International Experience Exchange and Co-operation for Safe and Efficient Decommissioning and Radioactive Waste Management

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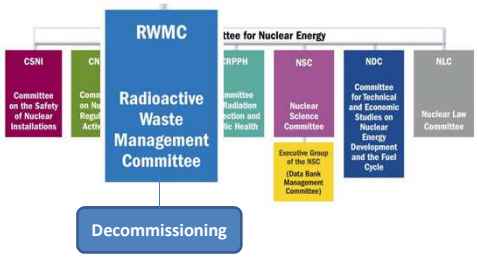
OECD BETTER POLICIES FOR BETTER LIVES
Nuclear Energy Agency
NEA NUCLEAR ENERGY AGENCY

Contents

1. The NEA: A Forum for Co-operation for the Most Advanced Countries in the World

- Founded in 1958
- 31 member countries
- 7 standing technical committees
- 75 working parties and expert groups
- 21 international joint projects



1. NEA Mission

- To assist its member countries in maintaining and further developing, through **international co-operation, the scientific, technological and legal bases** required for a safe, environmentally friendly and economical use of nuclear energy for peaceful purposes.

- To provide authoritative assessments and to forge **common understandings** on key issues, as **input to government decisions on nuclear energy policy**, and to broader OECD policy analyses in areas such as energy and sustainable development.

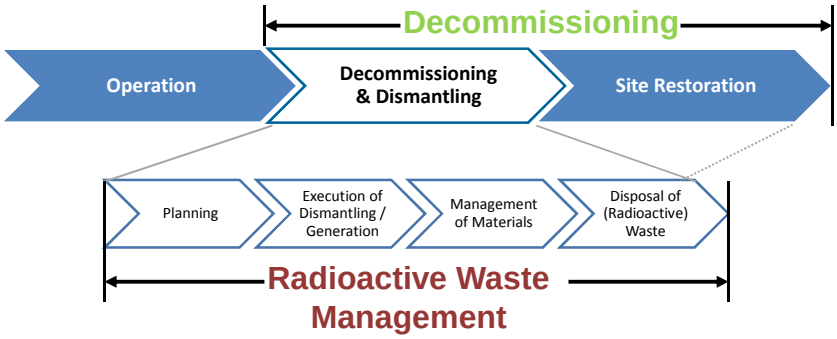
The Strategic Plan of the Nuclear Energy Agency: 2011-2016

1. NEA Membership

- Australia
- Austria
- Belgium
- Canada
- Chile
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Iceland
- Ireland
- Israel
- Italy
- Japan
- Korea
- Luxembourg
- Mexico
- Netherlands
- New Zealand
- Norway
- Poland
- Portugal
- Russia
- Slovak Republic
- Slovenia
- Spain
- Sweden
- Switzerland
- Turkey
- United Kingdom
- United States

OECD and NEA member
OECD member, not NEA
NEA member, not OECD

2. What is Decommissioning and RWM?



Funding, Cost Estimation, Safety, Stakeholders Involvement, Regulatory Framework, Final Repository, Radiological Protection, Waste Management Concept ...

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3. At NEA:

Steering Committee for Nuclear Energy

Radioactive Waste Management Committee

Regulators' Forum

Integration Group for the Safety Case (IGSC)

- CLAY CLUB
- SALT CLUB
- Expert Group on Operational Safety (EGOS)
- Radioactive Waste Repository Metadata Management (RepMet)

Forum on Stakeholder Confidence (FSC)

Working Party on Decommissioning and Dismantling (WPDD)

- Decommissioning Cost Estimation Group (DCEG)
- Task Group on Rad. Characterisation (TGRCD)
- Task Group on Nuclear Site Restoration (TGNSR)
- Task Group on Preparing for Decommissioning (TGPFD)

Expert Group on Predisposal Management of Radioactive Waste (EGPMRW)

Expert Group on Waste Inventorying & Reporting Methodology (EGIRM)

Expert Group on Preservation of Records, Knowledge and Memory across Generations (RK&M)

Expert Group on R&D on Fukushima RWM

Regulator-Implementer-Dialogue

Key work activities of RWMC:

- Overall waste management approaches and strategies
- Confidence building in waste disposal
- Long-term safety and safety case
- Scientific and technical studies, databases
- Decommissioning of nuclear facilities

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3. Who is involved in Decommissioning and RWM at NEA?

