

**Environmental Safety & Health Working Group
Radiation Protection Subgroup
EFCOG Minutes**

March 11, 2009 – 9:00 AM to 4:45 PM

Welcome and Introductions:

Opening comments were provided by Jim Stafford, Chair of the Radiation Protection EFCOG Subgroup. Jim thanked Joel Robowski and Pete O'Connel from HS-11 for attending.

Jim described the planned meeting interface with the Chemical Safety and Lifecycle Management Workshop and attendance at the opening remarks. After a short safety orientation participants were asked to identify themselves and the contractor/site that they represented.

Participants were asked to sign the attendance sheet being past around and to also review the EFCOG Contact List that we maintain on the EFCOG Web page. An updated copy of the contact list will be placed on the EFCOG Web page.

Jim Stafford provided a review of the planned agenda for the next two days. During the review three additional topics were requested by attendees and one was combined. Biological vector contamination, Impact of DOE Std 441.1 implementation, and clarification of REM reporting of skin dose were added to the agenda. The Wednesday DOE Source Control Update was combined with a HSS update on the topic planned for Wednesday afternoon.

Plutonium 241 Recommendation Status – Ted Giltz

The Plutonium 241 (^{241}Pu) task team provided working templates for development of authorized limits and exemption request packages that were provided in to EFCOG members in December 2008. As of the meeting no contractor had submitted an application package.

Hanford contractors reported each was pursuing submittal of authorized limit and exemption requests for select HTDs that would match the previously approved documents approved for Washington Closure Hanford. ^{241}Pu was not a part of the application based on early decisions with the WCH application and for site consistency it was decided to not modify the basis for this round of applications. The intent is that the ^{241}Pu applications will be further considered by Hanford contractors during FY09.

SNL reported that they have initiated development of an exemption request. No authorized limit application had been started.

SRS has initiated development of both documents.

**Radiation Protection
EFCOG Meeting Minutes
March 2009**

Ken Crase reported that the latest draft revision of DOE O 5400.5 was undergoing a red team review. The proposed document moves key numbers for release of personal property and DCG into guidance documents. This approach could still change.

Members requested that the templates for the exemption request and authorized limit be emailed to members since many had not received the initial distribution. If additional copies of the templates are desired send an email to [Ted Giltz](#).

Neutron Quality Factor Update – Ken Crase (Copy of Presentation available on WEB page)

Alignment with ICRP 74 for operational quantities used for neutron dose determination continues. Photon doses do not change. Neutron correction factors will be required to align with spectra data from bare Cf source. Anticipated 16-22% continues to appear to be the impact. Neutron instrument calibrations will require modifications; which may necessitate need to verify work place neutron doses are conservative when compared to effective dose. Draft data is being reviewed and team will provide technical document with recommendations by mid-summer.

Ken also discussed use of different dose conversion methods. For example design dose conversion factors may be different but since 835 applies to only occupational exposure is not a problem. DOE design values are guidelines and not exposure limits.

Ken cautioned that reviewers and designers should be clear on assumption and correction factors chosen. Past designs had enough conservative design assumptions that this has not emerged as an issue. New designs have more pressure for minimum cost savings and designs may be minimum engineered design and ignore potential impacts on actual monitoring of personnel who will occupy the facility or use the designed system.

Chemical Safety and Lifecycle Management Workshop Opening Remarks

The meeting attendees moved to the auditorium to attend the opening workshop comments. Additional details may be found in the Chemical Safety and Lifecycle Management Workshop meeting minutes.

- Jim Morgan and Steve Harris provided a Welcome
- Dr. Quigley provided the meeting safety topic and described the importance of recognizing that the number of times or frequency an event is performed should not be considered to be proportional to trouble that

**Radiation Protection
EFCOG Meeting Minutes
March 2009**

may occur. To emphasize his point he summarized a recent fatality at a Federal laboratory where a small quantity of a chemical aliquot splashed on the chemical technical working in a chemical hood. The tech was not wearing protective clothing and the chemical reacted with air causing the worker's sweater to catch fire and burn the individual with 2nd and 3rd degree burns. Safety requires understanding of hazards and adherence to safety practices – no matter how unlikely the consequence might be.

