

ISOE Programme - *Expert Group Activities* -



H. Burçin OKYAR
ISOE NEA Scientific Secretariat

OECD NEA
Division of Radiological Protection &
Radioactive Waste Management

2015 ISOE International Symposium
26-28 May 2015
Rio de Janeiro, Brazil

Agenda

- Programme structure / management & status of participation
- Programme essentials
- Dose trends
- EG/WG Activities
 - Published reports & New Working Group – RP aspects of decommissioning
- Technical Cooperation Agreements
- Draft Strategic Plan (2016-2019) & Survey on Radiation Protection Performance Indicators

ISOE Programme

Belgium, Czech Rep., Finland, France,
Germany, Hungary, Italy, Netherlands,
Russian Fed., Slovak Rep., Slovenia, Spain,
Sweden, Switzerland, UK

Japan, Rep. of Korea

Armenia, Brazil, Bulgaria, China, Lithuania,
Pakistan, Romania, South Africa, Ukraine, UAE

Canada, Mexico, US

European TC, CEPN

Asian TC, NSRA

IAEA TC

North American TC

National Coordinators

EG-SAM (disbanded)

EGPWC (disbanded)

WGDECOM

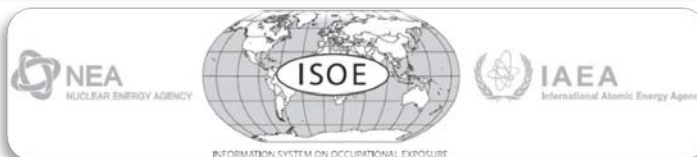
WGDA

Specialized Working/
Expert Groups

Officially participating Utilities & Regulatory Authorities

Joint NEA – IAEA
Secretariat

OECD / NEA
CRPPH



ISOE Management Board

ISOE Bureau

Chairman of the ISOE System	
	Chairman elected
Chairman Name: [Name] Country: [Country] Email: [Email]	Chairman elected Name: [Name] Country: [Country] Email: [Email]
Vice-Chair Name: [Name] Country: [Country] Email: [Email]	Past-Chairman Name: [Name] Country: [Country] Email: [Email]
ISOE Joint Secretariat Name: [Name] Country: [Country] Email: [Email]	ISOE Joint Secretariat Name: [Name] Country: [Country] Email: [Email]

NETWORK

NEA IT

DATABASE

Annual / Topical
Reports

ALARA
Symposia

Technical
Support

Analyses



Status of participation

- ISOE Terms and Conditions (2012-2015)
- **Official participants** include (as of March 2015):
 - 76 utilities in 29 countries
(349 operating reactors, 57 shutdown reactors)
 - 21 regulatory authorities in 19 countries (France and Slovenia are represented by two organisations)
- **Database:** 401 operating units and 81 units in some stage of decommissioning in 29 countries

New Strategy for official participation

Countries already participating in ISOE but some operating units are missing in the database

- China: 10 PWRs, 2 PHWRs, Russia: 1 FBR, 11 LWGRs, UK: 15 GCRs (*not participating but dose data in the ISOE database*)

Countries not yet participating in ISOE but with operating units

- Argentina : 3 PHWRs, India: 1 PWR, 18 PHWRs, 2 BWRs, Iran: 1 PWR, Chinese Taipei: 4 BWRs, 2 PWRs

