

Commemoration of the 20th Anniversary of the Global ISOE Program



David W. Miller, Cook Nuclear Plant, American Electric Power
2012 International ISOE ALARA Symposium,
Ft. Lauderdale, January 8-11, 2012

ISOE Global ALARA Program

- Developed in 1992 by OECD, Nuclear Energy Agency (Paris)
- Four ISOE Technical Centers on Paris, Vienna, Tokyo and University of Illinois
- Power Reactor Section, HPS, supported the concept in 1992 for US RPMs to voluntarily participate in

Annual ALARA Award

- Grew out of experience in studying the Finnish approach to work management
- An annual award could be a vehicle to communicate globally exceptional ALARA performance
- Hopefully, achieve rapid adoption at other ISOE sites
- What was the ISOE Work Management Expert Group Report?

ISOE Expert Group Reports

- US Chaired first international ISOE expert group report on work management at Nuclear Power Plants.
- 12 RPMs participated from Germany, Finland, Sweden, UK, Canada, US, Japan, Spain, etc.

Finland RPMs & Work Management

- The Finnish model of 7 and 12 day refueling outages on alternate years were carefully examined in the report
- Much of the work management report was based on the Finnish approach to work selection, scheduling, planning and execution.
- 104 US reactors went from 80% capacity factors in 1990's to 90% in 2000's based, in part, on Finnish model. Saved the construction of 13 1000 Megawatt plants just by better work management in the US

Need Identified

- The North American Technical Center, ISOE, identified the need to have an international ALARA Symposium annually to provide a forum for exchange of good dose reduction techniques and lessons learned
- The annual Global ALARA Performance Award was to serve as a capstone for the content of the symposia technical exchange forum
- First ISOE International ALARA Symposium was held in Orlando, FL in March, 1997
- Joint Meetings with HPS Midyear meeting occurred in 2001 and 2002 with positive results

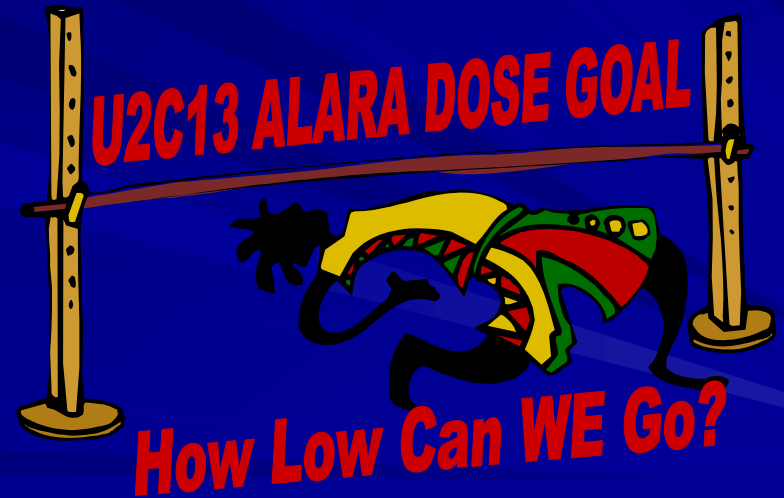
Global ALARA Award

- The NATC board composed of Canadian, Mexican and US RPMs approved the idea of an annual competition for the best example of a site's world class commitment to ALARA.
- The objective was to provide a good “take away” for each plant attending the ISOE international ALARA Symposium

“Take Away” Definition

- “Take Away” is a new dose reduction technique, training tool or ALARA program element that has been proven effective at one ISOE site
- It can be readily tried at all other interested sites to achieve a similar dose reduction

ALARA Logos



Examples

- Five Year ALARA Plan
- Tungsten shielding
- Permanent storage of Scaffolding in containment
- Remote monitoring systems
- Micro ALARA planning
- PWR Reactor Head Replacements Optimization

