



**2014 Winter Meeting
St. Pete Beach, FL
January 28-30, 2014**



2014 Board of Directors

Chairman:

2013-2015 Term

Steve Edelman (717-948-8516) steven.edelman@exeloncorp.com - Three Mile Island

Vice-Chairman

2013-2015 Term

2015-2017 Term as Chairman

Dana Page (803-701-3596) dana.page@duke-energy.com - Catawba Nuclear Station

Secretary

2012-2014 Term

Mark Roberts (815-406-3036) mark.roberts@exeloncorp.com - Byron Station

Treasurer

2013-2015 Term

Steve Lisi (704-875-5124) stephen.lisi@duke-energy.com - McGuire Nuclear Station

Steering Committee "At Large" Members

2013-2015 Term

4 Positions Open

**** Terms begin/end after the Summer Meeting of the year indicated ****



**St. Pete Beach
January 28-30, 2014**

MEETING BOOK INDEX

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PWR RP/ALARA Association Meeting Agenda

St. Pete Beach, Florida - January 2014

Monday, January 27

17:00 – 19:00 Steering Board Meeting & Appetizers

Tuesday, January 28

15:00 – 16:00 Meeting Registration – Grand Ballroom Foyer (Lobby Level)

16:00 – 17:00 Opening Ceremonies & Introduction:

- Welcome – Opening Remarks (Steve Edelman)
- Safety Review – Building escape routes (Dana Page)
- Introductions of Board Members (Steve Edelman)
- Introductions of “First Time” Representatives (Dana Page)
- Introduction of Association Members

18:00 – 19:30 Opening Reception on the Sunset Pavilion

Wednesday, January 29

07:00 – 08:00 Breakfast in Vendor Exhibit Hall (Grand Ballroom)

08:00 – 08:20 Meeting Overview (Steve Edelman)

- Establish Meeting Expectations
- Bench Mark question solicitation
- High Interest Topic Sheets/Program
- Board of Directors election overview
 - Nominations –2 year positions on Steering Board
- Steering Board Directors Report (Mark Roberts)
- Treasury Report (Stephen Lisi)

08:20 – 08:50 Vendor Presentations

08:50 – 10:15 Breakout Session by Plant Type (Document Successes & Challenges and a Golden Nugget)

- 2 Loop Westinghouse
- 3 Loop Westinghouse
- 4 Loop Westinghouse
- 4 Loop ICE
- B & W and CE Plants

- 10:15 - 10:45 **Break / Vendor Interface**
- 10:45 – 12:00 Breakout Sessions by Plant Type (Document Successes & Challenges and a Golden Nugget con't):
- 2 Loop Westinghouse
 - 3 Loop Westinghouse
 - 4 Loop Westinghouse
 - 4 Loop ICE
 - B & W and CE Plants
- 12:00 – 13:00 Lunch
- 13:00 – 13:40 Breakout Session Review (Successes and Challenges)
- B & W and CE
- 13:40 – 14:15 Vendor Presentations
- 14:15 – 14:45 **Break / Vendor Interface**
- 14:45 – 15:00 Presentation of Innovation Award and Career Achievement Award (Steve Edelman)
- 15:00 – 15:30 PWR ALARA Association Group Picture
- 15:30 – 15:40 End of Day Comments / Adjourn Day 2
- 17:00 – 18:30 Vendor Reception

Thursday, January 30

- 07:00 – 08:00 Breakfast in Vendor Exhibit Hall
- 08:00 – 08:10 Meeting Overview
- Board of Directors election
 - Vote –2 year positions on Steering Board
- 08:10 – 09:45 Breakout Session Review (Successes and Challenges)
- 2 Loop Westinghouse
 - 3 Loop Westinghouse
- 09:45 – 10:15 **Break / Vendor Interface**

- 10:15 – 11:10 Breakout Session Review (Successes and Challenges)
- 4 Loop Westinghouse
 - 4 Loop ICE
- 11:10 – 12:00 CZT at Cook (**David Miller**)
- 12:00 – 12:20 Golden Nuggets Review
- 12:20 – 13:20 **Lunch / Passport Drawing**
- 13:20 – 13:30 Steering Board Election results
- Recognize new Steering Board Members
- 13:15 – 14:30 Round Table Discussions
- 14:30 – 15:00 Closing Remarks and Update on the 2014 Summer Meeting (Providence, RI)
- 15:00 – 16:00 Steering Committee Meeting
- Opening Remarks
 - Welcome New Members
 - Review Meeting Critique Sheets
 - Election of Treasurer and Secretary
 - New Business

**PWR RP/ALARA Committee Meeting
January 28-30, 2014
St. Pete Beach, FL
Attendee List by Plant**

ANO

**Ryan Reynolds
Entergy
1448 State Route 333
Russellville, AR 72802
479-858-4456
rreyno2@entergy.com**

**Dan Stoltz
Entergy
1448 State Route 333
Russellville, AR 72802
479-858-7679
dstoltz@entergy.com**

Beaver Valley Power Station

**Jeffrey Fontaine
First Energy
PO Box 4
Shippingport, PA, 15077
724-462-3423
fontainej@firstenergycorp.com**

Braidwood

**Joe Coughlin
Exelon
35100 South Route 53, Suite 84
Braceville,IL 60416
815-417-2722
joseph.coughlin@exeloncorp.com**

**Harry Miller
Exelon
35100 South Route 53, Suite 84
Braceville,IL 60416
815-417-2713
harryl.miller@exeloncorp.com**

**Duke Morrison
Exelon
35100 South Route 53, Suite 84
Braceville,IL 60416
815-417-2241
duke.morrison@exeloncorp.com**

Byron

**Mark Roberts
Exelon
4450 N. German Church Rd
Byron,IL 61010
815-406-3036
mark.roberts@exeloncorp.com**

Catawba

**John Cooper
Duke Energy
4800 Concord Road
York,SC 29745
803-701-3053
john.cooper@duke-energy.com**

**Dana Page
Duke Energy
4800 Concord Road
York,SC 29745
803-701-3596
dana.page@duke-energy.com**

Comanche Peak

**Wayne Mandrell
Luminant
PO Box 1002
Glen Rose,TX 76043
254-897-6711
gerald.mandrell@Luminant.com**

Cook Nuclear Plant

**David Miller
AEP
One Cook Place
Bridgman, MI 49106
217-855-3238
dwmiller2@aep.com**

Corporate Office

Patrick Daly
Exelon
Exelon Corporation
PO Box 805398
Chicago, IL 60680
815 207 0908
patrick.daly@exeloncorp.com

Corporate Office

James Carswell
Southern Nuclear
205-992-5665
jacarswe@southernco.com

Crystal River 3

Larry Reeder
Duke Energy
15760 W. Powerline Street
Crystal River, FL 34428
352-795-6486 ext. 3597
larry.reeder@pgnmail.com

Kenny Young
Duke Energy
15760 W. Powerline Street
Crystal River, FL 34428
352-795-6486 ext. 3281
Kenneth.Young@pgnmail.com

Fort Calhoun Station

Dan Whisler
Omaha Public Power District
PO Box 550
Fort Calhoun, NE 68023
402-533-7136
dwhisler@oppd.com@oppd.com

Harris

Karen Rogers
Duke Energy
5413 Shearon Harris Road
New Hill, NC 27562
919-362-2628
karen.rogers@duke-energy.com

IPEC

Robin Tamburi
Entergy Nuclear Northeast
450 Broadway
Buchanan, NY 10511
914-254-5076
rtambur@entergy.com

Kewaunee

William Lehmbeck
Dominion
N 490, Hwy 42
Kewaunee, WI 54216-9511
920-388-8156
william.l.lehmbeck@dom.com

McGuire

Stephen Lisi
Duke Energy
7800 Hagers Ferry Road
Huntersville, NC 28078
980-878-5124
stephen.lisi@duke-energy.com

Millstone

Donald Delcore
Dominion
PO Box 148 Rope Ferry Road
Waterford, CT 06385
860-447-1791 x6512
donald.w.del.core@dom.com

North Anna Power Station

Robert McNutt
Dominion
PO Box 402
Mineral, VA, 23117
540-894-2610
robert.mcnutt@dom.com

Oconee

Roger Slocum
Duke Energy
7800 Rochester Highway
Seneca, SC 29672
864-873-3218
roger.slocum@duke-energy.com

Palo Verde

Lori Grusecki
APS
5801 S. Wintersburg Road, MS 6265
Tonopah, AZ 85354-7529
623-393-3504
Lori.Grusecki@aps.com

Seabrook

Kinsey Boehl
NextEra Energy
626 Lafayette Road
Seabrook, NH 03874
603-773-7638
kinsey.boehl@fpl.com

Prairie Island

James Blessinger
Xcel energy
1717 Wakonade Drive East
Welch, MN 55089
651-267-6541
james.blessinger@xenuclear.com

Sequoyah

Carl Summers
TVA
Sequoyah Access Road, MS SB2A
Soddy Daisy, TN37379
423-843-8540
cjsummers@tva.gov

