

Overview of the ISOE Programme & Database with dose trends at the NPPs



H. Burçin OKYAR
ISOE Scientific Secretary

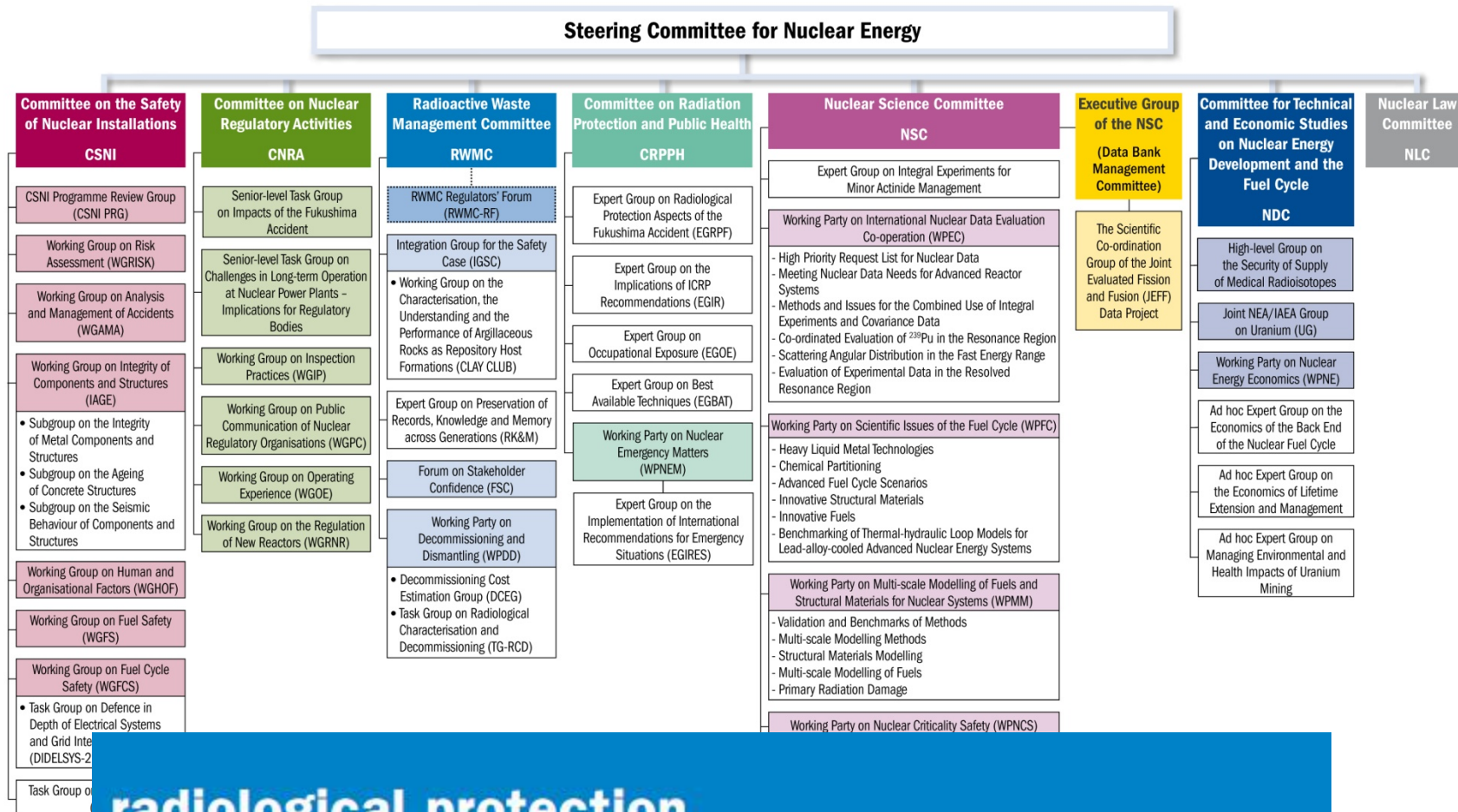
OECD NEA
Radiological Protection & Radioactive
Waste Management Division

ISOE 2014 Asian ALARA Symposium
23-25 September 2014
Gyeongju, Republic of Korea

Agenda

- Status of participation
- Database management
- Dose trends
- EG reports & Workshop
- ISOE / CPD co-operation in decommissioning (topical session)
- Regular / upcoming activities-meetings

Committee Structure of the OECD Nuclear Energy Agency (NEA)

