

DOE Occupational Radiation Exposure: 2017 Annual Report
Exhibit A-1. Labor Categories and Occupation Codes.

The following is a list of the Occupation Codes that are reported with each individual's dose record to the DOE Radiation Exposure Monitoring System (REMS) in accordance with DOE Order 231.1B. Occupation Codes are grouped into Labor Categories for the purposes of analysis and summary in this report. The occupation codes are listed in the REMS Reporting Guide, Table G-7, and represent a subset of the occupations listed in the Department of Commerce's Standard Occupational Classification (SOC) Manual (1980).

| Labor Category | Occupation Code | Occupation Name |
|---------------------|-----------------|---------------------------------|
| Agriculture | 562 | Groundskeepers |
| | 570 | Forest Workers |
| | 580 | Misc. Agriculture |
| Construction/Repair | 610 | Mechanics/Repairers |
| | 641 | Masons |
| | 642 | Carpenters |
| | 643 | Electricians |
| | 644 | Painters |
| | 645 | Pipe Fitter |
| | 650 | Miners/Drillers |
| | 660 | Misc. Repair/Construction |
| Laborers | 850 | Handlers/Laborers/Helpers |
| Management | 110 | Manager - Administrator |
| | 400 | Sales |
| | 450 | Admin. Support and Clerical |
| Misc. | 910 | Military |
| | 990 | Miscellaneous |
| Production | 681 | Machinists |
| | 682 | Sheet Metal Workers |
| | 690 | Operators, Plant/System/Utility |
| | 710 | Machine Setup/Operators |
| | 771 | Welders and Solderers |
| | 780 | Misc. Precision/Production |
| Professional | 160 | Engineer |
| | 170 | Scientist |
| | 184 | Health Physicist |
| | 200 | Misc. Professional |
| | 260 | Doctors and Nurses |
| Service Workers | 512 | Firefighters |
| | 513 | Security Guards |
| | 521 | Food Service Employees |
| | 524 | Janitors |
| | 525 | Misc. Service |
| Technicians | 350 | Technicians |
| | 360 | Health Technicians |
| | 370 | Engineering Technicians |
| | 380 | Science Technicians |
| | 383 | Radiation Monitors/Techs. |
| | 390 | Misc. Technicians |
| Transport Workers | 820 | Truck Drivers |
| | 821 | Bus Drivers |
| | 825 | Pilots |
| | 830 | Equipment Operators |
| | 840 | Misc. Transport |
| Unknown | 001 | Unknown |

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit A-2. Organizations Reporting to DOE REMS, 2013–2017.

The following is a list of all organizations reporting to the DOE REMS from 2013–2017.

The list provides the Site groupings used in this report as well as the organization reporting code and name.

| Site | Org. Code | Organization Name | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---------------------------------------|---|------|------|------|------|------|
| Albuquerque | OST3100 | Office of Secure Transportation | ● | ● | ● | ● | ● |
| Ames Laboratory | 1000503 | Ames Laboratory (Iowa State) | ● | ● | ● | ● | ● |
| Argonne National Laboratory (ANL) | 1000703 | Argonne National Laboratory | ● | ● | ● | ● | ● |
| | 1004031 | New Brunswick Laboratory | - | - | - | ● | - |
| Brookhaven National Laboratory (BNL) | 1001003 | Brookhaven National Laboratory | ● | ● | ● | ● | ● |
| DOE Headquarters | 1504001 | DOE Headquarters | ● | ● | ● | ● | ● |
| Energy Technology Engineering Center | 8001003 | Boeing North America, Inc. - Research | ● | ● | - | - | - |
| | 8002001 | Cabrera Services | - | - | ● | ● | ● |
| Fermi National Accelerator Lab. (FERMI) | 1002503 | Fermilab | ● | ● | ● | ● | ● |
| Grand Junction Site | 3260615 | Navarro Research and Engineering | - | - | - | - | ● |
| Hanford | 4700805 | Bechtel National Corporation | ● | ● | ● | ● | ● |
| | 4701001 | DOE, Office of River Protection | ● | ● | ● | ● | ● |
| | 4702004 | Advance Technology Laboratories | ● | ● | ● | ● | - |
| | 4702005 | Wastren Advantage, Inc. | - | - | ● | ● | ● |
| | 4707104 | Washington River Protection Solutions, LLC | ● | ● | ● | ● | ● |
| | NA-2000 | NNSA - Visitors | ● | ● | ● | ● | ● |
| | NA-2100 | NNSA - Management and Support Personnel | ● | ● | ● | ● | ● |
| | NA-2101 | NNSA - Mgmt. & Support Personnel: MELE Assoc. | ● | ● | ● | ● | ● |
| | NA-2110 | NNSA - North and South America | ● | ● | ● | ● | ● |
| | NA-2120 | NNSA - Europe, Africa and the Middle East | ● | ● | ● | ● | ● |
| | NA-2130 | NNSA - Asia and Members of the Former Soviet | ● | ● | - | - | - |
| | 7500503 | Battelle - PNNL | ● | ● | ● | ● | ● |
| | 7500504 | Battelle -PNNL- Subs | - | ● | ● | ● | ● |
| | 7500521 | Pacific Northwest Site Office | - | ● | ● | ● | ● |
| | 7500605 | Washington Closure Hanford | ● | ● | ● | ● | - |
| | 7502504 | AdvanceMed Hanford | ● | ● | ● | ● | ● |
| | 7505055 | Lockheed Martin Services, Inc. | ● | - | - | - | - |
| 7505214 | Mission Support Alliance (MSA) | ● | ● | ● | ● | ● | |
| 7505304 | CH2M Hill Plateau Remediation Company | ● | ● | ● | ● | ● | |
| 7506001 | DOE-Richland Field Office | ● | ● | ● | ● | ● | |
| Idaho Site | 3004001 | Idaho Field Office | - | ● | ● | ● | ● |
| | 3004404 | BBWI Service Subs | - | ● | ● | - | - |
| | 3005003 | INL - BEA, LLC - Research | ● | ● | ● | ● | ● |
| | 3005004 | INL - BEA, LLC - Services | ● | ● | ● | ● | ● |
| | 3005009 | INL - BEA, LLC - Security | ● | ● | ● | ● | ● |
| | 3005012 | INL - BEA, LLC - Production | ● | ● | ● | ● | ● |
| | 3006002 | INL - CWI - Projects | ● | ● | ● | - | - |
| | 3006002 | INL - Fluor- Projects | - | - | - | ● | ● |
| | 3006004 | ICP - CWI - Subcontractors | ● | ● | ● | - | - |
| | 3006004 | ICP - Fluor - Subcontractors | - | - | - | ● | ● |
| | 3006005 | ICP - CWI - Support | ● | ● | ● | ● | ● |
| | 3006016 | ICP - CWI - Construction Subs | ● | ● | ● | - | - |
| | 3006016 | ICP - Fluor - Construction Subs | - | - | - | ● | - |
| Kansas City Plant | 0531002 | Honeywell FM & T/KC Production | ● | ● | ● | - | - |
| Kansas City National Security Campus | 0531002 | Honeywell FM & T | - | - | - | ● | ● |

| Site | Org. Code | Organization Name | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|-----------|---|------|------|------|------|------|
| Lawrence Berkeley National Lab. (LBNL) | 8003003 | Lawrence Berkeley National Laboratory | ● | ● | ● | ● | ● |
| Lawrence Livermore National Lab. (LLNL) | 0580403 | Lawrence Livermore National Laboratory | ● | ● | ● | ● | ● |
| | 0580503 | LLNL - Nevada | - | - | - | - | ● |
| | 0580701 | LLNL - DOE Site Office | ● | ● | ● | ● | ● |
| Los Alamos National Lab. (LANL) | 0540001 | NNSA Los Alamos Site Office | ● | ● | ● | ● | ● |
| | 0544003 | Los Alamos National Laboratory | ● | ● | ● | ● | ● |
| | 0544006 | Los Alamos National Lab Construction Subs | - | - | - | - | ● |
| | 0544809 | Protection Technologies Los Alamos | ● | ● | ● | ● | ● |
| | 0544904 | Johnson Controls, Inc. | ● | ● | ● | ● | ● |
| National Renewable Energy Laboratory | 2806003 | National Renewable Energy Laboratory | ● | ● | ● | ● | ● |
| Nevada National Security Site | 0501001 | NNSA Service Center | ● | ● | ● | ● | - |
| | 0520001 | NNSA Nevada Site Office | ● | ● | ● | ● | ● |
| | 0521104 | Bechtel Nevada - Amador Valley | ● | ● | ● | ● | - |
| | 0521104 | MSTS - Livermore Operations | - | - | - | - | ● |
| | 0521204 | Bechtel Nevada - Las Vegas | ● | ● | ● | ● | - |
| | 0521204 | MSTS - Las Vegas | - | - | - | - | ● |
| | 0521304 | Bechtel Nevada - Los Alamos | ● | ● | ● | ● | - |
| | 0521304 | MSTS - Los Alamos | - | - | - | - | ● |
| | 0521314 | NSTec - Sandia | - | - | - | - | ● |
| | 0521405 | Bechtel Nevada - NTS | ● | ● | ● | ● | - |
| | 0521405 | MSTS - NTS | - | - | - | - | ● |
| | 0521416 | Bechtel Nevada - NTS - subcontractors | ● | ● | ● | ● | - |
| | 0521416 | MSTS - NTS subcontractors | - | - | - | - | ● |
| | 0521503 | Bechtel Nevada - Special Tech Lab. | ● | ● | ● | ● | - |
| | 0521503 | MSTS - Special Tech. Lab | - | - | - | - | ● |
| | 0528002 | Centerra-Nevada | - | ● | ● | ● | - |
| | 0528004 | Centerra-Nevada Subcontractors Lockheed | - | ● | ● | ● | - |
| | 0529004 | Nevada | - | - | - | - | ● |
| | 0529009 | Wackenhut Services Inc. - NV | - | - | - | - | ● |
| | 3505104 | Navarro-Intera LLC | ● | ● | ● | ● | ● |
| | 3508004 | Nye County Sheriff - NSTec | ● | ● | ● | ● | ● |
| | 3508703 | SAIC - NV | ● | - | - | - | ● |
| | 9708001 | USGS - Yucca | - | - | - | - | ● |
| New Brunswick Laboratory | 1004031 | New Brunswick Laboratory - Research | ● | ● | ● | ● | - |
| Oak Ridge Site | 4004203 | Oak Ridge Inst. For Science & Educ. (ORISE) | ● | ● | ● | ● | ● |
| | 4004525 | SEC Oak Ridge | ● | - | - | - | - |
| | 4004526 | LATA Sharp | ● | - | - | - | - |
| | 4003602 | UT-Battelle: ORNL-Isotek | ● | ● | ● | ● | - |
| | 4004602 | Wastren Advantage, Inc. | ● | ● | ● | - | - |
| | 4004602 | NorthWind Solutions | - | - | - | ● | - |
| | 4004602 | Tru Waste Processing Center - ORNL | - | - | - | - | ● |
| | 4005104 | USEC: Oak Ridge, K25 | ● | ● | ● | ● | - |
| | 4006002 | UCOR - ETPP | ● | ● | ● | ● | ● |
| | 4006503 | UT-Battelle - ORNL | ● | ● | ● | ● | ● |
| | 4006510 | UCOR - ORNL | - | ● | ● | ● | ● |
| | 4007509 | National Strategic Protective Services | ● | ● | ● | ● | - |
| | 4008010 | UCOR- Y-12 | ● | ● | ● | ● | ● |
| | 4018102 | CNS, LLC, Y-12 | ● | ● | ● | ● | ● |
| Paducah Gaseous Diff. Plant (PGDP) | 4007002 | Swift & Staley Team | ● | ● | ● | ● | ● |

| Site | Org. Code | Organization Name | 2013 | 2014 | 2015 | 2016 | 2017 |
|--|-----------|--|------|------|------|------|------|
| | 6203004 | LATA Environmental Services | ● | ● | ● | - | - |
| | 6203106 | B&W Conversions Services, LLC | ● | ● | ● | - | - |
| | 6203106 | DUF6 Paducah Construction Subs - MACS | - | - | - | ● | ● |
| | 6503304 | Fluor Paducah Deactivation Project | - | - | - | ● | ● |
| | 6503304 | Four Rivers Nuclear Partnership | - | - | - | - | ● |
| Pantex Plant (PP) | 0510001 | B & W Pantex - PXSO/NNSA and DOE Couriers | ● | - | - | - | - |
| | 0510001 | CNS Pantex - NNSA and DOE Couriers | - | ● | ● | ● | ● |
| | 0514004 | Battelle - Pantex | ● | ● | ● | ● | ● |
| | 0515002 | B & W Pantex | ● | - | - | - | - |
| | 0515002 | CNS Pantex | - | ● | ● | ● | ● |
| | 0515006 | B & W Pantex - Subcontractors | ● | - | - | - | - |
| | 0515006 | CNS Pantex - Construction Subs | - | ● | ● | ● | ● |
| | 0515009 | B & W Pantex - Security Forces | ● | - | - | - | - |
| | 0515009 | CNS Pantex - Security | - | ● | ● | ● | - |
| Portsmouth Gaseous Diff. Plant (PORTS) | 6202106 | Uranium Disposition Services - Portsmouth Sub | ● | ● | ● | - | - |
| | 6202106 | DUF6 Portsmouth Construction Subs - MACS | - | - | - | ● | ● |
| | 6202204 | Wastren - Portsmouth Services | ● | ● | ● | ● | ● |
| | 6202304 | FLUOR B & W Portsmouth | ● | ● | ● | ● | ● |
| Princeton Plasma Physics Laboratory | 1005003 | Princeton Plasma Physics Laboratory | ● | ● | ● | ● | ● |
| Sandia National Laboratories (SNL) | 0578003 | Sandia National Laboratories | ● | ● | ● | ● | ● |
| Savannah River Site (SRS) | 8500505 | Bechtel Construction - SR | ● | ● | ● | ● | ● |
| | 8500516 | Miscellaneous SRS Construction Subs | ● | ● | ● | ● | ● |
| | 8501042 | SRR Operations | ● | ● | ● | ● | ● |
| | 8501044 | SRR Service Subs | ● | ● | ● | ● | ● |
| | 8505501 | Savannah River Field Office | ● | ● | ● | ● | ● |
| | 8505504 | Misc. DOE Contractors - SR | ● | ● | ● | ● | ● |
| | 8505525 | Savannah River Nuclear Solutions, Inc. | ● | - | ● | ● | ● |
| | 8505526 | SR Construction - Parsons Subcontractors | ● | ● | ● | ● | ● |
| | 8509003 | Univ. of Georgia Ecology Laboratories | ● | ● | ● | ● | ● |
| | 8509509 | Wackenhut Services, Inc. - SRNS | ● | ● | ● | ● | ● |
| | 8511002 | Savannah River Nuclear Solutions, Inc. | ● | ● | ● | ● | ● |
| | 8511003 | Savannah River National Laboratory | - | - | - | ● | ● |
| | 8511004 | SRNS Service Subs | ● | ● | ● | ● | ● |
| | 8511005 | SRNS Construction | ● | ● | ● | ● | ● |
| | 8511006 | SRNS Construction Subs | ● | ● | ● | ● | ● |
| Separations Process Research Unit | 1523016 | NY SPRU | ● | ● | ● | ● | ● |
| SLAC National Accelerator Facility | 8008003 | Stanford Linear Accelerator Center | ● | ● | ● | ● | ● |
| Thomas Jefferson National Accelerator Facility | 1509521 | Jefferson Laboratory - DOE Employees | ● | ● | ● | ● | - |
| | 1509503 | Thomas Jefferson National Accelerator Facility | ● | ● | ● | ● | ● |
| Uranium Mill Tailings Remediation Action Project | 3260645 | Uranium Mill Tailings Remedial Action - Moab | ● | ● | ● | ● | ● |
| Waste Isolation Pilot Plant | 0701001 | Carlsbad Field Office | ● | ● | ● | ● | - |
| | 0702003 | LANL - WIPP | ● | - | ● | ● | ● |
| | 0703104 | Washington TRU Solutions LLC-WIPP | ● | ● | ● | ● | ● |
| | 0703109 | Santa Fe Protective Services - WIPP | ● | ● | ● | ● | ● |
| | 0703114 | WTS Subcontractors - WIPP | ● | - | ● | ● | ● |
| | 0703124 | WTS - Small Subs | ● | - | - | - | - |
| | 0704003 | Sandia National Laboratories - WIPP | ● | - | - | ● | - |
| West Valley Project | 4539004 | West Valley Nuclear Services, Inc. (WVNS) | ● | ● | ● | ● | ● |
| Pittsburg Naval Reactor Office | 6007504 | PNR - BAPL & BPMI-P | ● | ● | ● | ● | ● |

| Site | Org. Code | Organization Name | 2013 | 2014 | 2015 | 2016 | 2017 |
|----------------------------------|-----------|--------------------------------|------|------|------|------|------|
| | 6008003 | PNR - BAPL & BPMI-P | ● | ● | ● | ● | ● |
| | 6009003 | Naval Reactors - Idaho | ● | ● | ● | ● | ● |
| Schenectady Naval Reactor Office | 9004003 | Knolls Atomic Power Laboratory | ● | ● | ● | ● | - |
| | 9005003 | Knolls Atomic Power Laboratory | ● | ● | ● | ● | - |
| | 9005004 | Knolls Atomic Power Laboratory | ● | ● | ● | ● | - |

DOE Occupational Radiation Exposure: 2017 Annual Report Exhibit A-3. Facility Type Codes.

