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


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ISOE Scientific Secretary

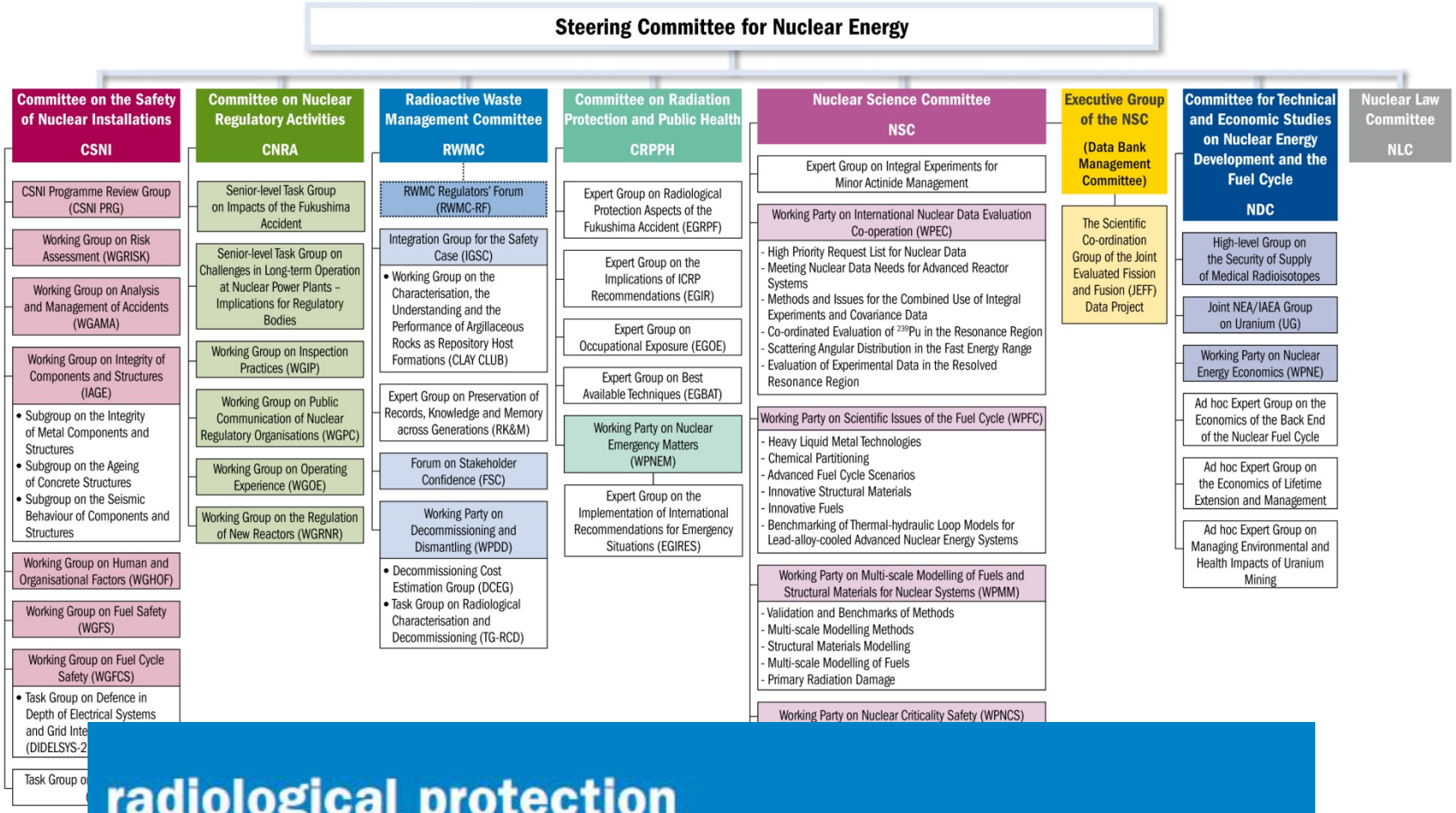
OECD NEA
Radiological Protection & Radioactive Waste Management Division

*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)

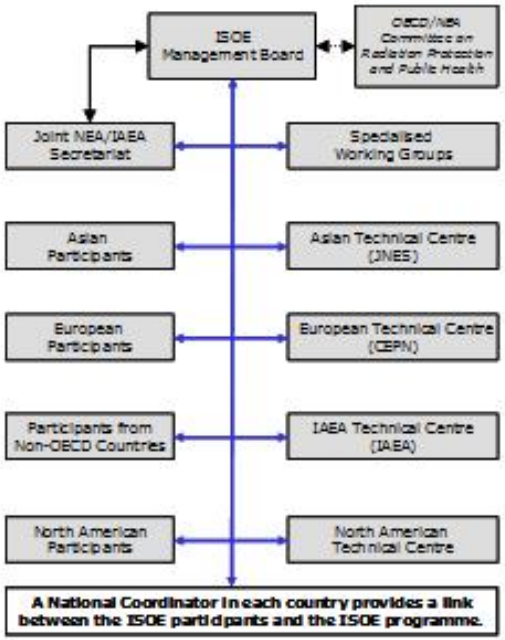



## radiological protection

At pres nt, 15 joint projects are being conducted in relation to uclear safety, two in support of radioactive waste manage ent, and one in the field of radiological protection. hese projects complement the NEA programme of work and contribute to achieving excellence in each of the respective areas of research.