- Bill McArthur described the purpose, focus, and importance of the HS organization. Mr. McArthur emphasized the benefits and support from DOE senior management available by putting all aspects of safety and health into one organization. Mr. McArthur introduced Glen Podonski, Chief Health, Safety and Security Officer.

Mr. Podonski provided a summary of the very good performance of DOE and its contractors. He highlighted the need to celebrate successes vs. survival. HSS was formed to emphasize the DOE commitment and focus on safety. His office is looking forward to working with Dr. Chu, the new Secretary of Energy, who for the first time in many years is already familiar with DOE and in fact has 4 years of experience working in one of the national laboratories.

DOE is positioned to increase natural science, climate research, fuel, and jobs for environmental and energy work. DOE will be receiving about \$110B from the Stimulus bill but most import is DOE must keep the 'training running on the tracks.' DOE and its contractors must stay on track with worker safety a priority, progress must be made while maintaining safety, and continue to make improvements using imagination, opportunities that meet the national challenge.

- Tony Umek, Chair of the S&H EFCOG, described the partnership of DOE and contractors. Key initiatives that EFCOG was being asked to pursue include use of lessons learned and development of leading indicators. Tony described the roles of line organizations, Subject Matter Experts, and site employees and response to chemical management activities. He said 'We are generally doing well at recognizing hazards with specific tasks. Co-located hazards exist in many situations and are seldom recognized or considered during planning.' Co-located hazards should be considered as a final check of 'ready to work.' Also standardization offers many advantages to safety, efficiency and productivity but should not be considered a means to eliminate requirements.
- Peter Winokur, PhD, from the DNFSB provided a [discussion of leading indicators and leadership](#). Dr. Winokur's talk asked the question 'What did you need to know the day before the event?' and provided several excerpts from recent events in DOE, government, and commercial

**Radiation Protection
EFCOG Meeting Minutes
March 2009**

industry. His talk proposed that a safety culture includes more than principals, functions, VPP, HPI and other programs. A safety culture relies on leadership, a commitment to ISM that includes leadership, empowered workers and a shared desire for excellence. He also proposed that that you should not expect what is not inspected.

Over 60% of recent DNFSB letters to DOE and contractors include some element of a safety culture issue. The higher occurring issues included failure to follow contractor requirements/process; insufficient resources allocated; decreasing oversight and lower management readily accepting risk without understanding implications.

DOE and contractor programs over emphasize lagging indicators. The emphasis on DART and TRC, while noteworthy, does not reflect the culture of an organization. Such reporting does not consider the low probability high consequence event.

Leading indicators provide indicators. Ignoring spills, control of materials, etc. may offer more insight than existing metrics. In 32 years, 42 people have died in the DOE while DART rates have improved. Think about that.

Suggest a more system-activity based focus. Dr. Winokur suggested that programs should focus on how systems prevent individual personal errors from impacting the hazard or plant. He suggested 4 steps. 1) goals should be based on outcomes, 2) Inspect and check safety progress, 3) establish metrics to measure and 4) metrics must measure mission outcomes.

The group then returned to the RP Meeting Conference room.

- Report on Bench Marking – Jim Stafford summarized data received from various benchmarking requests since the last meeting.
 - Ratio of RW to RCTs- Data from participating contractors (~9) showed a spread of 5:1 to 100:1. This probably should be expected based on the breath of activities being supported and the differences in how organizations support their customers. Due to the low response no definitive conclusions could be reached but there appears to be a bell curve with an average ratio of 20-40:1.
 - Provision allowed by 10 CFR 835, Appendix to average surface contamination. Only 3 contractors responded but discussions during the meeting concluded that the provision was seldom used on a routine basis. When used contractors implemented through procedure or work package direction. Pete O’Connel asked about the impacts of deleting. Contractors did not want to see the provision removed from the rule without additional impact review. Some use may be occurring with automatic monitoring instruments.

