ISOE Programme through the 20th Anniversary

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ISOE Joint Secretariat
OECD Nuclear Energy Agency
Radiation Protection and
Radioactive Waste Management Division

2012 ISOE Asian ALARA Symposium
24 – 26 September 2012, Tokyo- Japan

Success in 20 years

- ISOE Program
- Participation (utilities & regulatory authorities)
- Database - Network
- Recent Task/Expert Group activities
- Collaboartion with UNSCEAR and EDF MOU
- ISOE TC PIs
- ISOE Week (20th anniversary)

Committee Structure of the OECD Nuclear Energy Agency (NEA)

NEA joint projects

Project	Participants	Budget
Information System on Occupational Exposure (ISOE) Contact: halilburcin.okyar@oecd.org Current mandate: 2008-2011	Armenia, Belgium, Brazil, Bulgaria, Canada, China, Czech Republic, Finland, France, Germany, Hungary, Italy, Japan, Lithuania, Mexico, Netherlands, Pakistan, Republic of Korea, Romania, Russian Federation, Slovak Republic, Slovenia, South Africa, Spain, Sweden, Switzerland, United Kingdom, United States.	≈€ 450 K /year

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.

ISOE Programme

- Created in 1992 by OECD/NEA as a forum for RP experts from utilities and regulatory authorities world-wide to share amongst participants dose reduction information & coordinate projects to improve optimisation of worker radiological protection at NPPs
  - *Promoted and sponsored by NEA and IAEA*

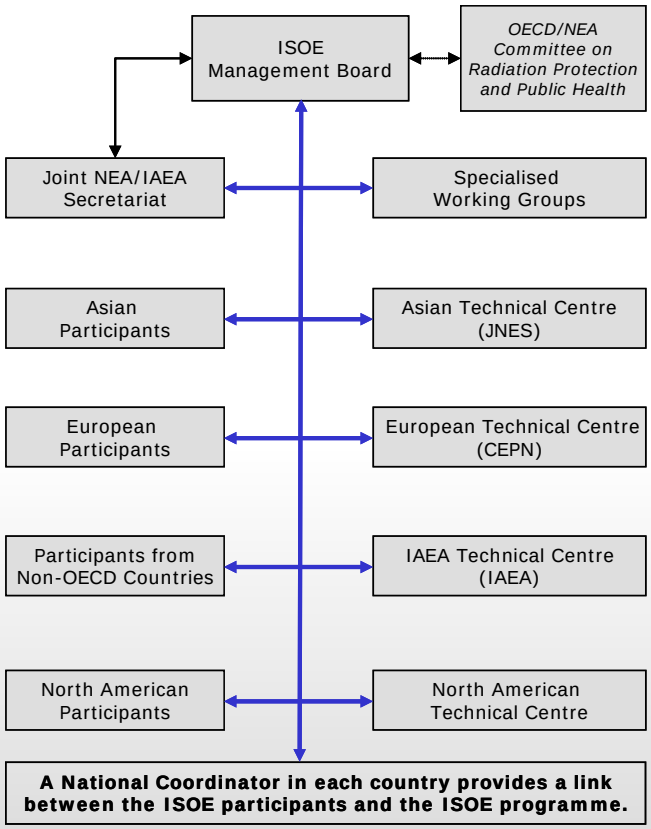
"... the exchange and analysis of information on collective radiation doses to the personnel of nuclear installations and to the employees of contractors, as well as on dose-reduction techniques, is essential to implement effective dose-control programmes and to apply the ALARA principle..."

(ISOE Terms and Conditions, 2012-2015)

ISOE facilitates occupational exposure management at NPPs through the operation of a system for exchanging, storing, and analysing operational information and experience on optimising occupational radiological protection in response to user needs:

- World's largest occupational exposure database for commercial NPPs
- An information exchange programme for sharing dose reduction information and experience
- Four ISOE technical centres support local members (Asia, Europe, North America and IAEA)

