achievements. The Report gives an overview of clearance levels and practices of selected OECD NEA Member Countries, however, the subject of optimisation of clearance vs VLLW/LLW disposal is discussed only marginally. The Report quotes outcomes of J< Averous' paper (2004).

Many countries built up their radioactive waste management infrastructure including final disposal facilities and established their clearance procedures. Some countries operate VLLW disposal facility because of either not having the clearance procedures, or lowering the volume of waste to be disposed of to LLW facility. Moreover, since the existing free capacities of final radioactive waste repositories are decreasing faster than it was projected, and building new final disposal capacities is getting more difficult due to public acceptance, an optimisation of final disposition (LLW, VLLW, clearance) of materials and radioactive waste is important. In light of this, it is also important to understand past decision making and priorities made by countries when they were forming their radioactive waste management concepts.

In the discussion it was proposed to organise a WPDD topical session on optimisation of final disposition of radioactive waste and materials from decommissioning.

## 15. COUNTRY UPDATES ON DECOMMISSIONING (see Item 7)

## 16. ANY OTHER BUSINESS

Mr Ivo Tripputi informed on the Paris Convention on the Third Party Liability in the Field of Nuclear Energy and on the current effort of the OECD NEA towards defining criteria for exclusion from the Convention for nuclear installations under decommissioning. Criteria for exclusion are proposed as the radioactivity in Bq of listed nuclides for a nuclear installation, and then the second scrutiny is to meet a site specific scenario criterion of less than 1 mSv individual annual off-site dose under accident conditions. Above mentioned radioactivity criteria have been derived from 10 mSv model, under considerably conservative assumptions concerning fraction of released inventory during accident. Therefore, it is assumed that only few installations under decommissioning would pass radioactivity criteria.

It was also noted that the combination of the new liability limits (2004 Amendment) and the difficulty to assess a real risk for the nuclear installation under decommissioning may make it difficult to insure the installation. Moreover, the proposed radioactivity criteria differ from those for a decommissioning license, what may be questioned by the public.

Since the proposed criteria for exclusion from the Convention are still being discussed within the NEA Commission on Radiation Protection and Public Health (CRPPH), the WPDD meeting was invited to discuss the radioactivity criteria at a separate meeting in

January 2014 to support the CRPPH.

Note after the meeting: The CPPRH announced that the representatives of the Parties of the Paris Convention achieved agreement on the subject and their discussion is completed. The Secretariat cancelled the preparation of the meeting proposed for January 2014.

## 17. DATE AND PLACE OF NEXT MEETING

Mr Evgeny Komarov proposed hosting of WPDD-15 meeting by Rosatom in the Russian Federation.

***Decision:*** WPDD Plenary meeting will be held in Moscow. A technical site visit will be held in Moscow or Novovoronez. Date of the meeting will be specified later, a proposed duration is 3-4 days, between 10-20 October 2014. The meeting will hold a special session on decommissioning scene in the Russian Federation and a topical session on optimisation of final disposition of radioactive waste and materials from decommissioning.

## 18. REVIEW OF MAIN DECISIONS AND ACTION ITEMS

Juan-Luis Santiago – see decisions in this record.

Tuesday 19 November 2013 (DAY 2)
A Topical Session on Preparation for Decommissioning

**Rapporteur's Report of the Topical Session on "Preparation for Decommissioning during Operation and after Final Shutdown" held during the 14th Meeting of the WPDD of the OECD/NEA in Paris (F), November 19, 2013**

B. Massing, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Bonn / Germany)

## 1. PRELIMINARY REMARK

During the 14th meeting of the Working Party on Decommissioning and Dismantling (WPDD) of the Nuclear Energy Agency (NEA) of the OECD, which took place in Paris (France) on November 18th - 20th 2013, a Topical Session was devoted to a preparation for decommissioning during post-operational phase. The motivation for this Topical Session was the growing number of NPPs that will terminate the power operation within the next years.
The session was divided into 9 presentations on technical aspects and 5 presentations on strategic aspects of preparation for decommissioning, followed by a panel discussion. It was chaired by Gérard Laurent, France, EDF.