Newly embarking countries: First NPPs under construction

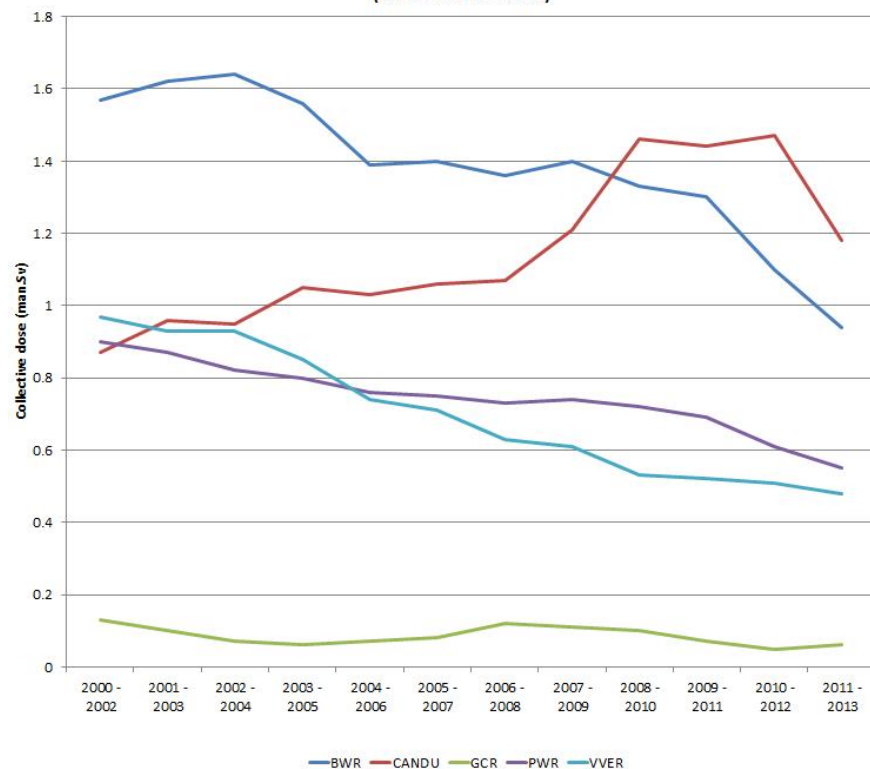
- United Arab Emirates: 3 PWRs under construction, Belarus: 2 PWRs under construction, Turkey, Poland, Viet Nam

ISOE Programme essentials

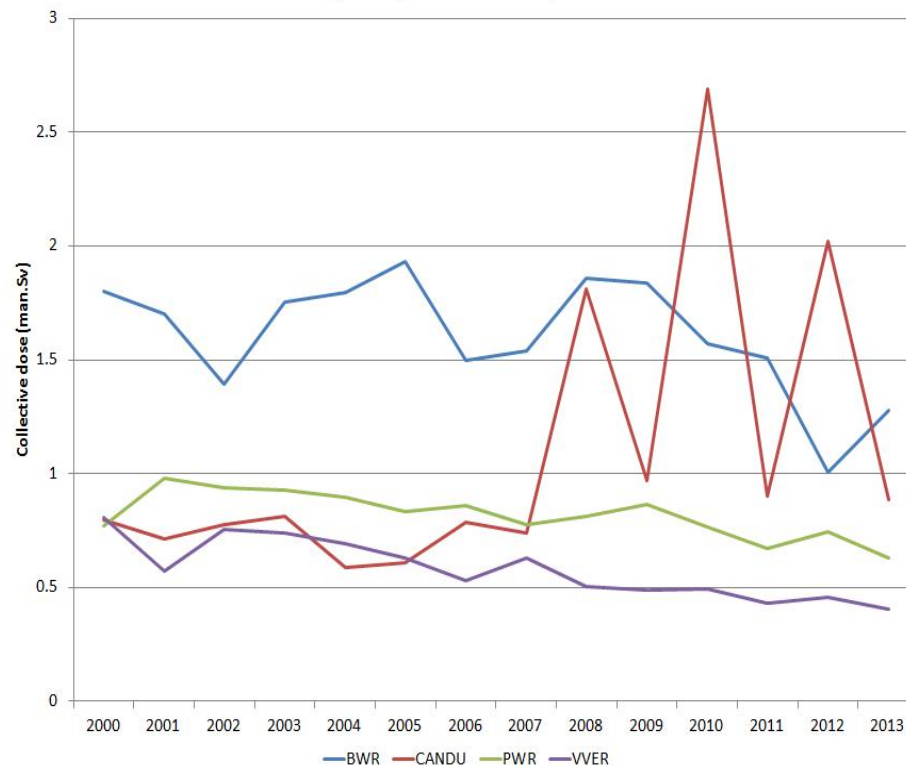
- Permission to the ISOE participating RA users to review the completeness data for other countries (detailed data on jobs/tasks) in 2013
- Removal of restrictions at the database and network web-site in 2014
- **MADRAS**
 - MADRAS analysis package : more than 80 different analysis (main trends in occupational exposure)
 - 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.
- **E-reporting (extension for the all ISOE with XML import file)**
 - Pilot project-completed (limited use)
 - Possible extension for the utilities in the ISOE , requires additional work
- **Website**
 - Effective tool for communication /forum
 - Announcements, documents/pubs, etc.
- **New ISOE D Q (trial period completed)**
 - Too detailed and complicated (tasks, jobs), continue with the current questionnaire

