October 5, 2020

Created by Pamela A. Powell

Site ALARA Committee & Change Control Board Meeting

The Site ALARA Committee and Change Control Board held a teleconference.

Rollcall was performed and Quorum was met for the SAC and CCB. (See Attached)

1) Introduction: Kent Williams

Kent welcomed everyone to the meeting.

2) Environmental ALARA: Teresa Eddy

Teresa gave an overview of Liquid and Airborne ALARA guides status through April (See attached).

Question was asked if there were any areas of concern for the guides. It was stated that there is a exceedance investigation in process for A Area Liquid Effluent outfall for TC-99. The exceedance is primarily due to debris in the outfall. There may be a request for an increase in guide prior to the end of the year. Dennis Carr requested a copy of the exceedance report when it is released.

3) SRS Neutron Dose: David Roberts

David Roberts gave a presentation on neutron dose for the site. (See Attached). He explained the investigations that were conducted.

Question was asked were there any peer checks done on the establishment of Minimum Reportable Dose (MRD). It was stated that technical reports were written, peer reviewed and signed my management.

Question was asked were MRDs at other sites looked at. It was stated that the neutron dose was based on source term in the facilities, but that it could be worth looking at other sites MRD values.

Question was asked how is the neutron dose from Panasonic dosimetry versus current dosimetry. It was stated that the dose from quarter 4 2019 was comparable.

Question was asked if employee that has not entered a rad area or signed in on an RWP is assigned dose. It was stated that employee is assigned dose unless it is attested and a REDI is performed by facility RPD.

4) Review of 2nd Quarter Performance: Pamela Powell

2nd Quarter PI were reviewed (See Attached)

Centerra Target 2.625 Actual 4.168 +58.78
Joyce Hopperton stated that when planning goals for 2020 it was not taken into consideration the EA site visit. Dose for the reminder of the year should be normal. No changes requested to goals at this time.

SRNL Target 14.0 Actual 5.017 -64.16
Jamie Willing discussed the decrease in work due to COVID posture and less Dosimetry being issued. No changes to goals requested at this time.

HCA Target 7.775 Actual 5.734 -26.25
Johnny Lott discussed the decrease in work due to COVID. No changes to goals requested at this time.

FCA Target 1.272 Actual .505 -60.39
Verne Moonyhan discussed the decrease in work due to COVID. No changes to goals requested at this time.

L Area Target 1.5 Actual .638 -57.47
No L Area representative present at the meeting.

Trit Target `1.989 Actual 1.022 -48.62
Adam Reese discussed that Tritium did not receive as much dose from extractions, cutterhead work, and waste cask work as planned. No changes to goals requested at this time.

LWO WT Target 20.20 Actual 5.119 -74.78
LWO TF Target 38.78 Actual 19.502 -49.71

LWO submitted a request to decrease their goals.

LWO Total – 55.5
WT – 15.3
TF – 40.2

Reduction was approved per the board.

Kent Williams concluded the meeting by reminding everyone to ensure that personnel are returning quarter 3 badges as soon as possible. Richard Sprague discussed starting to look at planning ALARA goals for 2021, but to not consider COVID as an impact for work performance.

SITE ALARA COMMITTEE
&
CHANGE CONTROL BOARD

ATTENDANCE ROSTER

Meeting Date: 10/05/2020 **Quarter/Year:** Q2/2020

	Chair		Alternate
✓	Dennis Carr	____	Wyatt Clark
____	Doug Bumgardner (Vice Chair)	____	John Gall

	SAC Voting Member		Alternate
✓	Kent Williams (Ex. Secretary)	✓	Roy Windham
✓	Richard Sprague (ESH&Q)	____	Mary Flora
____	Deborah Solomon (SRTE)	✓	Ruby Parks
✓	Verne Mooneyhan (SWM/TRU)	____	Robert Minnick
✓	Steve Wilkerson (NMD)	____	Nicholas Miller
✓	Janice Lawson (NMSP)	____	Durwood Melvin
✓	Geoffrey Smoland (SRNL)	____	Scott Craft
✓	Doug Bumgardner (TF)	____	
✓	Joel Cantrell (WT)	____	
____	William Harris		
____	John Gall (LWO RPD)	✓	Carol Hunter
____	Tim West (EC&ACP)	____	

Quorum Requirements: SAC = Chair/Vice Chair + 7 other members* = 8 total

Member may be represented by designated alternate. At least 2 members from each company are required for an official vote. CCB = Chair/Vice Chair + 5 other members = 6 Total May be represented by designated alternate.