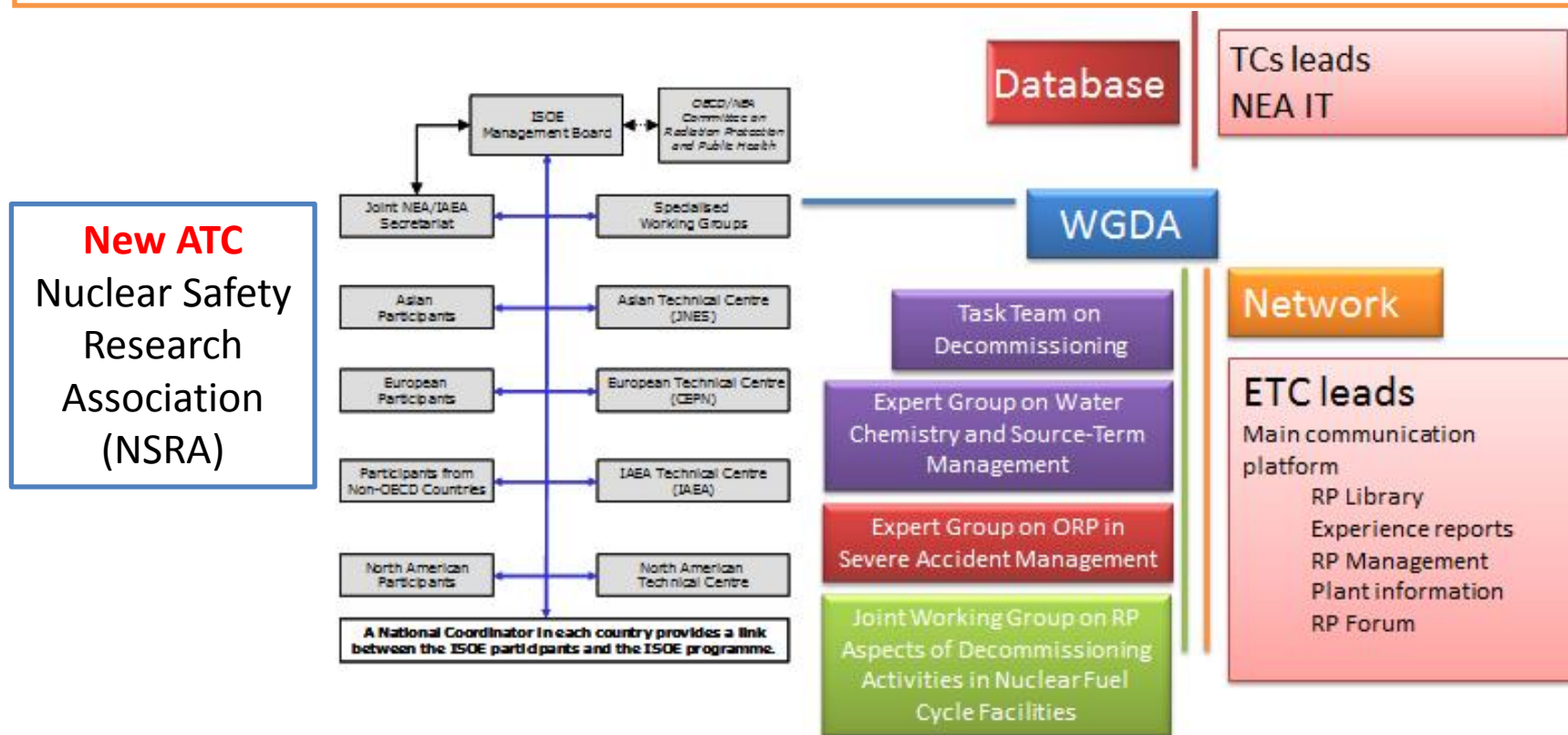


radiological protection

At present, 15 joint projects are being conducted in relation to nuclear safety, two in support of radioactive waste management, and one in the field of radiological protection. These projects complement the NEA programme of work and contribute to achieving excellence in each of the respective areas of research.

radiation transport and shielding

ISOE - Management



- Each group has specific mandate
- Product oriented
- Time limited

ISOE - Management

ISOE Bureau

Chairman of the ISOE System

2012-2014



USA

Willie HARRIS
Exelon Nuclear
Phone: +1 610 765 5350
Email: willie.harris@exeloncorp.com

Chairman elected



South Korea

Tae-Won HWANG
Korean Hydro & Nuclear Power Co. Ltd (KHNP)
Phone: +82 42 870 5400
Email: twhwang@khnp.co.kr

2015-2016

Vice-Chair

2012-2014



Switzerland

Swen-Gunnar JAHN
Swiss Federal Nuclear Safety Inspectorate (ENSI)
Phone: +41 56 460 8631
Email: swen-gunnar.jahn@ensi.ch

Past-Chairman



France

Gonzague ABELA
Electricité de France (EDF)
Phone: +33 1 4369 0620
Email: gonzague.abela@edf.fr

ISOE Joint Secretariat



H. Burçin OKYAR
OECD Nuclear Energy Agency (NEA)
Phone: +33 1 4525 1045
Email: HalilBurcin.OKYAR@oecd.org

ISOE Joint Secretariat



Jizeng MA
International Atomic Energy Agency (IAEA)
Phone: +43 1 2600 26173
Email: J.Ma@iaea.org

Bureau

- **Next Bureau:** Mr Hwang – Chair, Mr Harris – Past Chair, Mr Jahn- Vice-Chair
- Election for the Chair-elect from the IAEA TC domain according to 7 (f), rotation of representation through the TC regions

Status of participation

- ISOE Terms and Conditions (2012-2015)

Official participants include (as of August 2014):

- 76 utilities in 29 countries
(365 operating reactors, 43 shutdown reactors)
- 20 regulatory authorities in 18 countries (France and Slovenia are represented by two organisations)

Database: 401 operating units and 81 units in some stage of decommissioning in 29 countries

Notes: Chinese Taipei (Atomic Energy Council's Radiation Protection Department (AEC/DRP) plans to apply (&utilities totally 3 with 6 operational units)

ATC domain

Korea, Republic of	Korea Hydro and Nuclear Power Co. Ltd. (KHNP)	Kori 1, 2, 3, 4 Shin-Kori 1,2 Shin-Wolsong 1	Hanul 1, 2, 3, 4, 5, 6 Hanbit 1, 2, 3, 4, 5, 6 Wolsong 1, 2, 3, 4
---------------------------	---	--	---

Japan	Chubu Electric Power Co., Inc.	Hamaoka 1, 2, 3, 4, 5	
	Chugoku Electric Power Co. Inc.	Shimane 1, 2	
	Hokkaido Electric Power Co. Inc.	Tomari 1, 2, 3	
	Hokuriku Electric Power Co.	Shika 1,2	
	Japan Atomic Power Co.	Tokai 2	Tsuruga 1, 2
	Kansai Electric Power Co., Inc.	Mihama 1, 2, 3 Ohi 1, 2, 3, 4	Takahama 1, 2, 3, 4
	Kyushu Electric Power Co., Inc.	Genkai 1, 2, 3, 4	Sendai 1, 2
	Shikoku Electric Power Co., Inc.	Ikata 1, 2, 3	
	Tohoku Electric Power Co., Inc.	Onagawa 1, 2, 3	Higashidori 1
	Tokyo Electric Power Co.	Fukushima Daiichi 5, 6 Fukushima Daini 1, 2, 3, 4	Kashiwazaki Kariwa 1, 2, 3, 4, 5, 6, 7

Japan

Japan Atomic Energy Agency

Japan Atomic Power Co.

Tokyo Electric Power Co.

Fugen (LWCHWR)