## 2. PRESENTATIONS ON TECHNICAL ASPECTS OF PREPARATION FOR DECOMMISSIONING

### 2.1. Jean-Guy Nokhamzon, CEA (France): CEA's feedback experience in the preparation for decommissioning: research reactors and hot labs

The transition phase between the end of a facility's operation and the onset of its decommissioning is critical due to the numerous related necessary or advantageous modifications on the technical, organizational and management level. This transition process should be carefully managed in a gradual manner in order to minimize uncontrolled loss of resources. Moreover, a change of culture from operation to decommissioning is promoted and substantiated by a contrasting juxtaposition of various aspects with respect to these two distinct regimes. It is stressed that by comprehensively taking and recording all relevant data throughout the facility's design, construction, operation (including modifications if applicable), shutdown and post-shutdown phases considerable savings of resources can be achieved and potential delays in decommissioning can be precluded.

### 2.2. Hiroshi Rindo, JAEA (Japan): Examples of preparatory activities for decommissioning in JAEA facilities

The decommissioning plan, which is permitted at the end of the operation period, stipulates all relevant aspects of decommissioning, e.g. process of decontamination and dismantling, treatment and disposal of radioactive waste, safety evaluation, financial plan and cost estimation of the decommissioning.
The preparatory activities and activities for decommissioning are presented with the example of decommissioning a plutonium fuel fabrication facility, which is done in a phased process by removing SNM residuals, reduction of Glovebox size, storage of waste and building demolition. It is shown that a remote dismantling system could reduce the secondary waste and the exposure dose of the worker.

### 2.3. Gérard Laurent, EDF (France): Engaging the preparatory and post-definitive production shutdown operations for EDF-sites

Recent laws and decrees guarantee the safety of NPPs throughout their life cycle. In 2010, ASN issued the guide 6 about authorized activities during the transition phase. The activities in this pre-decommissioning phase are divided in those before and after the final shutdown. Before the shutdown preparatory tasks like collecting the relevant data about systems and inventory, performing a radiological characterization of the site, and setting off a stakeholder involvement as well as general management processes are to be addressed. After the shutdown preparation of dismantling activities, radiological characterisation activities, modifications and cleaning of nuclear circuits and removal of dangerous material and fuel are already authorized by the ASN. In addition the dismantling of the turbine hall and some conventional buildings and removal of the insulation material around pipes and equipment can be done during the transition phase. Furthermore, the lessons learnt include the importance of the availability of disposal routes for the arising waste, the concertation with stakeholders and human resources aspects.

### 2.4. Ralf Versemann, RWE Power AG (Germany): State of the art and future perspectives for decommissioning of nuclear power plants in Germany

According to previous experience in Germany the dismantling of NPP technologically is a mastered task and all vendors, authorities and inspectors have broad experience in D&D field. Some of the lessons learned are the possibility of dismantling activities with fuel elements, the reduction of costs for service operation by modification or exchange of systems and the dismantling and external treatment of large components. From the operators' point of view the permanent reduced risk potential of a NPP in decommissioning is not taken into account adequately.
As preparatory activities for decommissioning above all the removal of fuel elements, primary / system circuit decontamination, alignment of the organisation of shift, the radiological characterization, planning of infrastructure for dismantling and preparation of licensing have proved its worth. There are three dismantling variants practiced in Germany: the In-situ dismantling and the dismantling at a stretch with treatment on-site or externally contracted, which allows a flexible project management.

### 2.5. Beccy Pleasant, Magnox Ltd (UK): Magnox Ltd.'s transformation from operating to decommissioning – the impact on the workforce

As the majority of Magnox Ltd.'s NPPs have reached the end of their operating life, the company has started to implement an organizational restructuring from being focused on power generation towards the delivery of decommissioning projects in order to comply with regulatory requirements, to assure availability of skilled personnel, and to lower the costs of decommissioning. An important part of this transformation process is the effective and considerate management of human resources. At Magnox, the necessary workforce reduction is successfully dealt with by a new company employee agreement, staff retraining and reskilling programs, severance or early retirement, and other creative resourcing

solutions like transfer of personnel, yielding substantial savings in staff release costs and thus also in the overall program without leading to delay of projects or formal grievances.