Karl Klotz
Xcel energy
1717 Wakonade Drive East
Welch, MN 55089
651-267-6097
karl.klotz@xenuclear.com

Surry Power Station

Tony Hairston
Dominion Generation
5570 Hog Island Rd,
Surry, VA 23883
757-365-3212
anthony.e.hairston@dom.com

Robinson

Paul Manning
Duke Energy
3481 W. Entrance Road
Hartsville, SC 29055
843-857-1287
paul.manning@duke-energy.com

Three Mile Island

Steve Edelman
Exelon
PO Box 480 Middletown, PA 17112
717-948-8516
Steven.Edelman@exeloncorp.com

Salem

Ted Neufang
PSEG
P.O. Box 236 Mail Stop S04
Hancocks Bridge, NJ 08038
856-339-2832
Theodore.Neufang@pseg.com

Vogtle

Clark Bourne
Southern Nuclear
7821 River Road
Waynesboro, GA 30830
706-826-3872
rcbourne@southernco.com

San Onofre

Chris Ahola
SCE
5000 PCH
San Clemente, CA 92672
949-368-7422
chris.ahola@sce.com

Watts Bar

Brett Sumner
TVA
PO Box 2000
Spring City, TN 37381
423-365-1889
basummer@tva.gov

**PWR RP/ALARA Committee Meeting
January 28-30, 2014
St. Pete Beach, FL
Attendee List by Plant**

AREVA

Robin Rogers

AREVA

155 Mill Ridge Road

Lynchburg, VA 24502

434-832-2833

robin.rogers@areva.com

**PWR RP/ALARA Committee Meeting
July 24-26, 2013
Denver, CO
Vendor List by Company**

ACT / Silflex Shielding

Richard Culbertson
Chris Staal
Adrian Stewart
1317 Simpson Way
Escondido, CA 92029
858-213-1162
cubculbertson@cs.com

BHI Energy | Bartlett Nuclear

Bill Peoples
Rick Peck
60 Industrial Park Road
Plymouth, MA 02360
508-591-1149
lauren.buckman@
bhienergy.com

Bloxr Corporation

Mark Milewski
960 W. Levoy Drive
Salt Lake City, UT 84123
801-590-9895
cgreen@bloxr.com

Canberra

Mike Engelsman
David Gebbie
800 Research Parkway
Meriden, CT 06450
203-639-2148
Mike.engelsman@canberra.com

Comtronics Nuclear / Cobalt A/V

David Fried
2350 Fortune Drive
Lexington, KY 40509
800-264-6021
David.fried@comtronicsnow.com

Core VIS

Sam Gomez
5475 Harrisburg Industrial Park
Harrisburg, NC 28075
704-455-1229
gomezs@corevt.com

Day & Zimmerman

John Edwards
John Ellison
Luther Jones
Dave Wilkins
5800 E. Skelly Drive
Tulsa, OK 74135
john.edwards@dayzim.com

Dufrane Nuclear Shielding

Joshua Brooks
Noelle Brooks
Sasha Mansfield
125 Price Road
Winsted, CT 06098
860-379-2318
nbrooks@dufrane.com

Eastern Technologies/OREX

Ray McCullers
Benji McWaters
215 2nd Avenue
Ashford, AL 36312
334-798-1687
bmcwaters@orex.com

Eichrom Technologies/NPO

Mike Davis
Andrew Dockweiller
Earl Jacobson
J van de Linde
1955 University Lane
Lisle, IL 60532
630-963-0320
tgrosrenaud@eichrom.com

Frham Safety Products

Trip McGarity
Robbie Millen
Josh Wilkins
171 Grayson Road
Rock Hill, SC 29732
803-366-5131
trip@frhamsafety.com

Innovative Industrial Solutions

Shane Robinson
Stan Robinson
2830 Skyline Drive
Russellville, AR 72802
479-968-4266
stan.robinson@i-i-s.net

ISEC Industrial Security AB

Anthony Spadaro
Sporthallsvagen 2B
Hoganas SE
ansp@isec.se

Lancs Industries

Scott Williams
12704 NE 124th Street, Bldg 36
Kirkland, WA 98034
623-363-7687
swilliams@lancsindustries.com

Ludlum Measurements

John Anderson, Sr
Mike Shepherd
Mick Truitt
501 Oak Street
Sweetwater, TX 79556
325-235-5494
laplace@ludlums.com

Master-Lee Decon Services

Rick McCormick
Bob Burns
430 Miller Road
Medford, NJ 08055
609-953-3200
mccormick-ml@comcast.net

Mirion Technologies

Jim Gustafson
Dan Ipoletta
5000 Highlands Pkwy, Ste 150
Smyrna, GA 30082

New Green Legacy Services

Robert Moore
Patrick New
3715 Parmly Road
Perry, OH 44081
440-413-2443
Pat.new@newgreenlsi.com

Radeco

Keith Lovendale
Paul Lovendale
17 West Pkwy
Plainfield, CT 06374
860-564-1220
klovendale@radecoinc.com

RPS (Radiation Protection Systems)

David Cruise
John McDonnell
P.O. Box 890
Groton, CT 06340
860-445-0334
hdyouy@radprosys.com

Rolls Royce

Tom Kennedy
6546 Pound Road
Williamson, NY 14519
315-589-4000
Frank.ciulla@rolls-roycenuclear.com

S & W Technologies

Ralph Servati
Jim Wierowski
23 Scarborough Park
Rochester, NY 14625
585-787-9799
jcovert@swtechnologies.com

Scientech/Curtiss Wright

Tom Bernacki
Jim Hedtke
Lisa Littrell
44 Shelter Rock Road
Danbury, CT 06810
860-409-0513
tbernacki@curtisswright.com

Teletrix

Carlos Contreras
Michael Podobnik
PO Box 14209
Pittsburgh, PA 15239
412-798-3636
carlos@teletrix.com

Unitech Services Group

Michael Bernstein
Jan Long
Dave Welcher
295 Parker Street
Springfield, MA 01151
413-543-6911
lperez@unitechus.com

Uticom Systems

Bob Thompson
Jackie Waller
109 Independence Way
Coatesville, PA 19320
610-857-2986
Ben@uticom.net

Vocera Communications

Dave Bingham
Heidi Isaias
525 Race Street
San Jose, CA 95126
408-348-5469
jcrisci@vocera.com



Field Application of CZT Detector for Evaluation of Radiation Source Term

QuickTime™ and a
H.264 decompressor
are needed to see this picture.

Dr. David W. Miller, AEP D.C. Cook
Dr. Zhong He, PhD**, Nuclear Engineering Department,
University of Michigan

PWR ALARA Association Meeting
St. Petersburg, Fl
January 30, 2014




Presentation Outline



- Introduction
 - EdF
 - INPO Event Notice
- Why CZT and Canberra Instrument?
- Radiation Measurement and Performance Metrics
 - Source Term Tracking
- CZT Benchmark Results
 - First Field Trial Turkey Point 3R22
 - DC Cook-1,2
- 3D CZT



INPO Event Notice, July 5th 2011 Inadequate CRE Improvements



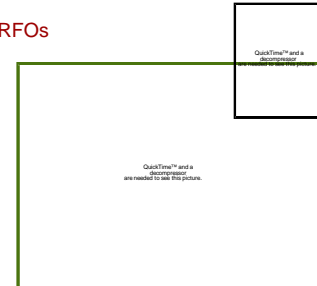
- **“During the past five years, the trend for reducing collective radiation exposure (CRE) has not been acceptable.”**
 - Several units remain well over the current industry CRE goal and have not made significant progress toward reducing collective dose.
 - The boiling water reactors as a group did not meet the 2010 CRE annualized cycle dose goal of less than 120 person-rem”
- **“Two major causes of high collective dose were**
 - elevated radioactive source terms and
 - shortfalls in outage dose reduction planning and work execution.”
- **2010 AFIs Revealing Weaknesses**
 - Source Term Management
 - Outage Dose Reduction Planning



Électricité de France (EDF) Leadership



- **Equipment and Method Developed by Commissariat à l'énergie atomique (CEA)**
 - Licensed to Canberra
- **EdF Plant Aging Program**
 - Deployed to all 58 EdF Nuclear Plants
 - Standard Protocols Measurements ALL RFOs
- **Purpose:**
 - Source Term Changes
 - EPD's and Instrument Cal
 - ALARA
 - Effective Dose Equivalent
 - Component Degradation
 - Dose Reduction Actions



What is CZT?

Cadmium Zinc Telluride (CZT) Gamma Spectroscopy

- **New Gamma Spectroscopy Technology**
 - Identifies Isotopes in Energies between 100 keV to 1800 keV
 - Isotopes ID for NPP:
 - Co-58, Co-60, Ag-110m, Cs-137, Sb-124 & 122, Cr-51, Fe-59, Mn-54, Zn-65
- **Small and Lightweight**
- **Portable**
- **Cost Effective**
- **No Cooling Required**
- **Refueling Outages**
 - 2 day Measurement
 - 2 day Analysis



Operating Characteristics

- **No Cooling Required**
 - Therefore no risk of having the detector compromised because of a lack of adequate cooling
 - The resolution is sufficient for determination of key power plant radioisotopes,
 - cobalts and cesiums, as well as Fe-59, Zn-65 and radioiodines
- **For power plant operations, the ability to have a hand held, easily positioned detector is a premium**
 - spaces are tight, or
 - positioning is difficult due to pipe placement, shielding, or
 - other equipment is challenging the operator's ability to perform quality measurements.