Steering Committee for Nuclear Energy

CSNI — Committee on the Safety of Nuclear Installations

CNRA — Committee on Nuclear Regulatory Activities

RWMC — Radioactive Waste Management Committee

CRPPH — Committee on Radiation Protection and Public Health

NSC — Nuclear Science Committee

NDC — Committee for Technical and Economic Studies on Nuclear Energy Development and the Fuel Cycle

NLC — Nuclear Law Committee

Examples
of co-operation on decommissioning issues within NEA

- Radiological Protection in Decommissioning (WGDECOM)
- Executive Group of the NSC (Data Bank Management Committee)
- Thermochemical Database (TDB Project)
- Decommissioning Cost Study (COSTDEC)
- 3rd Party Liability of Low Risks Facilities (Paris Convention)

3. Who is involved in Decommissioning and RWM?

National Level:

- Policy Makers
- Regulators, Authorities (nuclear and non-nuclear e.g. environmental)
- Utility Owners, Implementers
- Waste Management Organisations
- Service Contractors, Industry
- ...

International Level:

- European Commission **EC** *(Full Participant)*
- International Atomic Energy Agency **IAEA** *(Co-operative Agreement)*
- Global Nuclear Industry *(Input to Selected Activities)*
- World Nuclear Association **WNA**
- Western European Nuclear Regulator Association **WENRA**
- European Nuclear Installations Safety Standards Initiative **ENISS**
- Research Institutes e.g. EPRI
- …

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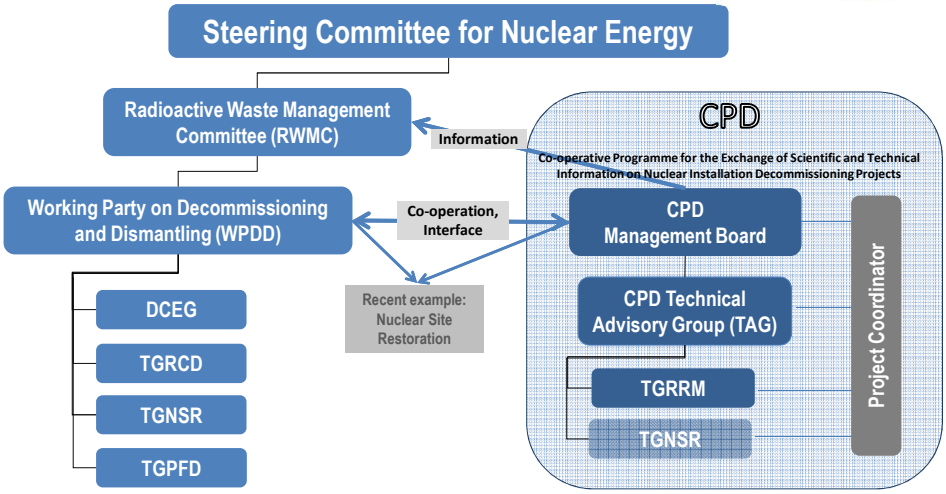
4. Decommissioning at NEA



4. Decommissioning at NEA

WPDD	CPD
Working Party on Decommissioning and Dismantling	Co-operative Programme for Decommissioning
Since year of 2000	Since year of 1985
Open to all OECD NEA countries	Confidentiality, CPD Agreement
Governments	Companies
Strategy makers, regulators, implementers	Implementers from decommissioning projects
Policies, strategies	Procedures, techniques
Representatives from 21 countries + EC, IAEA: 23 Regulators/Policy Makers, 24 Implementers, 8 Research Institutes, 7 Waste Management Organisations	**66 Decommissioning Projects from 25 organisations (Implementers)** from 14 countries + 1 non-OECD member country + EC
CPD provides advice and technical input to WPDD	

4. Decommissioning at NEA: WPDD and its Expert Groups

Working Party on Decommissioning and Dismantling (WPDD)

Decommissioning Cost Estimation Group (DCEG)	Task Group on Radiological Characterisation and Decommissioning (TG-RCD)	Task Group on Nuclear Site Restoration (TG-NSR)	Task Group on Preparing for Decommissioning during Operation and after Final Shutdown (TG-PFD)	Optimising Management of Low Radioactive Waste and Materials
• Since 2008 • Extended mandate till 2016 • Members: ~45 (16 countries) • DCEG Core Group • **Current focus**: uncertainties in decommissioning cost estimations Publications: 5 (+1)	• Since 2011 • Extended mandate till 2015 • Members: ~15 (8 countries) • **Current focus**: strategies for optimisation of characterisation in a waste and materials end-state perspective Publications: 1	• Since 2014 • Mandate till 2015 • Members: ~25 (11 countries) • **Focus:** strategic consi-derations for the sustainable remediation of nuclear installations during decommissioning	• Launched in March 2015 • Mandate till 2016 • Members: ~25 (9 countries) • **Focus**: optimisation of activities and measures with regard to preparation of the dismantling	• To be decided at WPDD-16 in Nov 2015