### 2.6. Juan-Luis Santiago, ENRESA (Spain): Technical case of ENRESA – Preparing for decommissioning in Spain

It is proposed to start the planning of D&D under the last years of operation. This includes the preparation of a well-documented D&D plan, to establish a detailed characterization, to define management processes for the different material streams and to ensure waste management routes. The licensing documents should take into account the hazard reduction over the time. A good response to regulatory requirements reduces the authorization times.
Operational wastes must be conditioned and spent fuel must be transferred to dry storage before decommissioning. Waste stores should be provided with sufficient capacity for LLW and VLLW, and highly activated wastes may require specific auxiliary facilities.
A number of preparatory activities are performed during the transition period in order to facilitate subsequent D&D operations; they will contribute to the reduction of hazards. The transition from operation to decommissioning should be combined with a change of mind. This includes a new organization with an appropriate mixture of experienced workers from operational phase and new workers with D&D experience as well as a project management structure and tools.

### 2.7. Boby Abu-Eid, US Nuclear Regulatory Commission (USA): Technical Case for commercial facilities in the USA

A survey of the decommissioning process is given by discussing several regulatory and technical aspects with emphasis on activities that are required of either the licensee or the regulatory body at different stages of the process. Among these aspects are e.g. the licensees' choice from distinct but combinable decommissioning alternatives (DECON, SAFSTOR and/or ENTOMB), the preparation and (indirect) approval of the Post-Shut Down Activity Report allowing for major decommissioning activities, and the license termination activities including in particular the requirements for the License Termination Plan and corresponding regulatory actions. With respect to the latter, specific regulations like the Independent Spent Fuel Storage Installation license and the NRC's general approach based on surface residual radioactivity are considered and also substantiated for the model case of reactor decommissioning, before more technical aspects related to radiation protection and protection of the environment are discussed. Moreover, details of the decommissioning funds planning as well as the involvement of stakeholders and the public are given, and finally a summary of both completed and future decommissioning projects is presented.

### 2.8. Andrew Szilagyi, US Department of Energy (USA): Technical case of the US DOE – Deactivation from Operations and Preparing for Demolition or Entombment

Whichever of the decommissioning strategic decision safe enclosure, demolition or entombment first deactivated end state conditions have to be specified for the facililties' structures, systems and components. The preparation of demolition or entombment includes the characterization and collection of information, technical planning and identification of technology needs. The creation of end point specifications is an important basis for management, project planning, operations and maintenance and also to inform regulators and other stakeholders. It is recommended to start planning for transitioning to deactivation and decommissioning months/years ahead of shutdown.

### 2.9. Ivo Tripputi, SOGIN (Italy): Practical aspects of safety culture

Transition from operation to decommissioning implies a deep change in safety culture and some risks related to the discontinuity. This relates in particular to

- the personnel: mental resistance to dismantle, fears to lose the job, need for requalification, possible loss of knowledge, lack of motivation

- contractors/subcontractors: a large use of contractors involves awareness and training of the working team about specific risks and radiological hazards, a mixing with external workers general lowers safety culture
- the plant: decommissioning has specific challenges, e.g. industrial risks (conventional hazards) and liquid pathways (large quantities of liquid waste produced) may become more important than in operation
- organization and top management: top management attitude to safety and safety culture is a fundamental element, necessary a combination of a formalized management system and personal behaviours
- other actors: all institutions should be involved in some form of safety culture sensitization; safety authority personnel should be involved also in safety culture (SC) training programs and how to monitor SC in decommissioning; SC should be part also of the stakeholder involvement.

A specific decommissioning safety culture plan should be prepared before the final shutdown. The SC plan should include policy statements and communication on safety, proper safety culture training classes, operational feedback programs, records and knowledge management, monitoring system based on Key Performance Indicators.