Structure



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 and Post-Accident Recovery

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 Products

ISOE Databases

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

Technical Support

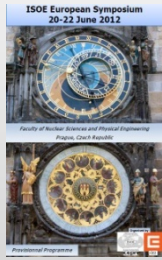
Annual and Topical Reports

ISOE

INFORMATION SYSTEM ON OCCUPATIONAL EXPOSURE

Technical Analyses

ISOE ALARA Symposia



ISOE Network

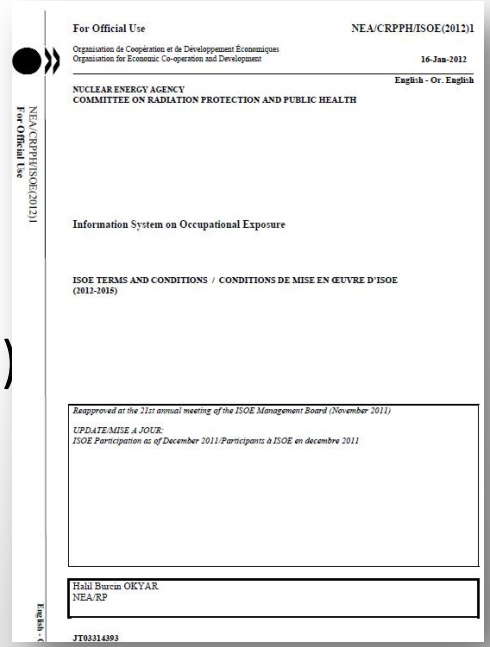
http://www.isoe-network.net/

Status of participation

As of September 2012

- 70 participating utilities from 29 countries
  - 323 operating reactors
  - 40 shutdown reactors
- Regulatory authorities from 24 countries (27 RAs)

- *ISOE Terms and Conditions- reapproved by the ISOE MB*
- *Agreed to invite ISOE participants to confirm ongoing acceptance*



For Official Use NEA/CRPPH/ISOE(2012)1

Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development 16-Jan-2012

English - Or. English

NUCLEAR ENERGY AGENCY
COMMITTEE ON RADIATION PROTECTION AND PUBLIC HEALTH

NEA/CRPPH/ISOE(2012)1
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Information System on Occupational Exposure

ISOE TERMS AND CONDITIONS / CONDITIONS DE MISE EN ŒUVRE D'ISOE
(2012-2015)

Reapproved at the 21st annual meeting of the ISOE Management Board (November 2011)

UPDATE/MISE A JOUR:
ISOE Participation as of December 2011/Participants à ISOE en decembre 2011

Halil Burcin OKYAR
NEA/RP

JT03314393

- **ISOE database**:
  - 394 operating reactors
  - 84 shutdown reactors

- *Annual collection of operational dose data from Participating Utilities at the site, unit, job and task level*

Signed acceptance forms

Japan

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

Operating reactors

Japan Atomic Energy Agency	Fugen (LWCHWR)

Definitely shutdown reactors

Ministry of Economy, Trade and Industry (METI)