CZT Device and Analysis Energy Fluence vs. Deposited Activity

- **CZT Output:**
 - Gamma Energy Emission
 - Isotopic Identification
- **Needs**
 - Pipewall thickness and diameter
 - Insulation material, if any
 - Station ion chamber results
- **Energy Fluence Rate**
 - MeV/photon
 - Worker Energy Field
- **Results from MicroShield output,**
 - Deposited activity in mCi/cm²
 - Dose contributions from each radioisotope
- **Energy Fluence Rate ≠ Deposited Activity**
 - Co-58 Attenuation ~ 20% to 25% by Pipewall



Benefits: Strength Added to RP and Chemistry Programs


- **Source Term Reduction**
 - Tracking Performance RFO to RFO
 - Sister Plant Comparison
 - Including 58 EdF Units
- **Dosimetry**
 - Electronic Dosimetry
- **ALARA**
 - Shielding
 - Areas Identified for Dose Reduction
- **Instrument Calibration**
- **Component Aging**
 - Isotope Signature

Canberra CZT Gamma Spectroscopy Field Trials



- **Origins at CEA and EdF in France**
 - All EdF sites Have CZT Instrument, 58 units
- **Needed to Trend and Track Source Term Reduction**
- **NPE/Bartlett Nuclear - Field Trials and Measurements**
 - **2005 Turkey Point-3R18- Was First**
 - 2010/2011/2012

| | | |
|----------------------|--------------------|----------------|
| • DC Cook U1C23 | DC Cook U2C19 | Kewaunee |
| • Braidwood A1R15 | Braidwood A2R15 | North Anna |
| • Beaver Valley 1R20 | Beaver Valley-2R15 | Turkey Pt 3R27 |
| • Surry-1 | VC Summer R19 | |
| • Nine Mile Point-1 | Turkey Point 4R26 | |
- **Utility Initiated Field Trials**
 - Byron-1R17 - Dresden - Peach Bottom
 - Quad-Cities - DC Cook 2C20 - Duke (McGuire/Catawba?)

How CZT Field Results Are Used to Benchmark Performance

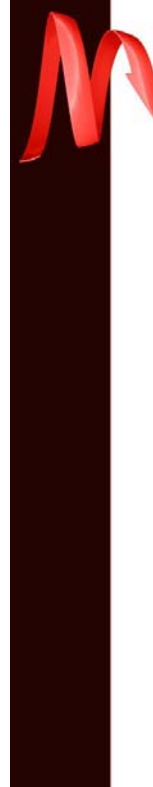
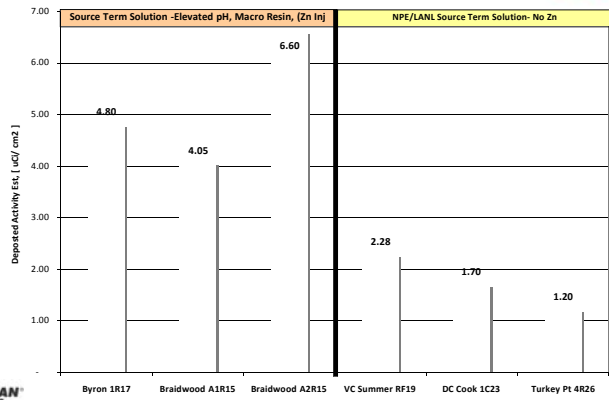


CZT Results - Benchmarks

Co-60 SG Hot Leg Piping Deposited Activity



CZT Co-60 SG Hot Leg Pipe Deposition Results

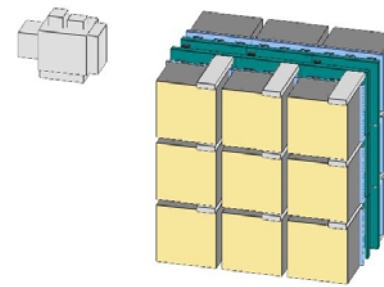


Data Sharing Through ISOE North American Technical Center

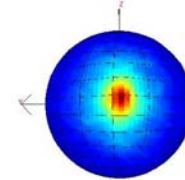
- **Standardized EDF Protocol**
 - Being Implemented in US NPP
 - AEP and Exelon Taking US Leadership.
 - Exelon committed to the process over the next 4 years as an assessment tool for determination of source term reduction success. Others above following suit.

- **IAEA/ISOE Data Base**
 - Director, Dr. David Miller
 - NATC MOU for Data Upload - EdF and US NPP
 - Permits Comparison of Plant Performance
 - Different Source Term reduction strategies and their impacts are measured promptly!

New Development on **Polaris 3D** Gamma-Ray Imaging Spectrometer System



662 keV
0 keV



Number of photons: 2033

Performance Goals:
 $\Delta E/E \leq 1\%$ FWHM
 (at 662 keV)
 Real-time γ Imaging
 + isotope I.D.

Eighteen $2 \times 2 \times 1.5 \text{ cm}^3$ CdZnTe detectors
 (**108** cm^3 , 648 grams = **1.43** lb)

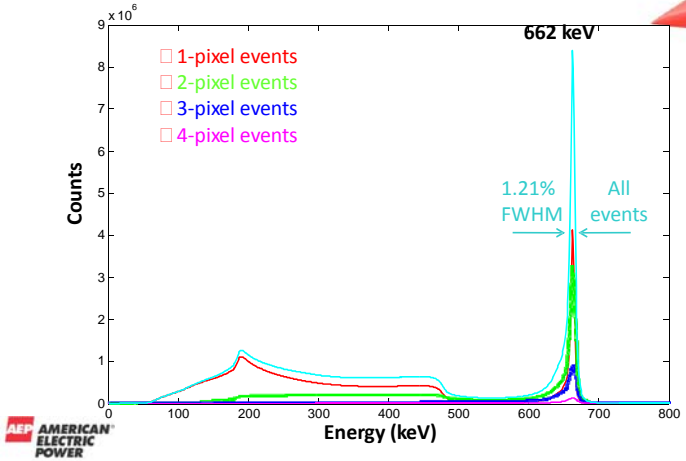
Polaris # 1



AEP AMERICAN ELECTRIC POWER

¹³⁷Cs Energy Spectra of the 2nd Polaris system

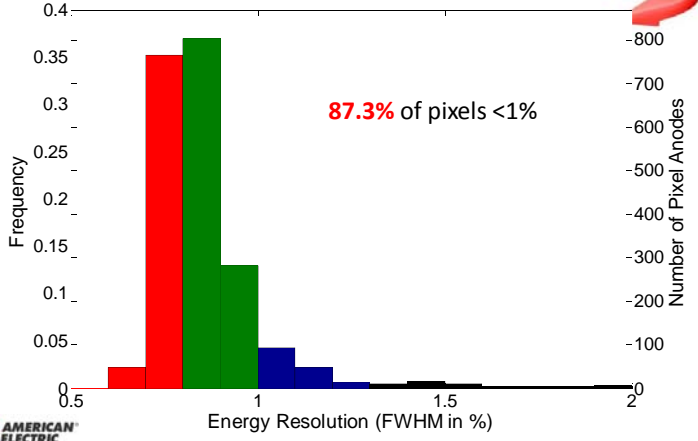
(From all 18 detectors of Polaris, 24°C, uncollimated ¹³⁷Cs)