The following is a list of Facility Type Codes reported to REMS in accordance with the REMS Reporting Guide. A facility type code is reported with each individual's dose record and indicates the facility type where the majority of the individual's dose was accrued during the monitoring year.

| Facility Type Code | Description |
|--------------------|-------------------------------------|
| 10 | Accelerator |
| 21 | Fuel/Uranium Enrichment |
| 22 | Fuel Fabrication |
| 23 | Fuel Processing |
| 40 | Maintenance and Support (Site-Wide) |
| 50 | Reactor |
| 61 | Research, General |
| 62 | Research, Fusion |
| 70 | Waste Processing/Mgmt. |
| 80 | Weapons Fab. and Testing |
| 99 | Other |

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-1. Site Dose Data, 2015.

| Site | Collective TED (person-rem) | Percent Change - Coll. TED | Number with Meas. Dose | Percent Change - # with Meas. Dose | Avg. Meas. TED (rem) | Percent Change - Avg. Meas. TED | Percentage of Coll. TED above 0.500 rem | Percent Change - Coll. TED above 0.500 rem |
|--|-----------------------------|----------------------------|------------------------|------------------------------------|----------------------|---------------------------------|---|--|
| Ames Laboratory | 1,247 | 43% ▲ | 39 | 18% ▲ | 0.032 | 21% ▲ | - | - |
| Argonne National Laboratory | 14,818 | -10% ▼ | 83 | -1% ▼ | 0.179 | -9% ▼ | 51% | -24% ▼ |
| Brookhaven National Laboratory | 3,345 | -54% ▼ | 134 | 4% ▲ | 0.025 | -56% ▼ | - | - |
| Energy Technology Engineering Center | 0.068 | - - | 3 | - - | 0.023 | - - | - | - |
| Fermi National Accelerator Laboratory | 16,640 | 50% ▲ | 235 | 22% ▲ | 0.071 | 23% ▲ | - | - |
| Hanford: Hanford Site | 62,612 | 54% ▲ | 687 | 4% ▲ | 0.091 | 48% ▲ | 51% | 172% ▲ |
| Hanford: Office of River Protection | 38,608 | 163% ▲ | 648 | 57% ▲ | 0.060 | 68% ▲ | 3% | - |
| Hanford: Pacific Northwest National Laboratory | 12,581 | -14% ▼ | 461 | -4% ▼ | 0.027 | -11% ▼ | - | - |
| Idaho National Laboratory | 123,232 | 43% ▲ | 1,331 | 13% ▲ | 0.093 | 26% ▲ | 19% | 73% ▲ |
| Kansas City Plant | 0.020 | - - | 12 | - - | 0.002 | - - | - | - |
| Lawrence Berkeley National Laboratory | 0.796 | - - | 11 | - - | 0.072 | - - | - | - |
| Lawrence Livermore National Laboratory | 8,123 | -3% ▼ | 112 | 4% ▲ | 0.073 | -6% ▼ | 27% | 257% ▲ |
| Los Alamos National Laboratory | 97,209 | 2% ▲ | 1,135 | -19% ▼ | 0.086 | 26% ▲ | 24% | 85% ▲ |
| National Renewable Energy Laboratory | 0.028 | - - | 4 | - - | 0.007 | - - | - | - |
| Nevada National Security Site | 5,045 | -11% ▼ | 98 | -16% ▼ | 0.051 | 6% ▲ | - | - |
| Oak Ridge: East Tennessee Technology Park | 0.059 | - - | 4 | - - | 0.015 | - - | - | - |
| Oak Ridge: Oak Ridge Institute for Science and Education | 0.122 | - - | 10 | - - | 0.012 | - - | - | - |
| Oak Ridge: Oak Ridge National Laboratory | 59,959 | -16% ▼ | 598 | -3% ▼ | 0.100 | -13% ▼ | 17% | -11% ▼ |
| Oak Ridge: Y-12 National Security Complex | 58,010 | -2% ▼ | 1,201 | -9% ▼ | 0.048 | 8% ▲ | 2% | -22% ▼ |
| Office of Secure Transportation | 0.029 | - - | 2 | - - | 0.015 | - - | - | - |
| Paducah Gaseous Diffusion Plant | 7,058 | -32% ▼ | 337 | 142% ▲ | 0.021 | -72% ▼ | - | - |
| Pantex Plant | 22,618 | -27% ▼ | 301 | -1% ▼ | 0.075 | -26% ▼ | 8% | -16% ▼ |
| Portsmouth Gaseous Diffusion Plant | 4,716 | -54% ▼ | 59 | -38% ▼ | 0.080 | -26% ▼ | - | - |
| Princeton Plasma Physics Laboratory | 0.623 | - - | 126 | - - | 0.005 | - - | - | - |
| Sandia National Laboratories | 5,284 | -12% ▼ | 99 | 12% ▲ | 0.053 | -21% ▼ | - | - |
| Savannah River Site | 95,074 | 2% ▲ | 1,884 | 19% ▲ | 0.050 | -14% ▼ | - | - |
| Separations Process Research Unit | 69,291 | 642% ▲ | 149 | 96% ▲ | 0.465 | 278% ▲ | 78% | - |
| SLAC National Accelerator Laboratory | 0.069 | - - | 2 | - - | 0.034 | - - | - | - |
| Thomas Jefferson National Accelerator Facility | 3,348 | -25% ▼ | 47 | 12% ▲ | 0.071 | -33% ▼ | - | - |
| Uranium Mill Tailings Remedial Action Project | 7,177 | -7% ▼ | 86 | 41% ▲ | 0.083 | -34% ▼ | - | - |
| Waste Isolation Pilot Plant | 0.161 | - - | 12 | - - | 0.013 | - - | - | - |
| West Valley Demonstration Project | 28,107 | 109% ▲ | 122 | 9% ▲ | 0.230 | 92% ▲ | 34% | - |
| Service Center Personnel* | 0.011 | - - | 1 | - - | 0.011 | - - | - | - |
| Totals | 746,088 | 20% ▲ | 10,033 | 6% ▲ | 0.074 | 14% ▲ | 22% | 120% ▲ |

Note: Boxed values (gray background) indicate the greatest value in each column.

* Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP, in addition to several smaller facilities not associated with a DOE site.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-2. Site Dose Data, 2016.

| Site | Collective TED (person-rem) | Percent Change - Coll. TED | | Number with Meas. Dose | Percent Change - # with Meas. Dose | | Avg. Meas. TED (rem) | Percent Change - Avg. Meas. TED | | Percentage of Coll. TED above 0.500 rem | Percent Change - Coll. TED above 0.500 rem | |
|--|-----------------------------|----------------------------|---|------------------------|------------------------------------|---|----------------------|---------------------------------|---|---|--|---|
| Ames Laboratory | 1.240 | -1% | ▼ | 41 | 5% | ▲ | 0.030 | -5% | ▼ | - | - | - |
| Argonne National Laboratory | 13.080 | -12% | ▼ | 70 | -16% | ▼ | 0.187 | 5% | ▲ | 56% | 11% | ▲ |
| Brookhaven National Laboratory | 3.217 | -4% | ▼ | 84 | -37% | ▼ | 0.038 | 53% | ▲ | - | - | - |
| Energy Technology Engineering Center | 0.089 | - | - | 2 | - | - | 0.044 | - | - | - | - | - |
| Fermi National Accelerator Laboratory | 11.930 | -28% | ▼ | 232 | -1% | ▼ | 0.051 | -27% | ▼ | - | - | - |
| Hanford: Hanford Site | 41.095 | -34% | ▼ | 1,217 | 77% | ▲ | 0.034 | -63% | ▼ | 2% | -96% | ▼ |
| Hanford: Office of River Protection | 37.102 | -4% | ▼ | 929 | 43% | ▲ | 0.040 | -33% | ▼ | - | - | - |
| Hanford: Pacific Northwest National Laboratory | 11.599 | -8% | ▼ | 420 | -9% | ▼ | 0.028 | 1% | ▲ | - | - | - |
| Idaho National Laboratory | 92.670 | -25% | ▼ | 1,273 | -4% | ▼ | 0.073 | -21% | ▼ | 3% | -85% | ▼ |
| Kansas City National Security Campus | 0.063 | - | - | 24 | - | - | 0.003 | - | - | - | - | - |
| Lawrence Berkeley National Laboratory | 0.823 | - | - | 13 | - | - | 0.063 | - | - | - | - | - |
| Lawrence Livermore National Laboratory | 8.215 | 1% | ▲ | 98 | -12% | ▼ | 0.084 | 16% | ▲ | 33% | 32% | ▲ |
| Los Alamos National Laboratory | 95.565 | -2% | ▼ | 1,106 | -3% | ▼ | 0.086 | 1% | ▲ | 24% | 1% | ▲ |
| National Renewable Energy Laboratory | 0.034 | - | - | 7 | - | - | 0.005 | - | - | - | - | - |
| Nevada National Security Site | 3.295 | -35% | ▼ | 84 | -14% | ▼ | 0.039 | -24% | ▼ | - | - | - |
| New Brunswick Laboratory | 0.096 | - | - | 4 | - | - | 0.024 | - | - | - | - | - |
| Oak Ridge: East Tennessee Technology Park | 0.114 | - | - | 3 | - | - | 0.038 | - | - | - | - | - |
| Oak Ridge: Oak Ridge Institute for Science and Education | 0.171 | - | - | 9 | - | - | 0.019 | - | - | - | - | - |
| Oak Ridge: Oak Ridge National Laboratory | 69.378 | 16% | ▲ | 617 | 3% | ▲ | 0.112 | 12% | ▲ | 18% | 4% | ▲ |
| Oak Ridge: Y-12 National Security Complex | 72.807 | 26% | ▲ | 1,460 | 22% | ▲ | 0.050 | 3% | ▲ | 2% | 3% | ▲ |
| Office of Secure Transportation | 0.072 | - | - | 3 | - | - | 0.024 | - | - | - | - | - |
| Paducah Gaseous Diffusion Plant | 6.201 | -12% | ▼ | 559 | 66% | ▲ | 0.011 | -47% | ▼ | - | - | - |
| Pantex Plant | 25.918 | 15% | ▲ | 295 | -2% | ▼ | 0.088 | 17% | ▲ | 10% | 32% | ▲ |
| Portsmouth Gaseous Diffusion Plant | 2.509 | -47% | ▼ | 40 | -32% | ▼ | 0.063 | -22% | ▼ | - | - | - |
| Princeton Plasma Physics Laboratory | 0.311 | - | - | 78 | - | - | 0.004 | - | - | - | - | - |
| Sandia National Laboratories | 2.756 | -48% | ▼ | 68 | -31% | ▼ | 0.041 | -24% | ▼ | - | - | - |
| Savannah River National Lab | 12.363 | - | - | 362 | - | - | 0.034 | - | - | - | - | - |
| Savannah River Site | 98.975 | 4% | ▲ | 2,437 | 29% | ▲ | 0.041 | -20% | ▼ | - | - | - |
| Separations Process Research Unit | 47.541 | -31% | ▼ | 101 | -32% | ▼ | 0.471 | 1% | ▲ | 77% | -1% | ▼ |
| SLAC National Accelerator Laboratory | 0.170 | - | - | 6 | - | - | 0.028 | - | - | - | - | - |
| Thomas Jefferson National Accelerator Facility | 0.777 | - | - | 30 | - | - | 0.026 | - | - | - | - | - |
| Uranium Mill Tailings Remedial Action Project | 7.044 | -2% | ▼ | 131 | 52% | ▲ | 0.054 | -36% | ▼ | 8% | - | - |
| Waste Isolation Pilot Plant | 0.322 | - | - | 23 | - | - | 0.014 | - | - | - | - | - |
| West Valley Demonstration Project | 41.122 | 46% | ▲ | 147 | 20% | ▲ | 0.280 | 21% | ▲ | 47% | 39% | ▲ |
| Service Center Personnel* | 0.257 | - | - | 15 | - | - | 0.017 | - | - | - | - | - |
| Totals | 708.921 | -5% | ▼ | 11,988 | 19% | ▲ | 0.059 | -20% | ▼ | 15% | -31% | ▼ |

Note: Boxed values (gray background) indicate the greatest value in each column.

* Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP, in addition to several smaller facilities not associated with a DOE site.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-3. Site Dose Data, 2017.

| Site | Collective TED (person-rem) | Percent Change - Coll. TED | Number with Meas. Dose | Percent Change - # with Meas. Dose | Avg. Meas. TED (rem) | Percent Change - Avg. Meas. TED | Percentage of Coll. TED above 0.500 rem | Percent Change - Coll. TED above 0.500 rem |
|--|-----------------------------|----------------------------|------------------------|------------------------------------|----------------------|---------------------------------|---|--|
| Ames Laboratory | 1.053 | -15% ▼ | 38 | -7% ▼ | 0.028 | -8% ▼ | - | - |
| Argonne National Laboratory | 9.885 | -24% ▼ | 75 | 7% ▲ | 0.132 | -29% ▼ | 50% | -11% ▼ |
| Brookhaven National Laboratory | 6.087 | 89% ▲ | 78 | -7% ▼ | 0.078 | 104% ▲ | - | - |
| Energy Technology Engineering Center | 0.026 | - | 2 | - | 0.013 | - | - | - |
| Fermi National Accelerator Laboratory | 10.210 | -14% ▼ | 201 | -13% ▼ | 0.051 | -1% ▼ | - | - |
| Grand Junction Site | 0.010 | - | 2 | - | 0.005 | - | - | - |
| Hanford: Hanford Site | 27.003 | -34% ▼ | 717 | -41% ▼ | 0.038 | 12% ▲ | 2% | -96% ▼ |
| Hanford: Office of River Protection | 24.387 | -34% ▼ | 597 | -36% ▼ | 0.041 | 2% ▲ | - | - |
| Hanford: Pacific Northwest National Laboratory | 13.555 | 17% ▲ | 517 | 23% ▲ | 0.026 | -5% ▼ | - | - |
| Idaho National Laboratory | 78.946 | -15% ▼ | 1,177 | -8% ▼ | 0.067 | -8% ▼ | 1% | -76% ▼ |
| Kansas City National Security Campus | 0.171 | - | 44 | - | 0.004 | - | - | - |
| Lawrence Berkeley National Laboratory | 1.257 | 53% ▲ | 18 | 38% ▲ | 0.070 | 10% ▲ | - | - |
| Lawrence Livermore National Laboratory | 7.134 | -13% ▼ | 115 | 17% ▲ | 0.062 | -26% ▼ | 28% | -15% ▼ |
| Los Alamos National Laboratory | 160.772 | 68% ▲ | 1,850 | 67% ▲ | 0.087 | 1% ▲ | 24% | - |
| National Renewable Energy Laboratory | 0.020 | - | 4 | - | 0.005 | - | - | - |
| Nevada National Security Site | 3.858 | 17% ▲ | 94 | 12% ▲ | 0.041 | 5% ▲ | - | - |
| Oak Ridge: East Tennessee Technology Park | 0.093 | - | 6 | - | 0.016 | - | - | - |
| Oak Ridge: Oak Ridge Institute for Science and Education | 0.243 | - | 23 | - | 0.011 | - | - | - |
| Oak Ridge: Oak Ridge National Laboratory | 87.621 | 26% ▲ | 661 | 7% ▲ | 0.133 | 18% ▲ | 32% | 80% ▲ |
| Oak Ridge: Y-12 National Security Complex | 75.890 | 4% ▲ | 1,453 | 0% - | 0.052 | 5% ▲ | 2% | 1% ▲ |
| Office of Secure Transportation | 0.311 | - | 8 | - | 0.039 | - | - | - |
| Paducah Gaseous Diffusion Plant | 5.159 | -17% ▼ | 113 | -80% ▼ | 0.046 | 312% ▲ | - | - |
| Pantex Plant | 24.986 | -4% ▼ | 333 | 13% ▲ | 0.075 | -15% ▼ | 8% | -28% ▼ |
| Portsmouth Gaseous Diffusion Plant | 2.553 | 2% ▲ | 41 | 2% ▲ | 0.062 | -1% ▼ | - | - |
| Princeton Plasma Physics Laboratory | 0.361 | - | 49 | - | 0.007 | - | - | - |
| Sandia National Laboratories | 2.146 | -22% ▼ | 73 | 7% ▲ | 0.029 | -27% ▼ | - | - |
| Savannah River National Lab | 20.128 | 63% ▲ | 581 | 60% ▲ | 0.035 | 1% ▲ | - | - |
| Savannah River Site | 152.418 | 54% ▲ | 3,830 | 57% ▲ | 0.004 | -2% ▼ | 5 | - |
| Separations Process Research Unit | 5.185 | -89% ▼ | 59 | -42% ▼ | 0.088 | -81% ▼ | 77% | -1% ▼ |
| SLAC National Accelerator Laboratory | 0.057 | - | 4 | - | 0.014 | - | - | - |
| Thomas Jefferson National Accelerator Facility | 0.270 | - | 20 | - | 0.014 | - | - | - |
| Uranium Mill Tailings Remedial Action Project | 5.656 | -20% ▼ | 66 | -50% ▼ | 0.086 | 59% ▲ | 8% | - |
| Waste Isolation Pilot Plant | 0.279 | - | 17 | - | 0.016 | - | - | - |
| West Valley Demonstration Project | 33.653 | -18% ▼ | 154 | 5% ▲ | 0.219 | -22% ▼ | 40% | -15% ▼ |
| Service Center Personnel* | 0.091 | - | 5 | - | 0.180 | - | - | - |
| Totals | 761.474 | 7% ▲ | 13,025 | 9% ▲ | 0.058 | -1% ▼ | 13% | -16% ▼ |

Note: Boxed values (gray background) indicate the greatest value in each column.

* Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP, in addition to several smaller facilities not associated with a DOE site.

DOE Occupational Radiation Exposure: 2017 Annual Report
Exhibit B-4. Internal Dose by Site, 2015–2017.

| Site | No. of Individuals with Measurable CED* 2015 | No. of Individuals with Measurable CED* 2016 | No. of Individuals with Measurable CED* 2017 | Collective CED Dose (person-rem) 2015 | Collective CED Dose (person-rem) 2016 | Collective CED Dose (person-rem) 2017 | Average Measurable CED 2015 | Average Measurable CED 2016 | Average Measurable CED 2017 |
|--|--|--|--|---------------------------------------|---------------------------------------|---------------------------------------|-----------------------------|-----------------------------|-----------------------------|
| Argonne National Laboratory | 4 | 1 | 3 | 0.180 | 0.114 | 0.261 | 0.045 | 0.114 ◀ | 0.087 |
| Hanford: Hanford Site | 4 | 3 | 22 | 0.034 | 0.016 | 0.102 | 0.008 | 0.005 | 0.005 |
| Hanford: Pacific Northwest National Laboratory | – | 2 | – | – | 0.004 | – | – | 0.002 | – |
| Idaho National Laboratory | 3 | 2 | – | 0.061 | 0.065 | – | 0.020 | 0.032 | – |
| Lawrence Livermore National Laboratory | 3 | 2 | – | 0.051 | 0.029 | – | 0.017 | 0.014 | – |
| Los Alamos National Laboratory | 31 | 29 | 11 | 0.144 | 0.111 | 0.062 | 0.005 | 0.004 | 0.006 |
| Oak Ridge: Oak Ridge National Laboratory | 2 | 4 | 2 | 0.186 | 0.055 | 0.233 | 0.093 ◀ | 0.014 | 0.116 ◀ |
| Oak Ridge: Y-12 National Security Complex | 1,042 ◀ | 1,130 ◀ | 1,204 ◀ | 48.720 ◀ | 59.165 ◀ | 64.090 ◀ | 0.047 | 0.052 | 0.053 |
| Paducah Gaseous Diffusion Plant | 4 | 7 | 5 | 0.086 | 0.087 | 0.099 | 0.022 | 0.012 | 0.020 |
| Pantex Plant | 2 | 1 | 1 | 0.003 | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 |
| Sandia National Laboratories | – | 1 | 4 | – | 0.001 | 0.190 | – | 0.001 | 0.048 |
| Savannah River Site | 5 | 5 | 1 | 0.061 | 0.020 | 0.004 | 0.012 | 0.004 | 0.004 |
| Separations Process Research Unit | 3 | – | – | 0.084 | – | – | 0.028 | – | – |
| Uranium Mill Tailings Remedial Action Project | 45 | 54 | 29 | 2.104 | 1.876 | 0.947 | 0.047 | 0.035 | 0.033 |
| Totals | 1,148 | 1,241 | 1,282 | 51.714 | 61.544 | 65.989 | 0.045 | 0.050 | 0.051 |

Note: Boxed values (gray background) indicate the greatest value in each column.

* The number of internal depositions represents the number of internal dose records with positive results reported for each individual.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-5. Neutron Dose Distribution by Site, 2017.

| Site | No. Meas. Dose | Meas. < 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.00 | 1.0–2.0 | >2.0 | Total Monitored * | No. of Individuals with Meas. Dose | % of Individuals with Meas. Dose | Collective Neutron Dose (person-rem) | Avg. Meas. Neutron Dose (rem) |
|--|----------------|---------------|-------------|-------------|-------------|------------|----------|----------|-------------------|------------------------------------|----------------------------------|--------------------------------------|-------------------------------|
| Ames Laboratory | 204 | – | – | – | – | – | – | – | 204 | – | – | – | – |
| Argonne National Laboratory | 1,779 | – | – | – | – | – | – | – | 1,779 | – | – | – | – |
| Brookhaven National Laboratory | 3,668 | 1 | – | – | – | – | – | – | 3,669 | 1 | 0% | 0.006 | 0.006 |
| Energy Technology Engineering Center | 5 | – | – | – | – | – | – | – | 5 | – | – | – | – |
| Fermi National Accelerator Laboratory | 1,370 | – | – | – | – | – | – | – | 1,370 | – | – | – | – |
| Hanford: Hanford Site | 3,745 | 232 | – | – | – | – | – | – | 3,977 | 232 | 6% | 1.889 | 0.008 |
| Hanford: Office of River Protection | 2,662 | 1 | – | – | – | – | – | – | 2,663 | 1 | 0% | 0.028 | 0.028 |
| Hanford: Pacific Northwest National Laboratory | 2,464 | 3 | – | – | – | – | – | – | 2,467 | 3 | 0% | 0.090 | 0.030 |
| Grand Junction Site | 22 | – | – | – | – | – | – | – | 22 | – | – | – | – |
| Idaho National Laboratory | 7,151 | 24 | 3 | – | – | – | – | – | 7,178 | 27 | 0% | 1.030 | 0.038 |
| Kansas City Security Campus | 113 | 1 | – | – | – | – | – | – | 114 | 1 | 1% | 0.020 | 0.020 |
| Lawrence Berkeley National Laboratory | 941 | – | – | – | – | – | – | – | 941 | – | – | – | – |
| Lawrence Livermore National Laboratory | 8,608 | 47 | – | 1 | 1 | – | – | – | 8,657 | 49 | 1% | 2.249 | 0.046 |
| Los Alamos National Laboratory | 9,934 | 741 | 143 | 35 | 8 | 7 | 8 | – | 10,876 | 942 | 9% | 74.395 | 0.079 |
| National Renewable Energy Laboratory | 11 | – | – | – | – | – | – | – | 11 | – | – | – | – |
| Nevada National Security Site | 1,538 | 1 | – | – | – | – | – | – | 1,539 | 1 | 0% | 0.020 | 0.020 |
| Oak Ridge: East Tennessee Technology Park | 370 | 2 | – | – | – | – | – | – | 372 | 2 | 1% | 0.031 | 0.016 |
| Oak Ridge: Oak Ridge Institute for Science and Education | 97 | – | – | – | – | – | – | – | 97 | – | – | – | – |
| Oak Ridge: Oak Ridge National Laboratory | 3,880 | 246 | 57 | 25 | 1 | – | – | – | 4,209 | 329 | 8% | 28.230 | 0.086 |
| Oak Ridge: Y-12 National Security Complex | 6,154 | 4 | – | – | – | – | – | – | 6,158 | 4 | 0% | 0.061 | 0.015 |
| Office of Secure Transportation | 305 | – | – | – | – | – | – | – | 305 | – | – | – | – |
| Paducah Gaseous Diffusion Plant | 1,874 | 1 | – | – | – | – | – | – | 1,875 | 1 | 0% | 0.030 | 0.030 |
| Pantex Plant | 4,625 | 28 | 2 | – | – | – | – | – | 4,655 | 30 | 1% | 1.264 | 0.042 |
| Portsmouth Gaseous Diffusion Plant | 2,592 | 10 | 1 | – | – | – | – | – | 2,603 | 11 | 0% | 0.687 | 0.062 |
| Princeton Plasma Physics Laboratory | 374 | – | – | – | – | – | – | – | 374 | – | – | – | – |
| Sandia National Laboratories | 1,782 | 2 | – | – | – | – | – | – | 1,784 | 2 | 0% | 0.029 | 0.014 |
| Savannah River National Lab | 681 | 1 | – | – | – | – | – | – | 682 | 1 | 0% | 0.084 | 0.084 |
| Savannah River Site | 5,869 | 70 | 20 | 7 | – | – | – | – | 5,966 | 97 | 2% | 8.083 | 0.083 |
| Separations Process Research Unit | 167 | – | – | – | – | – | – | – | 167 | – | – | – | – |
| SLAC National Accelerator Facility | 2,543 | – | – | – | – | – | – | – | 2,543 | – | – | – | – |
| Thomas Jefferson National Accelerator Facility | 1,149 | – | – | – | – | – | – | – | 1,149 | – | – | – | – |
| Uranium Mill Tailings Remediation Action Project | 126 | – | – | – | – | – | – | – | 126 | – | – | – | – |
| Waste Isolation Pilot Plant | 647 | – | – | – | – | – | – | – | 647 | – | – | – | – |
| West Valley Project | 385 | – | – | – | – | – | – | – | 385 | – | – | – | – |
| Service Center Personnel* | 319 | – | – | – | – | – | – | – | 319 | – | – | – | – |
| Totals | 78,154 | 1,415 | 226 | 68 | 10 | 7 | 8 | – | 79,888 | 1,734 | 2% | 118.226 | 0.068 |

Note: Boxed values (gray background) indicate the greatest value in each column.

*Represents the total number of monitoring records. The number of individuals specifically monitored for neutron radiation cannot be determined.

**Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP, in addition to several smaller facilities not associated with a DOE site.

DOE Occupational Radiation Exposure: 2017 Annual Report
Exhibit B-6a. Distribution of TED by Facility Type, 2015.

TOTAL EFFECTIVE DOSE (TED)

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)

| Facility Type | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
|---------------------------------|-----------------|----------------|--------------|-------------|-------------|-------------|-----------|----------|----------|----------|----------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| Accelerator | 6,680 | 310 | 58 | 15 | – | – | – | – | – | – | – | 7,063 | 5% | 383 | 22.847 | 0.060 |
| Fuel Processing | 648 | 205 | 13 | – | – | – | – | – | – | – | – | 866 | 25% | 218 | 7.374 | 0.034 |
| Fuel/Uranium Enrichment | 756 | 43 | – | – | – | – | – | – | – | – | – | 799 | 5% | 43 | 0.329 | 0.008 |
| Maintenance and Support | 11,284 | 1,772 | 285 | 81 | 41 | 20 | 11 | – | – | – | – | 13,494 | 16% | 2,210 | 176.856 | 0.080 |
| Other | 6,210 | 397 | 37 | 28 | 2 | – | – | – | – | – | – | 6,674 | 7% | 464 | 26.697 | 0.058 |
| Reactor | 67 | 16 | 9 | 1 | – | – | – | – | – | – | – | 93 | 28% | 26 | 2.407 | 0.093 |
| Research, Fusion | 312 | 128 | – | – | – | – | – | – | – | – | – | 440 | 29% | 128 | 0.647 | 0.005 |
| Research, General | 27,169 | 2,455 | 397 | 130 | 46 | 13 | 3 | – | – | – | – | 30,213 | 10% | 3,044 | 213.842 | 0.070 |
| Waste Processing/Management | 3,935 | 1,392 | 349 | 149 | 29 | 16 | 27 | – | – | – | – | 5,898 | 33% | 1,963 | 213.645 | 0.109 |
| Weapons Fabrication and Testing | 8,493 | 1,311 | 193 | 45 | 5 | – | – | – | – | – | – | 10,047 | 15% | 1,554 | 81.444 | 0.052 |
| Totals | 65,533 | 8,022 | 1,341 | 448 | 123 | 49 | 41 | – | – | – | – | 75,587 | 13% | 10,033 | 746.088 | 0.074 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report
Exhibit B-6b. Distribution of TED by Facility Type, 2016.

| TOTAL EFFECTIVE DOSE (TED) | | | | | | | | | | | | | | | | |
|--|-----------------|----------------|--------------|-------------|-------------|-------------|-----------|----------|----------|----------|----------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| Number of Individuals Receiving Radiation Doses in Each Dose Range (rem) | | | | | | | | | | | | | | | | |
| Facility Type | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
| Accelerator | 7,035 | 288 | 41 | 7 | – | – | – | – | – | – | – | 7,371 | 5% | 336 | 15.724 | 0.047 |
| Fuel Processing | 481 | 303 | 8 | 1 | – | – | – | – | – | – | – | 793 | 39% | 312 | 9.043 | 0.029 |
| Fuel/Uranium Enrichment | 709 | 59 | – | – | – | – | – | – | – | – | – | 768 | 8% | 59 | 0.517 | 0.009 |
| Maintenance and Support | 10,652 | 2,125 | 287 | 68 | 19 | 8 | 4 | – | – | – | – | 13,163 | 19% | 2,511 | 149.485 | 0.060 |
| Other | 5,970 | 828 | 42 | 20 | – | – | – | – | – | – | – | 6,860 | 13% | 890 | 29.364 | 0.033 |
| Reactor | 69 | 24 | 2 | – | – | – | – | – | – | – | – | 95 | 27% | 26 | 1.230 | 0.047 |
| Research, Fusion | 385 | 82 | – | – | – | – | – | – | – | – | – | 467 | 18% | 82 | 0.414 | 0.005 |
| Research, General | 26,972 | 2,692 | 339 | 129 | 17 | 3 | 8 | – | – | – | – | 30,160 ◀ | 11% | 3,188 ◀ | 183.899 | 0.058 |
| Waste Processing/Management | 3,590 | 2,154 | 316 | 161 | 48 | 26 | 8 | – | – | – | – | 6,303 | 43% ◀ | 2,713 | 219.397 ◀ | 0.081 ◀ |
| Weapons Fabrication and Testing | 9,985 | 1,588 | 211 | 65 | 6 | 1 | – | – | – | – | – | 11,856 | 16% | 1,871 | 99.848 | 0.053 |
| Totals | 65,848 | 10,143 | 1,246 | 451 | 90 | 38 | 20 | – | – | – | – | 77,836 | 15% | 11,988 | 708.921 | 0.059 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report
Exhibit B-6c. Distribution of TED by Facility Type, 2017.