## 3. PRESENTATIONS ON STRATEGIC ASPECTS OF PREPARATION FOR DECOMMISSIONING

### 3.1. Doug Metcalfe, Natural Resources of Canada (Canada): Strategic aspects of preparation for decommissioning – policy level considerations in considerations in Canada

Nuclear energy plays an important role in Canada's overall energy mix and is crucial part of clean energy mix. For on-going und future use of nuclear energy it is necessary to build public confidence, to ensure safe operation and decommissioning and to develop and implement long-term management solutions for all types of radioactive waste. For nuclear energy, which is under federal jurisdiction, there is a comprehensive legislative framework. The Canadian Nuclear Safety Commission (CNSC) is responsible for requirements and regulatory oversight of preliminary and detailed decommissioning plans and of financial guarantees for decommissioning and waste management. The Government of Canada demonstrates leadership and good stewardship by addressing federal decommissioning liabilities like the Nuclear Legacy Liabilities Program and the Post Hope Area Initiative.

### 3.2. Céline Fanguet, ASN (France): Preparation for decommissioning - Strategic considerations at the regulatory level in France

In France the decommissioning describes all technical and administrative activities carried out following the final shutdown of a nuclear facility. The phase between the final shutdown and the delicensing is authorized by a new decree called "MAD DEM" decree. For this decree a final shutdown and decommissioning application dossier called "MAD DEM" dossier is required. According to the ASN's policy on decommissioning and delicensing (2009) and "BNI Order" of 7 February 2012 the dismantling of the entire facility should start just after its final shutdown. Therefore the operator should endeavour to align the final shutdown date with the publication of the MAD DEM dossier.
The decommissioning phase may be preceded by a final shutdown preparation stage called "preparatory operations for final shutdown" (OPMAD). This preparatory phase is regulated by the initial operating license and allows the removal of the hazardous substances, the preparation for further decommissioning operations, characterisation operations, construction work with no impact to safety and pilot deconstruction work, but no irreversible dismantling operations.

### 3.3. Bernhard Massing, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Germany): Strategic considerations at policy level in Germany

Due to the phase-out decision in 2011 eight NPP expired the authorisation for power operation immediately and the remaining nine NPP in operation will gradually expire by 2022. Because of the unplanned and longer-lasting post operational phase the competent authority had to check if nuclear safety was affected, as a result of which the licence holders had to carry out a post operational safety analysis.
Preparatory work can be carried out during post operational phase under the operating license, such as unloading of fuel assemblies, handling of radioactive substances and disposal of radioactive operational waste and decontamination of systems and components. However, the premature dismantling of systems, components or buildings requires a decommissioning license. The guidelines concerning the technical qualification of NPP personnel were supplemented by modified requirements for NPP personnel in the post-operational phase in Mai 2013, regarding reduced requirements for practical experience for reactor operators and shift supervisors and determination of the minimum staffing of shift personnel.

### 3.4. Svante Andersen, Vattenfall Sweden (Sweden): Strategic considerations by a Swedish NPP operator

In Sweden the licensee, who is responsible for decommissioning and waste management, shall report decommissioning plans and fund the decommissioning cost. The SKB assists the NPPs to meet their responsibilities.
The four reactor units R1-R4 of the NPP Ringhals will finally shut down within the time period 2025 to 2043. For the physical decommissioning only 5 years are scheduled. This can be achieved by

- pre-planning phase before end of operation
- making the dismantling first in the computer (4D decommissioning simulator)
- direct start of nuclear and conventional dismantling after shutdown
- removal of reactor vessel in one piece, with transport of the BWR vessel to the final repository for short-lived LILW (SFR) and intermediate storage of the PWR vessels and internals at Ringhals until 2045

### 3.5. Boby Abu-Eid, US Nuclear Regulatory Commission (USA): Strategic considerations for commercial facilities in the USA

The NRC decommissioning process is presented as a structured procedure at the end of which will be the license. For evaluation of the radiological situation all available historical and operational data, sampling and environmental monitoring data need to be taken into consideration.
A self-assessment would be helpful to assess costs and to evaluate performance. The self-evaluation should also be subject to additional examination by peer review.

## 4. PANEL DISCUSSION

The presentations were followed by a panel discussion during which the panellists gave their views on key aspects with respect to preparation for decommissioning. The following statements provide an overview of this discussion by summarizing the key statements made by panellists and other meeting participants, combining similar topics.