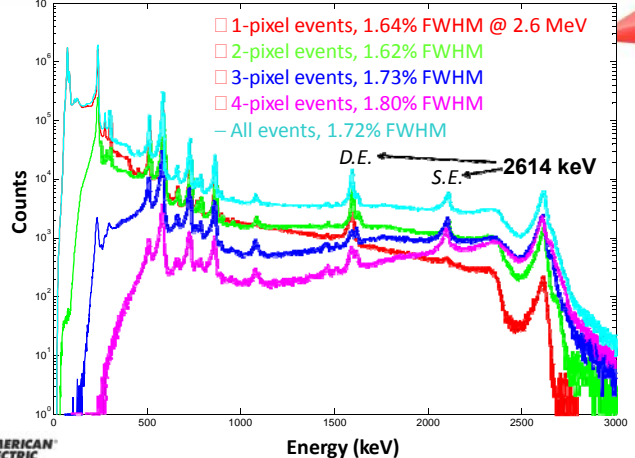
AEP AMERICAN ELECTRIC POWER

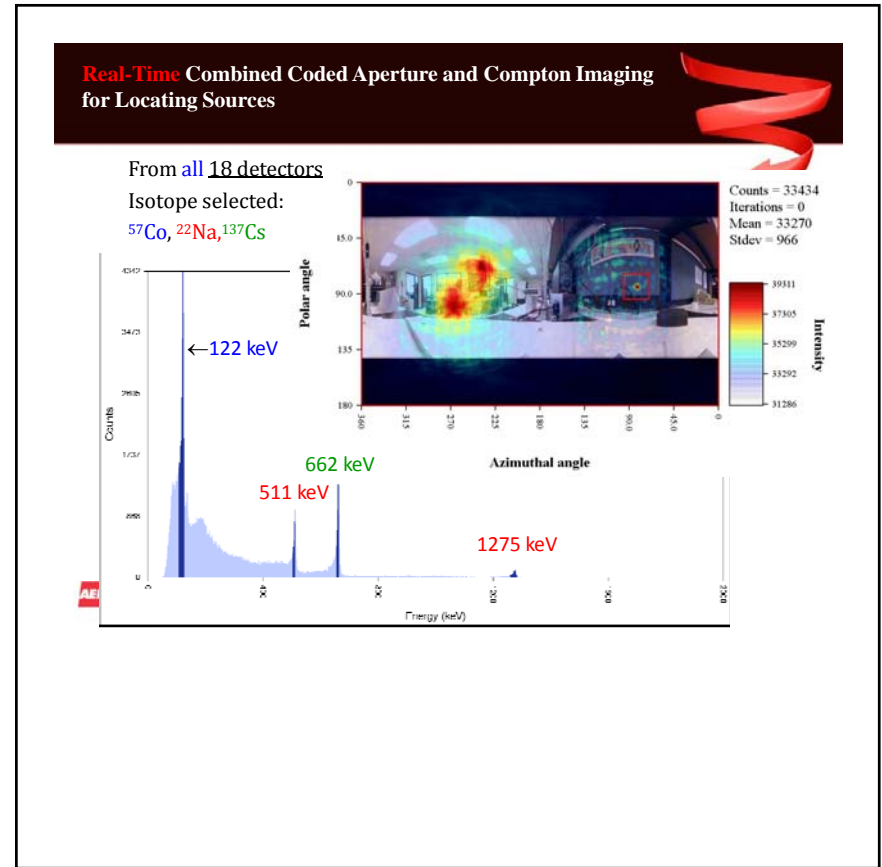
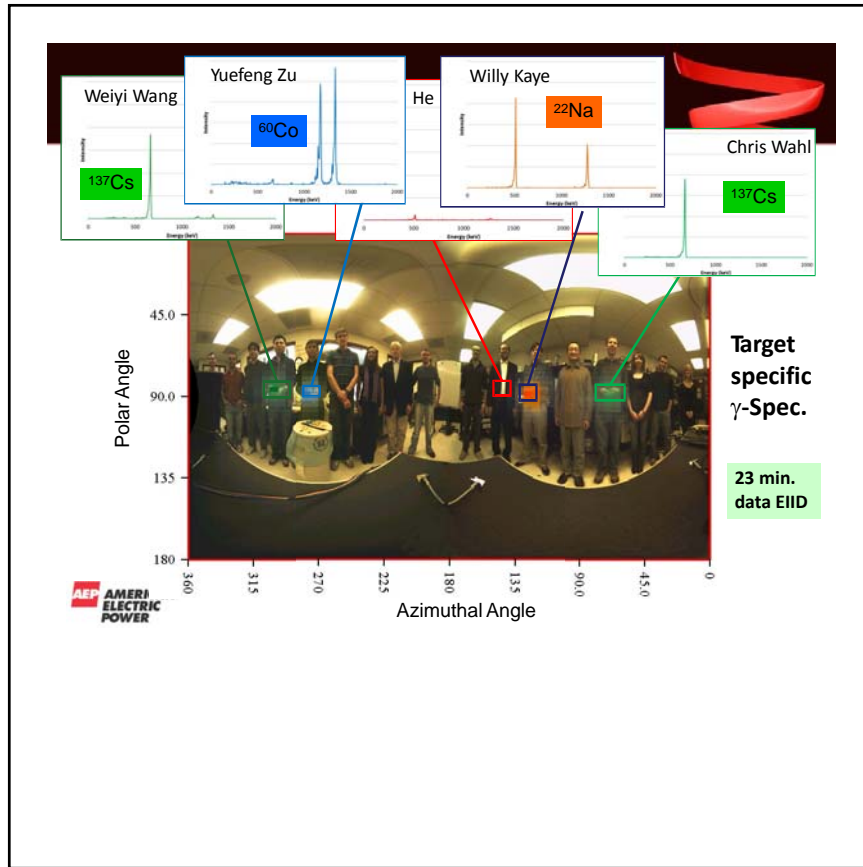
Distribution of Single-Pixel Energy Res. of Polaris #2

(Each Polaris has 2178 pixel anodes, 24°C, uncollimated ¹³⁷Cs source)



²²⁸Th Energy Spectra Polaris-2





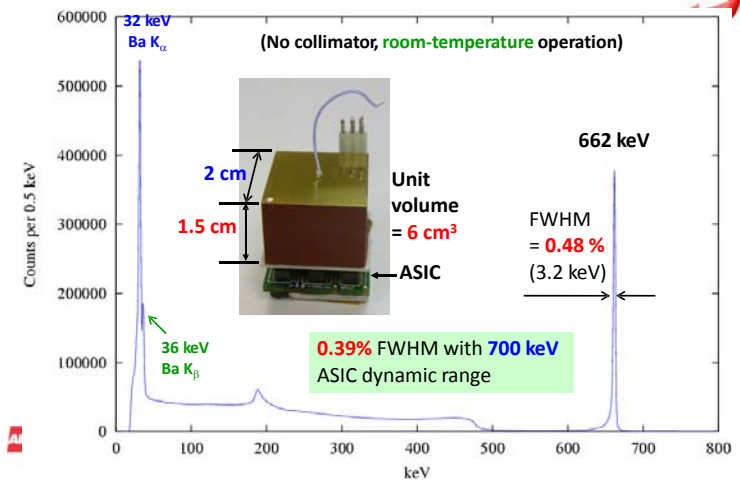
Expected improvements/challenges

- (1) Further improve energy resolution from current
~1.3% FWHM at 662 keV for all events $\rightarrow \leq 1\%$



Single-Pixel ^{137}Cs Spectrum of CdZnTe #4E-1 (121 Pixels)

Seven best Redlen, Inc. detectors: Single-pixel $\Delta E/E \leq 0.6\%$



Conclusions

- Conclusions:

(1) High resolution (<1% FWHM for single pixel events, ~1.3% FWHM for all events) and high relative efficiency (>30%) 3-D CdZnTe γ -ray imaging systems have been developed and operated by independent operators ~2 months in Nevada & ~2 months in Oak Ridge National Laboratory.

(2) The Polaris project funded by DTRA has enabled Redlen to produce $2 \times 2 \times 1.5$ cm³ CZT detectors commercially.

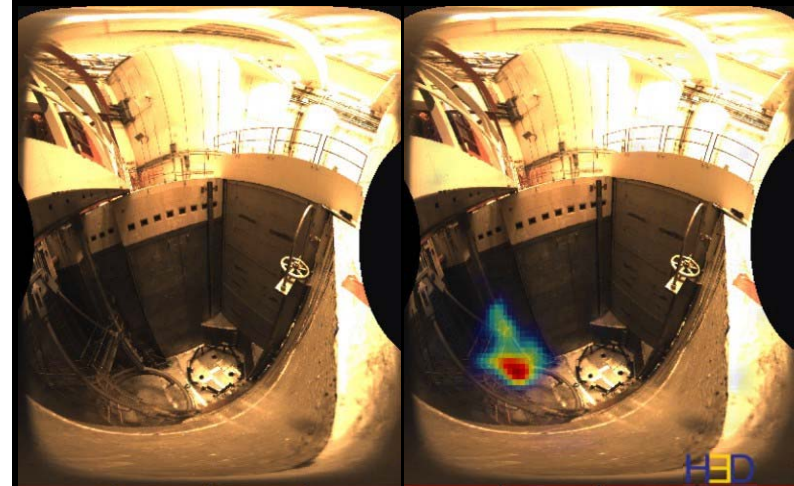
(3) Further performance improvements, such as \rightarrow 0.5% FWHM energy resolution, are achievable.