Quorum Met SAC: (Yes) No

Quorum Met CCB: (Yes) No

SITE ALARA COMMITTEE
&
CHANGE CONTROL BOARD

ATTENDANCE ROSTER

Other Meeting Attendees (print name)

Teresa Eddy
Kevin Webster
Todd Brantley
Carol Hunter
Sheila Bartlett
Tommy Chalker
Cathy Torres
Kenny Dukes
Charles Cothran
Paul Bordon
Natalie Glover
Susie Spires
Jamie Willing
Page Courtney
Johnny Lott
Wendy Hurtich
Joyce Hopperton

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2nd Quarter Site ALARA Committee Meeting

Kent Williams

Radiological Protection Director

Savannah River Nuclear Solutions, LLC

October 5, 2020

2nd Quarter Review

Teleconference

AGENDA

1.	Introduction	Kent Williams
2.	Environmental ALARA	Teresa Eddy
3.	SRS Neutron Dose	David Roberts
4.	2nd/3rd Qtr. Performance Indicators	Pamela Powell

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Environmental ALARA Update

Teresa Eddy
Environmental ALARA Chairperson
Savannah River Nuclear Solutions, LLC
September 2020

CY2020 Liquid ALARA Guides Status – June 2020

Area	YTD TED (mrem)	Projected Annual TED (mrem)	Guide (mrem)	YTD % of Guide
A-Area	1.11E-05	2.22E-05	6.00E-05	18.5%
F-Area	3.16E-05	6.31E-05	5.20E-04	6.1%
F-Tk Farm	3.46E-04	6.91E-04	1.00E-03	34.6%
H-Area	8.09E-05	1.62E-04	1.04E-03	7.8%
H-ETP	4.51E-04	9.03E-04	7.25E-03	6.2%
H-Tk Farm	1.43E-03	2.87E-03	8.65E-03	16.6%
K-Area	0.00E+00	0.00E+00	8.55E-06	0.0%
L-Area	6.81E-06	1.36E-05	7.08E-05	9.6%
S-Area	9.75E-07	1.95E-06	1.50E-04	0.7%
Tritium	2.49E-05	4.97E-05	3.00E-04	8.3%
Site Totals	2.39E-03	4.77E-03	1.90E-02	12.5%

CY2020 Airborne ALARA Guides – June 2020

Area	YTD TED (mrem)	Projected Annual TED (mrem)	Guide (mrem)	YTD % of Guide
A-Area	3.03E-08	6.06E-08	5.11E-02	0.0%
C-Area	4.78E-05	9.57E-05	2.31E-04	20.7%
F-Area	6.77E-05	1.35E-04	1.40E-03	4.8%
H-Area	1.05E-05	2.11E-05	5.00E-03	0.2%
H-ETP	0.00E+00	0.00E+00	1.00E-07	0.0%
H-Tk Farm	1.01E-09	2.02E-09	1.00E-06	0.1%
J-Area	1.33E-10	2.65E-10	5.00E-06	0.0%
K-Area	8.64E-04	1.73E-03	4.05E-03	21.3%
L-Area	9.83E-04	1.97E-03	4.50E-03	21.9%
S-Area	3.82E-07	7.65E-07	5.00E-05	0.8%
Tritium	5.01E-03	1.00E-02	8.95E-02	5.6%
Z-Area	1.29E-08	2.59E-08	5.00E-06	0.3%
Site Totals	6.99E-03	1.40E-02	1.56E-01	4.5%