Dose trends

3-year rolling average collective dose by reactor type
(whole ISOE database)



Average outage collective dose per reactor

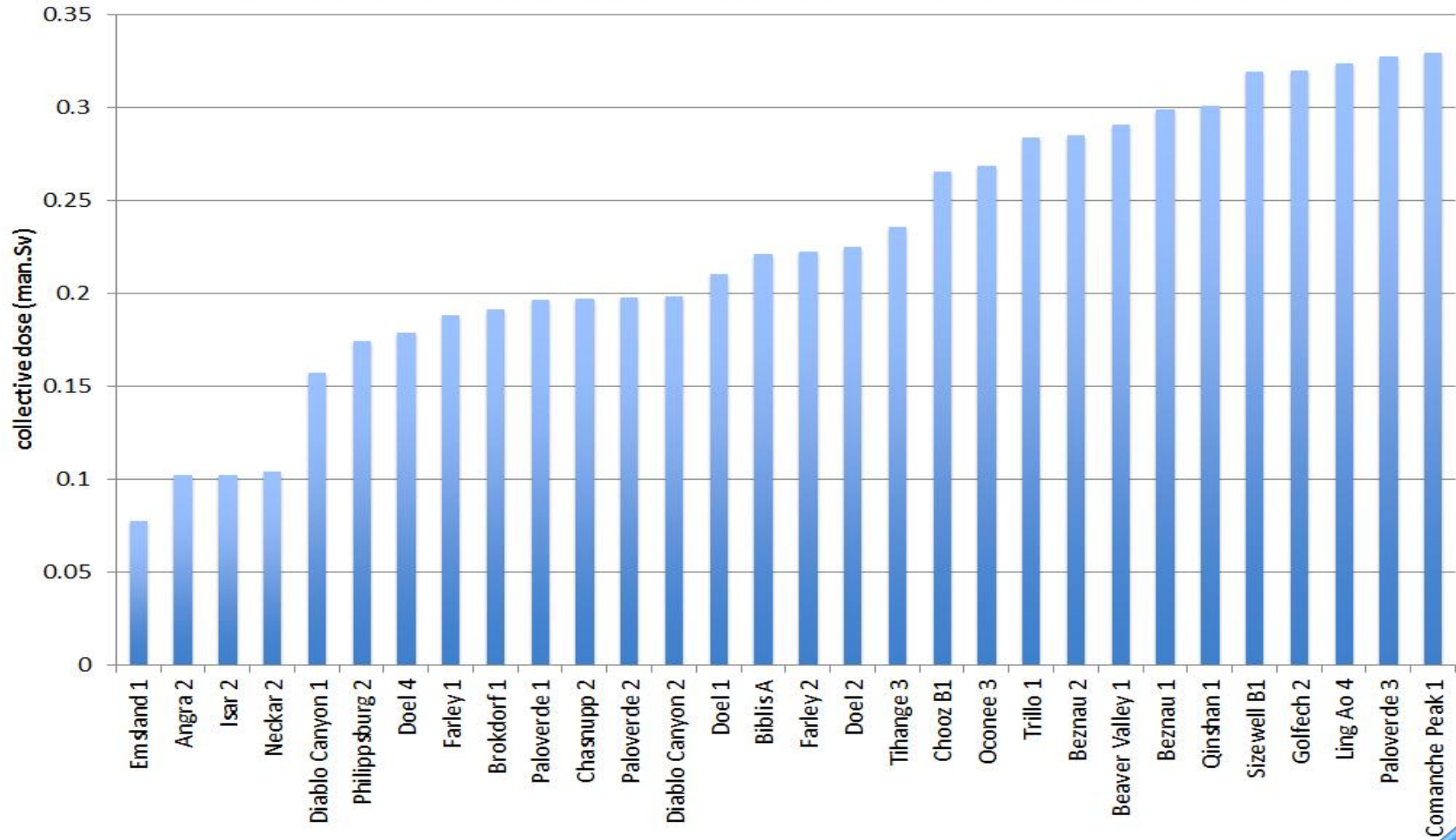


Dose trends

Quartile	Plant unit	2011-2013 (man.mSv)	2010-2012 (man.mSv)	Percent change from 2010-2012	2010-2012 quartile (if changed)
1	Chooz B1	265.32	535.17	-50%	2
	Golfech 2	320.05	388.52	-18%	
	Penly 2	349.55	338.2	3%	
	Chooz B2	349.99	342.89	2%	
	Chinon B4	355.23	714.07	-50%	3
	Nogent 1	380.37	375.09	1%	
	Belleville 2	386.69	401.43	-4%	
	Nogent 2	395.83	737.1	-46%	3
	Saint Alban 1	402.93	402.83	0%	
	Cattenom 2	409.13	394.37	4%	
	Belleville 1	424.88	758.28	-44%	3
	Flamanville 2	429.35	379.93	13%	
	Saint Alban 2	443.2	363.21	22%	
	Paluel 1	464.54	514.87	-10%	2
	Golfech 1	468.8	543.7	-14%	2
2	Paluel 4	486.09	343.88	41%	1
	Paluel 2	499.78	504.18	-1%	
	Paluel 3	503.71	426.6	18%	1
	Penly 1	508.3	497.62	2%	1
	Chinon B3	514.71	431.5	19%	1
	Civaux 1	546.73	499.43	9%	
	Cattenom 4	554.92	380.1	46%	1
	Blayais 3	557.36	709.01	-21%	3
	Cattenom 1	578.88	577.2	0%	
	Tricastin 4	584.33	685.3	-15%	3