Initial Measurement of Reactor Cavity

Optical Image

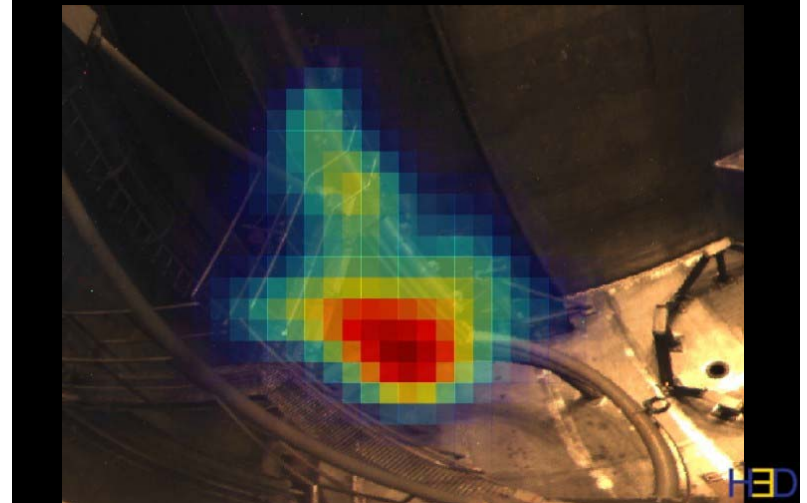
Gamma-Ray Image



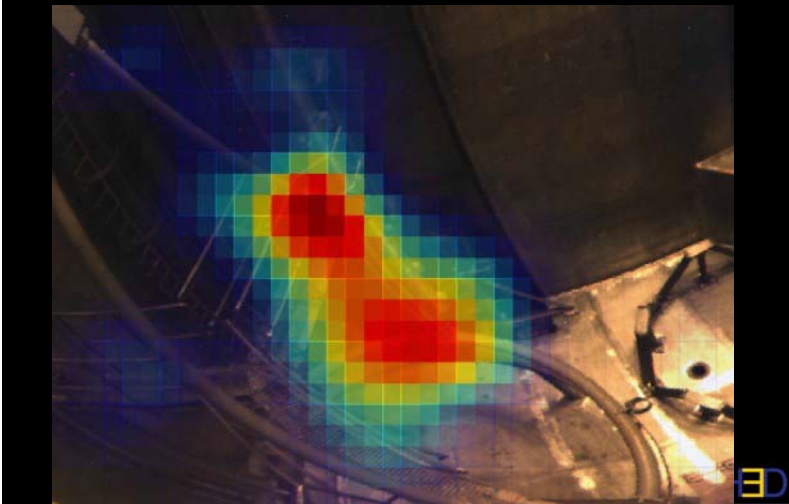
Zoom-View: Optical Image



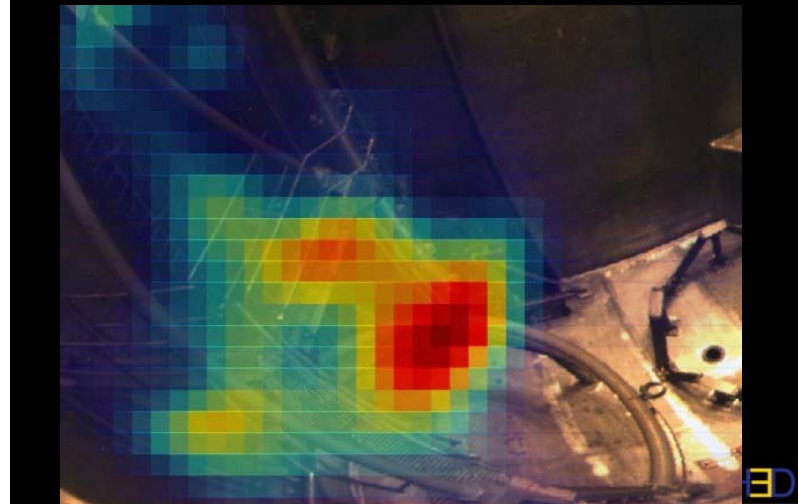
Co-60 (1333 keV) Image Overlay



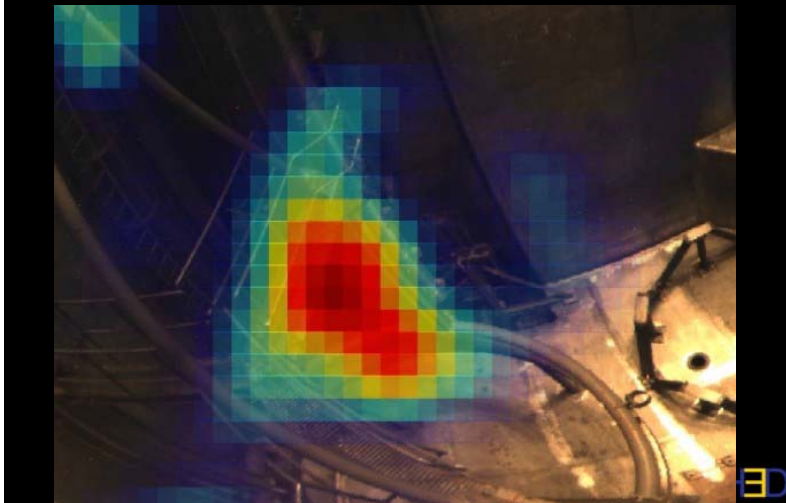
Nb-95? (766 keV) Image Overlay



Co-58 (811 keV) Image Overlay

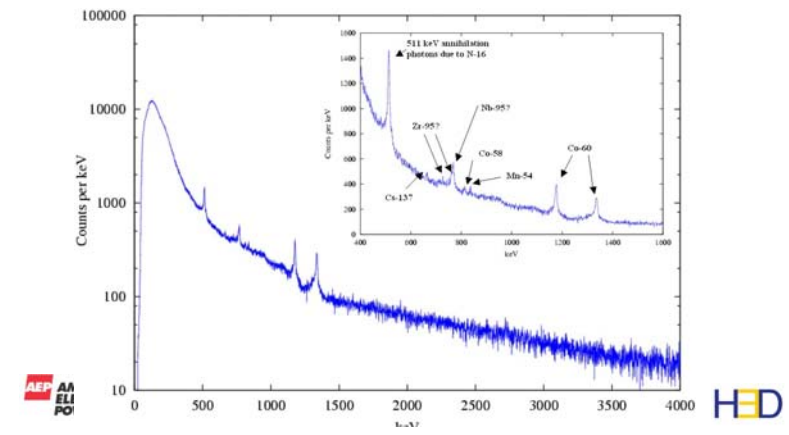


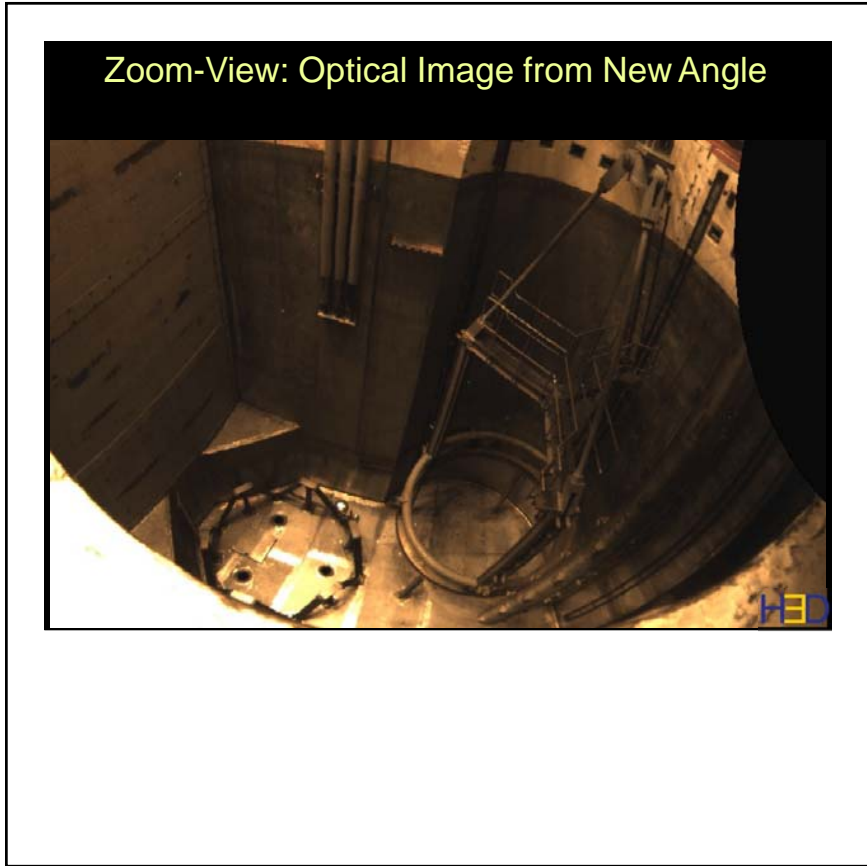
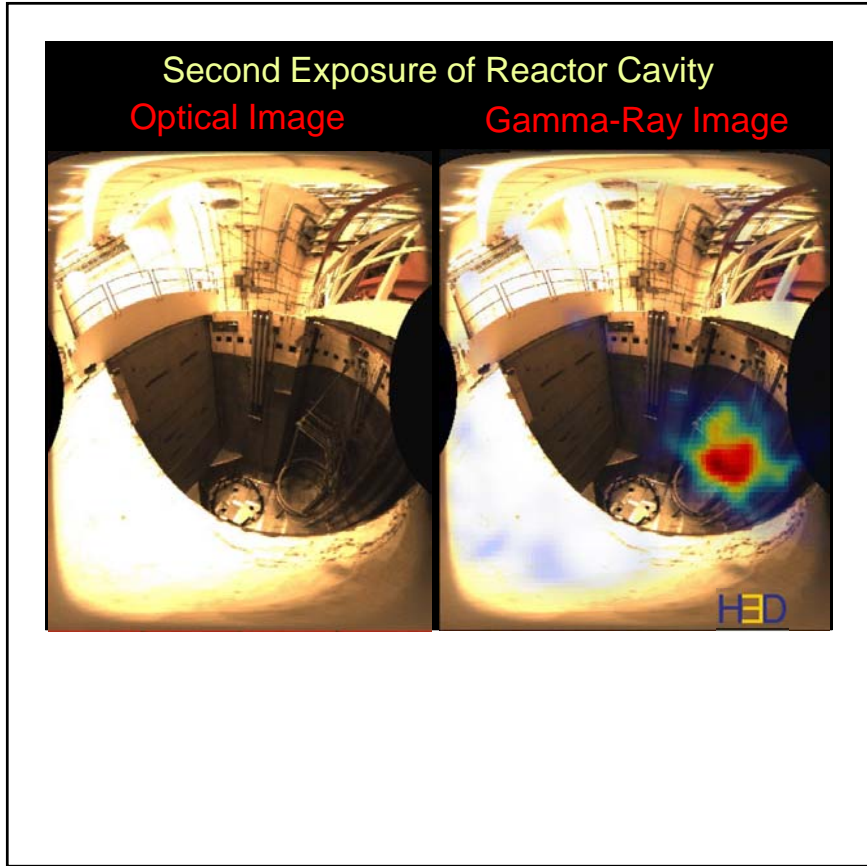
Mn-54 (834 keV) Image Overlay