Tokai 1

Fukushima Daiichi 1, 2, 3, 4

Operational

Definitively
Shut-down
Reactors

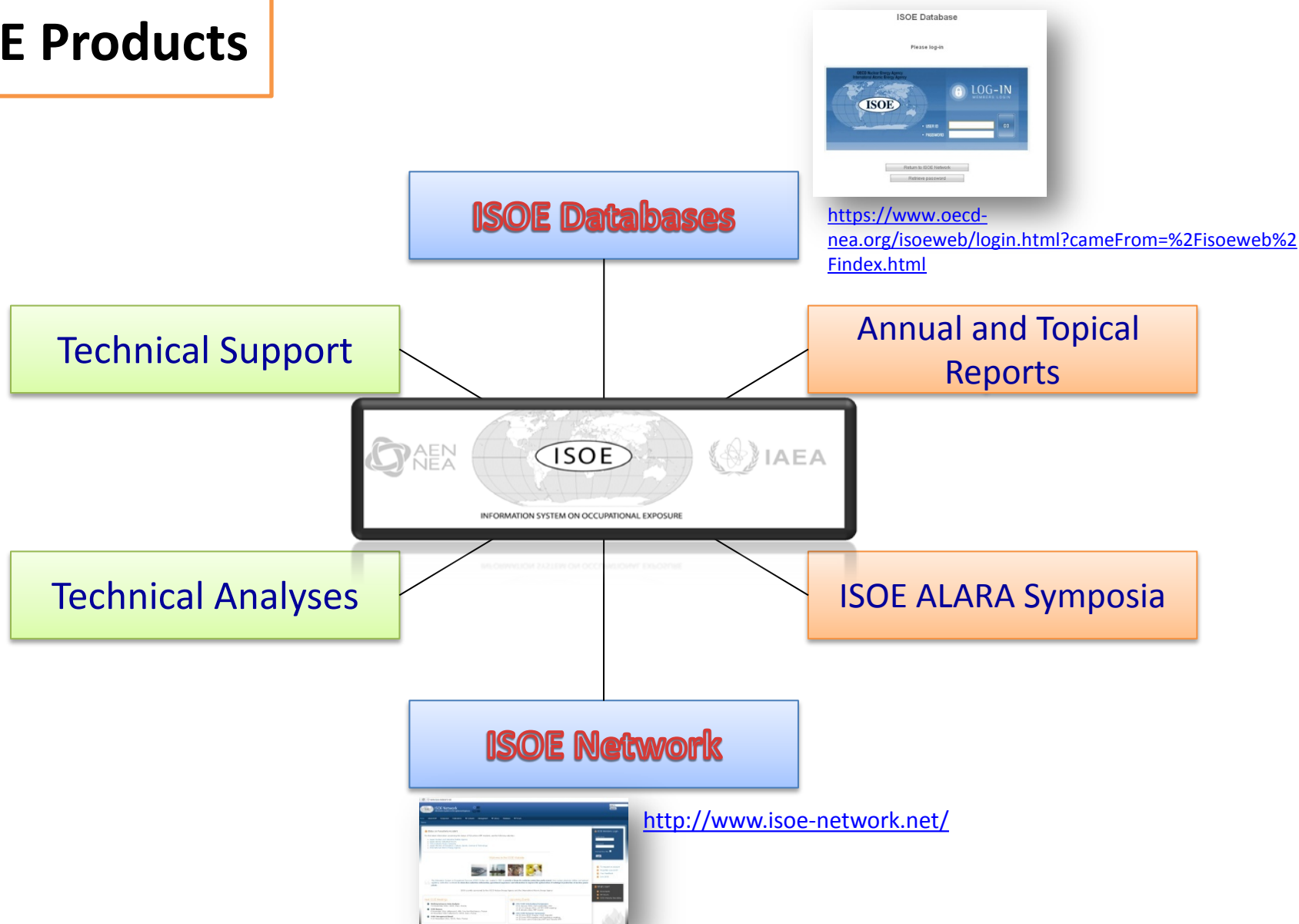
Japan	Nuclear Regulation Authority (NRA)
Korea, Republic of	Korea Institute of Nuclear Safety (KINS)

Regulator

Opening Gates for official participation

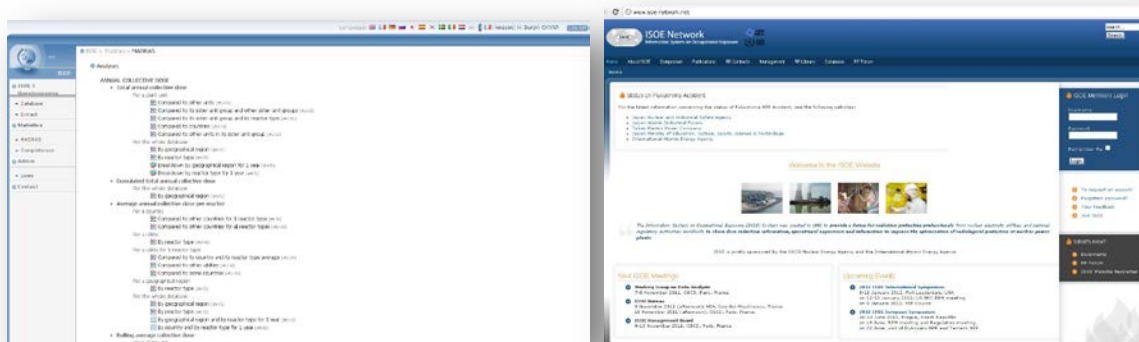
- Permission to the ISOE participating RA users to review the completeness data for other countries (detailed data on jobs/tasks)
- New comers to the Program (ONR, NRA)
- Policy Debate on Participation /Restrictions - The MB endorsed assigning full access right to the ISOE database to the registered users of officially participating RAs of the ISOE programme.

ISOE Products



Database Analyses and Benchmarking

- The extensive data in ISOEDAT provides a solid basis for analyses on issues in operational RP such as dose trends, doses related to certain jobs and tasks, identification of good performance, etc.
- Several ways to use the database:
 - MADRAS analysis package : Main trends in occupational exposure
 - Direct access to ISOE 1 questionnaires, including contact information and complementary data
 - For more complex analyses: Direct access to DB, requests to the technical centres, RP forum, ...



Network and Database

- <http://www.isoe-network.net/>
- <https://www.oecd-neo.org/isoeweb/login.html?cameFrom=%2Fisoeweb%2Findex.html>



Please include below a list of operational contact persons for your utility / nuclear power plant (Radiation protection managers, etc). This information will be used to create user accounts for access to the ISOE Network website and for periodic communications concerning ISOE topics.

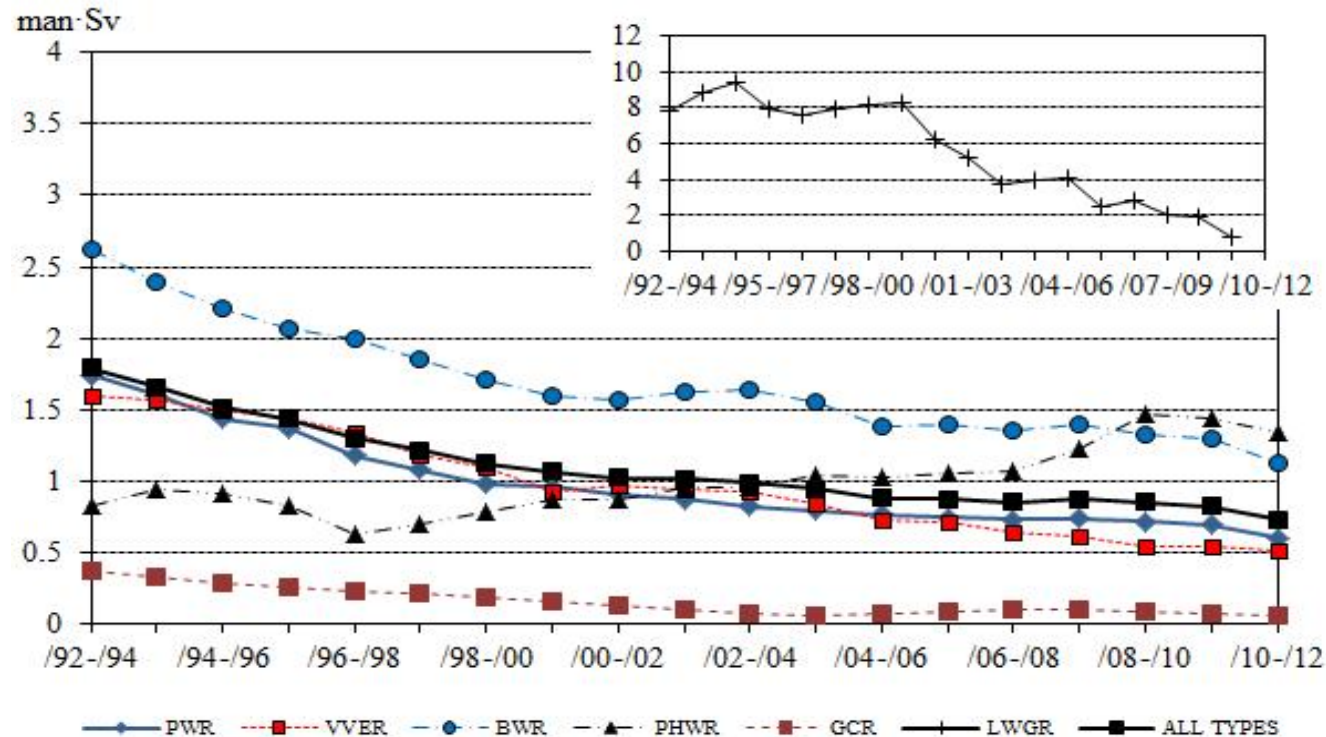
Title	
First Name *	
Family Name *	
Email address *	
Phone Number	
Function performed	
Utility *	
Nuclear Power Plant *	