**Radiation Protection
EFCOG Meeting Minutes
March 2009**

- A discussion regarding the upcoming impacts of the American Resource and Recovery Act of 2009 was held. No clear information is available but the largest amount of money will be going to the larger EM sites and the potential RP impacts are most severe at these sites. SRS and Hanford are looking at a significant increase in RW training demand, the need to conduct in house RCT new hire training and significant use of sub-contractor resources for support and program activities. Jerry Hiatt from Bartlet indicated that they were working with clients but significant numbers of senior contract RCTs would be a challenge.

Jerry indicated that commercial units are entering their outage cycles and several are performing extended outages (several fueling outages and at least 3 steam generator packages)

- Presentation by [Heartwood Studios](#). At the request of HSS representatives from Heartwood Studios provided a presentation and information regarding use of computer technology in training. The link above provides additional information about their product and tools.

A discussion regarding possible uses in radiation protection was conducted after the demonstration. From a standardization and consistency perspective use of such a product approach might offer benefit if DOE endorsed the content as acceptable for compliance. All sites already of compliant GERT materials. Several sites already use different generations of electronic learning tools.

After discussion it was decided to form a working group to further evaluate the use of such a product for GERT training. The working group was tasked with defining a common GERT course content based on the DOE guidance (what is already common between sites), determine if complex consistency was obtainable, and make a recommendation for further consideration of a DOE sponsored GERT video based course. The membership of the working group is:

- John Edelmayer (ICP Idaho)
 - Bob Miltenberger (Sandia)
 - ~~Kurt Galloway~~ Jeff Gill (NTS)
 - Kathy Shingleton (LLNL)
 - Ted Giltz – Chair (Hanford HAMMER)
 - Robert Ford – Hanford PNNL
- Nuclear Pipeline – An update of activities in progress or planned to address the anticipated shortfall of nuclear workers was performed.
 - SRS – Aiken Tech is using the Linn State model and has 67 students enrolled in certification program. 20 students will be hired

**Radiation Protection
EFCOG Meeting Minutes
March 2009**

as summer interns. Credits can be transferred into some nearby 4 year programs.

Francis Marian has 4 yr BS program. 1 graduate was hired last year and 1 offer is in progress.

- EITC has an on-going certification program. 18 students currently enrolled. 7 or 8 from last class have not been hired but stimulus money should help that picture.
- Jerry Hiatt – Bartlet – Overall improvement is occurring. In 2000 there were 0 programs for RCTs now there are at least 12. Several are teaming arrangements: Western Kentucky with Paducah; Spartanburg with Duke; and Chattanooga State with TVA.

INPO has approved standardized curriculum that most programs are satisfying. NRC and DOL grants want to see programs based on Linn State model. NRC will likely have ~\$15M in grants this year for educational support.

Jerry recommended that DOE contractors adopt some practices already being pursued by commercial companies. The obvious one for DOE is validating that a senior tech is needed for the task, using other crafts for ramp up/ramp down activities; and verifying criteria for transition from junior to senior (some commercial companies has imposed business practices in excess of NRC and ANSI requirements).

A starting junior RCT is at least \$28/hr with 60 hr per week and per diem. Average per diem is about \$125/day with critical skills/jobs pulling up to \$280/day.

SNL has 4 SRCT positions they have not been able to fill. They also have noted that the process to go from junior to senior RCT did not assure the individual would be successful as a SRCT. They are starting a formal two year qualification program to take a junior RCT through a series of increasing responsibility tasks that ultimately concludes as a SRCT with defined training objectives satisfied. Other sites may want to review their criteria from going from junior to senior RCT.

Ted Giltz reported that Columbia Basin College was restarting the Nuclear Technology 2 year program. Currently planning was to start the first class this fall. CBC has noted a general problem with freshmen being unable to complete the math for some existing programs and based on inputs from local employers expects a similar issue with the Nuclear Technology students. As a result a pre-entry math test must be completed satisfactorily or the student

**Radiation Protection
EFCOG Meeting Minutes
March 2009**

will be required to pass a remedial math course before beginning the two year program.