# ISOE - Management

**New ATC**
Nuclear Safety Research Association (NSRA)




Database

TCs leads
NEA IT

WGDA

Task Team on Decommissioning

Expert Group on Water Chemistry and Source-Term Management

Expert Group on ORP in Severe Accident Management

Joint Working Group on RP Aspects of Decommissioning Activities in Nuclear Fuel Cycle Facilities

Network

ETC leads
Main communication platform
- RP Library
- Experience reports
- RP Management
- Plant information
- RP Forum

- 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

2015-2016

South Korea

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

## 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**
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## 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<br>Shin-Kori 1,2<br>Shin-Wolsong 1 | Hanul 1, 2, 3, 4, 5, 6<br>Hanbit 1, 2, 3, 4, 5, 6<br>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<br>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<br>Fukushima Daini 1, 2, 3, 4 | Kashiwazaki Kariwa 1, 2, 3, 4, 5, 6, 7 |

Operational

| | | |
|---|---|---|
| **Japan** | Japan Atomic Energy Agency | Fugen (LWCHWR) |
| | Japan Atomic Power Co. | Tokai 1 |
| | Tokyo Electric Power Co. | Fukushima Daiichi 1, 2, 3, 4 |

Definitively Shutdown 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


ISOE Databases

https://www.oecd-nea.org/isoeweb/login.html?cameFrom=%2Fisoeweb%2Findex.html

Technical Support

Annual and Topical Reports


Technical Analyses

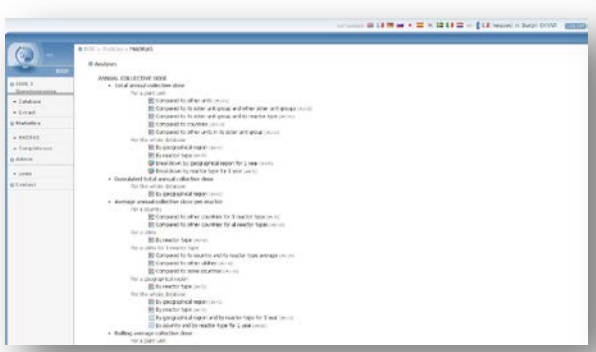
ISOE ALARA Symposia

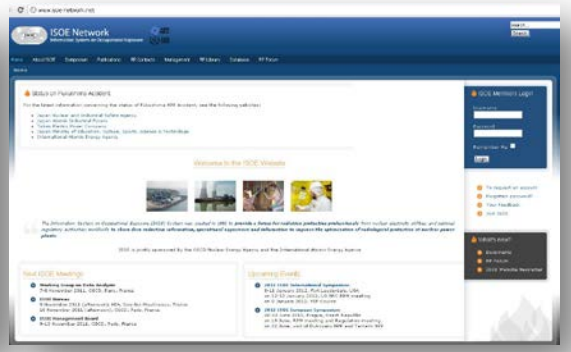
ISOE Network

http://www.isoe-network.net/

# 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-nea.org/isoeweb/login.html?cameFrom=%2Fisoeweb%2Findex.html

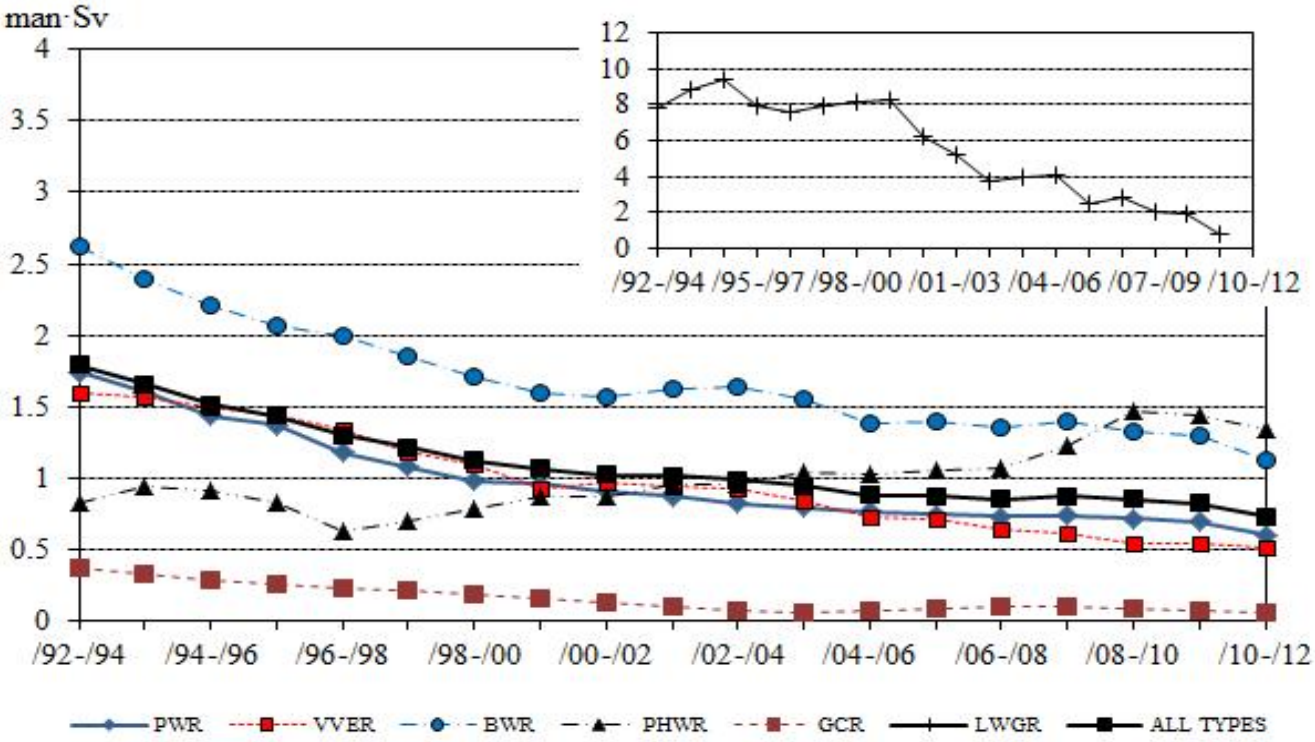
| Country | Number of Accounts Created | |
|---|---|---|
| | Authority | Utility |
| Japan | 4 | 52 |
| Korea (Republic of) | 6 | 42 |
| TOTAL | | 910 |

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 * | |

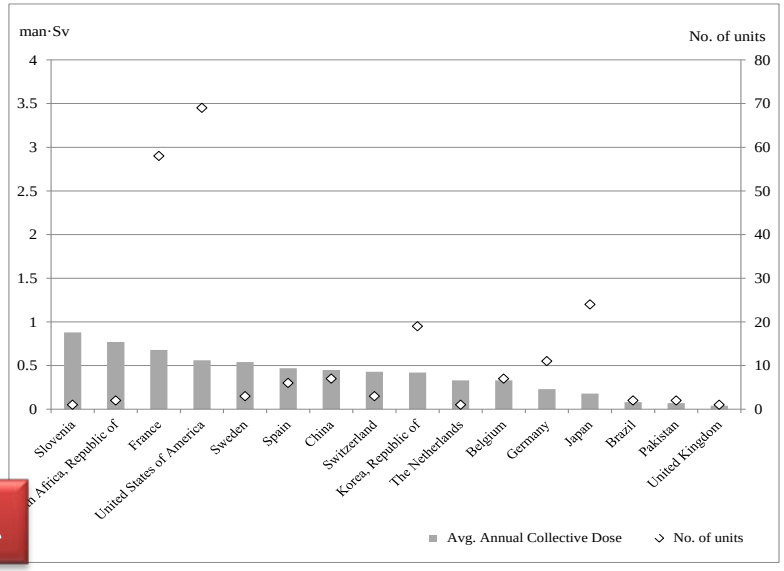
* Mandatory information (duplicate this table as needed)

# Trends

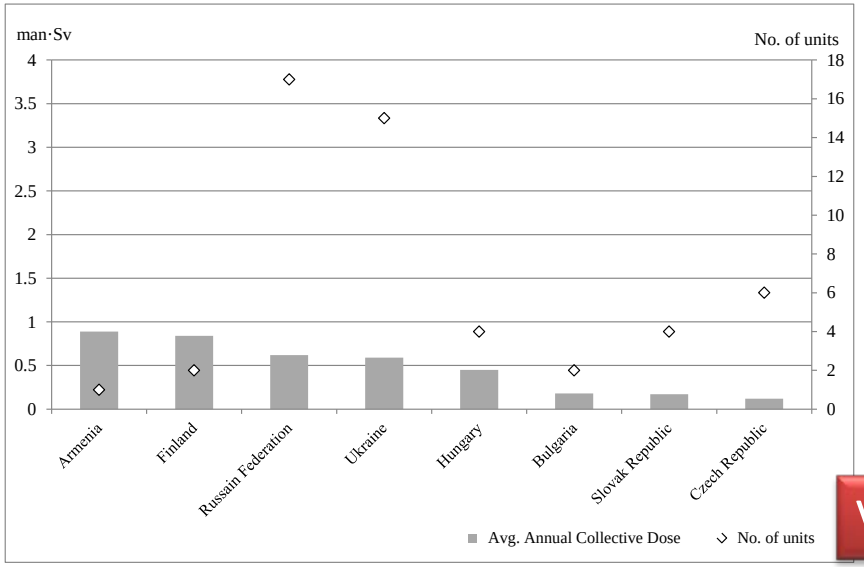



3-year rolling average collective dose per reactor for all operating reactors included in ISOE by reactor type, 1992-2012 (man·Sv/reactor)