- It is necessary and possible to speed up the transition period and the process of decommissioning. Preparing for decommissioning should start some years before the final shutdown. The application of decommissioning license should be prepared as soon as possible and the decommissioning may start with fuel on-site.

- Transition period from operation to decommissioning is a critical one with a change of culture, which is connected with changes of organisation and staff level. Particularly critical is the fact that personnel reductions must not decrease the competence and the knowledge of the site.
- The availability of a final disposal is a precondition for decommissioning and an unsolved problem in almost all countries. Implementation of clearance procedures or the construction of VLLW depositories may help to find a solution.
- The licensee would get more flexibility to offer the opportunity to dismantle during the transition period without a decommissioning license. However, EU directives demand the participation of the EU member states and the public before granting the decommissioning license. In addition problems could occur to define radioactive waste from operation and decommissioning.
- Public assessment and acceptance are important prerequisites for successful decommissioning.

## 5. CHAIRMAN'S conclusions (by Gérard Laurent)

Main lessons from all the excellent presentations given:
Great consistency of the concept and great homogeneity of the presentation requests.
To be able to start at the best the transition period the following themes will be prepared:

1. influence of time schedule dependence:
   a. direct decommissioning,
   b. decommissioning after a long term safe enclosure,
   c. non-scheduled final shut down (because of economic reasons or technical incidents, see US SONGS feedback).
2. how to preserve the operating data needed for D&D requests, how to deal with early characterization during operation.
3. how to capture D&D expertise and to move/preserve operating competence.
4. what can be done after final shut down and before the decommissioning official authorisation (turbine hall decommissioning, steam generators removal etc...).
5. what about waste management organisation, how to increase flexibility. Introduction of the 'rip and ship' concept in the decommissioning decree (like for the D&D of ZION).
6. the main drivers are the risks (risk management approach for decommissioning) but how to improve D&D efficiency with a good management of these risks.
7. how to deal with the regulatory change of frame from operating to decommissioning times (see the OECD reference of 2007), in order to secure the safety authority.
8. how to try to define the final issue for the site and manage the public communication on this point.

# Annex: AGENDA

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| **18 NOVEMBER 2013 (DAY 1)** | | | | |
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| **14th Meeting of the WPDD<br>Venue: OECD Nuclear Energy Agency, Le Seine Saint-Germain,<br>12, boulevard des Îles, Issy-les-Moulineaux, France<br>NEA Room A and B** | | | | |
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| **Chair: Juan-Luis Santiago, Spain** | | | | |
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| 14:00 | **1.** | **OPENING THE MEETING**<br>*Kazuo Shimomura, NEA Deputy Director – Safety and Regulation*<br>*Juan-Luis Santiago, Spain, WPDD Chair* | | |
| 14:15 | **2.** | **REVIEW AND ADOPTION OF AGENDA**<br>*Juan-Luis Santiago* | **D** | NEA/RWM/WPDD/A(2013)2<br>*(Document No.1 -* |
| 14:20 | **3.** | **REVIEW AND APPROVAL OF SUMMARY RECORD OF WPDD-13**<br>*Juan-Luis Santiago* | **D** | NEA/RWM/WPDD(2012)9<br>*(Document No.2)* |
| | **4.** | **INTERNATIONAL DEVELOPMENTS** | | |
| 14:25 | ***4.a*** | **IAEA – Decommissioning-related activities over the past year**<br>*Vladimir Michal, IAEA* | **I** | Oral Report |
| 14:40 | ***4.b*** | **EC – Decommissioning-related activities over the past year**<br>*Thomas Kirchner, EC* | **I** | Oral Report |
| | **5.** | **DEVELOPMENTS WITHIN THE NEA** | | |
| 14:55 | ***5.a*** | **RWMC and NEA Steering Committee**<br>*Michael Siemann, Head of RP & RWM Division, NEA* | **I** | Oral report |
| 15:05 | ***5.b*** | **CPD**<br>*Ivo Tripputi, Italy, CPD MB Chair* | **I** | Oral Report |
| | **6.** | **PROGRAMME OF WORK OF THE WPDD** | | |
| 15:20 | ***6.a*** | **Task Group on R&D Needs for Decommissioning**<br>*Gérard Laurent, France, R&D TG Chair*<br><br>*(The Report on R&D and Innovation Needs for Decommissioning was revised by the authors and was circulated to WPDD members on 6th November 2013 to comment the Report. A procedure for approval-in-principle through the WPDD Core Group is proposed.)* | **D** | Oral Report |