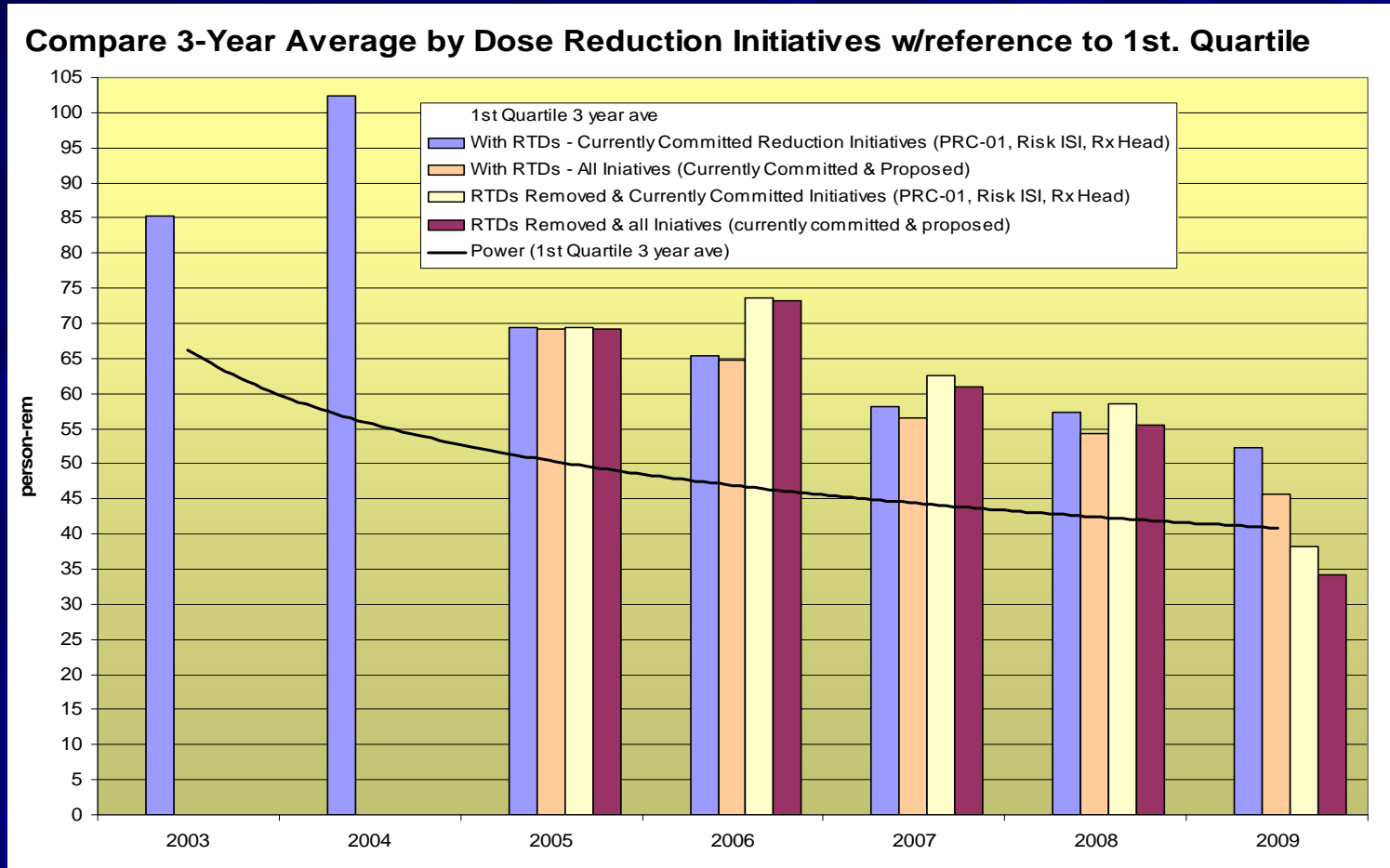
Awardees

- 1997 TVO, Finland- Short outages/ lower outage dose –work management.
- 1999 Peach Bottom, Exelon, Strong ALARA Culture at older BWR
- 2000 Palo Verde, APS –Dose reduction initiatives

Awardee Results, con't.