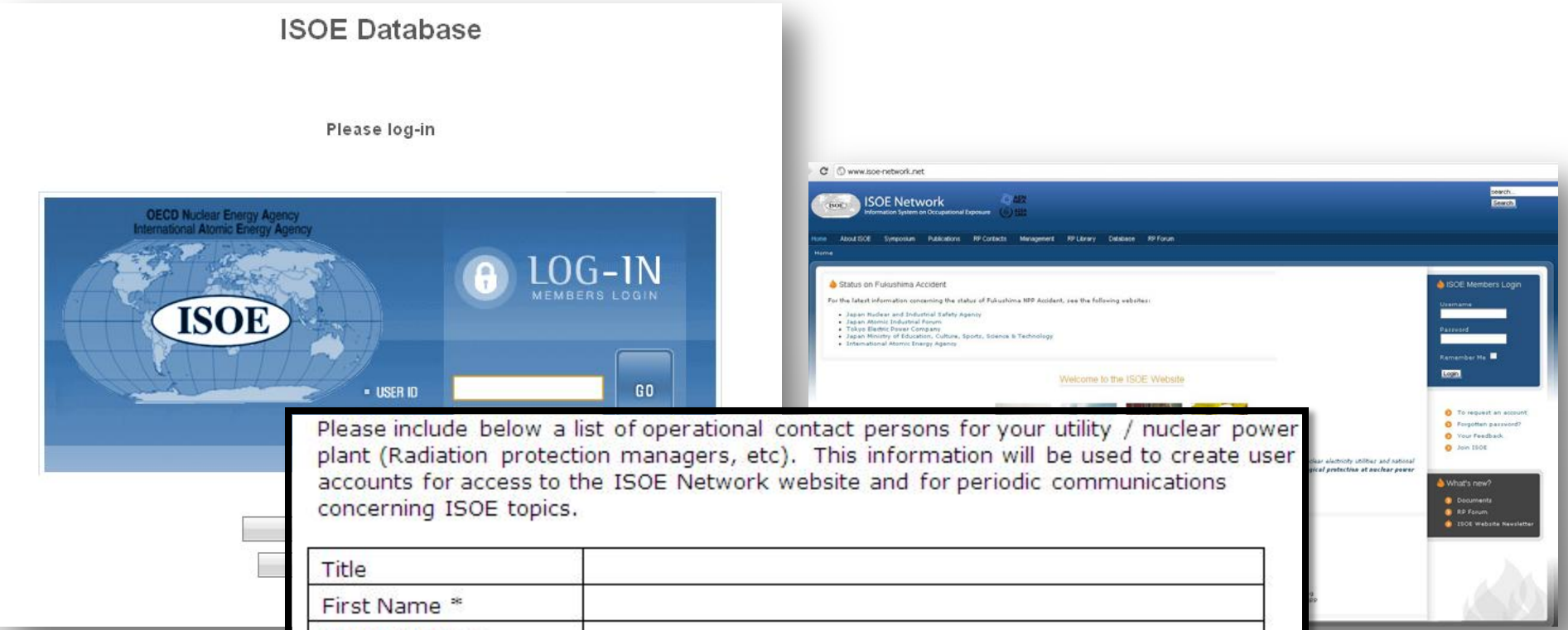
Participating RA

原子力規制委員会 Nuclear Regulation Authority

Establishment of new RA, independent from METI (19 Sep 2012)

ISOE Database

- **ISOE 1:** Dosimetric information from commercial NPPs in operation, shut down or in some stage of decommissioning, including:
  - annual collective dose for normal operation
  - maintenance/refuelling outage
  - unplanned outage periods
  - annual collective dose for certain tasks and worker categories
- **ISOE 2:** Plant-specific information relevant to dose reduction, such as materials, water chemistry, start-up/shutdown procedures, etc.
- **ISOE 3:** Radiation protection related information for specific operations, jobs, procedures, equipment or tasks (radiological lessons learned):
  - effective dose reduction
  - effective decontamination
  - implementation of work management principles