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| 15:40 | ***6.b*** | **Decommissioning Cost Estimation Group (DCEG)**<br>*by Björn Hedberg, Sweden, DCEG Chair*<br>• *The DCEG-6 Meeting and Current Status of Work*<br>• *DCEG Work Plan* | **I** | Oral Report |
| 15:55 | | ***BREAK*** | | |
| 16:15 | ***6.c*** | **Task Group on Radiological Characterisation and Decommissioning**<br>*Arne Larson, Sweden, RCD TG Chair*<br>• *Information on recently completed project*<br>• *Proposal of future work*<br>*(The Report on Radiological Characterisation for Decommissioning of Nuclear Installations was commented by WPDD members from 14 June 2013 till 15 August 2013. DCEG and the Task Group on R&D and Innovation Needs were also invited to comment the Report. Since comments were minor, in accordance with the decision of the WPDD Core Group the Report was issued in September 2013, and posted on publicly available web page of WPDD on 18th October 2013 as [ NEA/RWM/WPDD(2013)2)] .* | **I**<br>**D** | Oral Report |
| 16:35 | ***6.d*** | **Nuclear Site Restoration**<br>*Peter Orr, UK, CPD Nuclear Site Restoration TG Chair*<br>• *Reflection from the last topical session (WPDD-13)*<br>• *Information on the work progress of CPD Task Group on Nuclear Site Restoration*<br>• *Proposal to create a WPDD Task Group on Nuclear Site Restoration*<br>*(The CPD Task Group on Nuclear Site Restoration is currently working on a report on technical aspects of site restoration. WPDD members are invited to form the WPDD Task Group on Nuclear Site Restoration to launch work on a report on strategic aspects of site restoration.)* | **I**<br>**D** | Oral Report |
| 17:00 | **7.** | **COUNTRY UPDATES ON DECOMMISSIONING**<br>• *Country delegations are invited to present information on recent developments in their country on decommissioning aspects, following the structure of the template for individual country updates. The completed template should be provided to the NEA Secretariat at least one week before the meeting for later distribution.* | **I** | Oral Reports |
| 17:50 | **8.** | **SUMMARY OF DAY 1** | | |
| 18:00 | | ***ADJOURN*** | | |

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| **19 NOVEMBER 2013 (DAY 2)** | | |
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| **14th Meeting of the WPDD**<br>**Venue: OECD Nuclear Energy Agency, Le Seine Saint-Germain,**<br>**12, boulevard des Îles, Issy-les-Moulineaux, France**<br>**NEA Room A and B** | | |
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| **Topical Session on**<br>**'PREPARATION FOR DECOMMISSIONING DURING OPERATION AND AFTER FINAL SHUTDOWN'** | | |
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| **Session Chair:** Gérard Laurent, France, EDF<br>**Rapporteur:** Bernhard Massing, Germany, BMU | | |
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| 09:00 | **TS1.** | **INTRODUCTION TO THE TOPICAL SESSION**<br>*Session Chair* |
| | | **TECHNICAL ASPECTS OF PREPARATION FOR DECOMMISSIONING** |
| 09:10 | **TS2.** | **CEA'S FEEDBACK EXPERIENCE IN THE PREPARATION FOR DECOMMISSIONING: RESEARCH REACTORS AND HOT LABS**<br>*Jean-Guy Nokhamzon, France, CEA*<br>*(presentation 15', discussion)* |
| 09:30 | **TS3.** | **EXAMPLES OF PREPARATORY ACTIVITIES FOR DECOMMISSIONING IN JAEA FACILITIES**<br>*Hiroshi Rindo, Japan, JAEA*<br>*(presentation 15', discussion)* |
| 09:50 | **TS4.** | **ENGAGING THE PREPARATORY AND POST-DEFINITIVE PRODUCTION SHUTDOWN OPERATIONS FOR EDF SITES**<br>*Gérard Laurent, France, EDF*<br>*(presentation 15', discussion)* |
| 10:10 | **TS5.** | **STATE OF THE ART AND FUTURE PERSPECTIVES FOR DECOMMISSIONING OF NUCLEAR POWER PLANTS IN GERMANY**<br>*Ralf Versemann, Germany, RWE Power AG*<br>*(presentation 15', discussion)* |
| 10:30 | | ***BREAK*** |
| 10:40 | **TS6.** | **MAGNOX LTD's TRANSFORMATION FROM OPERATING TO DECOMMISSIONING – THE IMPACT ON THE WORKFORCE**<br>*Beccy Pleasant, UK, Magnox Ltd.*<br>*(presentation 15', discussion)* |
| 11:00 | **TS7.** | **TECHNICAL CASE OF ENRESA, SPAIN**<br>*Juan-Luis Santiago, Spain, ENRESA*<br>*(presentation 15', discussion)* |