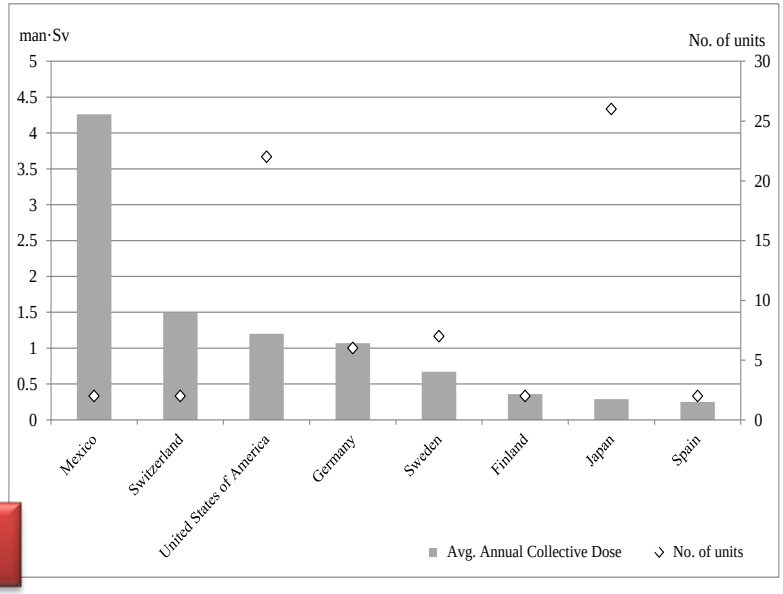
PWR



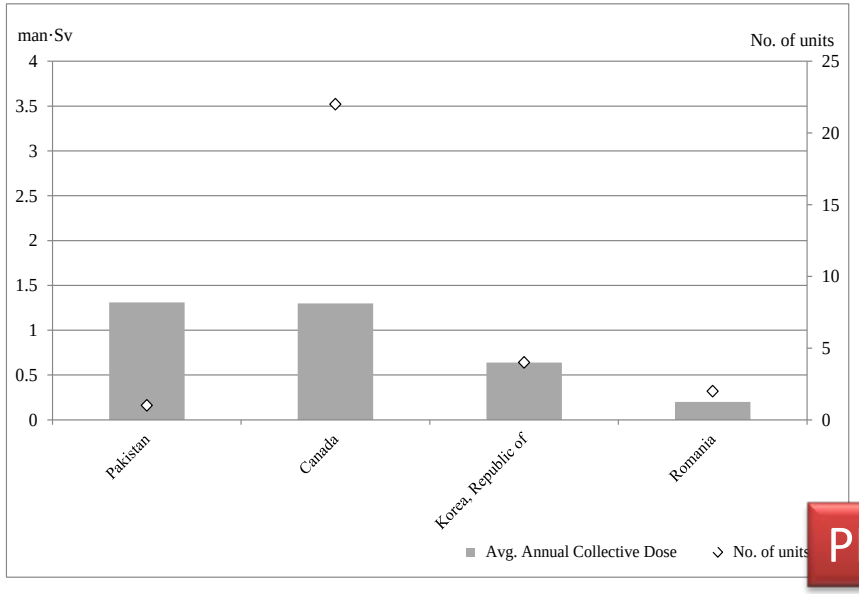

VVER




BWR

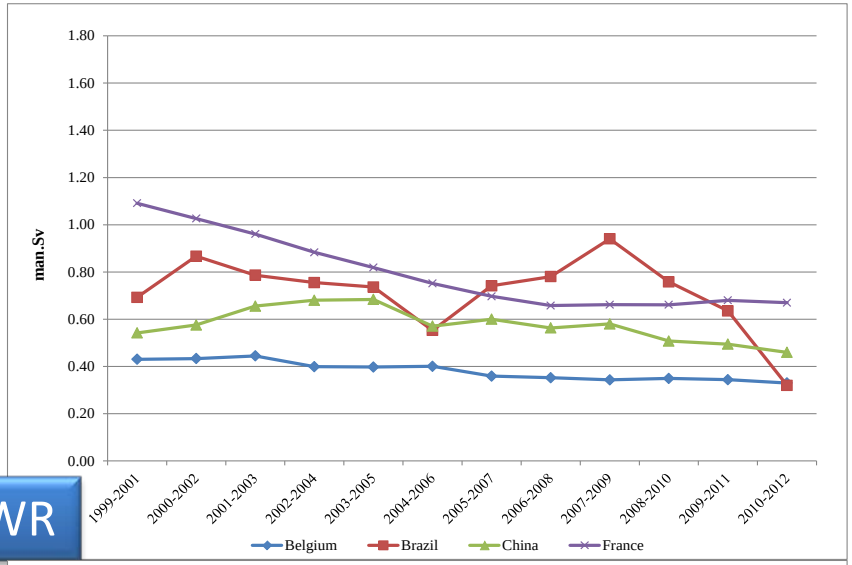



PHWR

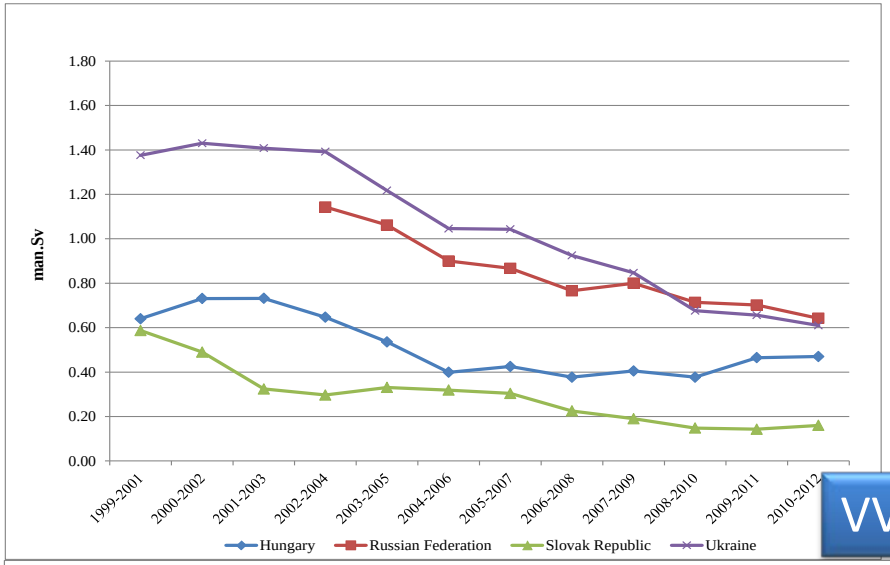



2012 average collective dose per reactor by country (man·Sv/reactor)