- 2001 Braidwood, Exelon-ALARA program elements
- 2002 Bryon, Exelon- dedicated refueling tools/materials control facility adjacent to containment
- 2003 Limerick, Exelon-Lowest US BWR outage doses
- 2004 Cook, AEP- 5 yr ALARA Plan, RTD Bypass Line removal & specialty resin results

DC Cook Dose History and Projections



The line in the graph above represents the projected top quartile performance through 2009. The bars indicate DC Cook's performance based upon our actions and depicts the actions required to achieve the desired results. The assumptions and dose reduction actions taken are detailed in section 9 of the 5-Year Plan.

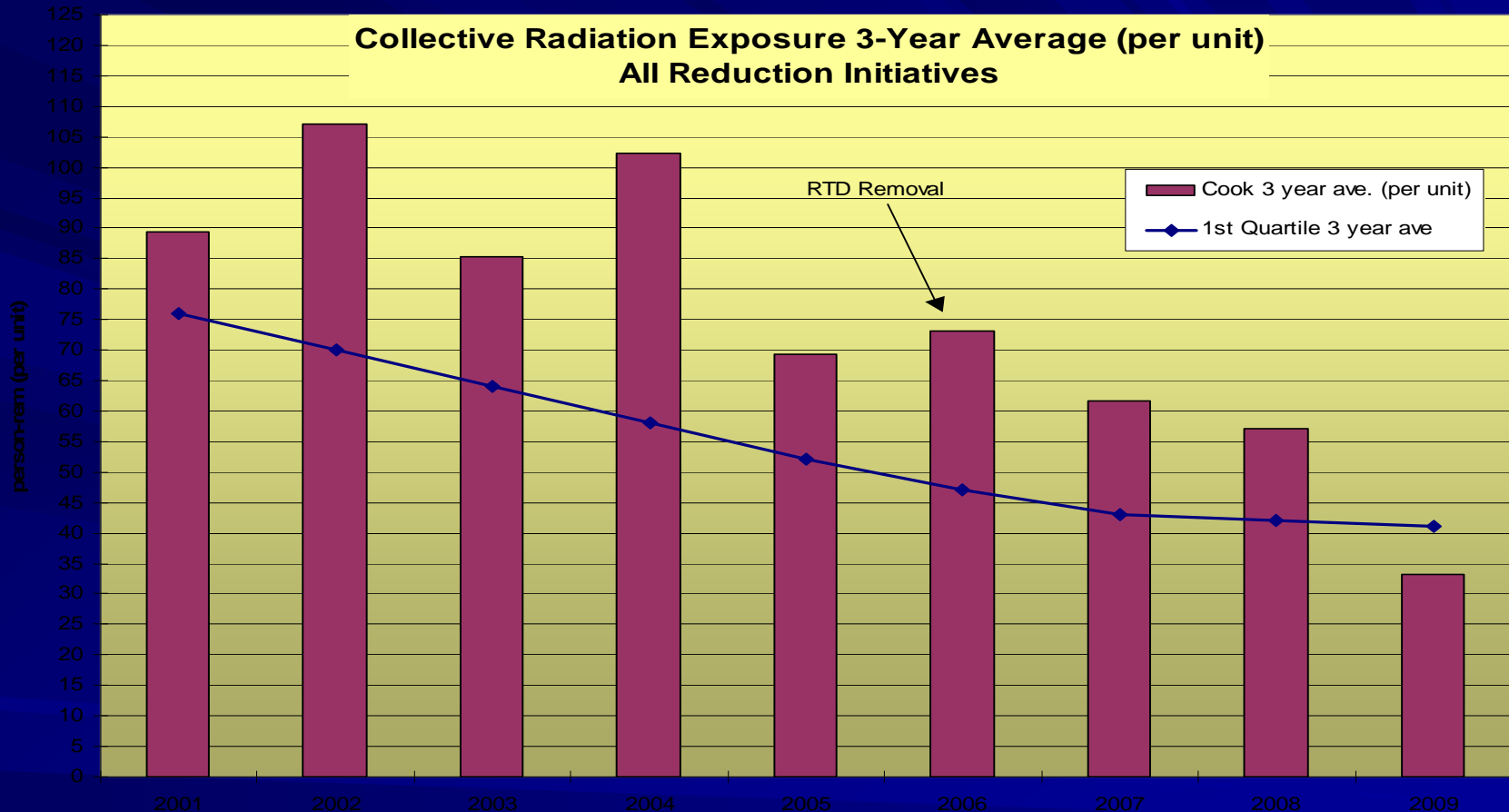
DC Cook Dose History and Projections

Year	Cook 3 year ave. (per unit)	Cook Annual	Cook delta to median	Industry Median	Cook delta To 1st Quartile	1st Quartile 3 year ave
1999	141	171	43	98	63	78
2000	105	338	23	82	26	79
2001	89	27	2	87	13	76
2002	107	278	30	77	37	70
2003	85	206	12	73	21	64
2004	102	130	33	69	44	58
2005	69	79	4	65	17	52
2006	73	230	13	60	26	47
2007	62	61	5	57	19	43
2008	57	52	2	55	15	42
2009	33	86	-20	53	-8	41

Shaded areas are forecasted numbers. Cook's annual dose projections are based upon removal of the RTD Bypass Manifolds and incorporation of the dose reduction initiatives listed in the 5-Year Plan. The projections also assume shorter refueling outage duration and provide the glide path to industry first quartile by 2009.

DC Cook Dose History and Projections

RTD Lines Removed & All Dose Savings Initiatives Incorporated (committed & proposed)



This graph details the red bar from the previous graph. The red bar represents DC Cook's lowest possible dose projections. It represents dose reductions accrued by the removal of the RTD lines and the implementation of the dose reduction initiatives listed in section 9 of the 5 Year Plan.