* Mandatory information

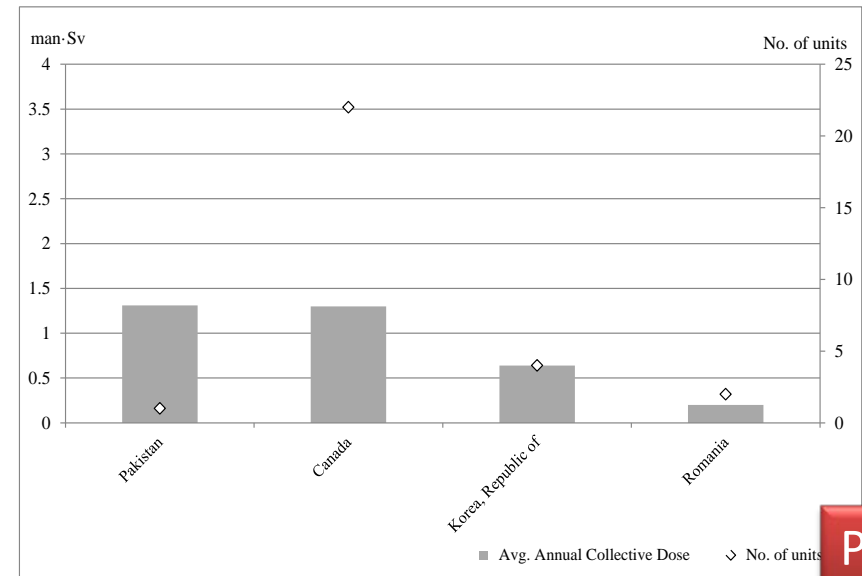
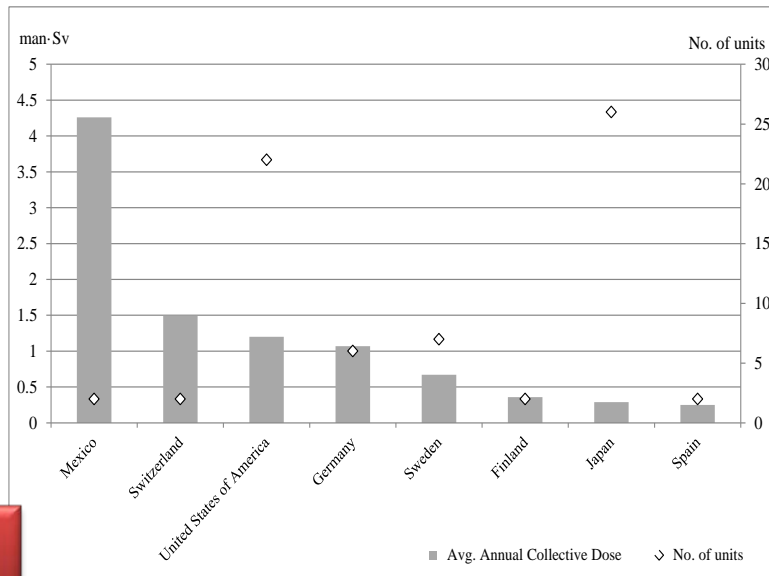
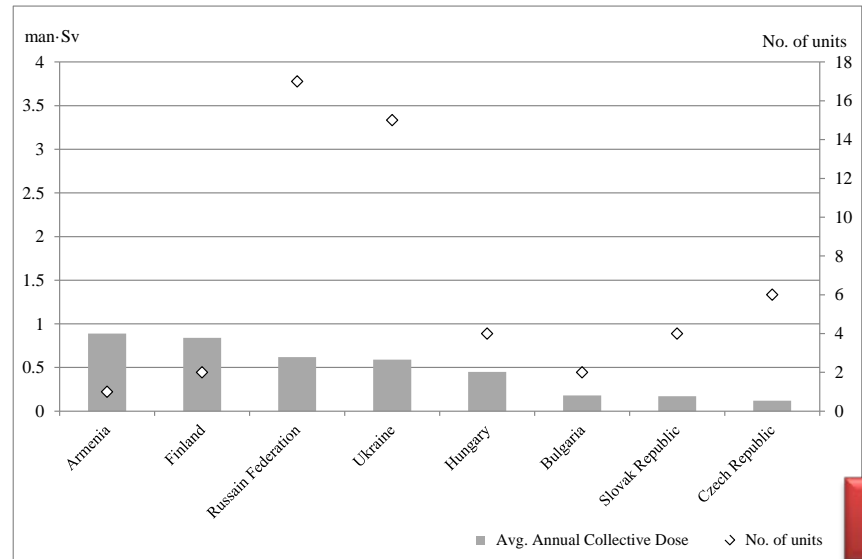
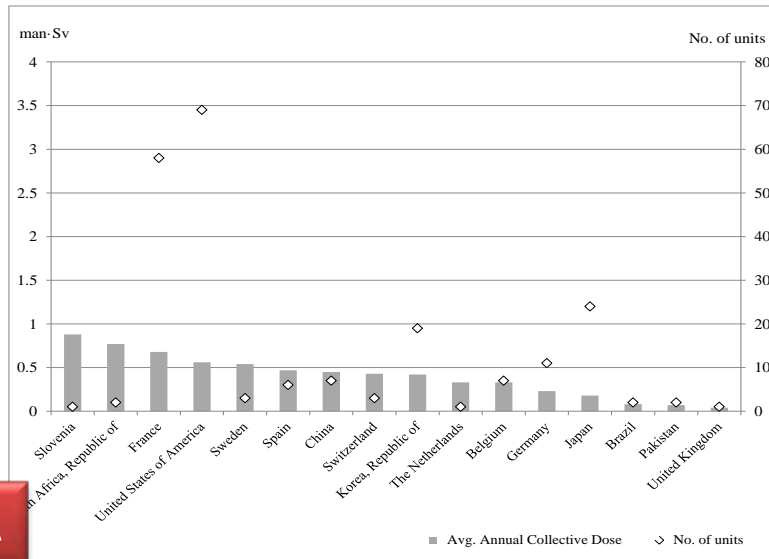
(duplicate this table as needed)