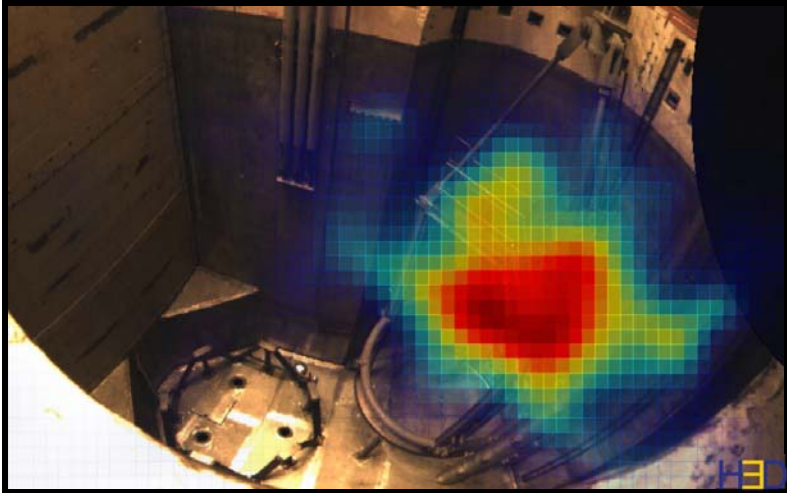
H3D Detector: Second Cavity Measurement

- Energy spectrum after a 35 minute measurement on the opposite edge of the cavity
- At the new angle the intensity of all isotopes has decreased relative to N-16

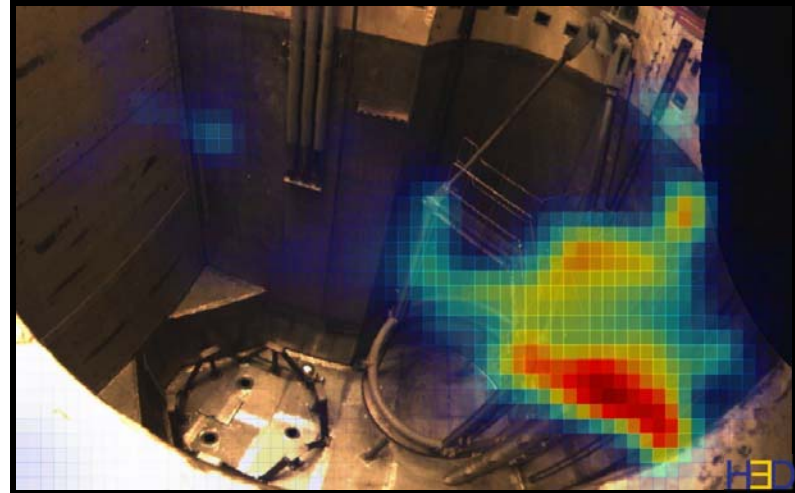




Co-60 (1333 keV) Image Overlay

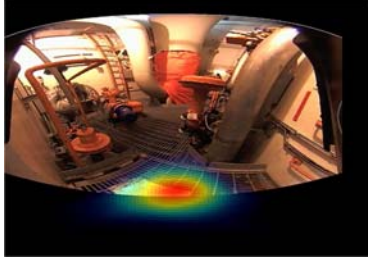


Nb-95? (766 keV) Image Overlay



U1 E RHR Hx Mid-Outage

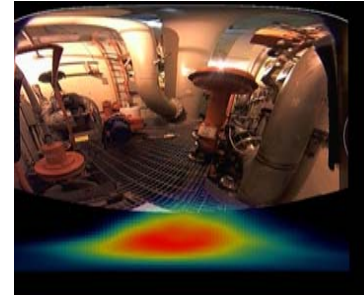
- **Measurement info:**
04-02-2013 13:38:03
(22.2 min) U1 E RHR
Hx
Selected Isotopes in
Post-Processed
Imaging: Cs-137



AEP AMERICAN
ELECTRIC
POWER

U1 E RHR Hx Post-Outage

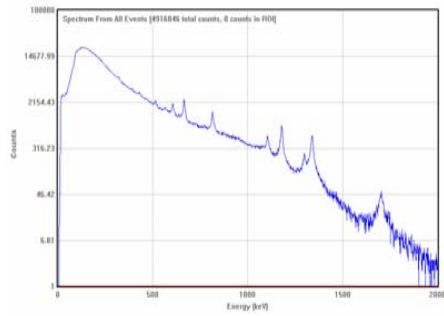
- **Photo Image**
- **Measurement info:**
05-16-2013 12:36:55
(16.5 min) U1 E RHR
Hx GA
Selected Isotopes in
Post-Processed
Imaging: Cs-137



AEP AMERICAN
ELECTRIC
POWER



U1 E RHR Hx Mid-Outage



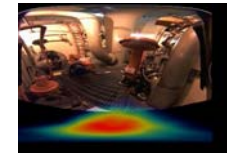
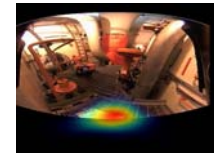
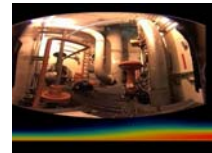
- Measurement info: 04-02-2013 13:38:03 (22.2 min) U1 E RHR Hx
- Isotopes: Co-58, Fe-59, Co-60, Sb-124, Cs-137
- Trace amounts of: Cr-51, Nb-95, Zr-95



U1 E RHR Time-lapse

- Mid-outage Post-outage
- Cs-137

Pre-Outage

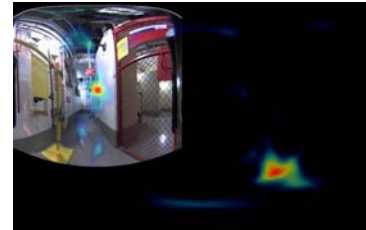


587' Aux building radiation area (RA)

- Image of the hallway next to north waste evaporator filter/pump room. It is the only RA on the 587' level that is
- not located in a room. Current hot spot is 60 mR/hr contact and 5 mR/hr at 30 cm. Cobalt- 60 is concentrated on valve
- 12-WD-322 in the waste disposal system. Cesium-137 is embedded in the floor, walls and piping.



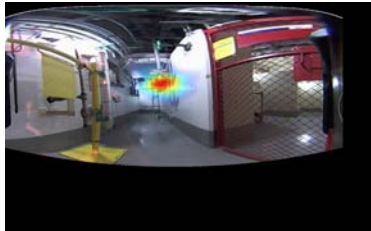
587' Aux RA



- **Measurement info:**
06-03-2013 13:40:32
(11.6 min) N. Waste Evaporator Feed/Filter Pump Room
- **Selected Isotopes in Post-Processed Imaging: Cs-137**



587' Aux RA



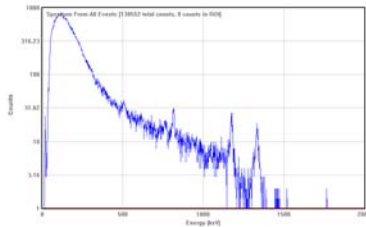
- **Measurement info:**
06-03-2013 13:40:32
(11.6 min) N. Waste
Evaporator
Feed/Filter Pump
Room
- **Selected Isotopes in**
Post-Processed
Imaging: Co-60



- CZT was used throughout the plant and identified a large amount of Cs-137 in beta gamma contamination
 - This confirms that alpha emitters very likely to be present in these areas/in the plant
 - Further justifies the need for the enhanced alpha monitoring program



650' Aux Building



- **Measurement info:**
05-20-2013 15:24:09
(30.5 min) 650'
Elevation O/S Vital
Area
- **Isotopes: Co-58, Co-60**
- **Trace Amounts of:**
Nb-95