Awardee's Continued

- 2005 Summer, SCE&GC, specialty resins
- 2006 Vogtle, Southern Nuclear, radworker ALARA Culture
- 2007 Beaver Valley, First Energy – 2 rem/unit operating dose
- 2008 Darlington, OPG, Canada, in-plant tritium mitigation successes
- 2009 Susquehanna, PPL Ltd., lowest BWR BRAC Points dose rates
- 2010 Could be your site!

Selection Criteria

- Significant dose reduction achievement over multiple years
- Practical application to many other LWRs globally
- Use of ISOE network and sharing of ALARA information globally

Judges

- The past 5 RPMs of sites receiving the ISOE world class ALARA award compose the judges for the next year's awardee
- A standardized rating sheet is prepared by each judge and tabulated

Site Photo

- The cover of the syllabus for the annual ISOE ALARA symposia features the site photo of the World Class ALARA winner
- Names of site VP, Plant Manager, RPM, ALARA coordinators, etc. are included on the cover

World Class Award Competition

- Winning site is honored at VIP dinner hosted by Exelon Board Member and keynote speakers
- Awardee site VP generally provides plenary address
- For example, Summer VP stated that ALARA could only happen at his site if he constantly supported it and provided strong funding for ALARA projects

Other Awardee Comments to Symposia

- A site VP spent \$32 million to remove the RTD Bypass lines from lower containment
- Lines were a major crud trap of cobalt activity in lower containment
- Unit 2 of site (Cook) achieved an PWR industry 4 loop outage dose record of 34 person rem in spring 2009
- Site VP brought the site from an INPO 4 to an INPO 1 in 3 years, in part, based on strong site ALARA Culture
- Cook 5 year ALARA Plan shared with other PWR sites including ISOE translations into Japanese & Russian