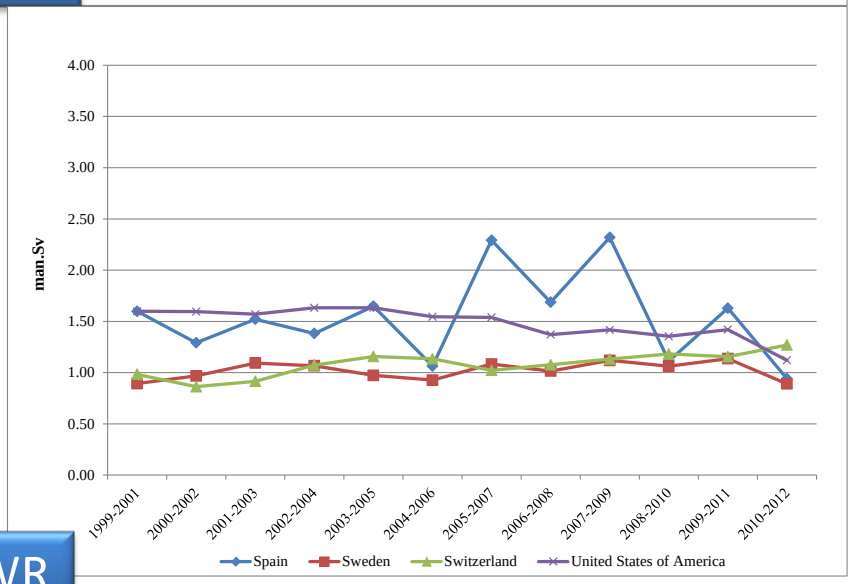
PWR



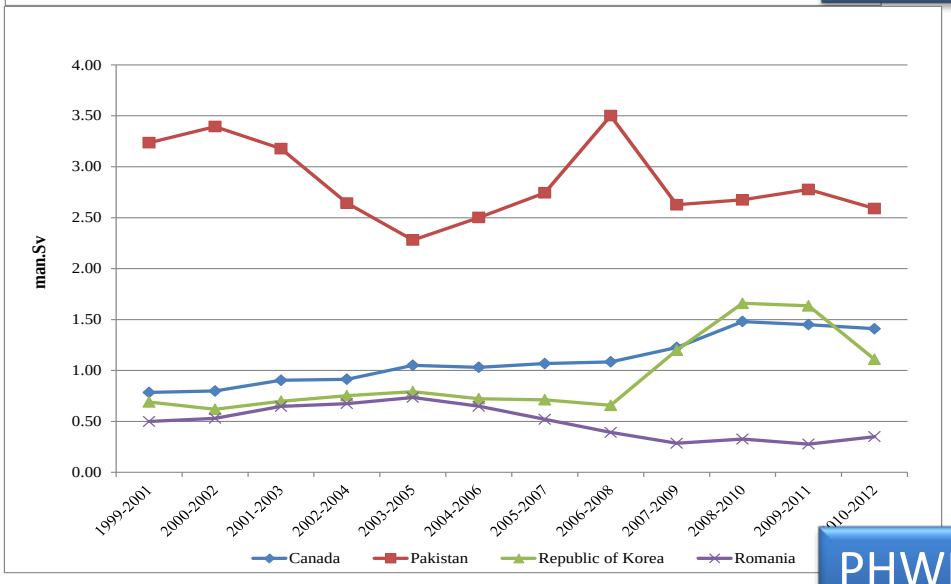

VVER




BWR

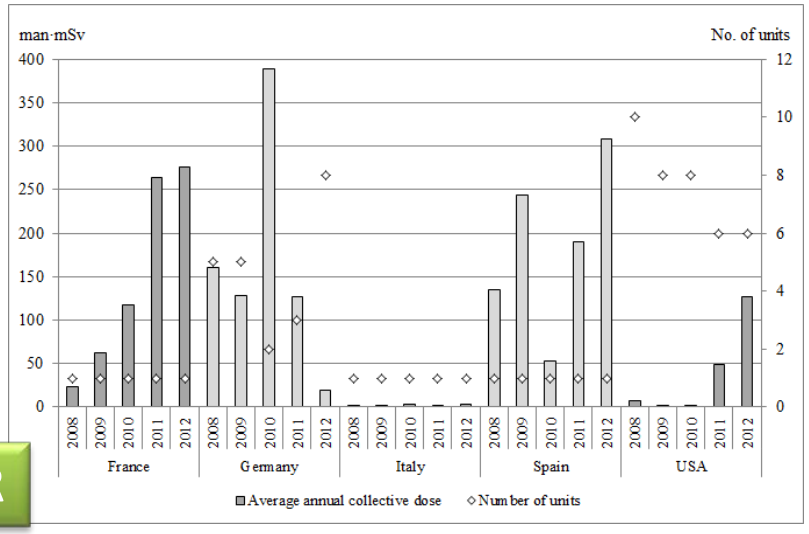


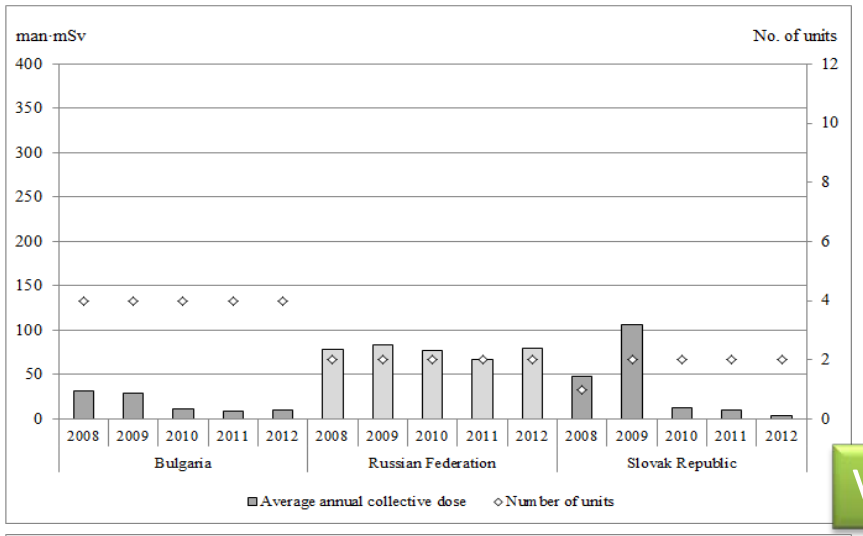

PHWR