AEP AMERICAN
ELECTRIC
POWER

650' Aux Building



- **Measurement info:** 05-20-2013 15:24:09 (30.5 min) 650' Elevation O/S Vital Area
- **Selected Isotopes in Post-Processed Imaging: Co-60**

AEP AMERICAN
ELECTRIC
POWER

650' Aux Building



- **Measurement info:**
05-20-2013 15:24:09
(30.5 min) 650'
Elevation O/S Vital
Area
- **Selected Isotopes in
Post-Processed
Imaging: Co-58**



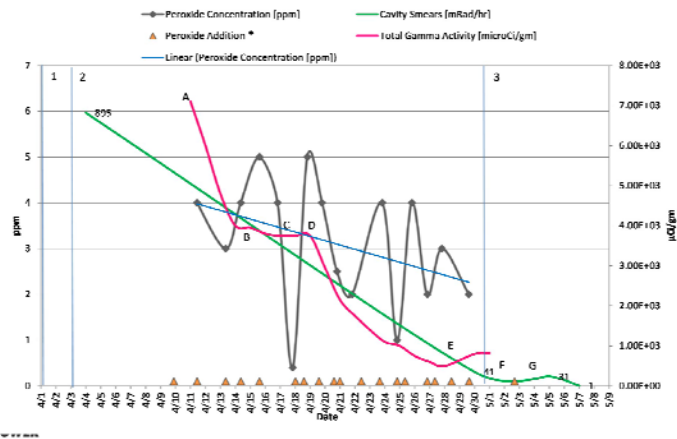
Lessons Learned for Refueling Outage

Reactor cavity clean using peroxide
addition and recirculation of cavity water
through the spent fuel pool demineralizer
using PRC-01 resin was effective
See Graph



Spent Fuel Pool Demin

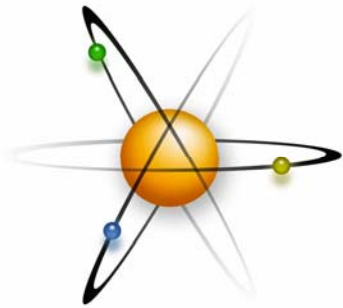
Total Gamma Activity - Reactor Cavity/Refuel Canal 1

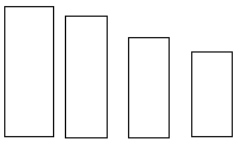


In Memory of Wataru Mizumachi 1942-2013
 College of Engineering ISOE Professional of the Year
 Awardee



Questions?





PWR RP/ALARA
Association

Plant Status Report Questionnaire Winter – 2014

(WINTER MEETING – PROVIDE PREVIOUS YEAR'S DOSE DATA; SUMMER MEETING – YTD DATA)

| | MWe | Cycle # |
|----|------|---------|
| U1 | 1260 | 17 |
| U2 | 1240 | 17 |
| U3 | N/A | N/A |

| Unit 1 | Exposure REM | | | | |
|-----------------|--------------|------|-----------|------|------|
| Power Ops: | 3.222 | YTD | PCES: | 0 | |
| Forced Outage: | N/A | | Reason: | | |
| Refuel Outage: | 42.000 | Est. | Duration: | 23 | Est. |
| | 25.303 | Act. | | 23 | Act. |
| PCEs: | 15 | Est. | 5 | Act. | |
| Lead Installed: | 80,000 | Lbs. | | | |

| Unit 2 | Exposure REM | | | | |
|-----------------|--------------|------|-----------|-----------------|------|
| Power Ops: | 2.478 | YTD | PCES: | 1 | |
| A2M05 Outage: | 1.600 | Est. | Reason: | 2A/2B RCP Seals | |
| | 1.433 | Act. | | 6 days | |
| Refuel Outage: | N/A | Est. | Duration: | | Est. |
| | | Act. | | | Act. |
| PCEs: | | Est. | | Act. | |
| Lead Installed: | | Lbs. | | | |

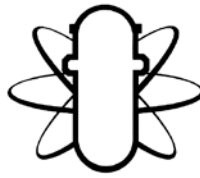
| | YES | NO | Range | Location |
|--------------------------------------|-----|----|----------------------------|--|
| Zinc Add: | X | | U1 = 5 ppb U2 = 5 ppb | U1 = 8 ppb last 3 mo U2 = 10 ppb last 3 mo |
| Specialty Resin: | X | | PRC-01M | U1 On-Line Demin U1 FC Demin U1 Outage Demin U2 On-Line Demin U2 FC Demin U2 Outage Demin |
| Constant modified pH: | X | | 7.4 | It takes 3 months to get to 7.4 |
| Perm Scaffolding: | X | | | Containment / Aux Bldg |
| Perm Shielding: | X | | | Aux Building only |
| Ultrasonic Fuel Clean: | | X | | |
| Reduced Inven. Shutdown Chem: | X | | From 125,000 to 60,000 gal | Have done in past (A1R13/A2R13). On hold until fuel cleaning is performed. |

| X | PLANT |
|--------------------------|--------------------|
| <input type="checkbox"/> | Arkansas Nuc One |
| <input type="checkbox"/> | Beaver Valley |
| X | Braidwood |
| <input type="checkbox"/> | Byron |
| <input type="checkbox"/> | Callaway |
| <input type="checkbox"/> | Calvert Cliffs |
| <input type="checkbox"/> | Catawba |
| <input type="checkbox"/> | Comanche Peak |
| <input type="checkbox"/> | Davis Besse |
| <input type="checkbox"/> | DC Cook |
| <input type="checkbox"/> | Diablo Canyon |
| <input type="checkbox"/> | EDF (France) |
| <input type="checkbox"/> | Farley |
| <input type="checkbox"/> | Fort Calhoun |
| <input type="checkbox"/> | Ginna |
| <input type="checkbox"/> | Indian Point |
| <input type="checkbox"/> | Kewaunee |
| <input type="checkbox"/> | McGuire |
| <input type="checkbox"/> | Millstone |
| <input type="checkbox"/> | North Anna |
| <input type="checkbox"/> | Oconee |
| <input type="checkbox"/> | Palisades |
| <input type="checkbox"/> | Palo Verde |
| <input type="checkbox"/> | Point Beach |
| <input type="checkbox"/> | Prairie Island |
| <input type="checkbox"/> | Ringhalls (Sweden) |
| <input type="checkbox"/> | Robinson |
| <input type="checkbox"/> | Saint Lucie |
| <input type="checkbox"/> | Salem |
| <input type="checkbox"/> | San Onofre |
| <input type="checkbox"/> | Seabrook |
| <input type="checkbox"/> | Sequoyah |
| <input type="checkbox"/> | Shearon harris |
| <input type="checkbox"/> | Sizewell B (UK) |
| <input type="checkbox"/> | South Texas Proj |
| <input type="checkbox"/> | Surry |
| <input type="checkbox"/> | Three Mile Island |
| <input type="checkbox"/> | Turkey Point |
| <input type="checkbox"/> | VC Summer |
| <input type="checkbox"/> | Vogtle |
| <input type="checkbox"/> | Waterford |
| <input type="checkbox"/> | Watts Bar |
| <input type="checkbox"/> | Wolf Creek |

Prepared By: Harry L. Miller

Date: 1/20/14

This information will be placed in the Committee Meeting Book and made available to all of the PWR RP/ALARA ASSOCIATION members.



Plant Status Report Questionnaire – Winter– Year 2014

(WINTER MEETING – PROVIDE PREVIOUS YEAR’S DOSE DATA; SUMMER MEETING – YTD DATA)

2010 MEMBERSHIP

- Arkansas Nuc One
- Beaver Valley
- Braidwood
- Byron
- Callaway
- Calvert Cliffs
- Catawba
- Comanche Peak
- Crystal River
- Davis Besse
- DC Cook
- Diablo Canyon
- EDF (France)
- Farley
- Fort Calhoun
- Ginna
- Harris
- Indian Point
- Kewaunee
- McGuire
- Millstone
- North Anna
- Oconee
- Palisades
- Palo Verde
- Point Beach
- Prairie Island
- Ringhalls (Sweden)
- Robinson
- Saint Lucie
- Salem
- San Onofre
- Seabrook
- Sequoyah
- Sizewell B (UK)
- South Texas Proj
- Surry
- Three Mile Island
- Turkey Point
- VC Summer
- Vogtle
- Waterford
- Watts Bar
- Wolf Creek
- Areva
- Westinghouse

Station: Comanche Peak

Utility: Luminant

| | NSSS | MWe | Cycle # | Core duty (H/L) |
|----|------|------|---------|-----------------|
| U1 | WEC | 1273 | 17 | H |
| U2 | WEC | 1270 | 14 | H |
| U3 | N/A | N/A | N/A | N/A |

| Unit 1 | Exposure (rem) | |
|-----------------|----------------|------------------------|
| Power Ops: | 6.1 | YTD |
| Forced Outage: | 0.05 | Reason: Leak Repair |
| Refuel Outage: | 66 | Est. Duration: 19 Est. |
| | 38.3 | Act. 21 Act. |
| Lead Installed: | 12000 | Lbs. PCEs: 19 |

| Unit 2 | Exposure (rem) | |
|-----------------|----------------|------------------------|
| Power Ops: | 6.1 | YTD |
| Forced Outage: | 0.04 | Reason: RCP Oil Levels |
| Refuel Outage: | NA | Est. Duration: NA Est. |
| | NA | Act. NA Act. |
| Lead Installed: | NA | Lbs. PCEs: 19 |

