Changes to DOE-STD-1128-98, "Guide for Occupational Radiological Protection in Plutonium Facilities

Section/Page	Change
Cover	Change "Metric" to "Not Measurement Sensitive".
Throughout the document	Change "the DOE Radiological Control Manual (RCM)" to "the DOE standard DOE-STD-1098-99, Radiological Control (RCS)". Change "RCM" to "RCS". Replace (DOE, 1993c) with (DOE, 1998a). Replace (DOE, 19941) with (DOE, 1999b). Delete reference to DOE Order 5700C, Quality Assurance. Replace ANSI N13.6-1989 (ANSI, 1996) with ANSI/HPS N13.6 (ANSI, 1999a). Change "ANSI N323-1993 (ANSI, 1993)" to "ANSI N323a (ANSI, 1997b)". Change "DOE Order 420.1 (DOE, 1995c)" to "Order 420.1A (DOE, 2002a)". Change "DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities (DOE, 1990a)" to "DOE Order 5480.19, Ch. 2, Conduct of Operations Requirements for DOE Facilities (DOE, 2001c)". Change "(DOE 1990b)" to ("DOE 1993c)". Change "Implementation Guide. External Dosimetry Program (DOE, 1994b)" to "Implementation Guide. External Dosimetry Program (DOE, 1999e)".
Page iv, last para	Change Office of Worker Protection Programs and Hazards Management (WPPHM) to Office of Worker Protection Policy and Programs (EH-52) Change (http://tis-nt.eh.doe.gov/wpphm/regs/regs.html) and (http://apollo.osti.gov/html/techstds/techstds.html) to (http://tis.eh.doe.gov/whs/rhmwp/regs.html) and (http://tis.eh.doe.gov/techstds/).
Page xi, Tables	Change "5.7.1 In an in Vivo Count Results" to "5.7.1 In Vivo Count Results" Change 5.8.4 "Ingrowth In an in Vivo" to "Ingrowth in an In Vivo Count". Change "MODELING THE BEHAVIOR OF PLUTONIUM IN AN IN THE BODY" to "MODELING THE BEHAVIOR OF PLUTONIUM IN THE BODY" Change 5.6.4 "Natural Plutonium Balance in an in Man" to "Natural Plutonium Balance in Man".
Page xv, Tables	Change 4.1 "Surface Radioactivity" to "Surface Contamination" Revise 6.10 to read "Reserved"
2-38 C-8 C-9 C-11 C-17 C-27	Delete references to "DOE Order 6430.1 A, General Design Criteria (DOE, 1989b)".
3-3	Delete last sentence.

Changes to DOE-STD-1128-98, "Guide for Occupational Radiological Protection in Plutonium Facilities

Section/Page	Change
3-5	Replace 835.401(b) with 835.401(a)(6).
3-10	Delete "See NUREG-0761 (NRC, 1981) 0.7B(I)(C), 0.9B(4), and 0.9C(I)(C)." Change "Implementation Guide G-10 CFR 83 5/G1-Rev. 1" to "Implementation Guide G44.1-10".
3-11	Change (DOE, 1994e) to (DOE, 1999d). Change "10 percent of the DAC value listed in Appendix A or Appendix C of 10 CFR 835" to "the DAC value listed in Appendix A or Appendix C of 10 CFR 835 or where an individual could receive 12 DAC hours in a week"
3-12	Replace "Articles 622 and 657" with "Article 622".
3-17	Change (10 CFR 835.1003(a) to (10 CFR 835.104). Change "G-10 CFR 835/B2-Rev. 1, Implementation Guide, Occupational ALARA Program (DOE, 1994c)" to "G-10 44 1.1-2, Implementation Guide. Occupational ALARA Program (DOE, 1999b)".
3-18	Change "(DOE, 1994a)" to "(DOE, 1999a)". Change "DOE/EH-0262T" to "DOE-STD-1122-99".
3-19	Change "(DOE, 1995f)" to (DOE, 1999c)". Change "Radiological Control Techniques" to "Radiological Control Technicians".
3-20	Delete ", just coming onto the market,".
3-21	Change "ANSI N13.1-1993" to "ANSI N13.1".
3-22	Delete last paragraph.
3-25	Change "(ANSI, 1969a)" to "(ANSI, 1969b)".
3-31	Change "(DOE, 1992c and DOE, 1995g)" to "(DOE, 1998b and DOE, 1998c)". Change "DOE/EH-0425 Plutonium Facilities Training (DOE, 1994k) in addition to Radiological Worker Training (DOE, 1995g)" to "DOE-HDBK-1145-2001 Radiological Safety Training for Plutonium Facilities (DOE, 2001a) in addition to Radiological Worker Training (DOE, 1998c)". Change "All training should be in accordance with Radiological Worker Training DOE/EH-0260T-1 (DOE, 1995g) and implemented by the guidance of G10 CFR 835/J1, Rev. 1, Implementation Guide. Radiation Safety Training (DOE, 1994f)." to "All training should be in accordance with Radiological Worker Training (DOE, 1998c) and implemented by the guidance of DOE G 441.1-12, Implementation Guide. Radiation Safety Training (DOE, 1999g)."
3-32	Change "DOE EH-0262T, Radiological Control Technician Training (DOE, 1995f)" to "DOE HDBK-1122-99, Radiological Control Technician Training (DOE, 1999c)".
3-33	Change "Guide G-10 CFR 835/H1, Rev. 1, Implementation Guides Occupational Radiation Protection Record-keeping and Reporting (DOE, 1994d)." to "Guide G 44 1.1-2, Implementation Guides Occupational Radiation Protection Record-keening and Reporting (DOE, 1999b)".