Country	Number of Accounts Created	
	Authority	Utility
Japan	4	52
Korea (Republic of)	6	42
TOTAL	910	

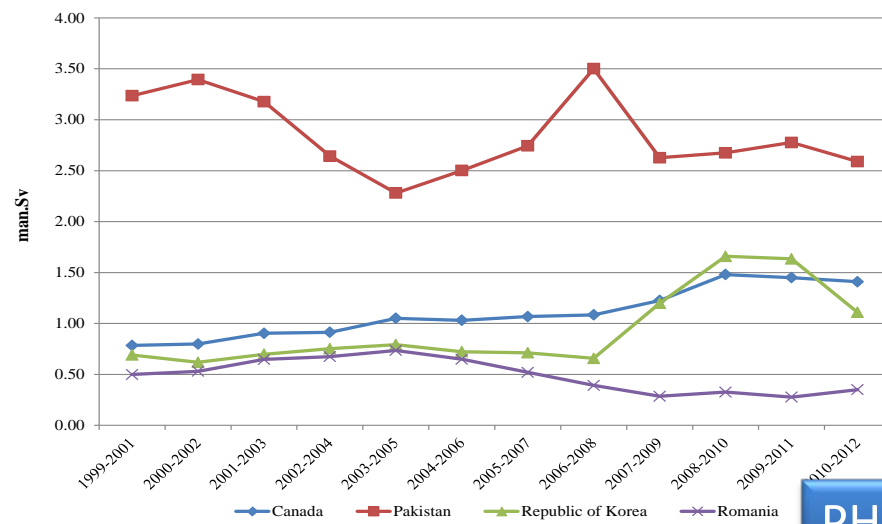
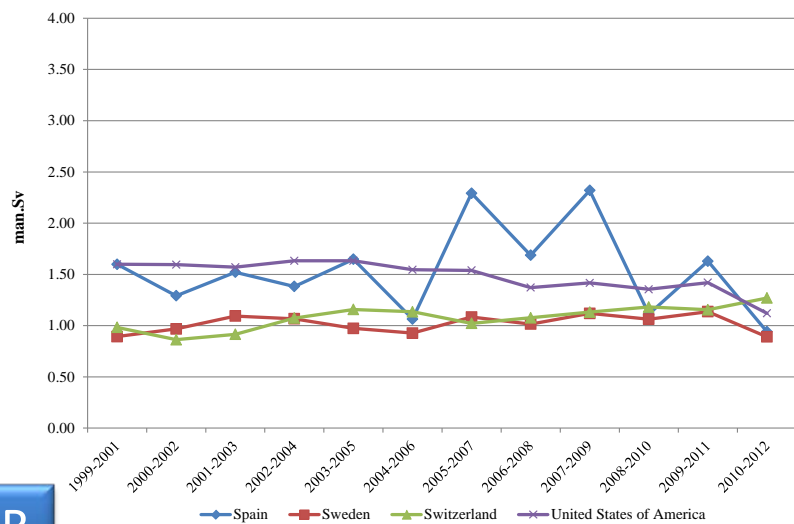
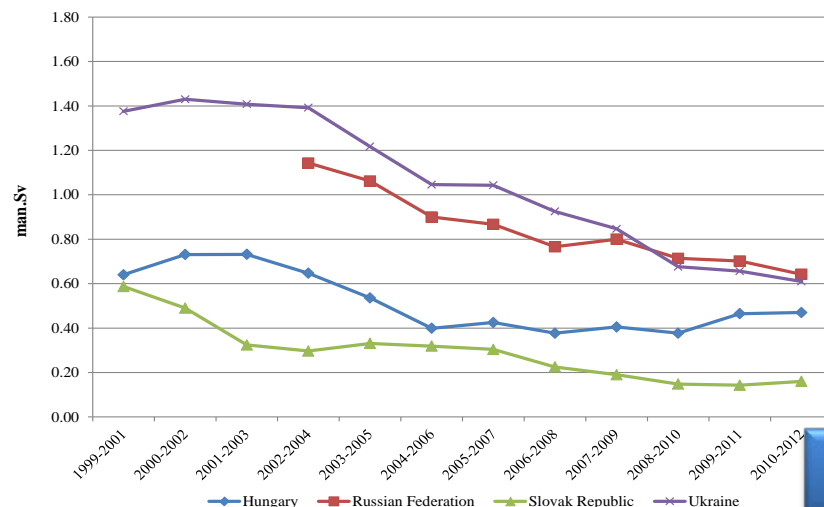
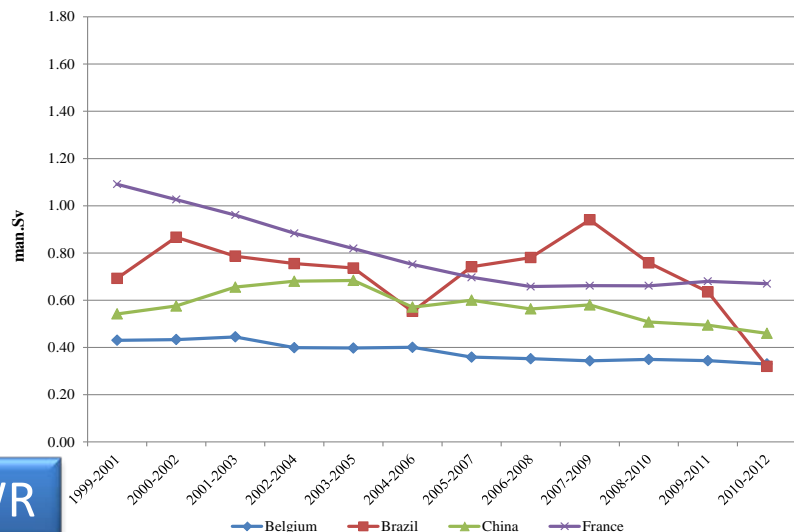
Trends



3-year rolling average collective dose per reactor for all operating reactors included in ISOE by reactor type, 1992-2012 (man·Sv/reactor)