	Dampierre 4	591.58	762.28	-22%	3
	Gravelines 6	600.58	771.43	-22%	3
	Flamanville 1	640.72	657.21	-3%	3
	Civaux 2	662.33	654.33	1%	3
	Cruas 1	663	536.68	24%	
3	Dampierre 2	667.12	758.06	-12%	
	Cruas 3	669.86	788.11	-15%	4
	Saint Laurent B1	704.31	515.2	37%	2
	Cruas 2	706.56	510.43	38%	2
	Gravelines 4	716.37	517.28	38%	2
	Cattenom 3	726.96	529.67	37%	2
	Cruas 4	779.83	1003.93	-22%	4
	Chinon B2	790.09	699.37	13%	
	Gravelines 5	821.54	994.26	-17%	4
	Chinon B1	837.56	459.3	82%	1
	Bugey 2	846.41	1512.14	-44%	4
	Blayais 1	861.5	1006.88	-14%	4
	Fessenheim 1	863.25	578.18	49%	
	Tricastin 3	888.71	1011.78	-12%	4
4	Tricastin 1	905.85	569.41	59%	2
	Blayais 2	976.42	563.96	73%	2
	Dampierre 1	1003.04	739.59	36%	3
	Bugey 5	1033.94	1001.26	3%	
	Blayais 4	1089.1	763.64	43%	3
	Bugey 4	1110.81	1143.21	-3%	
	Dampierre 3	1135.99	528.69	115%	2
	Saint Laurent B2	1142.98	567.65	101%	2
	Gravelines 2	1271.24	834.98	52%	
	Tricastin 2	1295.66	903.5	43%	
	Gravelines 1	1387.81	1129.09	23%	
	Bugey 3	1436.4	856.27	68%	
	Gravelines 3	1477.73	1569.44	-6%	
	Fessenheim 2	1807.54	1355.66	33%	