Changes to DOE-STD-1128-98, "Guide for Occupational Radiological Protection in Plutonium Facilities

Section/Page	Change
3-42	Change "G-10 CFR 835/G1-Rev. 1, Implementation Guide, Posting and Labeling for Radiological Control (DOE, 1994e)" to "G 44 1.1-10, Implementation Guide. Posting; and Labeling for Radiological Control (DOE, 1999d)".
4-1	Change "manual" to "guide". Delete "[DOE Order 6430.1A (DOE, 1989b]".
4-4	Change "Surface Radioactivity Values" to "Surface Contamination Values". Revive Table 4.1 to be consistent with 10 CFR 335 Appendix D.
4-10	Change "facility and equipment design" to "facility design features".
4-13	Change "shall describe the property, the date on which the release survey was performed, the identity of the individual who performed the survey, the type and identification number of the survey instrument used, and the results of the survey (10 CFR 835.1101(d))" to "should describe the property, the date on which the release survey was performed, the identity of the individual who performed the survey, the type and identification number of the survey instrument used, and the results of the survey shall be documented (10 CFR 835.703 (c))". Change "(DOE, 1994d)" to "(DOE, 1999b)".
4-23	Delete "As an example, studies have shown that workers required to wear respiratory protection are almost 25% less efficient that those doing the same work without wearing respirators."
4-24	Change "10 CFR 835.404" to "10 CFR 835.1102".
4-28	Change "10%" to "30%". Change "AN4 288.2" to "ANSI 288.2". Delete "These are tested and approved by DOE's Los Alamos National Laboratory."
5-2	Add "DOE is currently evaluating its internal dosimetry methodology and considering updating it to adopt newer models."
5-12	Change "10 CFR 835.702(c)5)" to "10 CFR 835.702(c)(5) and (6)". Change "cumulative TEDE received from external and internal sources while employed at the site or facility, since January 1, 1989" to "cumulative TEDE".
5-13	Change "The TEDE limit for the embryo/fetus" to "The dose equivalent limit for the embryo/fetus". Change "the public are limited by 10 CFR 835.207" to "the public are limited, in part, by 10 CFR 835.207".
5-34	Change "MODELING THE BEHAVIOR OF PLUTONIUM IN AN IN THE BODY" to "MODELING THE BEHAVIOR OF PLUTONIUM IN THE BODY".
5-37	Change 5.6.4 "Natural Plutonium Balance in an in Man" to "Natural Plutonium Balance in Man",
5-40	Change 5.6.4 "In an in Vivo Count Results" to "In Vivo Count Results".
5-51	Change "Ingrowth In an in Vivo" to "Ingrowth in an In Vivo Count".