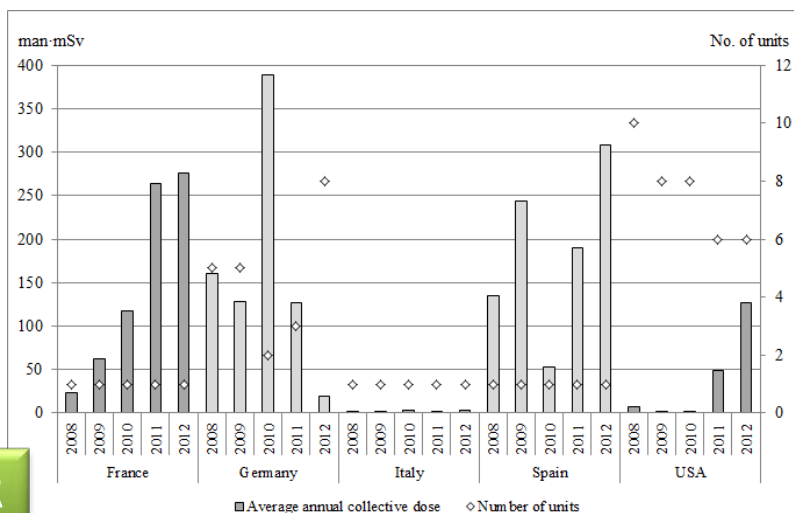


2012 average collective dose per reactor by country (man·Sv/reactor)

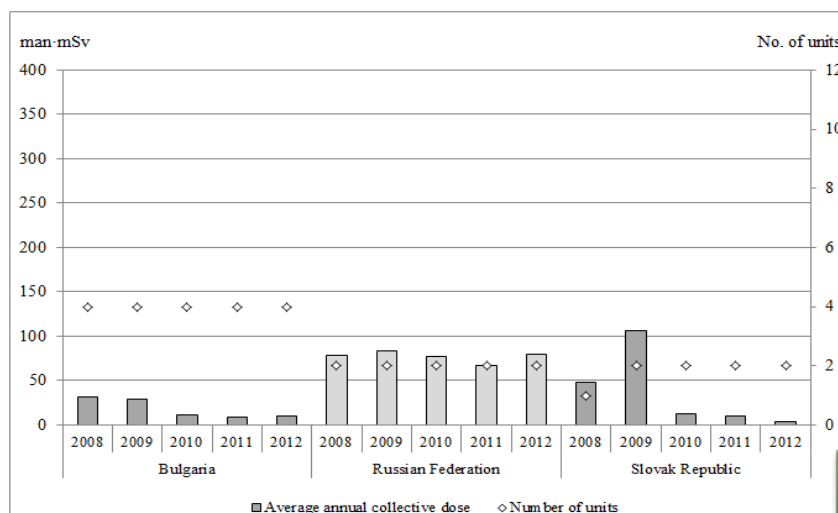


3-Year rolling average collective dose by country from 1999 to 2012

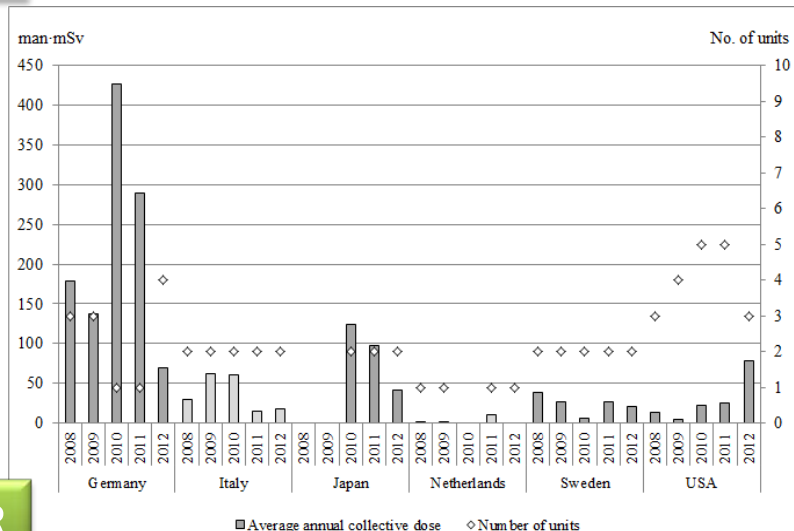
PWR



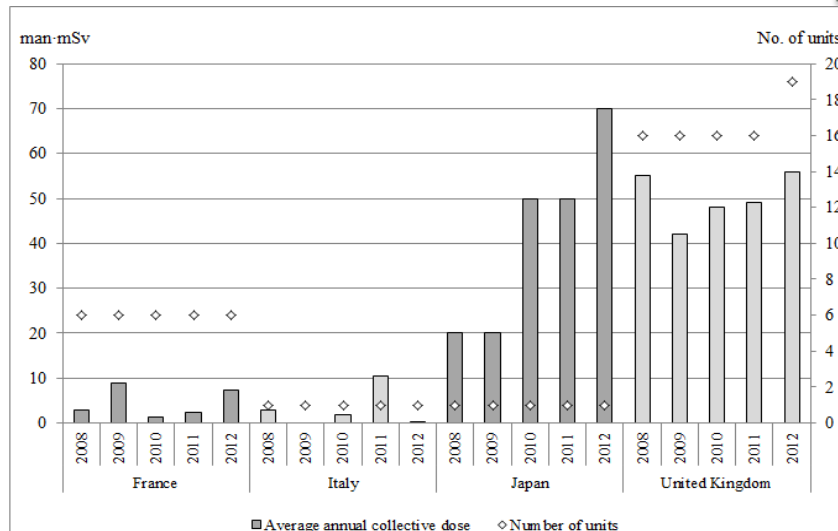
VVER



BWR



GCR



Average annual collective dose by country from 2008 to 2012 (definitely shutdown)

Expert Groups activities

- Expert Group on Primary Water Chemistry and Source-Term Management (**EGWC**)

- Established in November 2010
- 15 members (Utility, authority , TC representatives and EPRI)

Mandate

- Prepare a state of art report
- To review and analysis of current **knowledge**, **technology** and **experience** on RP aspects of primary water chemistry and source-term management
- To collect information and practical experience available in the nuclear industry on addressing operational aspects of primary water chemistry and source-term management
- To identify factors and aspects which play key roles in achieving good practices
- Facilitate the dialogue between RP and Chemists

ISOE EG Water Chemistry Report

- Approved report “Radiation Protection Aspects of primary Water Chemistry and Source term Management”
 - Introduction of strategies and techniques
 - Radiation field measurement techniques
 - Measurement locations and indices
 - Remediation of contamination during outages
 - Radiation protection outcomes