Jerry Hiatt reported that Linn State had encountered a similar problem and had a Nuclear Math Class developed. Curriculum materials are available from Linn State if anyone is interested.

- Argonne is considering preparing a MARSAM 3 day course and wanted to know the interest level. The course would be taught by Ablequest and company. Discussion indicated that there was general interest but attendees were not ready to make any commitments.

**Radiation Protection
EFCOG Meeting Minutes
March 2009**

DAY 2

- Jim started the day with a discussion of contract transition lessons learned. A review of current site contractors and individual manager employers was conducted by the group. The general consensus was funding for staff continuity was always a challenge.

Contractor management teams come in ready to aggressively challenge existing processes without fully understanding the local hazards and that a successful program must be more than a minimally compliant program. Loss of senior experienced people reveals many times that experience must be replaced by paper and training that cost money that contractors don't have.

Many actions and activities consume significant amounts of staff time to justify. Splitting of contracts is resulting in site inconsistencies that, while individually remaining compliant, risk confusion.

- Biological Vectors – Tom Bratvold (CHPRC Hanford) initiated a discussion regarding management of biological vectors and management of radioactivity in outdoor areas. He described some of the challenges occurring at Hanford. This type of problem is not an issue at many DOE sites.

A discussion of differences in monitoring soils for removable contamination occurred. Some sites don't have a definition for soil contamination areas and post only as a contamination area. Some sites use a volumetric approach and require lab counting of soil samples rather than use of field indicators. SRS has an established concentration value to determine the need to post as a contamination area but the transportability of the data due to differences in soils is unknown.

- Ken Crase (SRS) provided a discussion of skin dose guidance and requirements. ICRP 60 is the basis of what constitutes skin dose. A recent question regarding role up of dose information for the REM database initiated the discussion. ICRP 60 and 10 CFR 835 require that skin dose includes both the equivalent external dose and the CEDE dose from intakes. HSS has issued a technical position to clarify this position. The [technical position 09-01](#) has been issued.
- Jerry Hiatt introduced a resource related topic. The commercial industry is trying to develop a metric that addresses rad con support for emergent work vs. planned work. One metric are RWPs approved the same day as work performed may indicate a lack of involvement of RP in planning and the use of unplanned resources. Other indicators might be identification of

**Radiation Protection
EFCOG Meeting Minutes
March 2009**

contamination at the final barrier, the PCM, rather than identification and control at the source.

- Melanie May (HSS) provided an update on implementation of DOE N 234.1. The note requires implementation of a program to control high activity sources in support of the IAEA. She was surprised to hear that several contractors reported the contract direction had not been received to implement the program.

Several questions were identified during the conversation regarding implementation details. Although the note uses the 10 CFR 835 definition of sealed radioactive source some items that have been declared waste such as the CsSr capsules at Hanford would be included in the inventory. She indicated that significant energy and interest remains regarding any form of Cs due to the ease of making into a WMD. Questions regarding specialized containers should be addressed separately to DOE. The need to inventory more than Category I and II sources was based on DOE past decisions on the potential for related source questions and a desire not to have to perform multiple data calls. She did confirm that transactions met movement offsite or a hazard change. The notice does not include NRC licensed sources that might be in a contractor's possession.

- Jim Stafford reported that he had received inputs on existing leading indicators. Jim will review and consolidate for review offline. An updated status will be provided at the next meeting.
- The next EFCOG meeting is scheduled for October 6-8 at DOE NTS in Las Vegas.
- 10 CFR 835 Implementation Status – a general discussion of implementation was provided by contractors. Some laboratories have already implemented and had no significant problems. Minimal communications was needed, mostly to RCTs and RP professional staff. Most other contractors are implementing on January 1, 2010 and have identified no significant issues.
- Scott Walker provided an update on the Nano-Technology Subgroup and a primer on the potential occupational radiation protection impacts of working in a nano environment. Due to the small size (<100 nm in one dimension) and large surface area particles have different characteristics. No contamination values are established; measurement is not defined; and impacts of internal exposure are unclear. Additional information on nano-technology can be located at www.icon.rice.edu.
- DOELAP Update: Steve Zobel provided an update on DOELAP and the impacts of neutron measurement. He anticipates Bare Cf dose to