New ISOE Expert Report on ALARA Considerations for New Plants

- Emphasizes the need to have ALARA Committees conducted by the owner & AE firms during conceptual design, construction and start-up phases

ISOE Website

- New ISOE website contains the ISOE ALARA Library of references related to ALARA design considerations and ALARA operational lessons learned
- www.isoe-network.net

Expansion of ISOE ALARA Symposia

- North American practice of an annual ALARA symposium was expanded to a biannual European starting in 1999
- Japan started annual Asian ISOE ALARA Symposia in 2006
- Vienna will host international ISOE ALARA Symposia in October 2009 at IAEA

Next ISOE Symposia

- September 7-12, 2009 Asian Symposia featuring tour of Japanese Steel Works where reactor vessels are forged
- October 12-15, 2009 International ISOE ALARA Symposia hosted at IAEA by Vienna ISOE Center
- January 12-15, 2010 North American ISOE ALARA Symposia & EPRI RP Conference hosted by NATC at Ft. Lauderdale North Marriott

Application Process

- Apply between February 1-Nov 1
- Application forms available from NATC website hps.ne.uiuc.edu or email dmiller@illinois.edu
- Averages 5 applications per year
- Open to all countries participating in ISOE

- A decade of experience with selection and awarding for the ISOE World Class ALARA Award has served an important role in exchanging exceptional ALARA performance information globally
- The award provides all 433 ISOE reactor units with an annual exceptional ALARA practical that may be applicable to their site
- The award provided important peer RPM recognition of exceptional ALARA performance

Distinguished Paper Awardees

- Angra 1,2 ALARA Programs Successes & Future Initiative, Marcos Amaral, Angra NPP, Brazil
- Initial Implementation of Underwater Remote Dosimetry During Diving in the Spent Fuel Pools, Rich Leasure, RPM Braidwood, Exelon
- Congratulations!

20th Anniversary Testimonials

- Preparing a 20th ISOE Anniversary Report
- 10th ISOE Anniversary Report previously prepared and issued with enthusiastic response.
- Request for benefits received from the global program requested in fall 2011
- Also at this symposium

Dr. John Palms Statement

- “As a long time member first of PECO Corporation’s Nuclear Committee and then on the GENCO Committee of Exelon Corporation and serving at times as Chair of both committees.
- I have benefitted immensely by my continuous attendance at almost all of the USA ISOE-ALARA annual meetings.

Dr. Palms Continued,

- The information presented and exchanged has been invaluable to me as being responsible for the safe operation, maintenance and upgrading of the entire Exelon Nuclear Fleet.
- I strongly recommend board members of other US nuclear utilities attend these meetings and make use of the ISOE web site.

Dr. Palms Continued

- I am deeply appreciative of all those who make ISOE such a useful and very highly valued organization.”

Wataru Mizumachi Testmonial

- “ As the 7th ISOE chairman, I started the International ISOE ALARA Symposium every year by each Technical Center.
- ISOE activities, information exchange, benchmarking visits worldwide and the Symposium made the dramatic improvement on the radiation level whole over the world. I hope these ISOE activities continue forever.”

Wataru Mizumachi, January 10, 2012, Ft. Lauderdale. Fl. USA

Generic ISOE Symposium Trip Report

- Prepared by NATC staff on last day
- Emailed to all attendees
- If authorized by speakers, all papers will be posted on the ISOE website in January
- Accessible to anyone.

Next Symposia

- European ISOE ALARA Symposium, June 20-22, 2012, Prague- Caroline Schieber, ETC
- 2013 International ISOE ALARA Symposium, Japan, Wataru Mizumachi

Thank you

- Thank you to each attendee for making the 2012 International ISOE ALARA Symposium a success
- Thank you to Amy Moeller, NATC Meeting Planner
- Thanks to Bill Green and Derek Hultquist for meeting support
- Safe Travel on your Return Trip
- Come Back in 2013!