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)*

https://www.oecd-nea.org/isc rk.net/

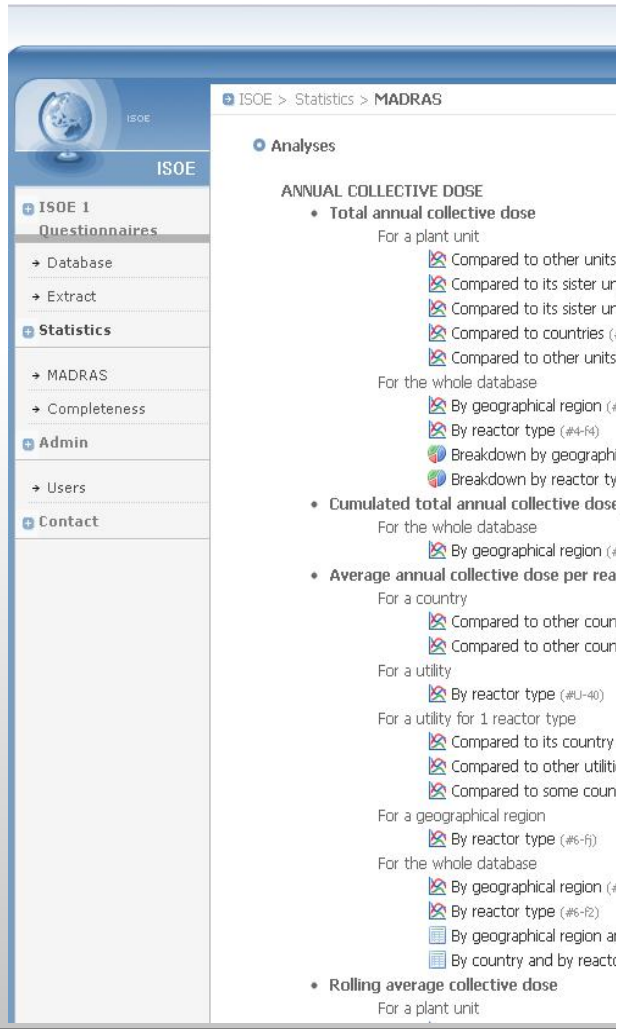
ISOE 1 Questionnaires

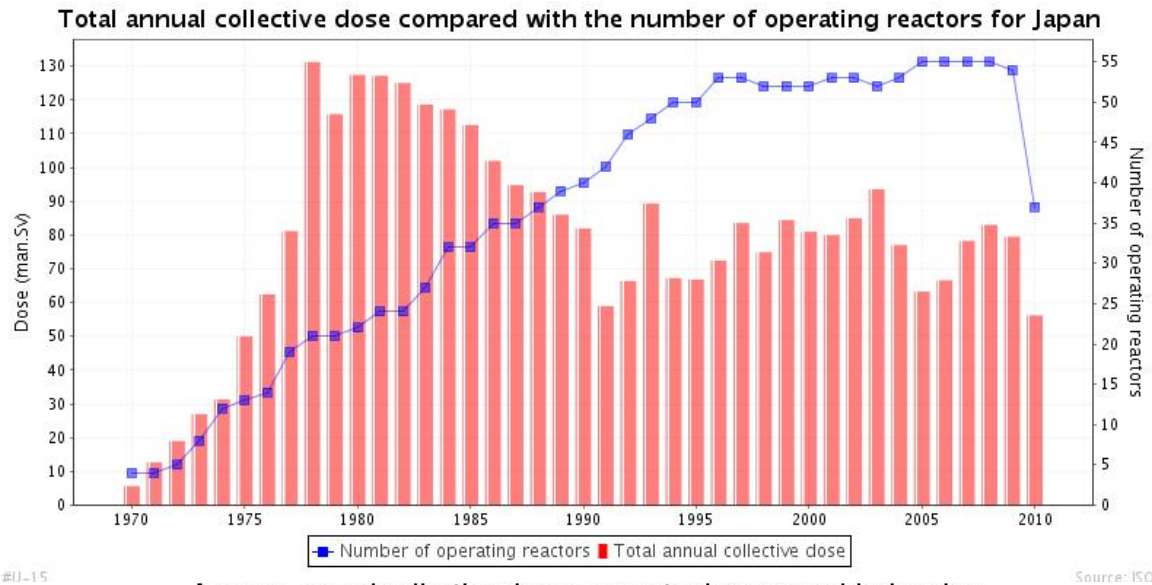
Country: Japan | Utility | Type: | Plant unit | Year - | Reactor status | Clear

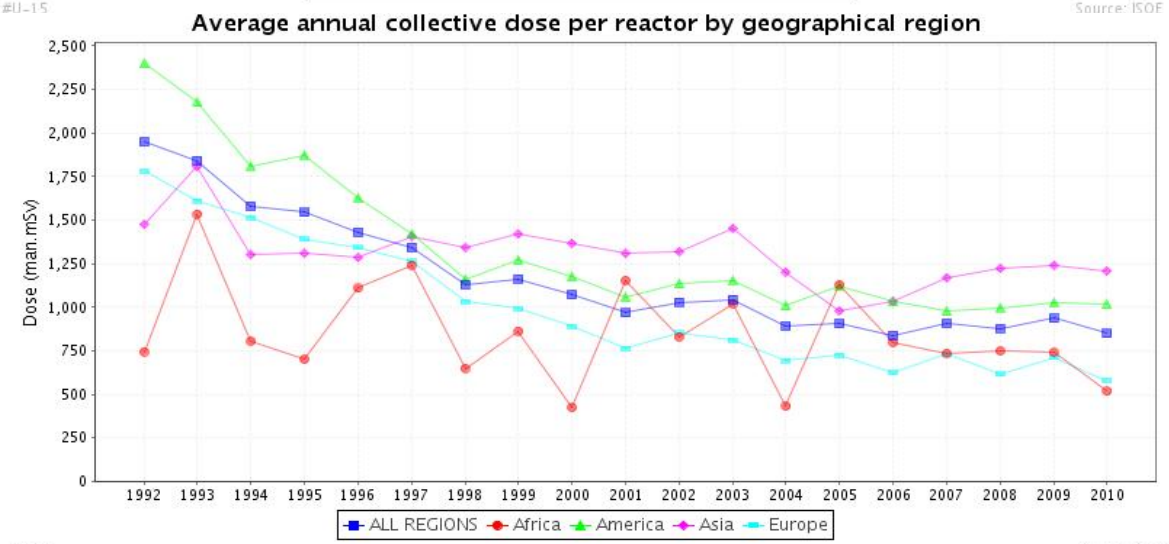
Prev. Next Page: [1] 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 ...52