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Section/Page	Change
6-28	Change "The response of neutron dosimeters to the neutron fields encountered in the workplace must be evaluated. All existing neutron dosimeters have a severe energy response problem and must be carefully calibrated for the specific radiation field in which the neutron dosimeter is worn. Typically, neutron dosimeters are calibrated to bare " to "The response of neutron dosimeters to the neutron fields encountered in the workplace must be evaluated. All existing neutron dosimeters have a severe energy response problem and must be carefully calibrated for the specific radiation field in which the neutron dosimeter is worn. Typically, neutron dosimeters are calibrated to either bare ".
6-29	Change "Recently, nuclear track dosimeter have been introduced for personnel dosimetry " to "Nuclear track dosimeters are also being used for personnel dosimetry".
6-30	Change "To provide a level of confidence in dosimetry services in DOE facilities, the DOELAP accreditation program has been established. 10 CFR 835 402(b) (DOE 1993c) requires that personnel dosimetry programs shall be adequate to demonstrate compliance with 10 CFR 835.202, including routine dosimeter calibration and conformance with the requirements of the DOELAP for Personnel Dosimetry. The National Institute of Standards and Technology (NIST) has also established the National Voluntary Laboratory Accreditation Program (NYLAP) for testing and accreditation of dosimeter processors serving commercial industry and medical facilities. Because the dosimetry needs at many DOE facilities, particularly those processing plutonium, are different from commercial industries, the DOE established a more stringent accreditation program. The DOELAP standard includes some tests that are different from those in ANSI N13.11 (ANSI, 1983a) on which the NVLAP program is based. For example, the DOELAP standard has a test category for low-energy, nearly monoenergetic x-rays similar to those emitted by plutonium and americium. " to "To provide a level of confidence in dosimetry services in DOE facilities, the DOELAP accreditation program was established. 10 CFR 835.402(b) (DOE 1998a) requires that personnel dosimetry programs implemented to demonstrate compliance with the dose limits established in Subpart C shall be accredited in accordance with the requirements of the DOELAP for Personnel Dosimetry. The National Institute of Standards and Technology (NIST) has also established the National Voluntary Laboratory Accreditation Program (NVLAP) for testing and accreditation of dosimeter processors serving commercial industry and medical facilities. Because the dosimetry needs at many DOE facilities, particularly those processing plutonium, are different from commercial industries, the DOE initially established a broader and more stringent accreditation program."
6-32	Change 'Pacific Northwest Laboratory of Richland, Washington. and the Radiological and Environmental Laboratory (RESL) of Idaho Falls, Idaho. Dosimeters are submitted by processors for testing to the performance testing laboratories in the categories listed in Table 6.10. If the dosimeter processor passes certain accuracy and tolerance testing criteria, a team of dosimetry experts visit the processor and assess the operation of the dosimetry program, including dosimetry records and data retrieval systems, before the dosimeter processor is certified. These requirements are given in the U. S. Department of Energy Standard Laboratory Accreditation Program for Personnel Dosimetry Systems. (DOE STD-1095-95 (DOE 199521).

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Section/Page	Change
6-32	At present, only personnel dosimeters for whole body irradiations are tested, but a DOE working group has been formed to develop an extremity dosimetry performance testing standard. The DOE also conducts an intercomparison of calibration sources used for radiation protection purposes, but in the near future DOE secondary calibration laboratories will be established to increase the consistency of radiation protection instrument calibrations to national standards." to "Pacific Northwest National Laboratory of Richland, Washington, and the Radiological and Environmental Sciences Laboratory (RESL) of Idaho Falls, Idaho. Dosimeters are submitted for testing to the performance testing laboratories in specified categories. If the dosimeter passes certain accuracy and tolerance testing criteria, a team of dosimetry experts visit the processor and/or site and assess the operation of the dosimetry program, including dosimetry records and data retrieval systems, before the dosimeter processor or DOE site is accredited. DOE requirements are given in the U. S. Department of Energy Standard Laboratory Accreditation Program for Personnel Dosimetry Systems, DOE STD-1095-95 (DOE 1995h). At present, both whole body personnel dosimeters and extremity dosimeters are being tested, with extremity dosimeter testing currently being voluntary. DOE will formalize the extremity dosimetry accreditation program in the near future."
6-34	Change Table 6.0 to "Reserved".
6-35	Change "DOE Order 420.1 (DOE, 1996). The requirements in 10 CFR 835.1304 require that fixed nuclear accident dosimeter (NADs) and personnel nuclear accident dosimeters (PNADs) shall be worn by all personnel entering a controlled area that contains locations requiring an installed criticality alarm system, such as those required in DOE Order 420.1 (DOE, 2003a); which requires installed criticality alarms. The criticality accident dosimetry system should follow the provisions of ANSI/ANS 13.3-1981" to "DOE Order 420.1A (DOE, 2002a). The requirements in 10 CFR 835.1304 require that fixed nuclear accident dosimeters (NADs) and personnel nuclear accident dosimeter (PNADs) shall be worn by all individuals entering a controlled area that contain quantities of fissile materials, such as those required in DOE Order 420.1A (DOE, 2003a); which requires installed criticality alarms. The criticality accident dosimetry system should follow the provisions of ANSI/ANS 13.3-1988". Change "initial screening of personnel" to "initial screening of individuals".
7-16	Change "personnel who enter locations in which installed criticality alarm systems are required" to "individuals who enter locations which specified quantities of fissile material".
7-19	Change "personnel who enter a controlled area with locations requiring an installed criticality alarm system" to "individuals who enter a controlled area with specified quantities of fissile material".