RADIATION PROTECTION ASPECTS OF PRIMARY WATER CHEMISTRY AND SOURCE TERM MANAGEMENT

PART A - STRATEGIES AND TECHNIQUES

1. BACKGROUND ON RADIATION FIELD GENERATION				
2. MATERIAL ISSUES	PWR	VVER	BWR	PHWR
3. CHEMICAL METHODS				
4. REMEDIATION OF CONTAMINATION DURING OUTAGES				

PART B - RADIATION FIELD MEASUREMENT TECHNIQUES

1. DOSE RATE MEASUREMENT TECHNIQUES				
2. GERMANIUM DETECTOR				
3. CZT DETECTOR				

PART C - MEASUREMENT LOCATIONS AND INDICES

1. DOSE RATE MEASUREMENTS	PWR	VVER	BWR	PHWR
2. GAMMA SPECTROMETRY				

PART D - RADIATION PROTECTION OUTCOMES

PLANT SPECIFIC RESULTS	PWR	VVER	BWR	PHWR
------------------------	-----	------	-----	------

E-report: http://www.oecd-nea.org/rp/reports/2014/EGWC_Report_2014.pdf (NEA web-site)
<http://www.isoe-network.net/index.php/publications-mainmenu-88/others.html> (ISOE network web-site).

Expert Groups activities

- Expert Group on Occupational Radiation protection in Severe Accident Management and Post-Accident Recovery (**EG-SAM**)
 - Established in May 2011
 - 45 members from 19 ISOE Countries
 - Mandate : To develop a report
 - Contribute to occupational exposure management by providing a view on management of high radiation area worker doses;
 - Develop a state-of-the-art ISOE report on best radiation protection management practices for proper radiation protection job coverage during severe accident initial response and recovery phase; and
 - Identify RP lessons learned from previous reactor accidents
 - Finalization of **interim** report by November 2013 (general issues)
 - Available @ the workshop web-pages (NEA & ISOE Network)
 - Approved by the WGDA and MB in Nov 2013
 - E-report , available at ISOE Network and NEA ISOE web-sites

<http://www.oecd-nea.org/rp/docs/2013/crpph-r2013-7.pdf>

<http://www.isoe-network.net/index.php/management-mainmenu-87/eg-sam.html>

Interim Conclusions

- As for all emergency situations, extensive emergency response plans are essential for protecting the public and emergency workers/responders.
- Specialized RP training and exercises related to SAM are imperative for emergency workers/responders.
- Effective implementation of a RP programme during a severe accident may be significantly impacted by facility configuration and controls.
- Individual worker protection, including the establishment of individual exposure guidance levels, extensive work controls, and thorough radiological exposure controls, are necessary to maintain emergency responder radiation exposures ALARA.
- During the emergency and post-accident mitigation phases, radioactive and contaminated materials released internally and externally from the affected facility require extensive radiological controls to avoid or minimize radiation exposures to emergency workers/responders and the public.
- There are always lessons to be learned from accidents such as TMI, Chernobyl and Fukushima (given in an annex).

International Workshop



Share practices and experiences in approaches to severe accident management:

- provide an international forum for information and experience exchange;
- identify best occupational radiation protection approaches in strategies, practices, as well as limitations for developing effective management;
- identify national experiences to be incorporated to the final version of ISOE EG-SAM report.

Format

- Series of plenary presentations providing overview of international practices and experiences in severe accident management and
- Breakout sessions discussing common themes and issues for possible inputs into the report.

International Workshop

- 66 participants from 17 countries
- Four plenary session and five break-out sessions (by taking into account the chapter structure of interim report) were organized to capture global (*ICRP, IAEA, USNRC, CNSC*), utility (*TEPCO, Electrabel, EDF, Exelon*) and regulatory authority (*CNSC, ASN, USNRC, KINS, STUK*) perspectives
- The workshop provided suggestions for improvement and some additional points to extent the view of interim report.

Next step

- The report will be submitted to the WGDA & ISOE Management Board approvals in November 2014.

New initiative

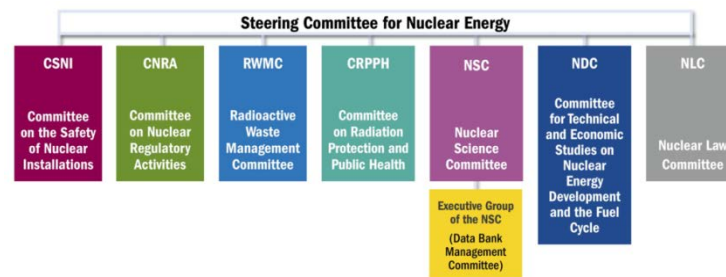
- Proposal for the establishment of a new **Joint ISOE/CPD Working Group on Radiological Protection Aspects of Decommissioning Activities in Nuclear Facilities**
- International Co-operative Programme on Decommissioning (CPD)

JWG-RPD

Background

- Drivers: Decommissioning of nuclear facilities is an increasing area of work and interest for the NEA.
- Need for a network of RP experts in order to discuss RP relevant activities of decommissioning projects.
- Network could be structured as a joint project of the ISOE and the CPD.

ISOE / CPD Co-operation in decommissioning

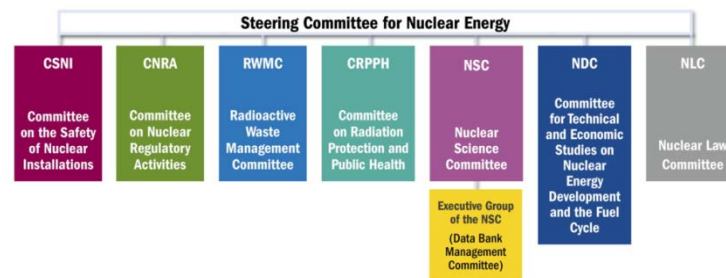


NEA in
Decommissioning /
Background

OECD NEA Radioactive Waste Management Committee	
WPDD	CPD
<i>Working Party on Decommissioning and Dismantling</i>	<i>Co-operative Programme for Decommissioning</i>
Since year of 2000	Since year of 1985
Open to all OECD NEA countries	Joint Project, Confidentiality, CPD Agreement (5ys renewal)
Governments	Companies
Strategy makers, regulators, implementers	Project implementers
Policies, strategies	Procedures, techniques
CPD provides an advice and technical input to WPDD	

Proposal

ISOE / CPD Co-operation in decommissioning



OECD NEA CRPPH	
CRPPH	ISOE
<i>Committee on Radiation Protection and Public Health</i>	<i>Information System on Occupational Exposure</i>
Since 1960s	Since 1992
Open to all OECD NEA countries	Joint Project, Confidentiality, Terms & Conditions
Governments	Utilities & RAs
Decision makers, regulators, implementers/inspectors	Operators, regulators
Policies, strategies	Procedures, techniques
ISOE provides technical input to CRPPH	