Country	Plant unit	Type:	Utility	Year	Status:	Validation	Actions
Japan	Shimane 1	BWR	CHUGOKU	2013	Operational	Unit	
Japan	Tsuruga 2	PWR	JAPCO	2011	Operational	Unit	
Japan	Tsuruga 1	BWR	JAPCO	2011	Operational	Unit	
Japan	Tomari 3	PWR	HEPCO	2011	Operational	TC	
Japan	Tomari 2	PWR	HEPCO	2011	Operational	TC	
Japan	Tomari 1	PWR	HEPCO	2011	Operational	TC	
Japan	Tokai 2	BWR	JAPCO	2011	Operational	Unit	
Japan	Tokai 1	GCR	JAPCO	2011	Decommissioning	Unit	
Japan	Shimane 2	BWR	CHUGOKU	2011	Operational	TC	
Japan	Shimane 1	BWR	CHUGOKU	2011	Operational	TC	
Japan	Shika 2	BWR	HOKURIKU	2011	Operational	Unit	
Japan	Shika 1	BWR	HOKURIKU	2011	Operational	Unit	
Japan	Sendai 2	PWR	KYUSHU	2011	Operational	Unit	
Japan	Sendai 1	PWR	KYUSHU	2011	Operational	Unit	
Japan	Mihama 1	PWR	KEPCO	2011	Operational	Unit	
Japan	Kashiwazaki-Kariwa 1	BWR	TEPCO	2011	Pre-operational	Unit	
Japan	Ikata 1	PWR	SHIKOKU	2011	Operational	Unit	
Japan	Hamaoka 5	BWR	CHUBU	2011	Operational	Unit	
Japan	Hamaoka 4	BWR	CHUBU	2011	Operational	Unit	
Japan	Hamaoka 3	BWR	CHUBU	2011	Operational	Unit	
Japan	Hamaoka 2	BWR	CHUBU	2011	Decommissioning	Unit	
Japan	Hamaoka 1	BWR	CHUBU	2011	Decommissioning	Unit	
Japan	Genkai 4	PWR	KYUSHU	2011	Operational	Unit	
Japan	Genkai 3	PWR	KYUSHU	2011	Operational	Unit	
Japan	Genkai 2	PWR	KYUSHU	2011	Operational	Unit	
Japan	Genkai 1	PWR	KYUSHU	2011	Operational	Unit	

Power of MADRAS







ISOE Database- New developments

MADRAS Analyses

- 21 new queries developed in 2011
  - 13 analyses on Dose rates
  - 9 analyses by utility
- Analyses to be developed in 2012
  - By Quartile,
  - By reactor age
  - Top 25 (3-year rolling average)

Other data analyses

- Explore how to use the data on individual dose distribution
- Explore possibilities for new MADRAS analysis using job doses

ISOE Network Website

	Registered
Authority	125
Utility	681
EC	1
Technical Centres	17
Secretariat	3
TOTAL	**827**

Work Group Activities

- Driving force - **WGDA**

- US Pilot Project
- Task Team on Decommissioning
- EG on Water Chemistry and Source-Term Management (EGWC)
- EG on ORP in Severe Accident Management and Post-Accident Recovery (EG-SAM)

US Pilot Project: Electronic Reporting to ISOE

- Electronic Reporting Module for US Utilities
  - data entry and submission to ISOE program from US utilities
  - use existing US utility systems to collate ISOE data into a central data file
- Effective collaboration between between NEA, CEPN, ORAU, PTI Systems, Duke Energy, and US NRC
- Goals of US Pilot Project
  - Reduce manual entry and inefficiencies in current process
  - Increase US utility participation in ISOE program by decreasing burden to submit data
  - Increase use of database to highlight other ISOE products useful in the exchange of operational experience

US Pilot Project

Current

- Duke Energy's Catawba and Oconee sites to submit test files to ISOE in Nov. 2011
- Duke Energy's McGuire, Catawba, and Oconee sites to submit actual data files to ISOE in December 2011
- ORAU and PTI Systems to work with Pacific Gas & Electric's Diablo Canyon started in January 2012
- Expand US Pilot Project to Canberra's Health Physics Information System-20 ~ 25% of US fleet

Task Team on Decommissionning

- **Objective :** modify the ISOE D Questionnaire for job / task data collection
- **Historic:**
  - 1st Task team produced a proposal for a new questionnaire in 2010
  - Questionnaire refused by a lot of ISOE participants, because of its complexity
  - New task team launched
  - New proposal in September 2011 (Exposure Data, Influencing Parameter and Task Descriptions), better accepted.
  - Submitted to WGDA and MB in Nov. 2011

Task Team on Decommissionning

- **Proposals:**
  - Implement the new questionnaire, but need to explore the timetable for the IT development
  - Add a section on the ISOE website RP Library to collect (annual) RP reports from plants under decommissioning
  - Encourage plants to submit these reports (can be posted in any language)
- A timeline is proposed by the ETC and under consideration for implementation by the NEA IT

EG on Water Chemistry and Source-Term Management (EGWC)

- **10 members (3rd meeting- 16 participants)**
  - 7 from utilities, 1 from authority, 1 from EPRI, 1 from ETC
- **Mandate**
  - 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

EGWC

- Meetings in June /October 2011 & February 2012
- Development of draft 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

EGWC

Next meeting: 1-2 October 2012

Progress report to WGDA: 12-16 November 2012 (ISOE week)

Approval of final report by ISOE Management Board (!)