David W. Roberts
External Dosimetry Group Lead

SRS Neutron Dose

October 5th, 2020

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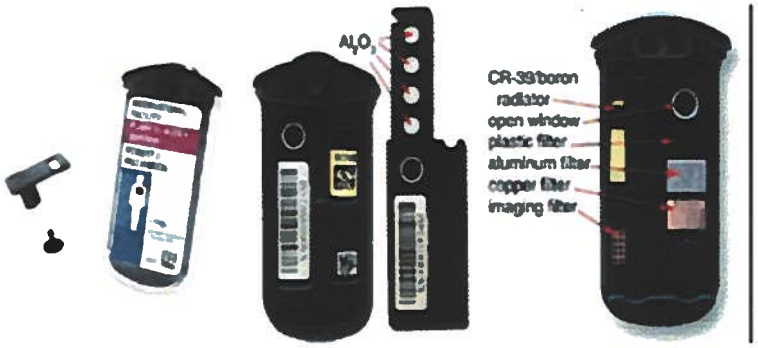
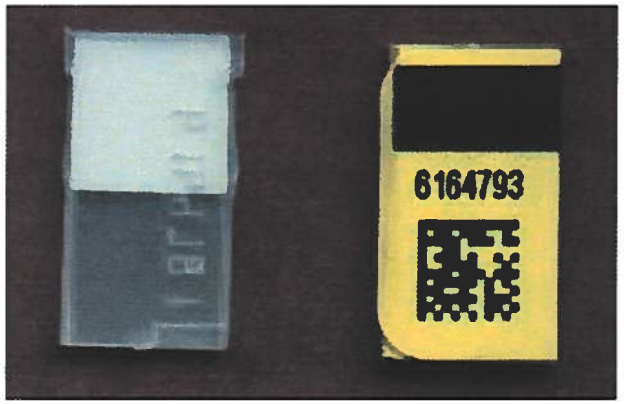
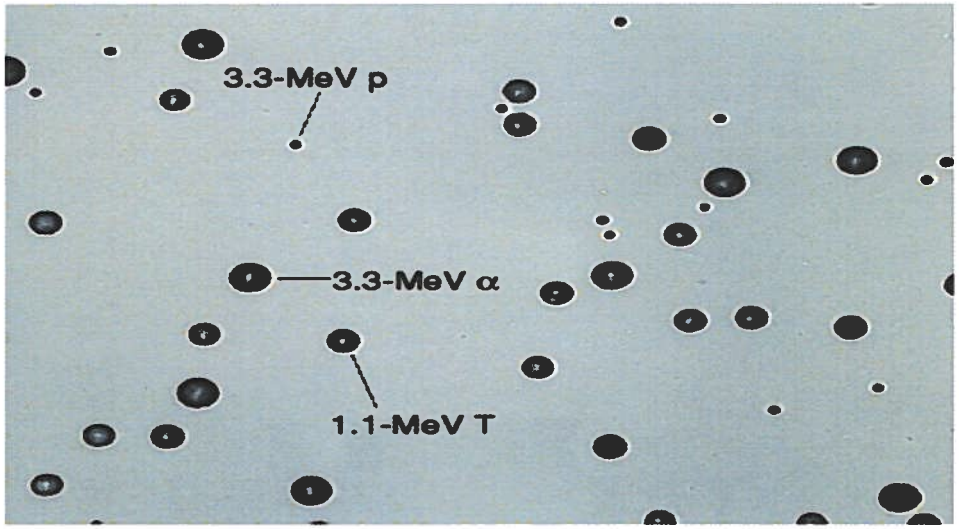
CR-39 Neutron Dosimeter Overview

- Left side of the CR-39 chip is covered with polyethylene and is used determine the Fast Neutron dose
- Right side of the CR-39 is covered with of boron loaded Teflon and is used to determine the Thermal Neutron dose
- Particle tracks are enlarged by etching the CR-39 in caustic NaOH solution. After etching the tracks are counted using the RadOsys Automated Counting System