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

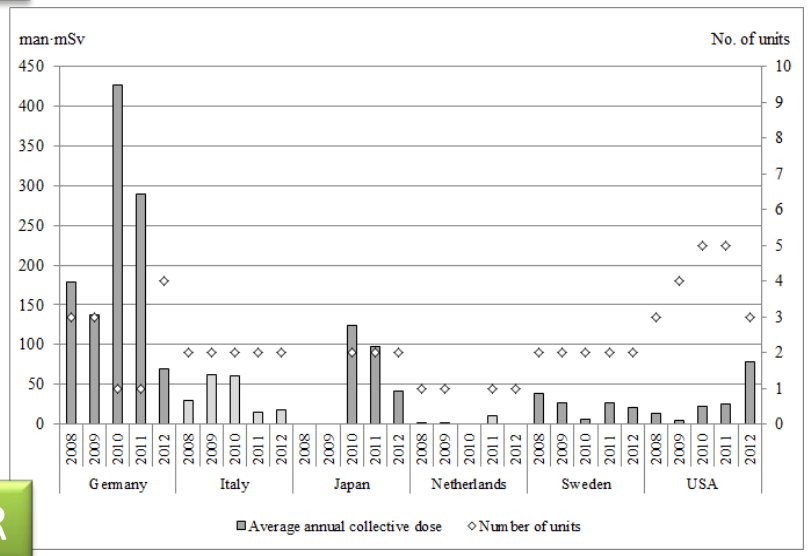
PWR

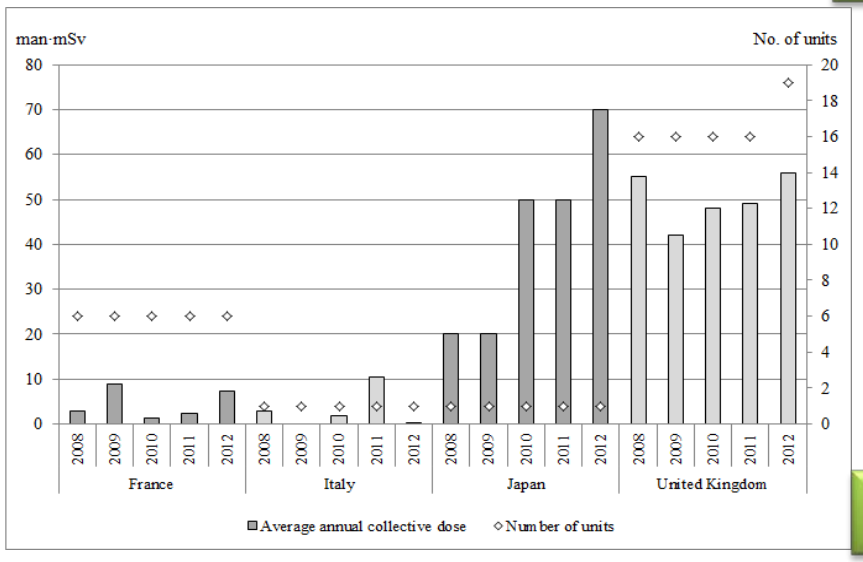



VVER

BWR




GCR

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