Work Plan

	Action	Date	Responsible
1.	Progress reporting on draft report at — WGDA meeting	17-18 April 2012	Mr. Vaillant (Presentation material will be prepared by the NEA Sec.)
2.	Comments/ inputs for version 5.1	End of February 2012	Mr. Wells
3.	Coordination meeting for the preparation of upcoming work plan & IRPA paper	16 March 2012	Mr. Rocher Mr. Okyar
4.	E-mail to ISOE TCs and NCs dealing with the preparation of chapter 6 - C#6: *Radiation protection outcomes* - indicate the methodology & intent Add VVER section as an example	End of February 2012	Mr. Rocher (E-ml will be drafted by the Sec)
5.	Prepare draft version 6.0 (clear) for review with new content AND circulate for inputs, drafts and comments to the members of the EGWC	30 March 2012	Mr. Okyar
6.	Coordination of Canadian input for version 6.0	-	Mr. Miller (NATC)
7.	Comments/ inputs for version 6.0	3 September 2012	EGWC members
8.	Prepare draft version 6.1 for the 4th meeting	-	Mr. Okyar
9.	4th EGWC meeting	1-2 October 2012	Mr. Okyar
10.	Progress reporting @ the WGDA meeting Approval by the ISOE MB (if possible OR extension of mandate)	12-13 November 2012 (WGDA) 14-15 November 2012 (ISOE MB)	Mr. Vaillant Mr. Okyar

EG on ORP in Severe Accident Management and Post-Accident Recovery (EG-SAM)

- Establishment of Group (May 2011)
- Preparation of ToR by the ISOE Joint Secretariat
- Approved by the ISOE MB in November 2011
- Call for nominees (end of December 2011)

– **45 members,**

- 18 countries: 35 from utilities, 8 from authority, 2 non-ISOE members (REAC/TS & RS Com)

– **Work initiated by the ISOE TCs**

- **NATC**

  Various meetings and collection of necessary data

- **ETC**

  Meeting in Prague (European members), 8 Feb 2012

  Review of work areas & proposals

ISOE EG-SAM Strategy

- **Overarching objective:**
  - Contribute to occupational exposure management (provide a view on management of high radiation area worker doses) in Fukushima with the ISOE participants (utility &RA)
  - address the experience of various ISOE utilities with various RP management approaches in severe accidents

- **Product:** develop a report
  - on best ORP management procedures for proper RP job coverage during severe accident,
  - initial response and recovery efforts to identify good RP practices
  - to organise and communicate radiation protection lessons learned from previous reactor accidents.

- **Pillar of work:** Collection of data, analysis and reporting

EG-SAM Timeline

- 8 February 2012 Kick-off meeting of the ETC sub-group in Prague
- 18-19 April 2012 (Paris, France): First meeting of the EG-SAM to identify topics of interest, and develop methodologies for completing its work.
- Version 5.0 is prepared
- Second meeting: 15-16 November 2012 (ISOE week)
- And after the Asian symposium (additional meeting) - review of version 5 and discussion on version 6
- Regular reporting to the WGDA and ISOE Management Board
- November 2014 final report, Management Board approval

Work Plan

Action	Date	Responsible
Integration of Prague proposal to the new content	End of May 2012	ISOE ETC
Distribution of draft report (version 5.0) to EG-SAM members	End of May 2012	ISOE NEA Secretariat
First drafts/inputs and comments for each chapter/ section of version 5.0	1 September 2012	EG-SAM members
Consolidation of all drafts and circulation of version 6.0	End of October 2012	ISOE NEA Secretariat

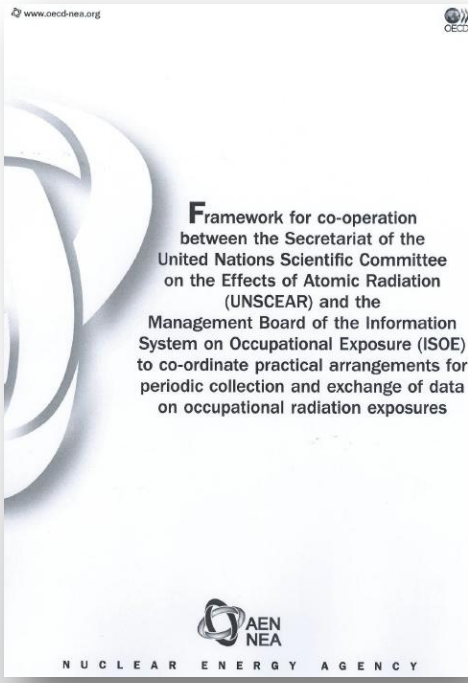
Version 5.0

1. Foreword / Executive Summary
2. Introduction / Scope
3. RP Management and Organization
4. RP training and practices related to severe accident management
5. Facility configuration and readiness
6. Worker Protection
7. Radioactive materials and contamination controls
8. Lessons Learned and Example Protective Measures
9. Conclusions