Dose trends

Top 30 plant units - 3-year rolling average annual collective dose (2011 - 2013) for PWRs

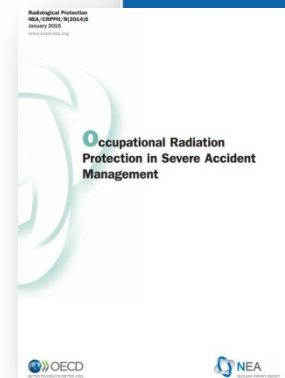
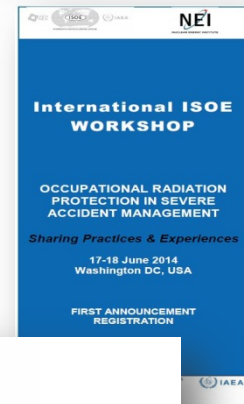
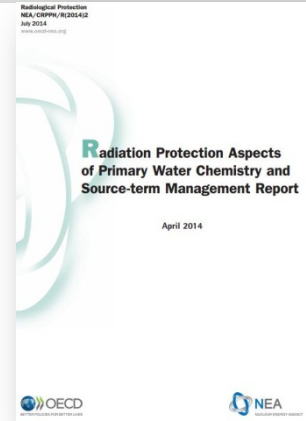


Top 10 of the MADRAS Analysis (2014)

Analysis	#
Total outage collective dose and outage duration	326
Total annual collective dose benchmarking: 1 unit vs. other units in its sister group	185
Total annual collective dose benchmarking: 1 unit vs. other units	167
Collective dose per job benchmarking: 1 unit vs. its sister unit group and other sister unit groups	165
Total outage collective dose benchmarking: 1 unit vs. other units	128
Average annual collective dose per reactor benchmarking: 1 country vs. other countries for 1 reactor type	69
Average annual collective dose per reactor benchmarking: 1 unit vs. its sister unit group and its reactor type	54
Collective dose per task for 1 unit	52
Rolling average collective dose per reactor benchmarking: 1 country vs. other countries for 1 reactor type	51
Total outage collective dose benchmarking: 1 unit vs. other units in its sister group	46

Expert Group reports

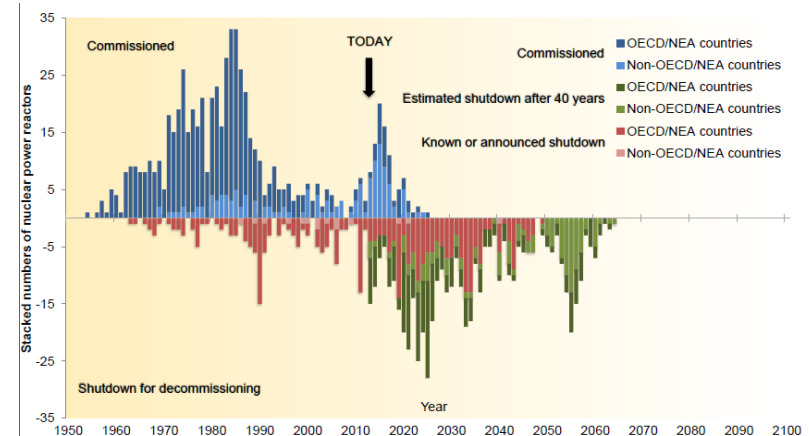
- EGPWC report: Radiation Protection Aspects of Primary Water Chemistry and Source-term Management
 - MOU with EDF (2011), NPP CZT measurement data, information exchange
 - Strategies, measurement techniques, locations and indices, remediation of contamination during outages and RP outcomes
 - Available at network web-site (July 2014)
- EG-SAM report: Occupational Radiation Protection in Severe Accident Management
 - Response of program to the Fukushima accident
 - Technical support during the early phase
 - management of high radiation area worker doses
 - effective use of personal protective equipment (PPE)
 - high-radiation area worker dosimetry for different types of emergency and high-radiation work situations
 - Contributed by 45 experts from 19 ISOE countries
 - Interim report in 2013 and international workshop in June 2014 (hosted by the NEI)
 - Approval in November 2014 by the ISOE MB and published in Jan 2015