# Expert Groups activities

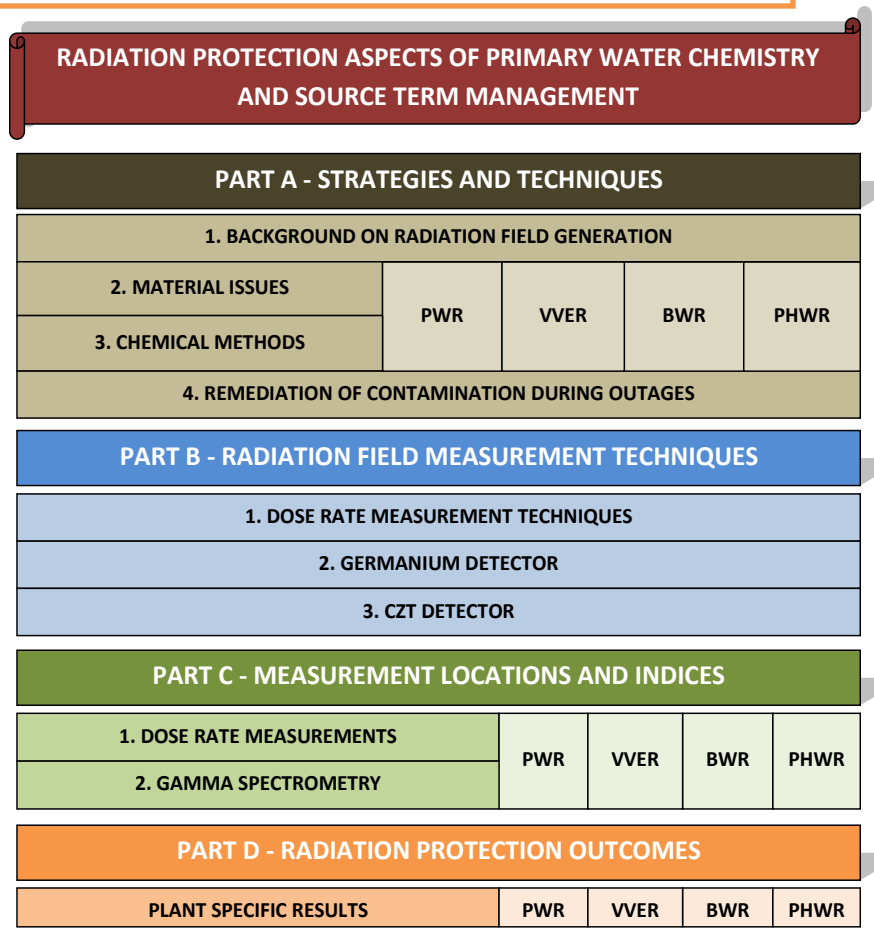
- Expert Group on Primary Water Chemistry and Source-Term Management (**EGWC**)
  - Established in November 2010
  - 15 members (Utility, authority , TC representatives and EPRI)