- Annex-1: Radiological Past Lessons Learned
- Annex-2: ISOE Programme
- Annex-3: Members list of the EG-SAM

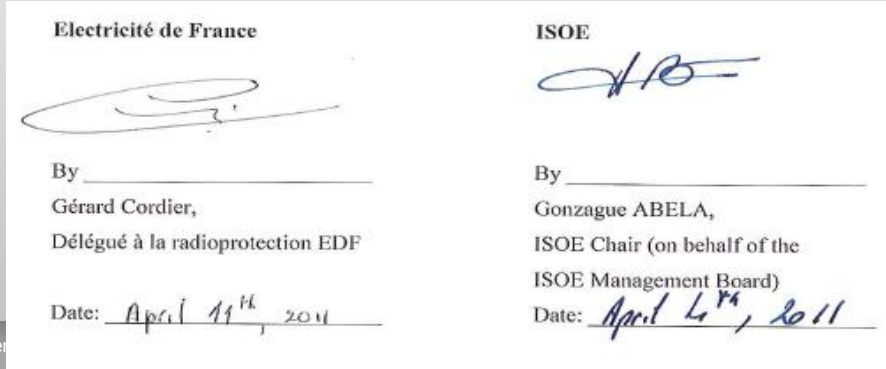
UNSCEAR Collaboration

- Framework for cooperation between the secretariat of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) and the Management Board of the Information System on Occupational Exposure (ISOE) to coordinate practical arrangements for periodic collection and exchange of data on occupational radiation exposures
  - Agreed by the ISOE MB (Nov meeting) and signed in December 2011
  - These specific data include:
    - Average collective dose over the period (total, average/reactor, average/energy generated);
    - Average number of reactors over the period;
    - Average energy generated over the period; and
    - Totals for each reactor type, based on reported data.



EDF MOU

- Sharing information, operating experience, and data to advance the understanding of the impact on NPP materials aging on corrosion product generation, transport and deposition on ex-core piping and components
- Approval of the MB during the 20th annual meeting
- Signed in April 2011
  - EDF, transfer results for CZT measurements
  - ISOE TCs agree to facilitate the transfer of NPP CZT Measurement data and posting on the ISOE-Network (restricted to participating utilities only)
  - EDF, provide information to facilitate the accuracy of CZT measurements
  - EDF and ISOE, sponsor technical subject matter experts to meet at least once per year



Electricité de France

By _____

Gérard Cordier,

Délégué à la radioprotection EDF

Date: April 11th, 2011

ISOE

By _____

Gonzague ABELA,

ISOE Chair (on behalf of the

ISOE Management Board)

Date: April 14th, 2011

ISOE TC PIs

- Effective management and crucial role of TCs
- Evaluation with generally accepted mechanisms and performance reviews
- Article 3 (d) of the Terms and Conditions of the ISOE

  "*the Centers shall be so organized as to ensure that all tasks as directed by the ISOE Management Board, or through the ISOE Bureau, can be undertaken in a satisfactory manner, and shall meet periodically to coordinate these efforts*"
- Agreed mechanisms;
  - to evaluate the performance (based on performance indicators),
  - to highlight the short-comings,
  - to include the regional expectations from technical centers (specific for each technical center, regionally translated and timely reporting)
  - criteria should be established (written procedure- generic).
- MB - assess the performance of technical centers annually in line with the (T&Cs)

ISOE TC PIs

1. ISOE DATABASE MANAGEMENT

1.1 Data collection and entry to the database

- Total number of units with reactor type in the region (operating and decom)
- Date, each year, when ALL data has been submitted to TC

1.2 Technical quality and validity of data submitted

Details of quality management framework (Quality Management System)

- Data validation
- Quality control of data collected, and on-line and off-line storage and retrieval services

ISOE TC PIs

2. CONTRIBUTION AND FINALIZATION OF ANNUAL

- Contribution to chapter on occupational dose studies, trend and feedback
- Info an evaluation of occupational dose trend in the region
- Info on specific chapter, as agreed by the WGDA
- Info on symposia organized during the reporting period
- Info on benchmarking visits organized during the reporting period
- Input for the ISOE News and content
- Input for the ISOE Website Newsletter and content

3. ISOE NETWORK WEBSITE MANAGEMENT AND TC INPUT

- ETC (requested or implemented website modifications (for example, new menu, category of documents…), management of user accounts, etc.
- Other TCs (info on inputs for the Network and on the respective regional website.