| TOTAL EFFECTIVE DOSE (TED) | | | | | | | | | | | | | | | | |
|--|-----------------|----------------|--------------|-------------|-------------|-------------|-----------|----------|----------|----------|----------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| Number of Individuals Receiving Radiation Doses in Each Dose Range (rem) | | | | | | | | | | | | | | | | |
| Facility Type | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
| Accelerator | 7,982 | 235 | 43 | 8 | – | – | – | – | – | – | – | 8,268 | 3% | 286 | 15.168 | 0.053 |
| Fuel Processing | 298 | 353 | 18 | – | – | – | – | – | – | – | – | 669 | 55% ◀ | 371 | 11.098 | 0.030 |
| Fuel/Uranium Enrichment | 366 | 6 | – | – | – | – | – | – | – | – | – | 372 | 2% | 6 | 0.093 | 0.016 |
| Maintenance and Support | 10,927 | 2,202 | 366 | 121 | 19 | 5 | 17 | – | – | – | – | 13,657 | 20% | 2,730 | 196.105 ◀ | 0.072 ◀ |
| Other | 6,095 | 804 | 31 | 11 | – | – | – | – | – | – | – | 6,941 | 12% | 846 | 23.918 | 0.028 |
| Reactor | 91 | 13 | 1 | – | – | – | – | – | – | – | – | 105 | 13% | 14 | 0.586 | 0.042 |
| Research, Fusion | 388 | 50 | – | – | – | – | – | – | – | – | – | 438 | 11% | 50 | 0.376 | 0.008 |
| Research, General | 27,409 | 2,809 | 350 | 94 | 30 | 8 | 4 | – | – | – | – | 30,704 ◀ | 11% | 3,295 | 188.688 | 0.057 |
| Waste Processing/Management | 3,618 | 2,777 | 372 | 180 | 48 | – | – | – | – | – | – | 6,995 | 48% | 3,377 ◀ | 188.688 | 0.065 |
| Weapons Fabrication and Testing | 9,689 | 1,762 | 215 | 67 | 6 | – | – | – | – | – | – | 11,739 | 17% | 2,050 | 104.377 | 0.051 |
| Totals | 66,863 | 11,011 | 1,396 | 481 | 103 | 13 | 21 | – | – | – | – | 79,888 | 16% | 13,025 | 761.474 | 0.058 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-7a. Collective TED by Site and Facility Type, 2015.

| Site | Accelerator | Fuel/Uranium Enrichment | Fuel Processing | Maintenance and Support | Reactor | Research, General | Research, Fusion | Waste Processing/Management | Weapons Fabrication and Testing | Other | Totals |
|--|---------------|-------------------------|-----------------|-------------------------|--------------|-------------------|------------------|-----------------------------|---------------------------------|---------------|----------------|
| Ames Laboratory | - | - | - | - | - | 1,247 | - | - | - | - | 1,247 |
| Argonne National Laboratory | - | - | - | - | - | 14,818 | - | - | - | - | 14,818 |
| Brookhaven National Laboratory | 2,440 | - | - | 0.577 | 0.010 | 0.030 | - | 0.288 | - | - | 3,345 |
| Energy Technology Engineering Center | - | - | - | - | - | - | - | - | - | 0.068 | 0.068 |
| Fermi National Accelerator Laboratory | 16.640 | - | - | - | - | - | - | - | - | - | 16,640 |
| Hanford: Hanford Site | - | - | - | 57,571 | - | - | - | - | - | 5,041 | 62,612 |
| Hanford: Office of River Protection | - | - | - | 11,579 | - | - | - | 10,725 | - | 16,304 | 38,608 |
| Hanford: Pacific Northwest National Laboratory | - | - | - | - | - | 12,581 | - | - | - | - | 12,581 |
| Idaho National Laboratory | - | - | - | - | - | 123,232 | - | - | - | - | 123,232 |
| Kansas City National Security Campus | - | - | - | - | - | - | - | - | 0.020 | - | 0.020 |
| Lawrence Berkeley National Laboratory | - | - | - | - | - | 0,796 | - | - | - | - | 0,796 |
| Lawrence Livermore National Laboratory | - | - | - | - | - | 8,123 | - | - | - | - | 8,123 |
| Los Alamos National Laboratory | - | - | - | 95,987 | - | 0,041 | - | - | - | 1,181 | 97,209 |
| National Renewable Energy Laboratory | - | - | - | - | - | 0,028 | - | - | - | - | 0,028 |
| Nevada National Security Site | - | - | - | 5,045 | - | - | - | - | - | - | 5,045 |
| Oak Ridge: East Tennessee Technology Park | - | 0,059 | - | - | - | - | - | - | - | - | 0,059 |
| Oak Ridge: Oak Ridge Institute for Science and Education | - | - | - | - | - | 0,122 | - | - | - | - | 0,122 |
| Oak Ridge: Oak Ridge National Laboratory | - | - | - | - | - | 35,941 | - | 24,018 | - | - | 59,959 |
| Oak Ridge: Y-12 National Security Complex | - | - | - | - | - | - | - | - | 58,010 | - | 58,010 |
| Office of Secure Transportation | - | - | - | - | - | - | - | - | 0,029 | - | 0,029 |
| Paducah Gaseous Diffusion Plant | - | 0,270 | - | - | - | 5,256 | - | 1,532 | - | - | 7,058 |
| Pantex Plant | - | - | - | - | - | - | - | - | 22,618 | - | 22,618 |
| Portsmouth Gaseous Diffusion Plant | - | - | - | - | - | 4,716 | - | - | - | - | 4,716 |
| Princeton Plasma Physics Laboratory | - | - | - | - | - | - | 0,623 | - | - | - | 0,623 |
| Sandia National Laboratories | 0,350 | - | - | 0,258 | 2,397 | 0,917 | 0,024 | 0,472 | 0,197 | 0,669 | 5,284 |
| Savannah River Site | - | - | 7,374 | 5,839 | - | 5,983 | - | 71,874 | 0,570 | 3,434 | 95,074 |
| Separations Process Research Unit | - | - | - | - | - | - | - | 69,291 | - | - | 69,291 |
| SLAC National Accelerator Laboratory | 0,069 | - | - | - | - | - | - | - | - | - | 0,069 |
| Thomas Jefferson National Accelerator Facility | 3,348 | - | - | - | - | - | - | - | - | - | 3,348 |
| Uranium Mill Tailings Remedial Action Project | - | - | - | - | - | - | - | 7,177 | - | - | 7,177 |
| Waste Isolation Pilot Plant | - | - | - | - | - | - | - | 0,161 | - | - | 0,161 |
| West Valley Demonstration Project | - | - | - | - | - | - | - | 28,107 | - | - | 28,107 |
| Service Center Personnel* | - | - | - | - | - | 0,011 | - | - | - | - | 0,011 |
| Totals | 22,847 | 0,329 | 7,374 | 176,856 | 2,407 | 213,842 | 0,647 | 213,645 | 81,444 | 26,697 | 746,088 |

Note: Boxed values (gray background) indicate the greatest value in each column.

* Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-7b. Collective TED by Site and Facility Type, 2016.

| Site | Accelerator | Fuel/Uranium Enrichment | Fuel Processing | Maintenance and Support | Reactor | Research, General | Research, Fusion | Waste Processing/ Management | Weapons Fabrication and Testing | Other | Totals |
|--|---------------|-------------------------|-----------------|-------------------------|--------------|-------------------|------------------|------------------------------|---------------------------------|---------------|----------------|
| Ames Laboratory | - | - | - | - | - | 1.240 | - | - | - | - | 1.240 |
| Argonne National Laboratory | - | - | - | - | - | 13.080 | - | - | - | - | 13.080 |
| Brookhaven National Laboratory | 2.518 | - | - | 0.333 | - | - | - | 0.366 | - | - | 3.217 |
| Energy Technology Engineering Center | - | - | - | - | - | - | - | - | - | 0.089 | 0.089 |
| Fermi National Accelerator Laboratory | 11.930 | - | - | - | - | - | - | - | - | - | 11.930 |
| Hanford: Hanford Site | - | - | - | 32.589 | - | - | - | 0.015 | - | 8.491 | 41.095 |
| Hanford: Office of River Protection | - | - | - | 11.119 | - | - | - | 11.240 | - | 14.743 | 37.102 |
| Hanford: Pacific Northwest National Laboratory | - | - | - | - | - | 11.599 | - | - | - | - | 11.599 |
| Idaho National Laboratory | - | - | - | - | - | 92.670 | - | - | - | - | 92.670 |
| Kansas City National Security Campus | - | - | - | - | - | - | - | - | 0.063 | - | 0.063 |
| Lawrence Berkeley National Laboratory | - | - | - | - | - | 0.823 | - | - | - | - | 0.823 |
| Lawrence Livermore National Laboratory | - | - | - | - | - | 8.215 | - | - | - | - | 8.215 |
| Los Alamos National Laboratory | 0.006 | - | - | 93.633 | - | 0.028 | - | - | - | 1.898 | 95.565 |
| National Renewable Energy Laboratory | - | - | - | - | - | 0.034 | - | - | - | - | 0.034 |
| Nevada National Security Site | - | - | - | 3.295 | - | - | - | - | - | - | 3.295 |
| New Brunswick Laboratory | - | - | - | - | - | 0.096 | - | - | - | - | 0.096 |
| Oak Ridge: East Tennessee Technology Park | - | 0.114 | - | - | - | - | - | - | - | - | 0.114 |
| Oak Ridge: Oak Ridge Institute for Science and Education | - | - | - | - | - | 0.171 | - | - | - | - | 0.171 |
| Oak Ridge: Oak Ridge National Laboratory | - | - | - | - | - | 41.747 | - | 27.631 | - | - | 69.378 |
| Oak Ridge: Y-12 National Security Complex | - | - | - | - | - | - | - | - | 72.807 | - | 72.807 |
| Office of Secure Transportation | - | - | - | - | - | - | - | - | 0.072 | - | 0.072 |
| Paducah Gaseous Diffusion Plant | - | 0.403 | - | - | - | 2.636 | - | 3.162 | - | - | 6.201 |
| Pantex Plant | - | - | - | - | - | - | - | - | 25.918 | - | 25.918 |
| Portsmouth Gaseous Diffusion Plant | - | - | - | - | - | 2.509 | - | - | - | - | 2.509 |
| Princeton Plasma Physics Laboratory | - | - | - | - | - | - | 0.311 | - | - | - | 0.311 |
| Sandia National Laboratories | 0.323 | - | - | 0.010 | 1.230 | 0.845 | 0.103 | 0.024 | 0.062 | 0.159 | 2.756 |
| Savannah River National Lab | - | - | 0.745 | 4.720 | - | 6.653 | - | 0.225 | 0.005 | 0.015 | 12.363 |
| Savannah River Site | - | - | 8.298 | 3.786 | - | 1.296 | - | 80.705 | 0.921 | 3.969 | 98.975 |
| Separations Process Research Unit | - | - | - | - | - | - | - | 47.541 | - | - | 47.541 |
| SLAC National Accelerator Laboratory | 0.170 | - | - | - | - | - | - | - | - | - | 0.170 |
| Thomas Jefferson National Accelerator Facility | 0.777 | - | - | - | - | - | - | - | - | - | 0.777 |
| Uranium Mill Tailings Remedial Action Project | - | - | - | - | - | - | - | 7.044 | - | - | 7.044 |
| Waste Isolation Pilot Plant | - | - | - | - | - | - | - | 0.322 | - | - | 0.322 |
| West Valley Demonstration Project | - | - | - | - | - | - | - | 41.122 | - | - | 41.122 |
| Service Center Personnel* | - | - | - | - | - | 0.257 | - | - | - | - | 0.257 |
| Totals | 15.724 | 0.517 | 9.043 | 149.485 | 1.230 | 183.899 | 0.414 | 219.397 | 99.848 | 29.364 | 708.921 |

Note: Boxed values (gray background) indicate the greatest value in each column.

* Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-7c. Collective TED by Site and Facility Type, 2017.

| Site | Accelerator | Fuel/Uranium Enrichment | Fuel Processing | Maintenance and Support | Reactor | Research, General | Research, Fusion | Waste Processing/Management | Weapons Fabrication and Testing | Other | Totals |
|--|---------------|-------------------------|-----------------|-------------------------|--------------|-------------------|------------------|-----------------------------|---------------------------------|---------------|----------------|
| Ames Laboratory | - | - | - | - | - | 1.053 | - | - | - | - | 1.053 |
| Argonne National Laboratory | - | - | - | - | - | 9.885 | - | - | - | - | 9.885 |
| Brookhaven National Laboratory | 4.529 | - | - | 1.284 | - | - | - | 0.274 | - | - | 6.087 |
| Energy Technology Engineering Center | - | - | - | - | - | - | - | - | - | 0.026 | 0.026 |
| Fermi National Accelerator Laboratory | 10.210 | - | - | - | - | - | - | - | - | - | 10.210 |
| Grand Junction Site | - | - | - | - | - | - | - | - | - | 0.010 | 0.010 |
| Hanford: Hanford Site | - | - | - | 20.425 | - | - | - | - | - | 6.578 | 27.003 |
| Hanford: Office of River Protection | - | - | - | 0.135 | - | - | - | 16.276 | - | 7.976 | 24.387 |
| Hanford: Pacific Northwest National Laboratory | - | - | - | - | - | 13.555 | - | - | - | - | 13.555 |
| Idaho National Laboratory | - | - | - | - | - | 78.946 | - | - | - | - | 78.946 |
| Kansas City National Security Campus | - | - | - | - | - | - | - | - | 0.171 | - | 0.171 |
| Lawrence Berkeley National Laboratory | - | - | - | - | - | 1.257 | - | - | - | - | 1.257 |
| Lawrence Livermore National Laboratory | - | - | - | - | - | 7.134 | - | - | - | - | 7.134 |
| Los Alamos National Laboratory | 0.012 | - | - | 159.080 | - | 0.071 | - | - | - | 1.609 | 160.772 |
| National Renewable Energy Laboratory | - | - | - | - | - | 0.020 | - | - | - | - | 0.020 |
| Nevada National Security Site | - | - | - | 3.858 | - | - | - | - | - | - | 3.858 |
| Oak Ridge: East Tennessee Technology Park | - | 0.093 | - | - | - | - | - | - | - | - | 0.093 |
| Oak Ridge: Oak Ridge Institute for Science and Education | - | - | - | - | - | 0.243 | - | - | - | - | 0.243 |
| Oak Ridge: Oak Ridge National Laboratory | - | - | - | - | - | 54.943 | - | 32.678 | - | - | 87.621 |
| Oak Ridge: Y-12 National Security Complex | - | - | - | - | - | - | - | - | 75.890 | - | 75.890 |
| Office of Secure Transportation | - | - | - | - | - | - | - | - | 0.311 | - | 0.311 |
| Paducah Gaseous Diffusion Plant | - | - | - | - | - | 0.119 | - | 5.020 | - | - | 5.159 |
| Pantex Plant | - | - | - | - | - | - | - | - | 24.986 | - | 24.986 |
| Portsmouth Gaseous Diffusion Plant | - | - | - | - | - | 2.553 | - | - | - | - | 2.553 |
| Princeton Plasma Physics Laboratory | - | - | - | - | - | - | 0.361 | - | - | - | 0.361 |
| Sandia National Laboratories | 0.087 | - | - | 0.576 | 0.586 | 0.376 | 0.015 | 0.240 | 0.174 | 0.517 | 2.146 |
| Savannah River National Laboratory | - | - | 0.084 | - | - | 13.922 | - | 0.277 | 0.077 | 0.084 | 20.128 |
| Savannah River Site | - | - | 11.014 | 5.338 | - | 4.520 | - | 121.530 | 2.768 | 7.118 | 152.418 |
| Separations Process Research Unit | - | - | - | - | - | - | - | 5.185 | - | - | 5.185 |
| SLAC National Accelerator Laboratory | 0.057 | - | - | - | - | - | - | - | - | - | 0.057 |
| Thomas Jefferson National Accelerator Facility | 0.270 | - | - | - | - | - | - | - | - | - | 0.270 |
| Uranium Mill Tailings Remedial Action Project | - | - | - | - | - | - | - | 5.656 | - | - | 5.656 |
| Waste Isolation Pilot Plant | - | - | - | - | - | - | - | 0.279 | - | - | 0.279 |
| West Valley Demonstration Project | - | - | - | - | - | - | - | 33.653 | - | - | 33.653 |
| Service Center Personnel* | - | - | - | - | - | 0.091 | - | - | - | - | 0.091 |
| Totals | 15.165 | 0.093 | 11.098 | 196.105 | 0.586 | 188.688 | 0.376 | 221.068 | 104.377 | 23.918 | 761.474 |

Note: Boxed values (gray background) indicate the greatest value in each column.

* Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-8. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Accelerator Facilities, 2017.