JWG - RPD

- Primarily focus on practical case studies and expert discussions that would help to identify good practices in the field of ORP
- Benchmarking will be a tool
- Not only limited with NPPs
- On going decommissioning projects in fuel cycle facilities
- Structure a database for NPP decommissioning works (ISOE experience)

Working environment

- 2day meeting/year (organized by the NEA)
- If feasible, hosted at a site concerned by decommissioning activities

JWG- Objectives

- Provide a forum for experts to discuss the current state of knowledge, technology, and experience in radiological protection issues directly related to the decommissioning of nuclear reactors / fuel cycle facilities
- Regularly reporting to the Management Boards of the ISOE and the CPD

JWG – Future directions

- Collecting information and practical experience available in the nuclear industry on addressing operational aspects of radiation protection during decommissioning of nuclear fuel cycle facilities with special emphasis on **procedures to manage occupational exposures**, and;
- Identifying factors and aspects which play key roles in achieving **good RP practices in decommissioning** (knowledge, experience, technology, regulatory requirements and guidance, worker involvement, information exchange and networking, etc.) and analysing and quantifying, as possible, their **impact on worker doses and operational costs**.

Joint Topical Session

Overview of the ISOE November 2014 Meetings 3 - 6 November 2014 – Paris / France

	3 November	4 November	5 November	6 November
Morning	WGDA	WGDA	ISOE CPD Joint Topical Session on Decommissioning	24th meeting of ISOE Management Board
Afternoon	WGDA	Extended Bureau	24th meeting of ISOE Management Board	24th meeting of ISOE Management Board
			PCC meeting	Extended Bureau

Purposes of the Joint Topical Session

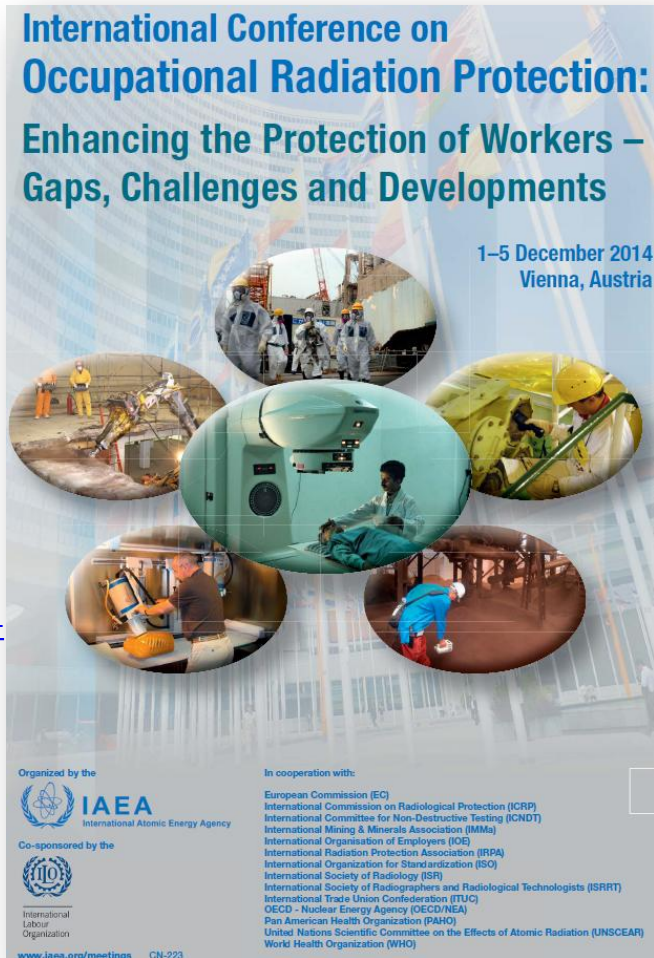
- To introduce the joint projects with their specific activities in the field of decommissioning,
- To discuss the proposal for the establishment of a new Joint Working Group, and
- To discuss trends, areas that need to be studied further by the joint working group.

09:00	Opening of the Joint Topical Session	Co-Chairs: Willie O. HARRIS (ISOE), Ivo TRIPPUTI (CPD)
Session 1: Overview of the Joint Projects (focus on decommissioning related activities)		
09:10	NEA IN DECOMMISSIONING / INTERNATIONAL PERSPECTIVE, NEED FOR A TASK FORCE	Mr Michael SIEMANN (NEA, RPRWM Division)
09:20	INTRODUCTION OF PROPOSAL ON THE ESTABLISHMENT OF A NEW JOINT ISOE/CPD WORKING GROUP ON RADIOLOGICAL PROTECTION ASPECTS OF DECOMMISSIONING ACTIVITIES IN NUCLEAR FACILITIES	Mr Ivo TRIPPUTI (CPD, SOGIN/Italy)
09:30	OVERVIEW OF THE ISOE PROGRAM, ACTIVITIES IN THE FIELD OF DECOMMISSIONING, ISOE DATABASE FEATURES FOR DECOMMISSIONING RELATED DATA AND ISOE D QUESTIONNAIRE	Mr Willie HARRIS (ISOE, Exelon Nuclear /US)
10:00	OVERVIEW OF THE CPD PROGRAM	Mr Ivo TRIPPUTI (CPD, SOGIN/Italy) OR Mr Robert WALTHERY (TAG Chair, Belgoprocess/Belgium)
10:30	Break	
11:00	ISOE BENCHMARKING ACTIVITIES (FUEL CYCLE FACILITIES), BROADENING ISOE DATABASE, FUTURE PERSPECTIVES	Mr Ludovic VAILLANT (ISOE ETC, CEPN/France)
Session 2: Discussion		
11:30	<p>This session will summarize the presentations and attempt to identify any trends, aspects, areas that need to be studied further by JWG-RPD:</p> <ul style="list-style-type: none"> Joint Rapporteur Group's Summary Possible topics for future work for the JWG-RPD 	Joint Rapporteur Group Halil Burçin OKYAR (ISOE) TBD (CPD)
12:30	Closing of the Joint Topical Session	Co-Chairs

For information

- International Conference on Occupational Radiation Protection: Enhancing the Protection of Workers – Gaps, Challenges and Developments
- Vienna, Austria 1–5 December 2014

<http://www-pub.iaea.org/iaeameetings/46139/International-Conference-on-Occupational-Radiation-Protection-Enhancing-the-Protection-of-Workers-Gaps-Challenges-and-Developments>





Australia



Austria



Belgium



Canada



Czech Republic



Denmark



Finland



France



Germany



Greece



Hungary



Iceland



Ireland



Italy



Japan



Luxembourg



Mexico



Netherlands



Norway



Poland



Portugal



Republic of Korea



Russian Federation



Slovak Republic



Slovenia



Spain



Sweden



Switzerland



Turkey



United Kingdom



United States

H. Burçin OKYAR
OECD NEA, RPRWM

halilburcin.okyar@oecd.org