Expert Group on Uncertainties (joint WG with IAEA) (DCEG-EGU)

4. Expert Groups – Example TGPFD

Modus Operandi

➢**Mandate for 2 years** basing on Terms of Reference (scope, methodology, remits)

➢Participation: **open to any expert** nominated by NEA member countries (with approval by their country delegation to OECD): 25 members from 25 organisations and 9 countries

➢2 meetings per year (usually at the NEA Offices in Paris, France) and several teleconferences

Role of TGPFD

➢To provide the member countries with **up-to-date information** and to **develop consensus** regarding strategic aspects of optimisation of activities and measures with regard to the preparation for D&D.

➢To help achieve this it will **keep under review relevant worldwide experience** and will identify and **examine pertinent issues** that are of interest to its members, the WPDD and to the international community.

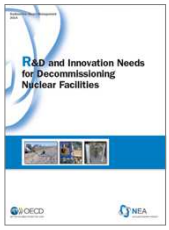
Remit

•**To foster exchange of international experiences**, strategic approaches, risks and opportunities between its members on issues concerning preparation of a nuclear facility for D&D.

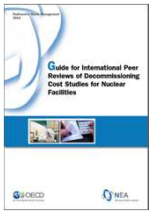
•**To produce a report** containing observations and recommendations to be considered in the development and optimisation of strategies and plans for preparation for decommissioning in the last years of operation and after final shutdown in order **to support on-going and new decommissioning projects, to achieve value for money, safety of workers and improvements in project management consistent with best practice and which enable the timely delivery of decommissioning targets.**

4. Recent WPDD Publications (1)

R&D and Innovation Needs for Decommissioning (2014)



- Areas with greatest potential for future improvements through R&D:
  1. Characterization and survey prior to dismantling
  2. Segmentation and dismantling
  3. Decontamination and remediation
  4. Materials and waste management
  5. Site characterization and environmental monitoring
- to be observed within WPDD Programme of Work
- **Link: https://www.oecd-nea.org/rwm/pubs/2014/7191-rd-innovation-needs.pdf**

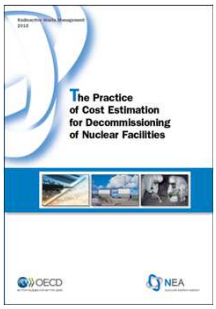


Guide for International Peer Review of Decommissioning Cost Studies for Nuclear Facilities (2014)

- Framework for decommissioning cost reviewers and reviewees to prepare for and conduct international peer reviews of decommissioning cost estimate studies for nuclear facilities
- Includes internationally developed checklists for attributes of cost estimates
- To promote transparency and accountability of decommissioning cost estimates
- **Link: https://www.oecd-nea.org/rwm/pubs/2014/7190-guide-peer-reviews.pdf**

4. Recent WPDD Publications (2)

The Practice of Cost Estimation for Decommissioning of Nuclear Facilities (2015)



- Guidance for preparing quality cost and schedule estimates in order to support detailed budgeting for
  - securing of funding
  - the preparation of decommmissionig plans (for licencing)
  - the decommissioning implementation
- To provide a detailed process to describe quality estimates in terms of cost classifications, the basis of estimates, the structure, risk analysis for cost and schedule, and quality assurance requirements
- **Link: www.oecd-nea.org/rwm/pubs/2015/7237-practice-cost-estimation.pdf**

All NEA publications in Radioactive Waste Management and Decommissioning availabe for free.