ACCELERATORS

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)

| Site/Contractor | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
|--|-----------------|----------------|-------------|-------------|-------------|-------------|----------|----------|----------|----------|----------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| Brookhaven National Laboratory | 2,764 | 37 | 12 | 5 | – | – | – | – | – | – | – | 2,818 | 2% | 54 | 4.529 | 0.084 |
| Fermi National Accelerator Lab | 1,169 | 167 | 31 | 3 | – | – | – | – | – | – | – | 1,370 | 15% | 201 | 10.210 | 0.051 |
| Sandia National Laboratories | 354 | 6 | – | – | – | – | – | – | – | – | – | 360 | 2% | 6 | 0.087 | 0.015 |
| SLAC National Accelerator Laboratory | 2,539 | 4 | – | – | – | – | – | – | – | – | – | 2,543 | 0% | 4 | 0.057 | 0.014 |
| Thomas Jefferson Natl. Accel. Facil. | 1,123 | 20 | – | – | – | – | – | – | – | – | – | 1,143 | 2% | 20 | 0.270 | 0.014 |
| Los Alamos National Laboratory | 26 | 1 | – | – | – | – | – | – | – | – | – | 27 | 4% | 1 | 0.012 | 0.012 |
| Office of Secure Transportation | 1 | – | – | – | – | – | – | – | – | – | – | 1 | 0% | 0 | 0.000 | 0.000 |
| Thomas Jefferson Site Office-DOE Employees | 6 | – | – | – | – | – | – | – | – | – | – | 6 | 0% | 0 | 0.000 | 0.000 |
| Totals | 7,982 | 288 | 41 | 7 | – | – | – | – | – | – | – | 8,268 | 3% | 286 | 15.165 | 0.053 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-9. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Fuel Facilities, 2017.

| FUEL FACILITIES | | | | | | | | | | | | | | | | |
|--|-----------------|----------------|-------------|-------------|-------------|-------------|----------|----------|----------|----------|----------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| Number of Individuals Receiving Radiation Doses in Each Dose Range (rem) | | | | | | | | | | | | | | | | |
| Site/Contractor | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
| ENRICHMENT | | | | | | | | | | | | | | | | |
| URS/CH2MHill - Oak Ridge (UCOR): ETPP | 366 | 6 | – | – | – | – | – | – | – | – | – | 372 | 2% | 6 | 0.093 | 0.062 |
| Totals | 366 | 6 | – | – | – | – | – | – | – | – | – | 372 | 2% | 6 | 0.093 | 0.062 |
| FABRICATION | | | | | | | | | | | | | | | | |
| | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| PROCESSING | | | | | | | | | | | | | | | | |
| Savannah River Nuclear Solutions | 218 | 284 | 17 | – | – | – | – | – | – | – | – | 519 | 58% | 301 | 9.663 | 0.032 |
| SRNS Construction | 13 | 19 | 1 | – | – | – | – | – | – | – | – | 33 | 61% | 20 | 0.619 | 0.031 |
| Savannah River National Laboratory | 2 | 3 | – | – | – | – | – | – | – | – | – | 5 | 60% | 3 | 0.084 | 0.028 |
| Savannah River Field Office | 5 | 9 | – | – | – | – | – | – | – | – | – | 14 | 64% | 9 | 0.181 | 0.020 |
| Wackenhut Services Inc. - SR | 50 | 29 | – | – | – | – | – | – | – | – | – | 79 | 37% | 29 | 0.435 | 0.015 |
| SRNS Service Subs | 8 | 9 | – | – | – | – | – | – | – | – | – | 17 | 53% | 9 | 0.116 | 0.013 |
| Misc. DOE Contractors - SR | 1 | – | – | – | – | – | – | – | – | – | – | 1 | 0% | 0 | 0.000 | 0.000 |
| SRR Operations | 1 | 8 | – | – | – | – | – | – | – | – | – | 1 | 0% | 0 | 0.000 | 0.000 |
| Totals | 298 | 353 | 18 | – | – | – | – | – | – | – | – | 669 | 55% | 371 | 11.098 | 0.030 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-10. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Maintenance and Support, 2017.

MAINTENANCE AND SUPPORT

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)

| Site/Contractor | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
|---|-----------------|----------------|-------------|-------------|-------------|-------------|-----------|----------|----------|----------|----------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| Los Alamos National Lab Construction Subs | 8 | – | 1 | – | – | – | – | – | – | – | – | 9 | 11% | 1 | 0.143 | 0.143 |
| Los Alamos National Laboratory | 5,437 | 1,308 | 278 | 114 | 19 | 5 | 17 | – | – | – | – | 7,178 | 24% | 1,741 | 158.746 | 0.091 |
| Savannah River National Laboratory | 5 | 49 | 22 | 1 | – | – | – | – | – | – | – | 77 | 94% | 72 | 5.684 | 0.079 |
| SRR Operations | 1 | 12 | 4 | – | – | – | – | – | – | – | – | 17 | 94% | 16 | 1.208 | 0.076 |
| Brookhaven National Laboratory | 797 | 14 | 4 | 1 | – | – | – | – | – | – | – | 816 | 2% | 19 | 1.284 | 0.068 |
| MSTS - NTS | 716 | 40 | 6 | 1 | – | – | – | – | – | – | – | 763 | 6% | 47 | 2.514 | 0.053 |
| CH2M Hill Plateau Remediation Company (CHPRC) | 1,162 | 391 | 42 | 4 | – | – | – | – | – | – | – | 1,599 | 27% | 437 | 16.867 | 0.039 |
| SRNS Construction Subs | 1 | 3 | – | – | – | – | – | – | – | – | – | 4 | 75% | 3 | 0.109 | 0.036 |
| MSTS - Las Vegas | 311 | 38 | 1 | – | – | – | – | – | – | – | – | 350 | 11% | 39 | 1.136 | 0.029 |
| Wackenhut Services Inc. - NV | 232 | 6 | – | – | – | – | – | – | – | – | – | 238 | 3% | 6 | 0.176 | 0.029 |
| Wastren Advantage, Inc. | 1 | 3 | – | – | – | – | – | – | – | – | – | 4 | 75% | 3 | 0.084 | 0.028 |
| Savannah River Nuclear Solutions | 74 | 139 | 2 | – | – | – | – | – | – | – | – | 215 | 66% | 141 | 3.592 | 0.025 |
| Mission Support Alliance | 1,032 | 141 | 5 | – | – | – | – | – | – | – | – | 1,178 | 12% | 146 | 3.558 | 0.024 |
| NNSA Los Alamos Site Office | 90 | 8 | – | – | – | – | – | – | – | – | – | 98 | 8% | 8 | 0.191 | 0.024 |
| SRNS Construction | 6 | 9 | 1 | – | – | – | – | – | – | – | – | 16 | 63% | 10 | 0.202 | 0.020 |
| Swift and Staley Team | 264 | 1 | – | – | – | – | – | – | – | – | – | 265 | 0% | 1 | 0.020 | 0.020 |
| Sandia National Laboratories | 360 | 8 | – | – | – | – | – | – | – | – | – | 368 | 2% | 8 | 0.151 | 0.019 |
| Washington River Protection Solutions LLC | 43 | 3 | – | – | – | – | – | – | – | – | – | 46 | 7% | 3 | 0.051 | 0.017 |
| MSTS - Special Tech. Lab | 17 | 1 | – | – | – | – | – | – | – | – | – | 18 | 6% | 1 | 0.016 | 0.016 |
| NNSA Nevada Site Office | 65 | 1 | – | – | – | – | – | – | – | – | – | 66 | 2% | 1 | 0.016 | 0.016 |
| SRNS Service Subs | 5 | 8 | – | – | – | – | – | – | – | – | – | 13 | 62% | 8 | 0.120 | 0.015 |
| Savannah River Field Office | 2 | 4 | – | – | – | – | – | – | – | – | – | 6 | 67% | 4 | 0.051 | 0.013 |
| SR construction - Parsons | – | 14 | – | – | – | – | – | – | – | – | – | 14 | 100% | 14 | 0.180 | 0.013 |
| Wackenhut Services Inc. - SR | 1 | 1 | – | – | – | – | – | – | – | – | – | 2 | 50% | 1 | 0.006 | 0.006 |
| Battelle - Pantex | 25 | – | – | – | – | – | – | – | – | – | – | 25 | 0% | 0 | 0.000 | 0.000 |
| Battelle - PNNL | 6 | – | – | – | – | – | – | – | – | – | – | 6 | 0% | 0 | 0.000 | 0.000 |
| DOE Headquarters | 137 | – | – | – | – | – | – | – | – | – | – | 137 | 0% | 0 | 0.000 | 0.000 |
| DOE-Richland Field Office | 5 | – | – | – | – | – | – | – | – | – | – | 5 | 0% | 0 | 0.000 | 0.000 |
| Johnson Controls Inc. | 10 | – | – | – | – | – | – | – | – | – | – | 10 | 0% | 0 | 0.000 | 0.000 |
| Misc. DOE Contractors - SR | 1 | – | – | – | – | – | – | – | – | – | – | 1 | 0% | 0 | 0.000 | 0.000 |
| MSTS - Livermore Operations | 10 | – | – | – | – | – | – | – | – | – | – | 10 | 0% | 0 | 0.000 | 0.000 |
| MSTS - Los Alamos | 7 | – | – | – | – | – | – | – | – | – | – | 7 | 0% | 0 | 0.000 | 0.000 |
| MSTS - NTS subcontractors | 44 | – | – | – | – | – | – | – | – | – | – | 44 | 0% | 0 | 0.000 | 0.000 |
| Navarro-Intera LLC | 18 | – | – | – | – | – | – | – | – | – | – | 18 | 0% | 0 | 0.000 | 0.000 |
| Nevada | 14 | – | – | – | – | – | – | – | – | – | – | 14 | 0% | 0 | 0.000 | 0.000 |
| NNSA Albuquerque Complex | 3 | – | – | – | – | – | – | – | – | – | – | 3 | 0% | 0 | 0.000 | 0.000 |
| NSTec - Sandia | 1 | – | – | – | – | – | – | – | – | – | – | 1 | 0% | 0 | 0.000 | 0.000 |
| Nye County Sheriff | 5 | – | – | – | – | – | – | – | – | – | – | 5 | 0% | 0 | 0.000 | 0.000 |
| Office of Secure Transportation | 2 | – | – | – | – | – | – | – | – | – | – | 2 | 0% | 0 | 0.000 | 0.000 |
| Protection Technologies Los Alamos | 5 | – | – | – | – | – | – | – | – | – | – | 5 | 0% | 0 | 0.000 | 0.000 |
| Science Applications Intl Corp. - NV | 1 | – | – | – | – | – | – | – | – | – | – | 1 | 0% | 0 | 0.000 | 0.000 |
| U.S. Geological Survey - Yucca | 1 | – | – | – | – | – | – | – | – | – | – | 1 | 0% | 0 | 0.000 | 0.000 |
| Totals | 10,927 | 2,202 | 366 | 121 | 19 | 5 | 17 | – | – | – | – | 13,657 | 20% | 2,730 | 196.105 | 0.072 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-11. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Reactor Facilities, 2017.

REACTOR FACILITIES

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)

| Site/Contractor | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
|--------------------------------|-----------------|----------------|-------------|-------------|-------------|-------------|---------|---------|---------|---------|------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| Sandia National Laboratories | 82 | 13 | 1 | | | | | | | | | 96 | 15% | 14 | 0.586 | 0.042 |
| Brookhaven National Laboratory | 8 | | | | | | | | | | | 8 | 0% | 0 | 0.000 | 0.000 |
| Los Alamos National Laboratory | 1 | | | | | | | | | | | 1 | 0% | 0 | 0.000 | 0.000 |
| Totals | 91 | 13 | 1 | | | | | | | | | 105 | 13% | 14 | 0.586 | 0.042 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-12. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Research, General, 2017.

RESEARCH, GENERAL

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)

| Site/Contractor | Less than Meas. | Meas. to 0.100 | 0.100-0.250 | 0.250-0.500 | 0.500-0.750 | 0.750-1.000 | 1.0-2.0 | 2.0-3.0 | 3.0-4.0 | 4.0-5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
|---|-----------------|----------------|-------------|-------------|-------------|-------------|----------|----------|----------|----------|----------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| Argonne National Laboratory | 1,704 | 55 | 11 | 4 | - | 3 | 2 | - | - | - | - | 1,779 | 4% | 75 | 9.885 | 0.132 |
| UT-Batelle ORNL | 3,072 | 317 | 57 | 32 | 27 | 4 | 2 | - | - | - | - | 3,511 | 13% | 439 | 52.573 | 0.120 |
| DUF6 Conversion Project- Portsmouth Subs | 275 | 5 | 7 | - | - | - | - | - | - | - | - | 287 | 4% | 12 | 1.374 | 0.115 |
| INL - BEA LLC - Security | 68 | 5 | 1 | 1 | - | - | - | - | - | - | - | 75 | 9% | 7 | 0.651 | 0.093 |
| ICP - Flour Projects (ICP and AMWTP) | 516 | 183 | 58 | 15 | 1 | - | - | - | - | - | - | 773 | 33% | 257 | 20.633 | 0.080 |
| ICP - Flour Service Subcontractors ICP/AMWTP | 729 | 266 | 88 | 11 | - | - | - | - | - | - | - | 1,094 | 33% | 365 | 27.434 | 0.075 |
| Lawrence Berkeley Laboratory | 923 | 15 | 1 | 2 | - | - | - | - | - | - | - | 941 | 2% | 18 | 1.257 | 0.070 |
| Lawrence Livermore National Laboratory Nevada | 151 | 11 | 4 | - | - | - | - | - | - | - | - | 166 | 9% | 15 | 0.947 | 0.063 |
| Lawrence Livermore National Laboratory | 8,373 | 88 | 7 | 2 | 2 | 1 | - | - | - | - | - | 8,473 | 1% | 100 | 6.187 | 0.062 |
| INL - BEA LLC - Research | 248 | 21 | 4 | 1 | - | - | - | - | - | - | - | 274 | 9% | 26 | 1.542 | 0.059 |
| INL - BEA LLC - Services | 3,960 | 396 | 58 | 17 | - | - | - | - | - | - | - | 4,431 | 11% | 471 | 26.178 | 0.056 |
| INL - BEA LLC - Production | 258 | 28 | 2 | 2 | - | - | - | - | - | - | - | 290 | 11% | 32 | 1.750 | 0.055 |
| ICP - CWI - Support | 30 | 12 | 2 | - | - | - | - | - | - | - | - | 44 | 32% | 14 | 0.684 | 0.049 |
| UCOR: ORNL | 437 | 49 | 6 | - | - | - | - | - | - | - | - | 492 | 11% | 55 | 2.370 | 0.043 |
| Fluor/B&W - Portsmouth | 2,131 | 27 | 2 | - | - | - | - | - | - | - | - | 2,160 | 1% | 29 | 1.179 | 0.041 |
| Los Alamos National Laboratory | 31 | 2 | - | - | - | - | - | - | - | - | - | 33 | 6% | 2 | 0.071 | 0.036 |
| Savannah River National Laboratory | 63 | 455 | 17 | 2 | - | - | - | - | - | - | - | 537 | 88% | 474 | 13.922 | 0.029 |
| Ames Laboratory (Iowa State) | 166 | 38 | - | - | - | - | - | - | - | - | - | 204 | 19% | 38 | 1.053 | 0.028 |
| Battelle - PNNL | 1,765 | 443 | 25 | 5 | - | - | - | - | - | - | - | 2,238 | 21% | 473 | 12.989 | 0.027 |
| Sandia National Laboratories | 341 | 16 | - | - | - | - | - | - | - | - | - | 357 | 4% | 16 | 0.376 | 0.024 |
| Isotek (Bldg 3019) | 75 | 5 | - | - | - | - | - | - | - | - | - | 80 | 6% | 5 | 0.091 | 0.018 |
| Savannah River Nuclear Solutions | 38 | 102 | - | - | - | - | - | - | - | - | - | 140 | 73% | 102 | 1.859 | 0.018 |
| Four Rivers Nuclear Partnership (FRNP) | 1,275 | 7 | - | - | - | - | - | - | - | - | - | 1,282 | 1% | 7 | 0.119 | 0.017 |
| Savannah River Field Office | 1 | 12 | - | - | - | - | - | - | - | - | - | 13 | 92% | 12 | 0.186 | 0.016 |
| SRNS Construction Subs | 1 | 14 | - | - | - | - | - | - | - | - | - | 15 | 93% | 14 | 0.219 | 0.016 |
| Battelle - PNNL- Subs | 173 | 25 | - | - | - | - | - | - | - | - | - | 198 | 13% | 25 | 0.378 | 0.015 |
| Idaho Field Office | 192 | 5 | - | - | - | - | - | - | - | - | - | 197 | 3% | 5 | 0.074 | 0.015 |
| SRNS Service Subs | 4 | 38 | - | - | - | - | - | - | - | - | - | 42 | 90% | 38 | 0.560 | 0.015 |
| SRR Operations | - | 1 | - | - | - | - | - | - | - | - | - | 1 | 100% | 1 | 0.015 | 0.015 |
| Wackenhut Services Inc. - SR | 17 | 51 | - | - | - | - | - | - | - | - | - | 68 | 75% | 51 | 0.747 | 0.015 |
| SRNS Construction | 24 | 56 | - | - | - | - | - | - | - | - | - | 80 | 70% | 56 | 0.779 | 0.014 |
| Misc. DOE Contractors - SR | - | 3 | - | - | - | - | - | - | - | - | - | 3 | 100% | 3 | 0.036 | 0.012 |
| Oak Ridge Institute for Science & Education | 74 | 23 | - | - | - | - | - | - | - | - | - | 97 | 24% | 23 | 0.243 | 0.011 |
| Pacific Northwest Site Office | 6 | 19 | - | - | - | - | - | - | - | - | - | 25 | 76% | 19 | 0.188 | 0.010 |
| Univ. of Georgia Ecology Laboratory | 2 | 11 | - | - | - | - | - | - | - | - | - | 13 | 85% | 11 | 0.114 | 0.010 |
| National Renewable Energy Laboratory | 7 | 4 | - | - | - | - | - | - | - | - | - | 11 | 36% | 4 | 0.020 | 0.005 |
| SRR Service Subs | - | 1 | - | - | - | - | - | - | - | - | - | 1 | 100% | 1 | 0.005 | 0.005 |
| Brookhaven National Laboratory | 2 | - | - | - | - | - | - | - | - | - | - | 2 | 0% | 0 | 0.000 | 0.000 |
| Lawrence Livermore National Laboratories | 18 | - | - | - | - | - | - | - | - | - | - | 18 | 0% | 0 | 0.000 | 0.000 |
| Misc. S.R.S. Const. Subcontractors | 1 | - | - | - | - | - | - | - | - | - | - | 1 | 0% | 0 | 0.000 | 0.000 |
| National Strategic Protective Services: NSPS | 102 | - | - | - | - | - | - | - | - | - | - | 102 | 0% | 0 | 0.000 | 0.000 |
| Wastren - Portsmouth Services | 156 | - | - | - | - | - | - | - | - | - | - | 156 | 0% | 0 | 0.000 | 0.000 |
| Totals | 27,409 | 2,809 | 350 | 94 | 30 | 8 | 4 | - | - | - | - | 30,704 | 11% | 3295 | 188.688 | 0.057 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-13. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Research, Fusion, 2017.