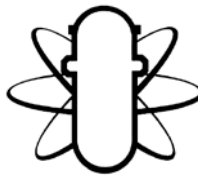
| Unit 3 | Exposure (rem) | |
|-----------------|----------------|---------------------|
| Power Ops: | NA | YTD |
| Forced Outage: | | Reason: |
| Refuel Outage: | | Est. Duration: Est. |
| | | Act. Act. |
| Lead Installed: | | Lbs. PCEs: |

Yes No Yes No Yes No Yes No
 Zinc Add: Ultrasonic Fuel Clean: Reduced Inven. Shutdown Chem:
 Specialty Resin: Macroporous PRC-01 Other: _____ Use On-Line? Yes No
 Constant modified pH: Yes No If yes, range: 7.4
 Perm Scaffolding: Yes No If yes, locations: Loop Rooms, Demin Pits, Penetration Rooms
 Perm Shielding: Yes No If yes, locations: RHR/ SI lines RB, PZR Spy, ECCS affected area

| PCEs (Summer meeting – previous year’s data; Winter meeting – YTD) | | | | |
|--|---------|----------|-----------|-------|
| | Level I | Level II | Level III | Total |
| On-Line | 4 | 0 | 0 | 4 |
| Unit 1 Outage | 19 | N/A | N/A | 19 |
| Unit 2 Outage | N/A | N/A | N/A | N/A |
| Unit 3 Outage | N/A | N/A | N/A | N/A |
| All PCEs | 23 | 0 | 0 | 23 |

Prepared By: Shari Mosty Date: Jan. 06, 2014

This information will be placed in the Committee Meeting Book and made available to all of the PWR RP/ALARA ASSOCIATION members.



Plant Status Report Questionnaire – (Circle one) Winter/Summer – Year [2014]

(WINTER MEETING – PROVIDE PREVIOUS YEAR’S DOSE DATA; SUMMER MEETING – YTD DATA)

2010 MEMBERSHIP

- Arkansas Nuc One
- Beaver Valley
- Braidwood
- Byron
- Callaway
- Calvert Cliffs
- Catawba
- Comanche Peak
- Crystal River
- Davis Besse
- DC Cook
- Diablo Canyon
- EDF (France)
- Farley
- Fort Calhoun
- Ginna
- Harris
- Indian Point
- Kewaunee
- McGuire
- Millstone
- North Anna
- Oconee
- Palisades
- Palo Verde
- Point Beach
- Prairie Island
- Ringhalls (Sweden)
- Robinson
- Saint Lucie
- Salem
- San Onofre
- Seabrook
- Sequoyah
- Sizewell B (UK)
- South Texas Proj
- Surry
- Three Mile Island
- Turkey Point
- VC Summer
- Vogtle
- Waterford
- Watts Bar
- Wolf Creek
- Areva
- Westinghouse

Station: McGuire

Utility: Duke Energy

| | NSSS | MWe | Cycle # | Core duty (H/L) |
|----|-------|-----|---------|-----------------|
| U1 | West. | 120 | 21 | H |
| U2 | West. | 120 | 20 | H |
| U3 | | | | |

| Unit 1 | Exposure (rem) | |
|-----------------|----------------|--------------------------|
| Power Ops: | 10.457 | YTD |
| Forced Outage: | 0.132 | Reason: |
| Refuel Outage: | 70.778 | Est. Duration: 32.1 Est. |
| | 92.040 | Act. 37.56 Act. |
| Lead Installed: | 97626 | Lbs. PCEs: 35 |

| Unit 2 | Exposure (rem) | |
|-----------------|----------------|---------------------|
| Power Ops: | 6.741 | YTD |
| Forced Outage: | 0 | Reason: |
| Refuel Outage: | | Est. Duration: Est. |
| | | Act. Act. |
| Lead Installed: | | Lbs. PCEs: |

| Unit 3 | Exposure (rem) | |
|-----------------|----------------|---------------------|
| Power Ops: | | YTD |
| Forced Outage: | | Reason: |
| Refuel Outage: | | Est. Duration: Est. |
| | | Act. Act. |
| Lead Installed: | | Lbs. PCEs: |

Zinc Add: Yes No
 Ultrasonic Fuel Clean: Yes No
 Reduced Inven. Shutdown Chem: Yes No
 Specialty Resin: Macroporous PRC-01 Other: _____ Use On-Line? Yes No
 Constant modified pH: Yes No If yes, range: 6.9 - 7.15
 Perm Scaffolding: Yes No If yes, locations: Scaffold stored in Incore Sump Room
 Perm Shielding: Yes No If yes, locations:

| PCEs (Winter meeting – previous year’s data; Summer meeting – YTD) | | | | |
|--|---------|----------|-----------|-------|
| | Level I | Level II | Level III | Total |
| On-Line | 16 | 1 | 1 | 18 |
| Unit 1 Outage | 32 | 3 | | 35 |
| Unit 2 Outage | | | | |
| Unit 3 Outage | | | | |
| All PCEs | 48 | 4 | 1 | 53 |

Prepared By: Stephen Lisi Date: 1/6/14

This information will be placed in the Committee Meeting Book and made available to all of the PWR RP/ALARA ASSOCIATION members.

HIGH INTEREST TOPIC AND QUESTIONNAIRE
PWR ALARA Association St. Pete Beach, FL January 28-30, 2014

Topic:

| Contact (Name) | Plant | NSSS | Comments |
|----------------|--------------------|------------|----------|
| | GINNA | 2LW | |
| | Kewaunee | 2LW | |
| | Point Beach 1,2 | 2LW | |
| | Prairie Island 1,2 | 2LW | |
| | Ringhals 2,3,4 | 2LW 3LW | |
| | Beaver Valley 1,2 | 3LW | |
| | Farley 1,2 | 3LW | |
| | Harris | 3LW | |
| | North Anna 1,2 | 3LW | |
| | Robinson | 3LW | |
| | Surry 1,2 | 3LW | |
| | Turkey Point 1,2 | 3LW | |
| | VC Summer | 3LW | |
| | Braidwood 1,2 | 4LW | |
| | Byron 1,2 | 4LW | |
| | Callaway | 4LW | |
| | Catawba 1,2 | 4LW | |
| | Comanche Peak 1,2 | 4LW | |
| | Cook 1,2 | 4LW | |
| | Diablo Canyon 1,2 | 4LW | |
| | Indian Point 2,3 | 4LW | |
| | McGuire 1,2 | 4LW | |
| | Salem 1,2 | 4LW | |

Return completed form to the Committee Secretary prior to the end of the meeting so that it may be included in the meeting report.

HIGH INTEREST TOPIC AND QUESTIONNAIRE
PWR ALARA Association St. Pete Beach, FL January 28-30, 2014

| Topic: | | | |
|----------------|---------------------|------------|----------|
| Contact (Name) | Plant | NSSS | Comments |
| | Seabrook | 4LW | |
| | Sequoyah 1,2 | 4LW | |
| | Sizewell B | 4LW | |
| | South Texas 1,2 | 4LW | |
| | Vogtle 1,2 | 4LW | |
| | Watts Bar | 4LW | |
| | Wolf Creek | 4LW | |
| | Millstone 3,2 | 4LW, CE | |
| | Calvert Cliffs | CE | |
| | Ft. Calhoun | CE | |
| | Palisades | CE | |
| | Palo Verde 1,2,3 | CE | |
| | San Onofre 2,3 | CE | |
| | St.Lucie 1,2 | CE | |
| | Waterford | CE | |
| | ANO 2,1 | CE, B&W | |
| | Crystal River | B&W | |
| | Davis Besse | B&W | |
| | Oconee 1,2,3 | B&W | |
| | TMI | B&W | |
| | Areva | | |
| | EDF | | |
| | Westing- house | | |



Winter 2014 St. Pete Beach, FL January 28-30, 2014

MEETING CRITIQUE

| |
|-----------------|
| Optional |
| Name: _____ |
| Utility: _____ |

The goal is to meet your expectations regarding this meeting. Please help us by providing your comments and suggestions regarding the following:

Plant Status Report: _____

Technical Content: _____

Vendor Participation: _____

Meeting Format (Breakout Session vs. Presentation, etc.): _____

Facilities (Meeting Room, Hotel Facilities, Location, etc.): _____

Please list any topics you would like to see the Board address in the future. Also include specific recommendations relative to the suggested presentation format, where possible (e.g. breakout session, technology presentation, survey, etc.): _____

Please provide suggestions for Board activities or actions which would help justify your company's continued participation in the PWR/ALARA Association: _____

Other Comments: _____

Do you anticipate your plant being represented by you or another representative at the Summer 2014 Meeting ? _____ If not, why?