New Working Group (ORP in decommissioning)

Situation ¹	In operation	Shutdown/under decommissioning	Fully decommissioned
Nuclear Power Reactors Worldwide	438	147	15
Nuclear Power Reactors OECD NEA	358	135	15
NEA Proportion	82 %	92 %	100 %

¹ PRIS database, IAEA



- **Working Group on Radiological Protection Aspects of Decommissioning Activities at NPPs** (discussed with the International Co-operative Programme on Decommissioning, CPD), topical session -5 Nov, approved by the MB, call for nomination in 2015
 - 22 members (13 ISOE countries) & 4 corresponding members
 - Primary focus on practical case studies and expert discussions that would help to identify good practices in the field of ORP , network of RP experts
 - On going decommissioning projects in NPPs
 - Structure a database for NPP decommissioning works (with current capacity and experience)
 - 2 day meeting/year (organized by the NEA), if feasible, hosted at a site concerned by decommissioning activities

WGDECOM

- Special topic for upcoming ISOE regional/ international symposiums
- Essentials for the PoW
 - identify the areas of ORP for NPPs planning decommissioning or in the process of decommissioning for effective management of occupational exposure;
 - identify the operational data that can be collected through the ISOE databases in order to suggest trends and aspects that can be studied and used for benchmarking as a starting point for more in-depth analyses;
 - identify the areas of ORP that would, through the exchange of experience, most effectively facilitate good management and international consensus on effective occupational exposure practices;
 - identify a network of RP experts at NPPs who are planning decommissioning or who are in the process of decommissioning (how to integrate into the ISOE programme to exchange occupational exposure management experience);
 - identify factors and aspects that play key roles in achieving good practices in decommissioning
 - knowledge and historical memory, experience, technology, regulatory requirements and guidance, worker involvement, information exchange and networking,
 - and analysing and quantifying their possible impact on occupational doses and operational costs.

Technical Cooperation Agreements

- Memorandum of Understanding with EDF (**March 2011**)
 - Sharing information, operating experience and data
 - Transfer of results for CZT measurements
 - ISOE- agree to facilitate the transfer of NPP CZT measurements data and posting on the network
 - Input for the EG Primary Water Chemistry and Source Management Report
- Framework for cooperation between the UNSCEAR secretariat and the ISOE MB to coordinate practical arrangements for periodic collection and exchange of data on occupational radiation exposures at nuclear facilities (**December 2011**)
 - To facilitate systematic and regular provision by ISOE to UNSCEAR of data and information on occupational radiation exposures at nuclear facilities (ISOE objective for data collection is consistent with the UNSCEAR objectives)
 - 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
 - Totals for each reactor type, based on reported data

TCA with the NEI

- Between the ISOE MB and the Nuclear Energy Institute (**November 2014**)
 - ISOE- to co-operate with NEI to develop and maintain an international system for the exchange of information and technical expertise on occupational exposure through the ISOE expert /working group activities. Such activities are established in response to industry needs by the MB.
 - NEI- to co-operate with ISOE because maintaining international excellence in safe and reliable nuclear power plant operations is a key public policy issue for NEI. NEI intends to provide technical expertise and information to ISOE for international harmonization of RP principles and practices.
- Objective: to facilitate the exchange among ISOE and NEI of information and experience on the optimisation of occupational radiation protection in the operation and decommissioning of nuclear power plants according to the agreed terms and conditions (expert /working group activities or organisation of international/ regional events)
- Future plans: TCAs with INPO, EPRI, ORAU, UNESA (ENRESA for decom), WANO