| RESEARCH, FUSION | | | | | | | | | | | | | | | | |
|--|-----------------|----------------|-------------|-------------|-------------|-------------|---------|---------|---------|---------|------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| Number of Individuals Receiving Radiation Doses in Each Dose Range (rem) | | | | | | | | | | | | | | | | |
| Site/Contractor | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
| Sandia National Laboratories | 61 | 1 | – | – | – | – | – | – | – | – | – | 62 | 2% | 1 | 0.015 | 0.015 ◀ |
| Princeton Plasma Physics Laboratory | 325 | 49 | – | – | – | – | – | – | – | – | – | 374 ◀ | 13% ◀ | 49 ◀ | 0.361 ◀ | 0.007 |
| Los Alamos National Laboratory | 2 | – | – | – | – | – | – | – | – | – | – | 2 | 0% | 0 | 0.000 | 0.000 |
| Totals | 385 | 50 | – | – | – | – | – | – | – | – | – | 438 | 11% | 50 | 0.376 | 0.008 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-14. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Waste Processing, 2017.

WASTE PROCESSING

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)

| Site/Contractor | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
|---|-----------------|----------------|-------------|-------------|-------------|-------------|---------|---------|---------|---------|------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| West Valley Nuclear Services Inc. | 231 | 67 | 30 | 34 | 23 | - | - | - | - | - | - | 385 | 40% | 154 | 33.653 | 0.219 |
| Tru Waste Processing Center - ORNL | 37 | 70 | 40 | 46 | 11 | - | - | - | - | - | - | 204 | 82% | 167 | 32.678 | 0.196 |
| SPRU-NY (Building remediation) | 108 | 36 | 22 | 1 | - | - | - | - | - | - | - | 167 | 35% | 59 | 5.185 | 0.088 |
| Energy Solutions - UMTRA Project - Moab | 60 | 50 | 9 | 7 | - | - | - | - | - | - | - | 126 | 52% | 66 | 5.656 | 0.086 |
| Bechtel Construction - SR | 55 | 345 | 73 | 22 | 5 | - | - | - | - | - | - | 500 | 89% | 445 | 32.777 | 0.074 |
| SRNS Service Subs | 42 | 81 | 4 | 11 | 2 | - | - | - | - | - | - | 140 | 70% | 98 | 7.254 | 0.074 |
| SR construction - Parsons | - | 3 | 2 | - | - | - | - | - | - | - | - | 5 | 100% | 5 | 0.334 | 0.067 |
| Brookhaven National Laboratory | 20 | 4 | 1 | - | - | - | - | - | - | - | - | 25 | 20% | 5 | 0.274 | 0.055 |
| SRR Operations | 389 | 1,011 | 104 | 36 | 7 | - | - | - | - | - | - | 1,547 | 75% | 1,158 | 57.866 | 0.050 |
| DUF6 Conversion Project - Paducah Subs | 223 | 91 | 14 | - | - | - | - | - | - | - | - | 328 | 32% | 105 | 5.020 | 0.048 |
| Sandia National Laboratories | 46 | 4 | 1 | - | - | - | - | - | - | - | - | 51 | 10% | 5 | 0.240 | 0.048 |
| Savannah River Nuclear Solutions | 165 | 344 | 30 | 15 | - | - | - | - | - | - | - | 554 | 70% | 389 | 17.168 | 0.044 |
| SRR Service Subs | 16 | 22 | - | 2 | - | - | - | - | - | - | - | 40 | 60% | 24 | 0.975 | 0.041 |
| Washington River Protection Solutions LLC | 1,438 | 363 | 39 | 6 | - | - | - | - | - | - | - | 1,846 | 22% | 408 | 16.223 | 0.040 |
| Misc. DOE Contractors - SR | 1 | 23 | 2 | - | - | - | - | - | - | - | - | 26 | 96% | 25 | 0.711 | 0.028 |
| Wastren Advantage, Inc. | 9 | 2 | - | - | - | - | - | - | - | - | - | 11 | 18% | 2 | 0.053 | 0.027 |
| Misc. S.R.S. Const. Subcontractors | 6 | 23 | - | - | - | - | - | - | - | - | - | 29 | 79% | 23 | 0.539 | 0.023 |
| Wackenhut Services Inc. - SR | 87 | 156 | 1 | - | - | - | - | - | - | - | - | 244 | 64% | 157 | 3.241 | 0.021 |
| Washington TRU Solutions LLC-WIPP | 543 | 16 | - | - | - | - | - | - | - | - | - | 559 | 3% | 16 | 0.265 | 0.017 |
| SRNL | 1 | 17 | - | - | - | - | - | - | - | - | - | 18 | 94% | 17 | 0.277 | 0.016 |
| SRNS Construction | 29 | 20 | - | - | - | - | - | - | - | - | - | 49 | 41% | 20 | 0.328 | 0.016 |
| WTS Subcontractors - WIPP | 55 | 1 | - | - | - | - | - | - | - | - | - | 56 | 2% | 1 | 0.014 | 0.014 |
| Savannah River Field Office | 14 | 24 | - | - | - | - | - | - | - | - | - | 38 | 63% | 24 | 0.312 | 0.013 |
| SR construction - Parsons Subcontractors | 2 | 3 | - | - | - | - | - | - | - | - | - | 5 | 60% | 3 | 0.020 | 0.007 |
| SRNS Construction Subs | 2 | 1 | - | - | - | - | - | - | - | - | - | 3 | 33% | 1 | 0.005 | 0.005 |
| Carlsbad Field Office | 26 | - | - | - | - | - | - | - | - | - | - | 26 | 0% | 0 | 0.000 | 0.000 |
| DOE-Richland Field Office | 1 | - | - | - | - | - | - | - | - | - | - | 1 | 0% | 0 | 0.000 | 0.000 |
| Los Alamos National Lab - WIPP | 4 | - | - | - | - | - | - | - | - | - | - | 4 | 0% | 0 | 0.000 | 0.000 |
| Los Alamos National Laboratory | 4 | - | - | - | - | - | - | - | - | - | - | 4 | 0% | 0 | 0.000 | 0.000 |
| Mission Support Alliance | 1 | - | - | - | - | - | - | - | - | - | - | 1 | 0% | 0 | 0.000 | 0.000 |
| Santa Fe Protective Services (WIPP) | 2 | - | - | - | - | - | - | - | - | - | - | 2 | 0% | 0 | 0.000 | 0.000 |
| Univ. of Georgia Ecology Laboratory | 1 | - | - | - | - | - | - | - | - | - | - | 1 | 0% | 0 | 0.000 | 0.000 |
| Totals | 3,618 | 2,777 | 372 | 180 | 48 | - | - | - | - | - | - | 6,995 | 48% | 3,377 | 221.068 | 0.065 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-15. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Weapons Fabrication, 2017.

WEAPONS FABRICATION

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)

| Site/Contractor | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
|---------------------------------------|-----------------|----------------|-------------|-------------|-------------|-------------|---------|---------|---------|---------|------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| CNS, LLC - Pantex | 4,219 | 262 | 43 | 22 | 3 | - | - | - | - | - | - | 4,549 | 7% | 330 | 24.903 | 0.075 |
| CNS, LLC - Y-12 | 4,632 | 1,228 | 172 | 45 | 3 | - | - | - | - | - | - | 6,080 | 24% | 1,448 | 75.797 | 0.052 |
| Office of Secure Transportaion | 286 | 8 | - | - | - | - | - | - | - | - | - | 294 | 3% | 8 | 0.311 | 0.039 |
| CNS, LLC - Subcontractors | 59 | 2 | - | - | - | - | - | - | - | - | - | 61 | 3% | 2 | 0.070 | 0.035 |
| Sandia National Laboratories | 118 | 7 | - | - | - | - | - | - | - | - | - | 125 | 6% | 7 | 0.174 | 0.025 |
| URS/CH2MHill - Oak Ridge (UCOR): Y-12 | 73 | 5 | - | - | - | - | - | - | - | - | - | 78 | 6% | 5 | 0.093 | 0.019 |
| SRNS Service Subs | 6 | 6 | - | - | - | - | - | - | - | - | - | 12 | 50% | 6 | 0.096 | 0.016 |
| Savannah River National Laboratory | 23 | 5 | - | - | - | - | - | - | - | - | - | 28 | 18% | 5 | 0.077 | 0.015 |
| Savannah River Nuclear Solutions | 154 | 169 | - | - | - | - | - | - | - | - | - | 323 | 52% | 169 | 2.346 | 0.014 |
| PXSO/NNSA and DOE Couriers | 19 | 1 | - | - | - | - | - | - | - | - | - | 20 | 5% | 1 | 0.013 | 0.013 |
| Savannah River Field Office | 4 | 6 | - | - | - | - | - | - | - | - | - | 10 | 60% | 6 | 0.079 | 0.013 |
| SRNS Construction | 21 | 19 | - | - | - | - | - | - | - | - | - | 40 | 48% | 19 | 0.247 | 0.013 |
| Kansas City National Security Campus | 70 | 44 | - | - | - | - | - | - | - | - | - | 114 | 39% | 44 | 0.171 | 0.004 |
| Los Alamos National Laboratory | 1 | - | - | - | - | - | - | - | - | - | - | 1 | 0% | - | 0.000 | 0.000 |
| Misc. DOE Contractors - SR | 2 | - | - | - | - | - | - | - | - | - | - | 2 | 0% | - | 0.000 | 0.000 |
| Misc. S.R.S. Const. Subcontractors | 1 | - | - | - | - | - | - | - | - | - | - | 1 | 0% | - | 0.000 | 0.000 |
| SRR Service Subs | 1 | - | - | - | - | - | - | - | - | - | - | 1 | 0% | - | 0.000 | 0.000 |
| Totals | 9,689 | 1,762 | 215 | 67 | 6 | - | - | - | - | - | - | 11,739 | 17% | 2050 | 104.377 | 0.051 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-16. Distribution of TED by Facility Type Listed in Descending Order of Average Measurable TED for Other, 2017.

| OTHER | | | | | | | | | | | | | | | | |
|--|-----------------|----------------|-------------|-------------|-------------|-------------|---------|---------|---------|---------|------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| Number of Individuals Receiving Radiation Doses in Each Dose Range (rem) | | | | | | | | | | | | | | | | |
| Site/Contractor | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
| Wastren Advantage, Inc. | 34 | 19 | 2 | - | - | - | - | - | - | - | - | 55 | 38% | 21 | 1.151 | 0.055 |
| CH2M Hill Plateau Remediation Company (CHPRC) | 515 | 98 | 6 | 9 | - | - | - | - | - | - | - | 628 | 18% | 113 | 6.055 | 0.054 |
| Office of River Protection | 107 | 6 | 1 | - | - | - | - | - | - | - | - | 114 | 6% | 7 | 0.347 | 0.050 |
| Washington River Protection Solutions LLC | 413 | 137 | 14 | - | - | - | - | - | - | - | - | 564 | 27% | 151 | 6.454 | 0.043 |
| SRNS Service Subs | 101 | 32 | 3 | 2 | - | - | - | - | - | - | - | 138 | 27% | 37 | 1.509 | 0.041 |
| Misc. DOE Contractors - SR | 32 | 3 | - | - | - | - | - | - | - | - | - | 35 | 9% | 3 | 0.113 | 0.038 |
| Sandia National Laboratories | 349 | 15 | 1 | - | - | - | - | - | - | - | - | 365 | 4% | 16 | 0.517 | 0.032 |
| SRR Service Subs | 3 | 1 | - | - | - | - | - | - | - | - | - | 4 | 25% | 1 | 0.028 | 0.028 |
| DOE-Richland Field Office | 461 | 17 | 2 | - | - | - | - | - | - | - | - | 480 | 4% | 19 | 0.500 | 0.026 |
| SRR Operations | 3 | 4 | - | - | - | - | - | - | - | - | - | 7 | 57% | 4 | 0.074 | 0.019 |
| Los Alamos National Laboratory | 3,408 | 96 | 1 | - | - | - | - | - | - | - | - | 3,505 | 3% | 97 | 1.609 | 0.017 |
| Savannah River Nuclear Solutions | 363 | 268 | 1 | - | - | - | - | - | - | - | - | 632 | 43% | 269 | 4.295 | 0.016 |
| Univ. of Georgia Ecology Laboratory | 14 | 10 | - | - | - | - | - | - | - | - | - | 24 | 42% | 10 | 0.157 | 0.016 |
| Savannah River Field Office | 26 | 18 | - | - | - | - | - | - | - | - | - | 44 | 41% | 18 | 0.258 | 0.014 |
| Cabrera Services | 3 | 2 | - | - | - | - | - | - | - | - | - | 5 | 40% | 2 | 0.026 | 0.013 |
| SRNS Construction | 77 | 41 | - | - | - | - | - | - | - | - | - | 118 | 35% | 41 | 0.514 | 0.013 |
| Bechtel National Corporation | 21 | 2 | - | - | - | - | - | - | - | - | - | 23 | 9% | 2 | 0.024 | 0.012 |
| Mission Support Alliance | 58 | 2 | - | - | - | - | - | - | - | - | - | 60 | 3% | 2 | 0.023 | 0.012 |
| SRNS Construction Subs | 3 | 1 | - | - | - | - | - | - | - | - | - | 4 | 25% | 1 | 0.009 | 0.009 |
| Savannah River National Laboratory | 7 | 10 | - | - | - | - | - | - | - | - | - | 17 | 59% | 10 | 0.084 | 0.008 |
| Wackenhut Services Inc. - SR | 41 | 20 | - | - | - | - | - | - | - | - | - | 61 | 33% | 20 | 0.161 | 0.008 |
| Grand Junction Site | 20 | 2 | - | - | - | - | - | - | - | - | - | 22 | 9% | 2 | 0.010 | 0.005 |
| CSC Hanford Occupational Health Services | 25 | - | - | - | - | - | - | - | - | - | - | 25 | 0% | 0 | 0.000 | 0.000 |
| NNSA Los Alamos Site Office | 2 | - | - | - | - | - | - | - | - | - | - | 2 | 0% | 0 | 0.000 | 0.000 |
| Office of Secure Transportation | 8 | - | - | - | - | - | - | - | - | - | - | 8 | 0% | 0 | 0.000 | 0.000 |
| Protection Technologies Los Alamos | 1 | - | - | - | - | - | - | - | - | - | - | 1 | 0% | 0 | 0.000 | 0.000 |
| Totals | 6,095 | 804 | 31 | 11 | - | - | - | - | - | - | - | 6,941 | 12% | 846 | 23.918 | 0.028 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report
Exhibit B-17. Internal Dose by Facility Type and Nuclide, 2015–2017.