Visit: http://www.oecd-nea.org/rwm/public-documents/

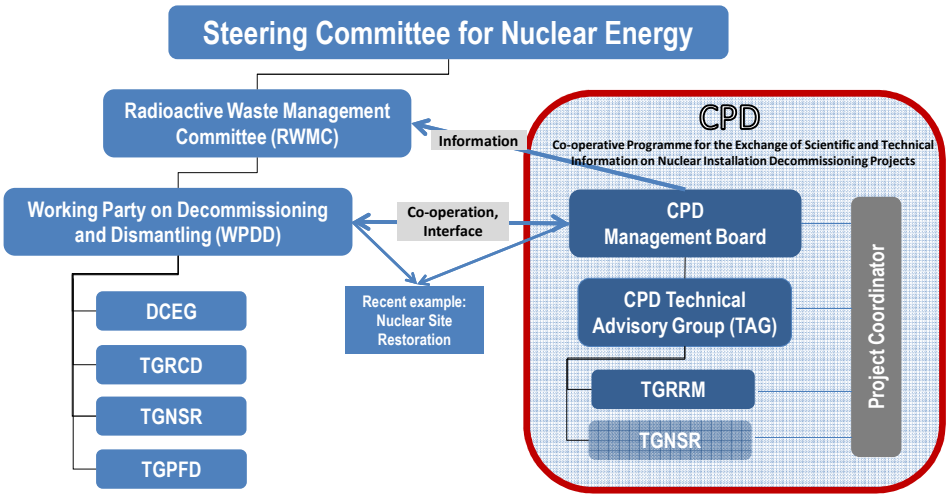
4. Publications in Decommissioning

- Radiological Characterisation for Decommissioning of Nuclear Installations (2013)
- International Structure for Decommissioning Costing (ISDC) of Nuclear Installations (2012)
- The Management of Large Components from Decommissioning to Storage and Disposal (2012)
- Applying Decommissioning Experience to the Design and Operation of New Plants (2010)
- Regulating the Decommissioning of Nuclear Facilities. Relevant Issues and Emerging Practices (2010)
- Release of Radioactive Materials and Buildings from Regulatory Control (2008)
- Stakeholder Issues and Involvement in Decommissioning Nuclear Facilities (2007)
- Decommissioning Funding: Ethics, Implementation, Uncertainties (2006)
- Selecting Strategies for the Decommissioning of Nuclear Facilities (2006)
- The Release of Sites of Nuclear Installations (2006)
- Achieving the Goals of the Decommissioning Safety Case (2005)
- Decommissioning: It can and has been done (2005)
- The Decommissioning and Dismantling of Nuclear Facilities: Status, Approaches, Challenges (2002)
- ...

All NEA publications in Radioactive Waste Management and Decommissioning availabe for free.

Visit: http://www.oecd-nea.org/rwm/public-documents/

4. Decommissioning at NEA: Joint Projects



4. NEA Co-operative Programme for Decommissioning (1)

Co-operative Programme for the Exchange of Scientific and Technical Information on Nuclear Installation Decommissioning Projects (CPD)

- **Joint undertaking of decommissioning projects**, set up 1985 according to Article 5 of the NEA statute
  - ✓ Planned, ongoing, dormant and terminated decom projects
  - ✓ NPPs, Research Reactors, Fuel Cycle Facilities
- The fundamental principle is that of sharing, i.e. "Give & Take" technical and scientific information.
- **Confidentiality and funding assured by an Agreement**, renewed for the period 2014-2018
- Interactions with WPDD implemented and synergies searched
- **25 Organisations with 66 decom projects from 14 Countries + EC:**
  - ✓ Chinshan NPP 1&2 (Chinese Taipei) and Danish Decommissioning recently accepted
  - ✓ Russian Bochvar Institute in the pipeline of affiliation
  - ✓ Other new entries are expected soon
- **Link: https://www.oecd-nea.org/jointproj/decom.html**

4. NEA Co-operative Programme for Decommissioning (2)

CPD Management Board (MB)

- Overall responsibility for the management and controll of the CPD and for ensuring compliance with the scope and objectives of the Agreement
- Meeting 1x per year
- Decision on acceptance of new CPD participants and decom projects

Technical Advisory Group (TAG)

- Senior specialists from decommissioning projects
- 2 meetings per year (May and October), hosted by CPD members
- 2014: UK / Italy; 2015: Germany / Slovak Republic; 2016: Belgium

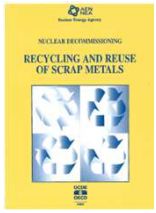
CPD Task Groups

- Mandate for 2 years to work on specific (technical) topics of interest
- Experts from the NEA member organisations
- **Synergies and interactions with WPDD**:
  Experience has already shown that beginning the discussions on technical details between implementers at CPD before having the dialogue with regulators and policy makers may significantly change key factors towards a successful, safe and efficient decommissioning of nuclear installations in future.