Special Liaison Organisation Status with the ICRP

- ICRP formal relation with organisations (working or high level engagement)
 - 16 international organisations (NEA, IAEA, ILO, WHO, IRPA, EAN, etc.)
- March 2015, ISOE formal application
 - to continue the input for applied radiation protection professionals involved in nuclear power operation and regulation to future ICRP reports, especially during their development
 - Annual reporting of reactor unit doses, key work activities and selected dose rate results,
 - Collection and exchange of good radiological practices and lessons learned,
 - Preparation of expert group reports on a variety of radiation protection issues, and
 - Regional and International ISOE ALARA Symposia where international dose reduction experience is exchanged.
- ISOE has been granted special liaison status, and is listed among the organisations in formal relations with ICRP on 30th of March 2015
- http://www.icrp.org/icrp_group.asp?id=80

Draft Strategic Plan (2016-2019)

- Parallel to the renewal of ISOE T&Cs
- Overview of the direction of the ISOE (fulfillment of mission)
- Goals and the procedures to be used
- Focus on meeting international needs

- **Strategic Plan**
 - meet the expectations of the members (and other customers) of the ISOE programme
 - support the extension of the ISOE to countries newly embarking on the use of nuclear power for electricity generation (and presumably to “nuclear” utilities and authorities which are not yet ISOE members),
 - continue to explore approaches to maintain worker doses ALARA, while considering safety-related and societal (e.g., environmental) challenges, and appropriately addressing economic aspects of electricity generation via nuclear power, and
 - develop collaborative efforts with other appropriate networks and programs

Draft Strategic Plan (2016-2019)

- **Goals**

- Establishment of an Expert Group for Refurbishment Activities and Plant Life Extension. (focus on ORP and potentially on radioactive waste generation and management), completed steam generator or reactor vessel head replacements and other major refurbishment activities (e.g., at PHWR facilities)
 - Intentional review of EGOE Case Study #1 (2010) and “Work Management to Optimize Occupational Radiological Protection at Nuclear Power Plants” (2009), o A first step may be determining whether revisions or addenda to those operating experiences, lessons learned and multi-disciplinary work planning
 - Intentional review of the network/website for improvements (to become the primary “one-stop shop” for relevant inputs)
 - Enhanced use of technical cooperation agreements with appropriate international organizations
- To be reviewed in May 2015 by Bureau and submission of MB approval in Nov 2015

RP Performance Indicators

- Nuclear industry
 - to monitor performance and progress,
 - to set challenging goals for improvement, and
 - to gain
 - additional perspective on performance relative to others
- Collective radiation exposure (used by the ISOE)
- ISOE radar: RP PIs relevant for normal operating conditions as well as anticipated abnormal conditions
- Safety-related performance areas of the plant, including operations, maintenance, worker safety, public safety and compliance, etc.
- Radiation safety-related indicators such as non-compliance with RP procedures, radiation occurrence index, station whole body dose, frequency of exceeding operating emission levels, etc.
- International debate on RP PIs in order to more effectively monitor performance and progress

RP Performance Indicators (Survey)

Draft Qs

- What PIs are primarily used in your organization?
- Have you planned, or do you have any plans, to modify your RP PIs (e.g. either the data used for indicators or the PIs themselves)? If any changes, please provide details (such as the role of PI, selection criteria, functional areas covered, etc.).
- Have you ever communicated your RP PIs with the utility/Regulatory Body? If yes, is this a regulatory requirement, and if so please provide the details of legal reporting requirements.
- Have you contributed your experience to international/national studies of RP PIs? If so, please specify.
- To be reviewed in May 2015 (conduct: through the Q3/Q4 of 2015)

Thank you for
your time

H.Burcin OKYAR
OECD NEA
12, Boulevard des Iles
92130, Issy-les-Moulineaux/ France
Washington, DC, 20006-3708 USA
Tel: +33 (1) 45 24 10 45
E-mail: halilburcin.okyar@oecd.org

More information @

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