| Facility Type | Nuclide* | No. of Individuals with Measurable CED** 2015 | No. of Individuals with Measurable CED** 2016 | No. of Individuals with Measurable CED** 2017 | Collective CED Dose (person-rem) 2015 | Collective CED Dose (person-rem) 2016 | Collective CED Dose (person-rem) 2017 | Average Measurable CED (rem) 2015 | Average Measurable CED (rem) 2016 | Average Measurable CED (rem) 2017 |
|--------------------------|---------------|---|---|---|---------------------------------------|---------------------------------------|---------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Accelerator | Total | – | – | – | – | – | – | – | – | – |
| Fuel Fabrication | Total | – | – | – | – | – | – | – | – | – |
| Fuel Processing | Plutonium | 2 | 4 | – | 0.006 | 0.016 | – | 0.003 | 0.004 | – |
| | Total | 2 | 4 | – | 0.006 | 0.016 | – | 0.003 | 0.004 | – |
| Fuel/Uranium Enrichment | Total | – | – | – | – | – | – | – | – | – |
| Maintenance and Support | Americium | 3 | 2 | 20 | 0.027 | 0.014 | 0.091 | 0.009 | 0.007 | 0.005 |
| | Hydrogen-3 | 16 | 16 | 2 | 0.035 | 0.042 | 0.004 | 0.002 | 0.003 | 0.002 |
| | Plutonium | 2 | – | 2 | 0.014 | – | 0.011 | 0.007 | – | 0.006 |
| | Uranium | 13 | 12 | 9 | 0.101 | 0.068 | 0.058 | 0.008 | 0.006 | 0.006 |
| | Total | 34 | 30 | 33 | 0.177 | 0.124 | 0.164 | 0.005 | 0.004 | 0.005 |
| Other | Hydrogen-3 | – | 1 | – | – | 0.001 | – | – | 0.001 | – |
| | Plutonium | 1 | 1 | – | 0.048 | 0.002 | – | 0.048 | 0.002 | – |
| | Uranium | 1 | – | – | 0.001 | – | – | 0.001 | – | – |
| | Total | 2 | 2 | – | 0.049 | 0.003 | – | 0.025 | 0.002 | – |
| Reactor | Total | – | – | – | – | – | – | – | – | – |
| Research, Fusion | Total | – | – | – | – | – | – | – | – | – |
| Research, General | Americium | 4 | 2 | – | 0.092 | 0.065 | – | 0.023 | 0.033 | – |
| | Hydrogen-3 | 1 | 4 | – | 0.012 | 0.025 | – | 0.012 | 0.006 | – |
| | Mixed | 2 | – | – | 0.255 | – | – | 0.128 ◀ | – | – |
| | Other | – | – | 2 | – | – | 0.057 | – | – | 0.029 |
| | Plutonium | 2 | – | – | 0.068 | – | – | 0.034 | – | – |
| | Polonium | – | 1 | – | – | 0.024 | – | – | 0.024 | – |
| | Uranium | 6 | 9 | 9 | 0.122 | 0.211 | 0.543 | 0.020 | 0.023 | 0.060 ◀ |
| | Total | 16 | 18 | 11 | 0.564 | 0.354 | 0.600 | 0.035 | 0.020 | 0.055 |
| Waste Processing/Mgmt. | Mixed | 1 | – | – | 0.015 | – | – | 0.015 | – | – |
| | Other | – | 1 | – | – | 0.001 | – | – | 0.001 | – |
| | Plutonium | 2 | – | – | 0.069 | – | – | 0.035 | – | – |
| | Uranium | 45 | 54 | – | 2.104 | 1.876 | – | 0.047 | 0.035 | – |
| | Total | 48 | 55 | – | 2.188 | 1.877 | – | 0.046 | 0.034 | – |
| Weapons Fab. and Testing | Hydrogen-3 | 2 | 2 | 1 | 0.007 | 0.005 | 0.004 | 0.004 | 0.003 | 0.004 |
| | Mixed | 33 | 19 | 13 | 0.764 | 0.296 | 0.193 | 0.023 | 0.016 | 0.015 |
| | Uranium | 1,101 ◀ | 1,111 ◀ | 1,192 ◀ | 47.959 ◀ | 58.869 ◀ | 63.898 ◀ | 0.047 | 0.053 ◀ | 0.054 |
| | Total | 1,046 | 1,132 | 1,206 | 48.730 | 59.170 | 64.095 | 0.047 | 0.052 | 0.053 |
| | Totals | 1,148 | 1,241 | 1,282 | 51.714 | 61.544 | 65.989 | 0.045 | 0.050 | 0.051 |

Note: Boxed values (gray background) indicate the greatest value in each column.

*Intakes grouped by nuclide. Intakes involving multiple nuclides were grouped into "mixed." Nuclides where fewer than 10 individuals had intakes were grouped as "other."

**The number of internal depositions represents the number of internal dose records with positive results reported for each individual.

DOE Occupational Radiation Exposure: 2017 Annual Report
Exhibit B-18a. Distribution of TED by Labor Category, 2015.

TOTAL EFFECTIVE DOSE (TED)

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)

| Labor Category | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
|-------------------------|-----------------|----------------|--------------|-------------|-------------|-------------|-----------|---------|---------|---------|------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| Agriculture | 70 | 5 | – | – | – | – | – | – | – | – | – | 75 | 7% | 5 | 0.126 | 0.025 |
| Construction/Repair | 3,434 | 1,050 | 204 | 66 | 9 | 2 | 1 | – | – | – | – | 4,766 | 28% | 1,332 | 92.139 | 0.069 |
| Laborers | 946 | 179 | 66 | 48 | 20 | 11 | 1 | – | – | – | – | 1,271 | 26% | 325 | 57.823 | 0.178 ◀ |
| Management | 6,822 | 686 | 50 | 16 | 1 | – | 1 | – | – | – | – | 7,576 | 10% | 754 | 28.750 | 0.038 |
| Miscellaneous | 4,317 | 364 | 114 | 34 | 6 | – | – | – | – | – | – | 4,835 | 11% | 518 | 43.857 | 0.085 |
| Production | 2,328 | 962 | 214 | 68 | 27 | 8 | 7 | – | – | – | – | 3,614 | 36% ◀ | 1,286 | 119.463 | 0.093 |
| Professional/Scientists | 19,819 | 1,942 | 152 | 44 | 2 | 1 | 1 | – | – | – | – | 21,961 ◀ | 10% | 2,142 ◀ | 85.738 | 0.040 |
| Service Workers | 4,579 | 515 | 36 | 10 | 1 | 1 | – | – | – | – | – | 5,142 | 11% | 563 | 23.077 | 0.041 |
| Technicians | 6,632 | 1,374 | 371 | 121 | 52 | 24 | 30 | – | – | – | – | 8,604 | 23% | 1,972 | 234.436 ◀ | 0.119 |
| Transport Workers | 1,019 | 72 | 23 | 6 | 3 | 1 | – | – | – | – | – | 1,124 | 9% | 105 | 10.042 | 0.096 |
| Unknown | 15,588 | 880 | 112 | 36 | 2 | 1 | – | – | – | – | – | 16,619 | 6% | 1,031 | 50.637 | 0.049 |
| Totals | 65,554 | 8,029 | 1,342 | 449 | 123 | 49 | 41 | – | – | – | – | 75,587 | 13% | 10,033 | 746.088 | 0.074 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report
Exhibit B-18b. Distribution of TED by Labor Category, 2016.

TOTAL EFFECTIVE DOSE (TED)

Number of Individuals Receiving Radiation Doses in Each Dose Range (rem)

| Labor Category | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
|-------------------------|-----------------|----------------|--------------|-------------|-------------|-------------|-----------|----------|----------|----------|----------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| Agriculture | 80 | 1 | – | – | – | – | – | – | – | – | – | 81 | 1% | 1 | 0.005 | 0.005 |
| Construction/Repair | 3,300 | 1,228 | 178 | 46 | 3 | – | – | – | – | – | – | 4,755 | 31% | 1,455 | 77.708 | 0.053 |
| Laborers | 917 | 309 | 67 | 45 | 1 | – | – | – | – | – | – | 1,339 | 32% | 422 | 35.875 | 0.085 |
| Management | 6,696 | 1,024 | 41 | 9 | – | 1 | – | – | – | – | – | 7,771 | 14% | 1,075 | 30.171 | 0.028 |
| Miscellaneous | 4,615 | 409 | 81 | 21 | 2 | – | 1 | – | – | – | – | 5,129 | 10% | 514 | 34.509 | 0.067 |
| Production | 2,472 | 1,077 | 246 | 137 | 32 | 5 | 1 | – | – | – | – | 3,970 | 38% | 1,498 | 145.606 | 0.097 |
| Professional/Scientists | 18,154 | 2,547 | 154 | 32 | 7 | 2 | – | – | – | – | – | 20,896 | 13% | 2,742 | 92.100 | 0.034 |
| Service Workers | 5,253 | 789 | 48 | 16 | – | – | – | – | – | – | – | 6,106 | 14% | 853 | 30.225 | 0.035 |
| Technicians | 7,194 | 1,607 | 377 | 136 | 41 | 29 | 18 | – | – | – | – | 9,402 | 24% | 2,208 | 228.022 | 0.103 |
| Transport Workers | 999 | 120 | 17 | 4 | 3 | 1 | – | – | – | – | – | 1,144 | 13% | 145 | 9.587 | 0.066 |
| Unknown | 16,168 | 1,032 | 37 | 5 | 1 | – | – | – | – | – | – | 17,243 | 6% | 1,075 | 25.113 | 0.023 |
| Totals | 65,848 | 10,143 | 1,246 | 451 | 90 | 38 | 20 | – | – | – | – | 77,836 | 15% | 11,988 | 708.921 | 0.059 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report
Exhibit B-18c. Distribution of TED by Labor Category, 2017.

| TOTAL EFFECTIVE DOSE (TED) | | | | | | | | | | | | | | | | |
|--|-----------------|----------------|--------------|-------------|-------------|-------------|-----------|----------|----------|----------|----------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| Number of Individuals Receiving Radiation Doses in Each Dose Range (rem) | | | | | | | | | | | | | | | | |
| Labor Category | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
| Agriculture | 75 | – | – | – | – | – | – | – | – | – | – | 75 | – | – | – | – |
| Construction/Repair | 3,350 | 1,305 | 218 | 59 | 11 | – | – | – | – | – | – | 4,943 | 32% | 1,593 | 96.080 | 0.060 |
| Laborers | 937 | 262 | 69 | 33 | – | – | – | – | – | – | – | 1,301 | 28% | 364 | 30.578 | 0.084 |
| Management | 6,351 | 1,175 | 45 | 17 | 4 | – | – | – | – | – | – | 7,592 | 16% | 1,241 | 38.798 | 0.031 |
| Miscellaneous | 4,625 | 576 | 98 | 22 | 2 | – | 1 | – | – | – | – | 5,324 | 13% | 699 | 40.223 | 0.058 |
| Production | 2,209 | 1,129 | 249 | 116 | 40 | 1 | – | – | – | – | – | 3,744 | 41% | 1,535 | 139.532 | 0.091 |
| Professional/Scientists | 18,688 | 3,232 | 190 | 55 | 7 | 2 | 7 | – | – | – | – | 22,181 | 16% | 3,493 | 132.858 | 0.038 |
| Service Workers | 5,826 | 774 | 49 | 10 | – | – | – | – | – | – | – | 6,659 | 13% | 833 | 28.575 | 0.034 |
| Technicians | 7,156 | 1,665 | 380 | 146 | 38 | 10 | 12 | – | – | – | – | 9,407 | 24% | 2,251 | 208.426 | 0.093 |
| Transport Workers | 793 | 97 | 10 | 9 | – | – | – | – | – | – | – | 909 | 13% | 116 | 7.908 | 0.068 |
| Unknown | 16,853 | 796 | 88 | 14 | 1 | – | 1 | – | – | – | – | 17,753 | 5% | 900 | 38.496 | 0.043 |
| Totals | 66,863 | 11,011 | 1,396 | 481 | 103 | 13 | 21 | – | – | – | – | 79,888 | 16% | 13,025 | 761.474 | 0.058 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-19. Internal Dose by Labor Category, 2015–2017.

| Labor Category | No. of Individuals with Measurable CED* 2015 | No. of Individuals with Measurable CED* 2016 | No. of Individuals with Measurable CED* 2017 | Collective CED Dose (person-rem) 2015 | Collective CED Dose (person-rem) 2016 | Collective CED Dose (person-rem) 2017 | Average Measurable CED (rem) 2015 | Average Measurable CED (rem) 2016 | Average Measurable CED (rem) 2017 |
|-------------------------|--|--|--|---------------------------------------|---------------------------------------|---------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Construction/Repair | 193 | 230 | 223 | 8.548 | 9.481 | 8.899 | 0.044 | 0.041 | 0.040 |
| Laborers | 64 | 68 | 71 | 4.953 | 6.752 | 6.520 | 0.077 ◀ | 0.099 ◀ | 0.092 ◀ |
| Management | 93 | 93 | 90 | 4.555 | 4.319 | 6.207 | 0.049 | 0.046 | 0.069 |
| Miscellaneous | 10 | 18 | 8 | 0.269 | 0.314 | 0.140 | 0.027 | 0.017 | 0.018 |
| Production | 325 ◀ | 345 ◀ | 351 ◀ | 18.931 ◀ | 22.435 ◀ | 22.294 ◀ | 0.058 | 0.065 | 0.064 |
| Professional/Scientists | 173 | 181 | 188 | 4.194 | 5.783 | 6.702 | 0.024 | 0.032 | 0.036 |
| Service Workers | 33 | 35 | 43 | 1.166 | 1.530 | 2.504 | 0.035 | 0.044 | 0.058 |
| Technicians | 111 | 129 | 114 | 4.345 | 5.635 | 5.548 | 0.039 | 0.044 | 0.049 |
| Transport Workers | 27 | 27 | 19 | 1.465 | 1.200 | 0.678 | 0.054 | 0.044 | 0.036 |
| Unknown | 119 | 115 | 175 | 3.288 | 4.095 | 6.497 | 0.028 | 0.036 | 0.037 |
| Totals | 1,148 | 1,241 | 1,282 | 51.714 | 61.544 | 65.989 | 0.045 | 0.050 | 0.051 |

Note: Boxed values (gray background) indicate the greatest value in each column.

*The number of internal depositions represents the number of internal dose records with positive results reported for each individual.