CR-39 Neutron Dosimeter Overview



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Dosimeter Accreditation

- Landauer is NVLAP accredited and participates in DOELAP Proficiency Testing
- SRS External dosimetry is DOELAP accredited and has responsibility for ensuring Landauer meets the requirements established by DOELAP
- SRS External Dosimetry received DOELAP accreditation on December 9, 2019
- Landauer completed the required DOLAP proficiency testing on January 15, 2019
- SRS External Dosimetry is required to conduct "Blind Spike" audits for all accredited categories within a two-year period

Table 1. Whole Body Dosimeter DOELAP Categories

Testing category		InLight 2T
IA	Accident, photons: General	X
IIA	Photons/photon mixtures: General	X
IID	Photons/photon mixtures: Pu Specific	X
IIIA	Betas: General	X
IIID	Betas: Uranium slab	X
IVA-1	Photon/beta mixtures: IIA + IIIA	X
IVA-4	Photons/beta mixtures: IID + IIIA	X
IVD-1	Photon/beta mixtures: IIA + IIID	X
IVD-4	Photon/beta mixtures: IID + IIID	X
VA-1	Neutron/photon mixtures: IIA + Gen Neutrons	X
VA-4	Neutron/photon mixtures: IID + Gen Neutrons	X

Q1 2020 Neutron Dose

- Q1 2020 Dose reports were distributed on May 6, 2020
- Health Physics Services (HPS) noticed only three individuals out of approximately 2,000 employees received a positive neutron dose
- Landauer was contacted and raw neutron data was requested. SRS External Dosimetry determined that Facility Neutron Correction Factor (FNCF) should be applied at Landauer not at SRS
- Re-calculation resulted in an increase of positive neutron dose for several hundred employees