**Radiation Protection
EFCOG Meeting Minutes
March 2009**

increase 20% and moderated Cf to change 30-33%. Update of source characterization is in progress. He anticipates implementation of the newer models in 2nd session of 2010 schedule. Update to the DOE Dosimetry technical standard is in progress. Office of Enforcement has indicated no intent to initiate enforcement action as long as overall accreditation is maintained.

- **Pete O'Connel asked for recommendations regarding potential changes to DOE O 231.1 for ORPs reporting. Members strongly recommended review and if needed additional discussion regarding situations where non-removable contamination/radioactivity was identified outside a CA/HCA/ARA during work and controlled. Members also wanted to clarify the intent of 'likely to exceed'. Several members were not aware of the request and Jim Stafford indicated he would redistribute the Order for an additional review.**
- Ken Crase provided an update for the revision of DOE O 5400.5. Draft 2 is undergoing a red team review within DOE. Draft 1 comments were generally favorable and have been resolved. One upcoming impact being proposed is the order will require an Environmental Protection Program Plan, similar to an RPP. The issue of recycle of metals will not be addressed in the revision.
- HSS indicated that 3 technical position papers were under consideration. One addresses use of social security numbers, one addresses administrative fixes to 835 and the last addresses packaging of nuclear materials (DOE O 441.1)
- Continuing issues that were not discussed and tabled included release of metals for recycle, use of averaging for removable contamination

Jim Stafford concluded the meeting. Robert Ford indicated that his desired topic of DOE O 441.1 had been worked offline and no additional group effort was needed.

ACTION: Attached is an updated contact list based on the existing list located on the EFCOG WEB page and the attendance sheet from the March 2009 meeting. Please review and provide updates as appropriate.

**Radiological Protection Subgroup
Membership Roster
Draft AS OF 3/31/2009
Provide updates/corrections to [Ted Giltz](#)**

| Name | Title/Position | Site/Facility | Company Address | Phone/Fax | E-mail |
|----------------------|---|--|---|------------------------------|-----------------------------|
| Adams, Edward (Ed) J | Manager, Closure, Radiological Control | Hanford | WRPS Hanford PO Box 1500/MSIN R1- 05 Richland, WA 99352 | 509-373-2927 509-372-3522 | Edward_J_Adams@rl.gov |
| Anderson, Amanda | | | | 202-586-9144 | Amanda.anderson@nq.doe.gov |
| Boone, Darren | | | | | |
| Bratvold, Tom | CHPRC Rad Protection | Hanford | CHPRC P.O. Box 1600; MSIN H8-26 Richland, WA 99352 | 509-373-2360 509-372-0008 | Tom_Bratvold@rl.gov |
| Chadly, Pete | Senior Health Physicist | Dave Moeller & Associates | 2750 Prosperoty Ave Fairfax, VA 22306 | 702-375-2480 | Peter.chadly@moellerinc.com |
| Crase, Ken | RPD Technical & Regulatory Advisor | SRNS | Bldg 730-1B Sabannah River Site Aiken, SC 29808 | 803-952-7892 | Kenneth.crase@srs.gov |
| Ecclesine, Amy | QA/Compliance PM for Rad Protection Group | LBNL | 1 Cyclotron Way (75A-101) Berkeley, CA 94720 | 510-486-4670 | AEcclesine@lbl.gov |
| Edelmayer, John | Radiological Control Director | ICP/INL | ICP P.O. Box 1625, 2525 N. Fremont Avenue Idaho Falls, Idaho | 208-533-0941 208-526-4282 | John.Edelmayer@icp.doe.gov |
| Eisele, Shawna | | | | 505-665-7797 | seisele@lanl.gov |
| Ford, Robert | Manager Radiation Protection Division/RSO | Pacific Northwest National Laboratory | P.O. Box 999 MSIN J2-40, 902 Battelle BLVD. Richland, WA 99352 | 509-371-7851 509-371-7882 | Robert.ford@pnl.gov |
| Foulke, Judy | Health Physicist | DOE HQ-11 | | | Judy.foulke@hq.doe.gov |
| Galloway, Kurt | Rad Ops Manager | NTS | | 702-295-3523 | Gallowk@nv.doe.gov |
| Gilbreth, Lisa B. | ES&H Specialist | Pantex | BWXT – Pantex Box 30020 Amarillo, TX 79120-0020 | 806-477-7301 806-477-7975 | lgilbret@pantex.com |
| Gilles, Michael | D.D. RPD | SRNS | 730-1B | 803-952-8389 | Michael.gilles@srs.gov |
| Giltz, Ted | HAMMER Rad Con Manager | Hanford | P.O. Box 1000 Richland, WA 99352 | 509-373-2134 | Theodore_P_Ted_Giltz@rl.gov |