4. CPD Task Group on Recycling and Reuse of Material

- 15 volunteering experts from CPD member organisations from 8 countries + NEA

- **Objective:** Update of the 1996 report on "Recycling and Reuse of Scrap Metals"
  - to cover all materials (mainly) from decommissioning
  - to provide an overview of the various approaches being made by international and national organisations to the management of slightly contaminated material arising in nuclear decommissioning

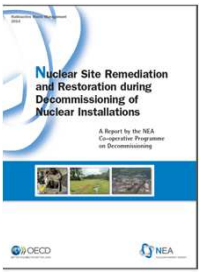


- **Recent activities and status:**
  - 1st meeting in September 2014: Discussion of scope and terms of reference
  - Questionnaire drafted and spread for collecting data and updated information primarily from CPD member organisations (April – June 2015)
  - Evaluation of questionnaire responses has started: **34 Responses from 12 Countries**

- **Report to be published in late 2016 containing:**
  - comments on improvements and changes in technology, methodology and regulation since the first report in 1996.
  - based on analysis of data collected primarily from CPD member organisations by questionnaire
  - Case Studies to illustrate points of significance.

4. Recent CPD Publications

Nuclear Site Remediation and Restoration during Decommissioning of Nuclear Installations (2014)



- Addresses technical aspects of nuclear site remediation
- Highlights lessons learnt from remediation experiences of NEA countries that may be particularly helpful to practitioners, regulators and site operators.
- To provides observations (including case studies) and recommendations to be considered in the development of strategies and plans for efficient nuclear site remediation that ensures protection of workers and the environment.
- **Link:** https://www.oecd-nea.org/rwm/pubs/2014/7192-cpd-report.pdf

- Decontamination and Dismantling of Radioactive Concrete Structures (2011)
- Remote Handling Techniques in Decommissioning: A report of the NEA Co-operative Programme on Decommissioning (CPD) project (2011)
- Radioactivity Measurements at Regulatory Release Levels (2006)
- Nuclear Decommissioning: A Proposed Standardised List of Items for Costing Purposes; an Interim Technical Document (1999)
- Nuclear Decommissioning: Decontamination Techniques used in Decommissioning Activities: A report by the NEA Task Group on Decontamination (1999)
- Recycling and Reuse of Scrap Metals: A Report by a Task Group of the NEA Co-operative Programme on Decommissioning (1996)

4. Events with NEA Engagement

- **International Conference** **9-11 Nov 2015**
  "Decommissioning of Nuclear Facilities: Strategies, Practices and Challenges"
  in the framework of the AtomECO (Moscow, Russian Federation)
  - Session 1: Strategy – government, industry strategy and business strategy for the decommissioning of nuclear power plants
  - Session 2: Practice – experience and future challenges for the decommissioning of nuclear energy
  - Session 3: Challenges – different roles and expectations for renewable energy stakeholders

  http://www.oecd-nea.org/rwm/workshops/decom-installations2015/

- **Workshop** "Sampling and Characterisation" (Montpellier, France) **17-19 Nov 2015**
  http://fr.amiando.com/Sampling-and-Characterisation-2015.html

- **Symposium** „Preparation of Nuclear Facilities for Decommissioning"
  (Lyon, France), initiated by WPDD TGRCD and TGPFD,
  co-organised with IAEA, EDF, Areva, CEA and Studsvik
  http://predec2016.scientific-event.com/ **16-18 Feb 2016**

- **IAEA Conference** "Advancing the Global Implementation of Decommissioning and Environmental Remediation Programmes" (Madrid, Spain) **23-27 May 2016**

5. Conclusions

Good reasons for International Experience Exchange and Co-operation:

- To ensure that the safest, most economic and environmentally-friendly options for decommissioning are employed.
- For those with less experience: benefit in not having to go through an expensive learning and development programme
- Dialog between different stakeholders with different expertise, different point of views, between different generations: Sharing of experience basing on Give&Take and developing a common understanding
- **Networking:** experience exchange is not only restricted to meetings only

*"**We owe it to ourselves and to future generations** to deal with radioactive materials and waste in a safe and environmentally responsible manner. Societal support for decommissioning is fostered through dialogue and rests on confidence that decommissioning is technologically sound and that safety can be demonstrated convincingly."*[1]

NEA invites all interested to join its initiatives and expert groups for international experience exchange and co-operation!

[1] *Source: NEA Flyer "Working Party on Decommissioning and Dismantling", 2009*

Thank you for your Attention!

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