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| 11:20 | **TS8.** | **ASPECTS OF PREPARATION FOR DECOMMISSIONING US COMMERCIAL FACILITIES – REGULATORY PERSPECTIVE**<br>*Boby Abu-Eid, USA, US Nuclear Regulatory Commission*<br>*(presentation 15', discussion)* |
| 11:40 | **TS9.** | **TECHNICAL CASE OF THE US DOE**<br>*Andrew Szilagyi, USA, US Department of Energy*<br>*(presentation 15', discussion)* |
| 12:00 | | ***Lunch*** |
| 13:20 | **TS10.** | **PRACTICAL ASPECTS OF SAFETY CULTURE: SOGIN, ITALY**<br>*Ivo Tripputi, Italy, SOGIN*<br>*(presentation 15', discussion)* |
| 13:40 | **TS11.** | **SUMMARY OF TECHNICAL ASPECTS**<br>*Session Chair* |
| | | **STRATEGIC ASPECTS OF PREPARATION FOR DECOMMISSIONING**<br>(What are / should be regulators' requirements concerning preparation for decommissioning during operation & transition period) |
| 13:50 | **TS12.** | **STRATEGIC CONSIDERATIONS AT POLICY LEVEL IN CANADA**<br>*Doug Metcalfe, Canada, Natural Resources of Canada*<br>*(presentation, - discussion in panel)* |
| 14:05 | **TS13.** | **STRATEGIC CONSIDERATIONS AT THE REGULATORY LEVEL IN FRANCE**<br>*Céline Fanguet, France, ASN*<br>*(presentation, - discussion in panel)* |
| 14:20 | **TS14.** | **STRATEGIC CONSIDERATIONS AT POLICY LEVEL IN GERMANY**<br>*Bernhard Massing, Germany, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety*<br>*(presentation, - discussion in panel)* |
| 14:35 | **TS15.** | **STRATEGIC CONSIDERATIONS BY A SWEDISH NPP OPERATOR**<br>*Svante Andersen Sweden, Vattenfall Sweden*<br>*(presentation, - discussion in panel)*<br>*(In Sweden, the NPP operators and their jointly owned waste management company SKB are responsible for strategic considerations for decommissioning and waste management.)* |
| 14:50 | **TS16.** | **STRATEGIC CONSIDERATIONS ON COMMERCIAL FACILITIES IN THE USA**<br>*Boby Abu-Eid, USA, US Nuclear Regulatory Commission*<br>*(presentation, - discussion in panel)* |
| 15:05 | | ***Break*** |
| 15:30 | **TS17.** | **PANEL** |
| 16:30 | **TS18.** | **CONCLUDING REMARKS**<br>*Session Chair* |
| 16:40 | | **CLOSURE OF THE TOPICAL SESSION** |