**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




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

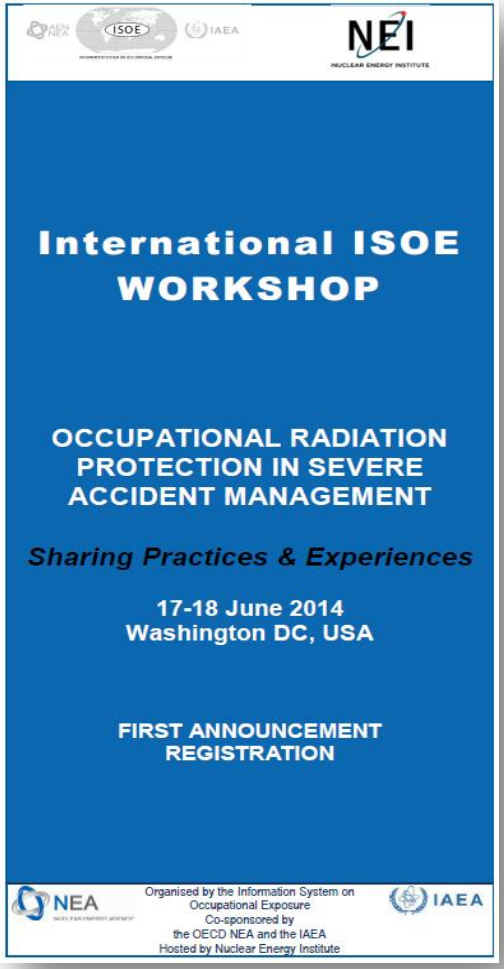
http://www.oecd-nea.org/rp/docs/2013/crpph-r2013-7.pdf

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** |
| *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 | 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** |
| *Committee on Radiation Protection and Public Health* | *Information System on Occupational Exposure* |
| 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 | |

NEA in ORP

# 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**

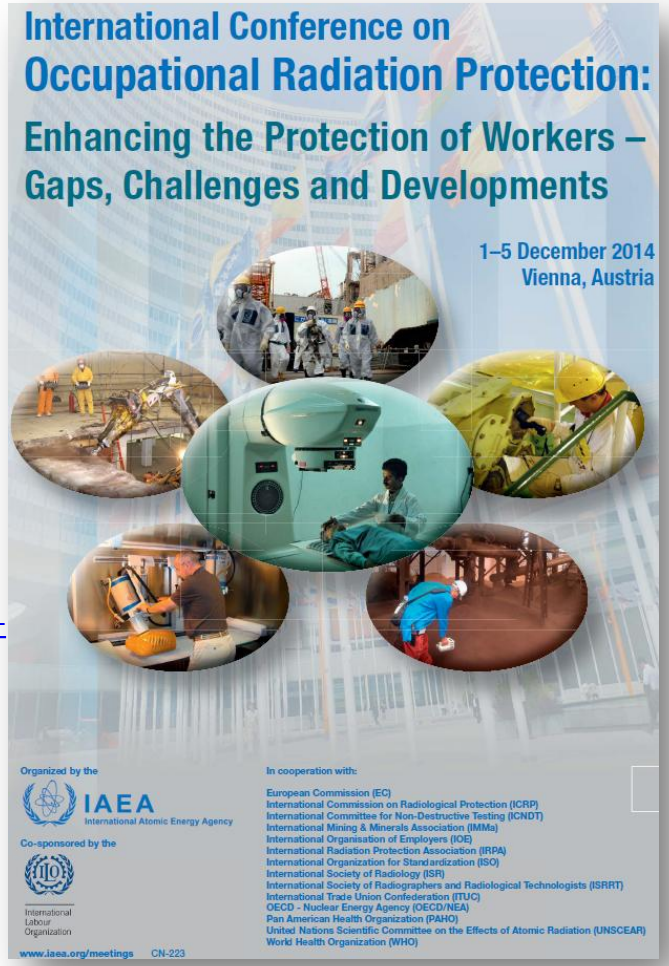
- To introduce the joint projects with their specific activities in the field of decommissioning,
- To discuss the proposal for the establishment of a new Joint Working Group, and
- To discuss trends, areas that need to be studied further by the joint working group.

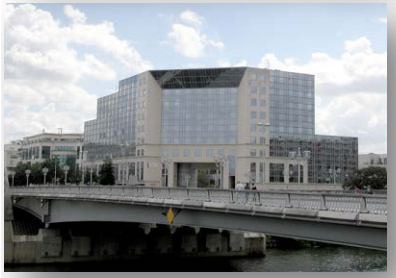
| | | |
|---|---|---|
| **09:00** | **Opening of the Joint Topical Session** | **Co-Chairs:**<br>**Willie O. HARRIS (ISOE), Ivo TRIPPUTI (CPD)** |
| **Session 1: Overview of the Joint Projects (focus on decommissioning related activities)** | | |
| **09:10** | **NEA IN DECOMMISSIONING / INTERNATIONAL 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<br>(ISOE, Exelon Nuclear /US) |
| **10:00** | **OVERVIEW OF THE CPD PROGRAM** | Mr Ivo TRIPPUTI (CPD, SOGIN/Italy)<br>OR<br>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<br>(ISOE ETC, CEPN/France) |
| **Session 2: Discussion** | | |
| **11:30** | This session will summarize the presentations and attempt to identify any trends, aspects, areas that need to be studied further by JWG-RPD:<br>• Joint Rapporteur Group's Summary<br>• Possible topics for future work for the JWG-RPD | Joint Rapporteur Group<br>Halil Burçin OKYAR (ISOE)<br>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



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