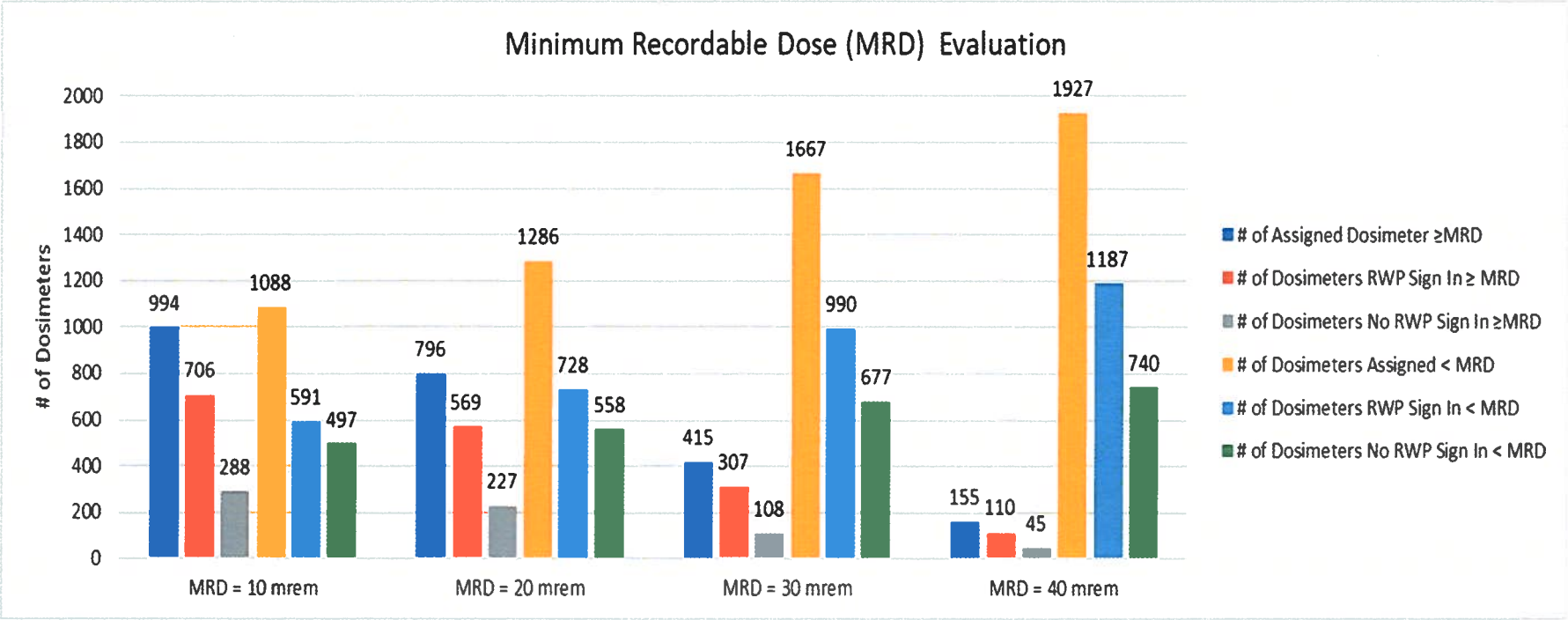
Q1 2020 Dose Reports

- **Landauer determined FNCFs of 2.44 for Fast Neutrons and 2.06 Thermal Neutrons**
- **EDGL performed manual calculations using SRS specific FNCFs**
- **The EDGL concluded that the probable cause of the neutron dose discrepancies were attributed to the misapplication of the FNCF and Landauer's Minimum Reportable Dose (MRD) calculation**
  - Minimum Reportable Dose (MRD): The calculated dose level below which the dose result will be reported as zero after all corrections are applied (e.g., Calibration & FNCF)
- **Once Landauer applied the SRS specific FNCF the population of positive neutron dosimeters increased dramatically but was not inline with expectations of dose assignment**
- **It was determined that SRS needed a site specific MRD to address the number of unexpected neutron dose assignments**

SRS Neutron Minimum Recordable Dose (MRD) Determination

- Development of the SRS neutron MRD was based on the number of individuals who did or did not sign in on RWPs
- The MRD was adjusted up or down and an evaluation was done between the employees who would be assigned dose and had signed onto an RWP versus those who had not signed into an RWP
- The methodology used is reasonable based on the historical use of MRDs for the Panasonic dosimeter
- A conservative approach was used when determining the MRD of 30; there may be individuals who could be assigned dose but did not sign in, but an MRD of 30 encompassed the largest number of employees who had signed in on an RWP
- MRD will be evaluated as needed based on trends of neutron dose results
- Contested dose will be handled on a case by case basis, but doses between 30 and 50 are at the lower level of detection (higher level of uncertainty at low dose values)

SRS Neutron Minimum Recordable Dose (MRD) Determination



Contested Dosimeter Results

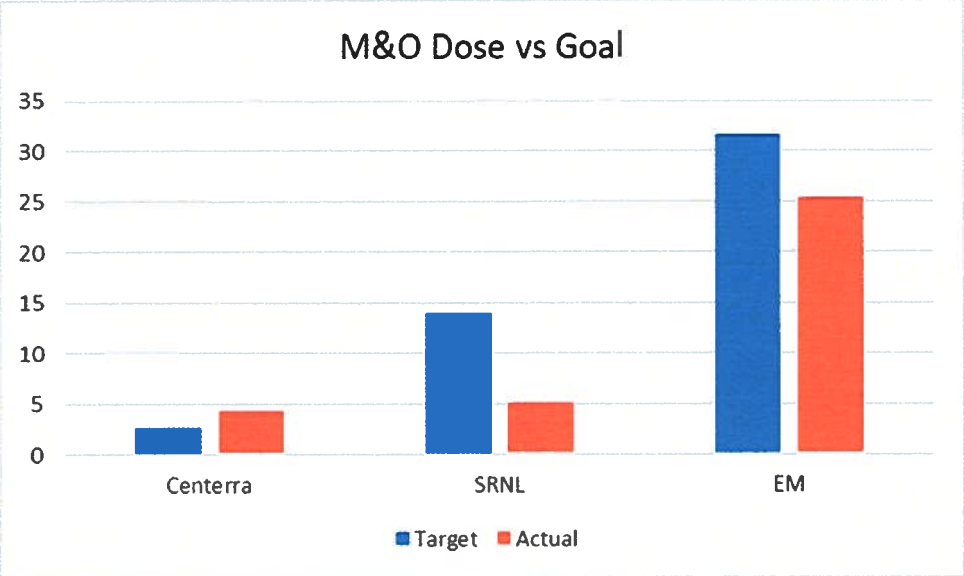
- **External Dosimetry has evaluated contested neutron doses greater than 50 mrem**
- **A reanalysis from Landauer reported zero for an initially reported dose of 90 - the difference was attributed to scratches on the CR-39**
- **External Dosimetry began an investigation focusing on the potential cause of scratches on a CR-39**
  - Request results from unworn dosimeters that have been stored in B-Area (no source term)
  - Request results from SRR issued neutron dosimeters (worn but no source term)
  - Benchmark study with other DOE sites using the Landauer CR-39 (J-Lab, LLNL, and INL)
  - Hosted a conference call with Landauer to discuss details of CR-39 processing and dose analysis
  - Investigate CR-39 detectability values for thermal and fast neutrons used by Landauer