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| **19 NOVEMBER 2013 (DAY 2)** | | | | |
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| **14th Meeting of the WPDD<br>Venue: OECD Nuclear Energy Agency, Le Seine Saint-Germain,<br>12, boulevard des Îles, Issy-les-Moulineaux, France<br>NEA Room A and B** | | | | |
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| **Chair: Juan-Luis Santiago, Spain** | | | | |
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| 16:40 | **9.** | **Special presentation:<br>R&D DECOMMISSIONING PROGRAMME FOR FUKUSHIMA**<br>*Hiroshi Rindo, Japan, JAEA* | **I** | Oral report |
| 17:20 | **10.** | **Special presentation:<br>THE IAEA INTERNATIONAL PEER REVIEW OF THE ROADMAP TOWARDS DECOMMISSIONING OF FUKUSHIMA DAIICHI NPP**<br>*Vladimir Michal, IAEA* | **I** | Oral report |
| 17:40 | **11.** | **Special presentation:<br>DEVELOPMENTS OF CHARACTERIZATION STANDARDS AT THE INTERNATIONAL LEVEL**<br>*Jean-Guy Nokhamzon, France, CEA* | **I** | Oral report |
| 18:00 | | ***Adjourn*** | | |

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| **20 NOVEMBER 2013 (DAY 3)** | | | | |
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| **14th Meeting of the WPDD<br>Venue: OECD Nuclear Energy Agency, Le Seine Saint-Germain,<br>12, boulevard des Îles, Issy-les-Moulineaux, France<br>NEA Room A and B** | | | | |
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| **Chair: Juan-Luis Santiago, Spain** | | | | |
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| 09:00 | **12.** | **OPENING DAY 3**<br>*Juan-Luis Santiago, Spain, WPDD Chair* | | |
| | **13.** | **DECOMMISSIONING IN THE RUSSIAN FEDERATION** | | |
| 09:05 | ***13.a*** | **Decommissioning legal framework and funding**<br>*Evgeny Komarov, Russian Federation, Rosatom*<br>• *Presentation (20') and discussion* | **I** | Oral Report |
| 09:30 | ***13.b*** | **Decommissioning costing**<br>*Tatyana Berezovskaya, Russian Federation, Rosatom*<br>• *Presentation (20') and discussion* | **I** | Oral Report |
| 09:55 | ***13.c*** | **Decommissioning of nuclear power plants**<br>*Vladimir Zimin, Russian Federation, JSC VNIIAES*<br>• *Presentation (20') and discussion* | **I** | Oral Report |
| 10:20 | ***13.d*** | **Activities of the JSC VNIINM in decommissioning**<br>*Leonid Sukhanov, Russian Federation, A.A. Bochvar High-technology Research Institute of Inorganic Materials (JSC VNIINM)*<br>• *Presentation (20') and discussion* | **I** | Oral Report |
| 10:45 | | ***BREAK*** | | |
| 11:05 | **14.** | **POTENTIAL WPDD FUTURE WORK**<br>• ***Invited Presentation: Material Clearance and Site Release: Different Strategies***<br>*by Jörg Feinhals (Germany, DMT GmbH & Co. KG)*<br>*(Presentation 20')*<br>• ***Clearance and/or VLLW disposal: The roles in the optimisation of radioactive waste management for decommissioning***<br>*by Claudio Pescatore (NEA) and Michel Dutzer (France, ANDRA)*<br>*(Presentation 20')*<br>• *Discussion and way forward* | **I**<br><br><br><br>**I**<br><br><br><br>**D** | Oral Report<br><br><br><br>Oral Report |
| 12:05 | **15.** | **COUNTRY UPDATES ON DECOMMISSIONING (cont. from Day 1, see Item 7)** | **I** | Oral Reports |

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| **CLOSING SESSION** | | | | |
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| 12:25 | **16.** | **ANY OTHER BUSINESS**<br>*Juan-Luis Santiago*<br>*Any other item raised in the meeting that needs further addressing* | | |
| 12:35 | **17.** | **DATE AND PLACE OF NEXT MEETING**<br>*Secretariat*<br>• *The Secretariat proposes the Russian Federation to host the WPDD-15 in 2014.* | **D** | |
| 12:45 | **18.** | **REVIEW OF MAIN DECISIONS AND ACTION ITEMS**<br>*Juan-Luis Santiago* | **D** | |
| 13:00 | | ***ADJOURN*** | | |