ISOE TC PIs

4. OTHER TOPICS

- Participation to the meetings

  (including Bureau, MB, WGDA and EGs, etc)
- Nomination to expert groups and follow-up
- Organization of the ISOE International / Regional ALARA symposium
- ISOE organized benchmarking visits
- New documents and reports

  (including technical reports, information sheets, information exchange activities, etc.)
- Any other issue not listed above

Currently; under preparation

Review and approval in November meeting (WGDA & MB)

Conclusion

- **Value:** an important combination of global occupational dose data, dose reduction experience and information exchange among participating utilities, authorities to facilitate practical optimisation of worker radiological protection
- **Success:** ISOE has proved successful in helping radiation protection experts to better manage occupational exposures at nuclear power plants
- **Future:** ISOE will continue to facilitate the sharing of experience, and the building of linkages between ISOE members worldwide to develop a global approach to ALARA work management (and ORP in severe accident management)

ISOE Week in November

Schedule of ISOE Meetings for 2012 & 2013

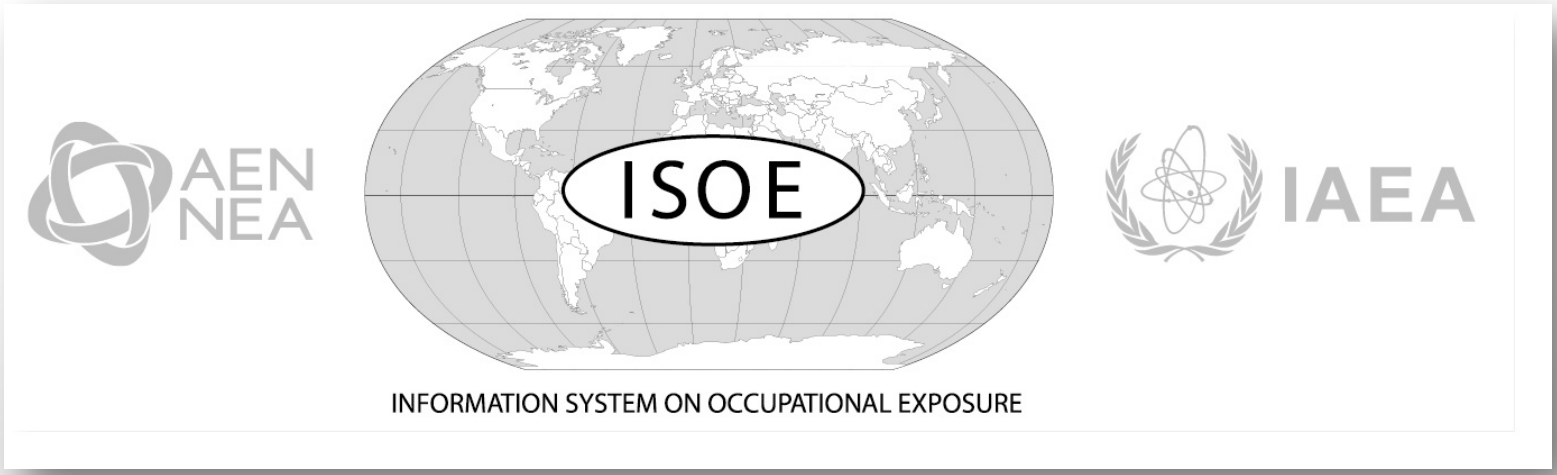
2012

— 1-2 October 2012: 4th meeting of the ISOE EGWC (OECD, Paris)
— 12-13 November 2012: ISOE WGDA meeting (OECD, Paris)
— 13 November 2012: ISOE Bureau meeting (OECD, Paris)
— 14-15 November 2012: 22nd ISOE Management Board meeting (OECD, Paris)
— 15-16 November 2012: 2nd meeting of the ISOE EG-SAM (OECD, Paris)

2013

— 21-24 May 2013: ISOE Bureau and WGDA meetings
— 18-22 November 2013: WGDA and ISOE Management Board meetings

For further information, please visit ISOE websites	ISOE Network: www.isoe-network.net OECD/NEA: www.oecd-nea.org/jointproj/isoe.html IAEA TC: /www-ns.iaea.org/tech-areas/rw-ppss/isoe-iaea-tech-centre.asp NATC: hps.ne.uiuc.edu/natcisoe/ ATC: www.ines.go.jp/isoe/english/index.html



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http://www.oecd-nea.org/jointproj/isoe.html
http://www.isoe-network.net

EGOE

Policy and strategic areas of ORP with a focus on the nuclear power sector

Case Study No.1: ORP principles and criteria for designing new NPPs - **published**

Case Study No.2: Dose Constraints in Occupational Radiation Protection – **published**

Case Study No.3: Policy and Practical Issues in ORP in NPPs – **under preparation**