**Radiological Protection Subgroup
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| Name | Title/Position | Site/Facility | Company Address | Phone/Fax | E-mail |
|-----------------------|---|-----------------------------------|--|------------------------------|-----------------------------|
| Haeberlin, Jeffery M. | RCM | Yucca Mountain | | | |
| Hansen, Kent | Manager, Radiological Control | AMWTP | BBWI-AMWTP P.O. Box 1625 Idaho Falls, ID 83415-4207 | 208-557-7218 208-557-7225 | HANSRK@amwtp.inl.gov |
| Hiatt, Jerry W. | Chief Technical Officer | Savanah River Support | Bartlett Services, Inc. 60 Industrial Park Rd Plymouth, MA 02644 | 508-591-1286 508-746-8588 | Jerry.hiatt@bartlettinc.com |
| Hoover, Paul S. | Technical Staff Advisor, RP Division | Los Alamos National Laboratory | Los Alamos National Security MS G760 Los Alamos, NM 87545 | 505-665-4691 505-664-0668 | phoover@lanl.gov |
| Kahnhauser, Henry F. | Manager, HPTS | Brookhaven National Lab | BSA Building 120 Upton, NY 11973- 5000 | 631-344-7509 631-344-7091 | hfk@bnl.gov |
| Kestell, David | Manager, Radiological Control | LBNL | UC-LBNL 1 Cyclotron Rd. Berkeley, CA 94720 | 510-486-7157 510-486-4776 | DJKESTELL@LBL.gov |
| Laiche, Thomas P. | Technical Team Leader | Sandia National Labs | Sandia National Labs P.O. Vox 5800, MS 1103 Albuquerque, NM 87185 | 505-845-3066 505-284-6164 | Tlaich@sandia.gov |
| Ledoux, Mark R. | Corporate Director, Radiation Safety | | Energy Solutions, LLC 423 West 300 South, Suite 200 Salt Lake City, Utah 84101 | 801-649-2152 801-413-5646 | mledoux@energysolutions.com |
| Lombardozzi, Peter R. | Manager, Radiological Control and Engineering | Hanford | Fluor Hanford P.O. Box 1000 MSIN E6- 24 Richland, WA 99352 | 509-373-9778 | Peter_R_Lombardozzi@rl.gov |
| Matheny, Michael D. | Manager | Savannah River | WSRC Bldg 766-H, Rm 3206B Aiken, SC 29808 | 803-208-3298 | Michael.matheny@srs.gov |
| McBride, Douglas H. | Manager, | Nevada Test Site | National Security | 702-295-6683 | mcbriidd@nv.doe.gov |