Conclusion

- Over 50 STAR Action Items have been created (2020-CTS-004662)
- Landauer re-calculated the dose results associated with approximately 2,082 neutron dosimeters from Q1
- Approximately 415 neutron dosimeters have positive recorded dose using an MRD =30 mrem and approximately 1,667 neutron dosimeters have a recorded dose of 0 mrem after recalculation using an MRD = 30 mrem
- Landauer stated that neutron tracks are in general very small and any surface imperfection can create problems. They have improved the analysis process over the last few years, but scratches cannot totally be eliminated
- The goal of the SRS External Dosimetry Program is to protect the Radiation Worker; therefore, a conservative approach is applied to QTR 1 neutron dosimetry
- This conservatism is applied to all personnel who are assigned a neutron dosimeter whether they sign in or not
- The potential for personnel to receive a recordable dose between 30 and 50 mrem is possible despite not having worked in a neutron radiation field
- To eliminate this condition, personnel should not receive a dosimeter if not required

Questions ?

M&O Dose vs Goal



Title	Target	Actual	Percent
Centerra	2.625	4.168	+58.78
SRNL	14.0	5.017	-64.16
EM	31.489	25.387	-19.38

LWO Dose vs Goal

Title	YTD 2020
LWO Target	59.08
LWO YTD Dose	24.621
LWO Percent	-58.32

Maximum Individual Dose

Title	YTD	Facility
EM	182	KAC
LWO	220	HTF
SRNL	199	
Centerra	59	

Maximum Extremity

Title	CY20
EM Maximum Extremity Dose	1.48 (NMD)
LWO Maximum Extremity Dose	2.717 (HTF)

Radiological Events

Title	YTD 2020	Event
M&O ORPS PerCon	0	
M&O Non ORPS Percon	1	SRNL Shoe Contamination
M&O ORPS Rad Mat	1	High Activity in HANM Corridor
M&O Non ORPS Rad Mat	0	
LWO ORPS PerCon	0	
LWO Non ORPS PerCon	1	Personal Effect Contamination HTF
LWO ORPS Rad Mat	0	
LWO Non ORPS Rad Mat	0	

Intakes

Title	CY20
M&O > 500 mrem	0
M&O > 100 mrem	0
LWO > 500 mrem	0
LWO > 100 mrem	0

+/- 25 %

Facility	Target	Actual	Percent
Centerra	2.625	4.168	+58.78
SRNL	14.0	5.017	-64.16
HCA	7.775	5.734	-26.25
FCA	1.275	.505	-60.39
L AREA	1.5	.638	-57.47
TRIT	1.989	1.022	-48.62
LWO – WT	20.30	5.119	-74.78
LWO – TF	38.78	19.502	-49.71

LWO Goal Reduction

- **Current Goal**
  - LWO 74.66
    - *WT 25.4*
    - *TF 49.26*
- **Proposed Goal Change**
  - LWO 55.5
    - *WT 15.3*
    - *TF 40.2*