DOE Occupational Radiation Exposure: 2017 Annual Report
Exhibit B-20. Dose Distribution by Labor Category and Occupation, 2017.

| Labor Category | Occupation | Less than Meas. | Meas. to 0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Monitored | Percent of Monitored with Meas. TED | No. with Meas. TED | Collective TED (Person-rem) | Avg. Meas. TED (rem) |
|-------------------------|--------------------------------|-----------------|----------------|--------------|-------------|-------------|-------------|-----------|----------|----------|----------|----------|-----------------|-------------------------------------|--------------------|-----------------------------|----------------------|
| Agriculture | Groundskeepers | 52 | – | – | – | – | – | – | – | – | – | – | 52 | – | – | – | – |
| | Misc. Agriculture | 23 | – | – | – | – | – | – | – | – | – | – | 23 | – | – | – | – |
| Construction/Repair | Carpenters | 299 | 108 | 28 | 8 | 2 | – | – | – | – | – | – | 445 | 33% | 146 | 11.871 | 0.081 |
| | Electricians | 1,072 | 348 | 32 | 10 | 2 | – | – | – | – | – | – | 1,464 | 27% | 392 | 17.973 | 0.046 |
| | Masons | 14 | 15 | 1 | – | – | – | – | – | – | – | – | 30 | 53% | 16 | 0.576 | 0.036 |
| | Mechanics/Repairers | 455 | 186 | 23 | 9 | 3 | – | – | – | – | – | – | 676 | 33% | 221 | 13.599 | 0.062 |
| | Miners/Drillers | 80 | 1 | – | – | – | – | – | – | – | – | – | 81 | 1% | 1 | 0.015 | 0.015 |
| | Misc. Repair/Construction | 928 | 424 | 95 | 23 | 4 | – | – | – | – | – | – | 1,474 | 37% | 546 | 36.412 | 0.067 |
| | Painters | 125 | 52 | 2 | – | – | – | – | – | – | – | – | 179 | 30% | 54 | 1.673 | 0.031 |
| | Pipe Fitter | 377 | 171 | 37 | 9 | – | – | – | – | – | – | – | 594 | 37% | 217 | 13.961 | 0.064 |
| Laborers | Handlers/Laborers/Helpers | 937 | 262 | 69 | 33 | – | – | – | – | – | – | – | 1,301 | 28% | 364 | 30.578 | 0.084 |
| Management | Admin. Support & Clerical Sec. | 1,491 | 105 | 1 | – | – | – | – | – | – | – | – | 1,597 | 7% | 106 | 1.980 | 0.019 |
| | Manager - Administrator | 4,852 | 1069 | 44 | 17 | 4 | – | – | – | – | – | – | 5,986 | 19% | 1,134 | 36.813 | 0.032 |
| | Sales | 8 | 1 | – | – | – | – | – | – | – | – | – | 9 | 11% | 1 | 0.005 | 0.005 |
| Miscellaneous | Military | 58 | 2 | – | – | – | – | – | – | – | – | – | 60 | 3% | 2 | 0.035 | 0.018 |
| | Miscellaneous | 4,567 | 574 | 98 | 22 | 2 | – | 1 | – | – | – | – | 5,264 | 13% | 697 | 40.188 | 0.058 |
| Production | Machine Setup/Operators | 112 | 152 | 54 | 13 | 1 | – | – | – | – | – | – | 332 | 66% | 220 | 18.688 | 0.085 |
| | Machinists | 161 | 7 | 1 | – | – | – | – | – | – | – | – | 169 | 5% | 8 | 0.337 | 0.042 |
| | Misc. Precision/Production | 457 | 209 | 28 | 12 | 2 | – | – | – | – | – | – | 708 | 35% | 251 | 16.144 | 0.064 |
| | Operators, Plant/ System/Util. | 1,251 | 694 | 156 | 88 | 35 | – | – | – | – | – | – | 2,224 | 44% | 973 | 97.614 | 0.100 |
| | Sheet Metal Workers | 198 | 61 | 8 | 3 | 2 | 1 | – | – | – | – | – | 273 | 27% | 75 | 6.270 | 0.084 |
| | Welders and Solderers | 30 | 6 | 2 | – | – | – | – | – | – | – | – | 38 | 21% | 8 | 0.479 | 0.060 |
| Professional/Scientists | Doctors and Nurses | 61 | – | – | – | – | – | – | – | – | – | – | 61 | – | – | – | – |
| | Engineer | 5,475 | 933 | 56 | 13 | 4 | 1 | – | – | – | – | – | 6,482 | 16% | 1,007 | 36.015 | 0.036 |
| | Health Physicist | 295 | 84 | 9 | 4 | – | – | – | – | – | – | – | 392 | 25% | 97 | 4.614 | 0.048 |
| | Misc. Professional | 6,951 | 1,565 | 89 | 23 | – | – | – | – | – | – | – | 8,628 | 19% | 1,677 | 53.953 | 0.032 |
| | Scientist | 5,906 | 650 | 36 | 15 | 3 | 1 | – | – | – | – | – | 6,618 | 11% | 712 | 38.276 | 0.054 |
| Service Workers | Firefighters | 555 | 57 | 3 | 1 | – | – | – | – | – | – | – | 616 | 10% | 61 | 1.787 | 0.029 |
| | Food Service Employees | 2 | 1 | – | – | – | – | – | – | – | – | – | 3 | 33% | 1 | 0.010 | 0.010 |
| | Janitors | 316 | 21 | 1 | – | – | – | – | – | – | – | – | 338 | 7% | 22 | 0.694 | 0.032 |
| | Misc. Service | 3,102 | 341 | 38 | 7 | – | – | – | – | – | – | – | 3,488 | 11% | 386 | 18.113 | 0.047 |
| | Security Guards | 1,851 | 354 | 7 | 2 | – | – | – | – | – | – | – | 2,214 | 16% | 363 | 7.971 | 0.022 |
| Technicians | Engineering Technicians | 1,814 | 174 | 26 | 9 | 1 | – | – | – | – | – | – | 2,024 | 10% | 210 | 12.612 | 0.060 |
| | Health Technicians | 159 | 35 | 5 | – | – | – | – | – | – | – | – | 199 | 20% | 40 | 1.930 | 0.048 |
| | Misc. Technicians | 2,321 | 378 | 40 | 19 | 7 | 5 | 3 | – | – | – | – | 2,773 | 16% | 452 | 34.828 | 0.077 |
| | Radiation Monitors/Techs. | 1,083 | 760 | 201 | 64 | 22 | 3 | 2 | – | – | – | – | 2,135 | 49% | 1,052 | 98.659 | 0.094 |
| | Science Technicians | 616 | 142 | 36 | 6 | 1 | – | – | – | – | – | – | 801 | 23% | 185 | 12.397 | 0.067 |
| | Technicians | 1,163 | 176 | 72 | 48 | 7 | 2 | 7 | – | – | – | – | 1,475 | 21% | 312 | 48.000 | 0.154 |
| Transport Workers | Bus Drivers | 3 | – | – | – | – | – | – | – | – | – | – | 3 | – | – | – | – |
| | Equipment Operators | 131 | 58 | 5 | 7 | – | – | – | – | – | – | – | 201 | 35% | 70 | 5.391 | 0.077 |
| | Misc. Transport | 349 | 21 | – | – | – | – | – | – | – | – | – | 370 | 6% | 21 | 0.614 | 0.029 |
| | Pilots | 4 | – | – | – | – | – | – | – | – | – | – | 4 | – | – | – | – |
| | Truck Drivers | 306 | 18 | 5 | 2 | – | – | – | – | – | – | – | 331 | 8% | 25 | 1.903 | 0.076 |
| Unknown | Unknown | 16,853 | 796 | 88 | 14 | 1 | – | 1 | – | – | – | – | 17,753 | 5% | 900 | 38.496 | 0.043 |
| Totals | | 66,863 | 11,011 | 1,396 | 481 | 103 | 13 | 21 | – | – | – | – | 79,888 | 16% | 13,025 | 761.474 | 0.058 |

Note: Boxed values (gray background) indicate the greatest value in each column.

DOE Occupational Radiation Exposure: 2017 Annual Report
Exhibit B-21. Internal Dose Distribution by Site and Nuclide, 2017.

| Number of Individuals Receiving Radiation Doses in Each Dose Range (rem) | | | | | | | | | | | | | | | |
|--|------------|----------------|-------------|-------------|-------------|-------------|-------------|---------|---------|---------|---------|------|-----------------------------|-----------------------------|----------------|
| Site | Nuclide* | Meas. to 0.020 | 0.020–0.100 | 0.100–0.250 | 0.250–0.500 | 0.500–0.750 | 0.750–1.000 | 1.0–2.0 | 2.0–3.0 | 3.0–4.0 | 4.0–5.0 | >5.0 | Total Indiv. with Meas. CED | Collective CED (person-rem) | Avg. CED (rem) |
| Argonne National Laboratory | Uranium | – | – | 1 | 1 | – | – | – | – | – | – | – | 2 | 0.211 | 0.106 |
| Argonne National Laboratory | Other | – | – | 1 | – | – | – | – | – | – | – | – | 1 | 0.050 | 0.050 |
| Hanford: Hanford Site | Americium | 20 | – | – | – | – | – | – | – | – | – | – | 20 | 0.091 | 0.005 |
| Hanford: Hanford Site | Plutonium | 2 | – | – | – | – | – | – | – | – | – | – | 2 | 0.011 | 0.006 |
| Los Alamos National Laboratory | Hydrogen-3 | 2 | – | – | – | – | – | – | – | – | – | – | 2 | 0.004 | 0.002 |
| Los Alamos National Laboratory | Uranium | 8 | 1 | – | – | – | – | – | – | – | – | – | 9 | 0.058 | 0.006 |
| Oak Ridge: Oak Ridge National Laboratory | Uranium | – | 1 | 1 | – | – | – | – | – | – | – | – | 2 | 0.233 | 0.116 ◀ |
| Oak Ridge: Y-12 National Security Complex | Mixed | 8 | 4 | – | – | – | – | – | – | – | – | – | 12 | 0.192 | 0.016 |
| Oak Ridge: Y-12 National Security Complex | Uranium | 490 | 515 | 145 | 39 | 3 | – | – | – | – | – | – | 1,192 ◀ | 63,898 ◀ | 0.054 |
| Paducah Gaseous Diffusion Plant | Uranium | 3 | 2 | – | – | – | – | – | – | – | – | – | 5 | 0.099 | 0.020 |
| Pantex Plant | Mixed | 1 | – | – | – | – | – | – | – | – | – | – | 1 | 0.001 | 0.001 |
| Sandia National Laboratories | Other | 1 | 2 | 1 | – | – | – | – | – | – | – | – | 4 | 0.190 | 0.048 |
| Savannah River Site | Hydrogen-3 | 1 | – | – | – | – | – | – | – | – | – | – | 1 | 0.004 | 0.004 |
| Uranium Mill Tailings Remedial Action Project | Uranium | 12 | 16 | 1 | – | – | – | – | – | – | – | – | 29 | 0.947 | 0.033 |
| Totals | | 548 | 543 | 149 | 39 | 3 | – | – | – | – | – | – | 1,282 | 65,989 | 0.051 |

Note: Boxed values (gray background) indicate the greatest value in each column.

*Intakes grouped by nuclide. Intakes involving multiple nuclides were grouped into "mixed." Nuclides where fewer than 10 individuals had intakes were grouped as "other."

DOE Occupational Radiation Exposure: 2017 Annual Report

Exhibit B-22. Extremity Dose Distribution by Site, 2017.

| Site | No. Meas. Dose | Meas. to 0.100 | 0.100–1.0 | 1.0–5.0 | 5.0–10.0 | 10.0–20.0 | 20.0–30.0 | >30.0 | Total Monitored* | No. with Meas. | No. Above Monitoring Threshold (5 rems)** | Collective Extremity Dose (person-rem) | Avg. Meas. Extremity Dose (rem) |
|--|----------------|----------------|--------------|------------|-----------|-----------|-----------|----------|------------------|----------------|---|--|---------------------------------|
| Ames Laboratory | 198 | 6 | – | – | – | – | – | – | 204 | 6 | – | 0.200 | 0.033 |
| Argonne National Laboratory | 1,697 | 56 | 18 | 6 | – | 1 | – | 1 | 1,779 | 82 | 2 | 78.954 | 0.963 |
| Brookhaven National Laboratory | 3,632 | 9 | 24 | 4 | – | – | – | – | 3,669 | 37 | – | 17.976 | 0.486 |
| Energy Technology Engineering Center | 5 | – | – | – | – | – | – | – | 5 | – | – | – | – |
| Fermi National Accelerator Laboratory | 1,366 | 1 | 2 | 1 | – | – | – | – | 1,370 | 4 | – | 4.260 | 1.065 |
| Hanford: Hanford Site | 3,807 | 53 | 87 | 30 | – | – | – | – | 3,977 | 170 | – | 82.731 | 0.487 |
| Hanford: Office of River Protection | 2,106 | 276 | 255 | 26 | – | – | – | – | 2,663 | 557 | – | 131.325 | 0.236 |
| Hanford: Pacific Northwest National Laboratory | 1,903 | 503 | 57 | 2 | – | 2 | – | – | 2,467 | 564 | 2 | 57.564 | 0.102 |
| Grand Junction Site | 22 | – | – | – | – | – | – | – | 22 | – | – | – | – |
| Idaho National Laboratory | 5,941 | 854 | 334 | 39 | 10 | – | – | – | 7,178 | 1,237 | 10 | 255.887 | 0.207 |
| Kansas City National Security Plant | 82 | 32 | – | – | – | – | – | – | 114 | 32 | – | 1.094 | 0.034 |
| Lawrence Berkeley National Laboratory | 918 | 10 | 6 | 5 | 2 | – | – | – | 941 | 23 | 2 | 23.546 | 1.024 |
| Lawrence Livermore National Laboratory | 8,615 | 13 | 24 | 5 | – | – | – | – | 8,657 | 42 | – | 24.716 | 0.588 |
| Los Alamos National Laboratory | 8,969 | 1,339 | 438 | 112 | 10 | 8 | – | – | 10,876 | 1,907 | 18 | 549.942 | 0.288 |
| National Renewable Energy Laboratory | 11 | – | – | – | – | – | – | – | 11 | – | – | – | – |
| Nevada National Security Site | 1,535 | 4 | – | – | – | – | – | – | 1,539 | 4 | – | 0.110 | 0.028 |
| Oak Ridge: East Tennessee Technology Park | 372 | – | – | – | – | – | – | – | 372 | – | – | – | – |
| Oak Ridge: Oak Ridge Institute for Science and Education | 97 | – | – | – | – | – | – | – | 97 | – | – | – | – |
| Oak Ridge: Oak Ridge National Laboratory | 4,024 | 32 | 101 | 37 | 11 | 4 | – | – | 4,209 | 185 | 15 | 255.167 | 1.379 |
| Oak Ridge: Y-12 National Security Complex | 6,106 | 10 | 29 | 12 | 1 | – | – | – | 6,158 | 52 | 1 | 42.084 | 0.809 |
| Office of Secure Transportation | 305 | – | – | – | – | – | – | – | 305 | – | – | – | – |
| Paducah Gaseous Diffusion Plant | 1,875 | – | – | – | – | – | – | – | 1,875 | – | – | – | – |
| Pantex Plant | 4,474 | 60 | 81 | 39 | 1 | – | – | – | 4,655 | 181 | 1 | 113.046 | 0.625 |
| Portsmouth Gaseous Diffusion Plant | 2,603 | – | – | – | – | – | – | – | 2,603 | – | – | – | – |
| Princeton Plasma Physics Laboratory | 374 | – | – | – | – | – | – | – | 374 | – | – | – | – |
| Sandia National Laboratories | 1,784 | – | – | – | – | – | – | – | 1,784 | – | – | – | – |
| Savannah River National Lab | 539 | 52 | 86 | 5 | – | – | – | – | 682 | 143 | – | 42.182 | 0.295 |
| Savannah River Site | 5,201 | 281 | 374 | 97 | 9 | 4 | – | – | 5,966 | 765 | 13 | 427.837 | 0.559 |
| Separations Process Research Unit | 158 | 6 | 3 | – | – | – | – | – | 167 | 9 | – | 0.970 | 0.108 |
| SLAC National Accelerator Laboratory | 2,543 | – | – | – | – | – | – | – | 2,543 | – | – | – | – |
| Thomas Jefferson National Accelerator Facility | 1,149 | – | – | – | – | – | – | – | 1,149 | – | – | – | – |
| Uranium Mill Tailings Remedial Action Project | 126 | – | – | – | – | – | – | – | 126 | – | – | – | – |
| Waste Isolation Pilot Plant | 647 | – | – | – | – | – | – | – | 647 | – | – | – | – |
| West Valley Demonstration Project | 345 | 18 | 22 | – | – | – | – | – | 385 | 40 | – | 6.360 | 0.159 |
| Service Center Personnel*** | 319 | – | – | – | – | – | – | – | 319 | – | – | – | – |
| Totals | 73,848 | 3,615 | 1,941 | 420 | 44 | 19 | – | 1 | 79,888 | 6,040 | 64 | 2115.951 | 0.350 |

Note: Boxed values (gray background) indicate the greatest value in each column.

* Represents the total number of monitoring records. The number of individuals provided extremity monitoring cannot be determined.

** All extremity doses above 5 rems were for the upper extremities (hands and forearms). DOE annual limit for extremities is 50 rems.

10 CFR 835.402(a)(1)(ii) requires extremity monitoring for a shallow dose equivalent to the skin or extremity of 5 rems or more in a year.

*** Includes personnel at NNSA Albuquerque complex, Oak Ridge, and WIPP.