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| Name | Title/Position | Site/Facility | Company Address | Phone/Fax | E-mail |
|----------------------|---|------------------------------|---|------------------------------|-------------------------------|
| | Radiological Engineering | (NTS) | Technologies (NSTex) P.O. Box 98521, NTS272 Las Vegas, NC 89193 | 702-295-9335 | |
| McClain, Ken | CHPRC Radcon, IA | Hanford | CHPRC P.O. Box 1600; MSIN H8-26 Richland, WA 99352 | 509-372-2677 | Kenneth_W_Ken_Mcclain@rl.gov |
| McMahon, Mark | Manager | NTS | National Security Technologies P.O. Box 98521 Las Vegas, NC 89193 | 702-295-1639 702-295-6832 | mcmahom@nv.doe.gov |
| Millsap, Joel W. | | Fluor Hanford, Rad Pro, IA | Fluor Hanford, P.O. Box 1000 MSIN A1-14 Richland, WA 99352 | 509-376-3676 | William_J_Joel_Millsap@rl.gov |
| Minnick, Sheri | | | | 630-918-9003 | sminnick@anl.gov |
| Miltenberger, Bob | Manager | Sandia National Laboratories | Sandia Corporation PO Box 5800 Albuquerque, NM 87185-1103 | 505-845-0904 505-284-8874 | rpmilte@sandia.gov |
| Moroney, John D. III | ESH Team Leader | NTS | LANL P.O. Box 0 Mercury, NV 89023 | 702-295-7620 702-295-7378 | jmoroney@lanl.gov |
| O'Connell, Peter | Health Physical | DOE-HQ | | 301-903-5641 | Peter.o'connel@hq.doe.gov |
| Ogurek, Al | Manager, Radiological Engineering | Yucca Mountain Project | Bechtel 1180 N Town Center Dr Las Vegas, NV 89144 | 702-821-7797 702-821-9021 | Alfred_Ogurek@ymp.gov |
| Oliver, Bobby | Radiological Eng. Mngr. | B&W Y-12 | P.O. Box P, Oak Ridge, TN 37831 | 855-241-2097 | oliverrw@y12.doe.gov |
| Padezanin, Pat | | | | 803-952-8309 | Patricia.padezanin@srs.gov |
| Pegram, David | | | | 301-903-9840 | Dave.pegam@hq.doe.gov |
| Perkins, Dale E. | Radiological Protection Operations Group Leader | ORNL | UT-Battelle P.O. Box 2008 Oak Ridge, TN 37831-6160 | 865-574-6671 865-241-2779 | perkisinde@ornl.gov |
| Rabovsky, Joel | | | | 301-903-2135 | Joel.rabovsky@ng.doe.gov |

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| Name | Title/Position | Site/Facility | Company Address | Phone/Fax | E-mail |
|-------------------------|---|--------------------------------------|--|------------------------------|------------------------------|
| Rogers, Tye | VP of Compliance & Permitting | SLC | Energy Solutions 423 Southt 300 West, Suite 200 Salt Lake City, Utah 84101 | 801-649-2146 801-413-5646 | trogers@energysolutions.com |
| Rynders, David | Director, Radiological Control | Idaho National Laboratory | Battelle Energy Alliance, LLC PO Box 1625 Idaho Falls, ID 83415 | 208-526-8048 208-526-3149 | David.Rynders@inl.gov |
| Shingleton, Kathleen L. | Radiation Protection Program Manager | LLNL | P.O. Box 808, L-384 Livermore, CA 94551 | 925-422-5172 925-422-5270 | Shingleton2@llnl.gov |
| Stafford, Herbert J. | Director, Radiological Protection Department | Savannah River | SRNS Bldg 730-1b Rm 215 STS Aiken, SC 29801 | 803-952-9888 803-952-8666 | Jim.stafford@srs.gov |
| Torres, Marcia M | Quality Assurance Manager – Radiation Protection Department | SLAC National Accelerator Laboratory | 2575 Sand Hill RD Menlo Park, CA 94025 | 650-926-2764 | mtorres@slac.stanford.edu |
| Walker, Scott L. | | | | 505-665-0857 | swalker@lanl.gov |
| Williams, Pat | | | | 301-903-7024 | Patricia.williams@hg.doe.gov |
| Zeman, Gary | RSO | Argonne National Laboratory | U Chicago LLC 9700 S. Cass Avenue Argonne, IL 60439 | 630-252-8893 630-252-8493 | gzeman@anl.gov |