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Section/Page	Change
8-6	Change "(WIPP) under construction and testing at Carlsbad, New Mexico. Volume allocations have been given to each DOE site for the waste to be placed there, so limiting the quantity of high-level TRU waste is extremely important. The current date at which WTPP will be permitted to accept waste and the cost of waste disposal there have not yet been determined. In the interim, virtually all DOE facilities are required to store TRU on the site where it is generated" to "(WIPP) at Carlsbad, New Mexico. Volume allocations have been given to each DOE site for the waste to be placed there, so limiting the quantity of high-level TRU waste is extremely important".
8-8	Change "are discussed in DOE Order 6430.IA, General Design Criteria (DOE, 1989b); ANSI N5 1 0-1989," to "are discussed in ANSI N5 1 0-1 989,". Delete reference to DOE Order 6430.1A, General Design Criteria (DOE, 1989b).
8-10	Change "(DOE, 1994g), and ANSI N13.1- 1969, Guide to Sampling; Airborne Radioactive Materials in Nuclear Facilities (ANSI, 1969b)" to "(DOE, 1999f), and ANSI N13.1-1969, Guide to Sampling Airborne Radioactive Materials in Stacks and Ducts (ANSI, 1969b)".
8-18 8-27	Change "per ANSI N14.5 (ANSI, 1987d)" to "per ANSI N14.5 (ANSI, 1997a)".
9-1	Change "DOE Order 15 1.1 (DOE, 1995a)" to "DOE Order 15 1.1 (DOE, 2000a)".
9-3	Change "DOE Order 15 1.1 (DOE, 1995a)" to "DOE Order 15 1.1 (DOE, 2000a)". Change "Order requirements is being published by the DOE Office of Emergency Management (DOE, 1997). The Emergency Management Guides (EMGs) have been drafted, put through final concurrence, and are awaiting publication" to "Order requirements has been published by the DOE Office of Emergency Management (DOE, 1997). The Emergency Management Guides (EMGs) have been published".
9-11	Change "The Emergency Management Guide for the Implementation of DOE Order 15 1.1 (DOE, 1997) authorizes" to "The Introduction to the Emergency Management Guide (DOE, 1997) and related guidance authorize".
10-1	Change "DOE P 450-1 and DOE Order 440.1" to "DOE P 450.1 and DOE Order 440.1a".

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Section/Page	Change
10-2	Change "D&D activities are DOE Order 5820.2A, Radioactive Waste Management (DOE. 1988b); DOE Order 4700.1, ;Project Management System (DOE, 1992e); DOE Order 5400.5, Radiation Protection of the Public and Environment (DOE. 1990b); DOE Order 6430.1A, General Design Criteria (DOE, 1989b); DOE Order 23 1.1, Environment Safety and Health Reporting (DOE, 1995b); DOE Order 420.1 A, Facility Safety (DOE, 2003a). The DOE operations offices may have implementation procedures corresponding to these Orders that contractors will also need to comply with. Section 5 of DOE Order 5820.2A, Radioactive Waste Management (DOE, 1988b), provides requirements important to decommissioning of radioactively contaminated facilities. It requires that DOE organizations develop and document their programs to provide for the surveillance, maintenance, and decommissioning of contaminated facilities. Requirements are divided into the following categories: general, facility design, post-operational activities, decommissioning project activities, and quality assurance. These categories are discussed below in Section 10.3. DOE Order 4700.1, Program Management System (DOE, 1992e), provides the requirements to ensure a disciplined, systematic, and coordinated approach to project management. All projects, including D&D projects, should have clearly defined goals and objectives that support program requirements. Specific objectives include 1) promoting project execution that meets technical, schedule, and cost objectives, 2) meeting all applicable environmental, health and safety, and quality assurance requirements, and 3) avoiding a commitment of major resources before project definition. Good program management techniques should consider D&D costs as part of the life-cycle and select a tentative D&D method during the facility design phas. Section V of DOE Order 5400.5, Radiation Protection of the Public and Environment (DOE, 1990b)," to "D&D activities are DOE Order 4700.1, Lifecycle Asset Management (DOE, 1998d); DOE Order 5400.5, Ch. 2, Radiation Protection of the Public and Environment (DOE, 1993c; DOE Order 23 1.1, Environment Safety and Health Reporting (DOE, 1996e); DOE Order 420.IA, Facility Safety (DOE, 2003a). The DOE operations offices may have implementation procedures corresponding to these Orders that which contractors will also need to comply. DOE Order 430.1A, Lifecycle Asset Management (DOE, 1998d), provides the requirements to ensure a disciplined, systematic, and coordinated approach to project management. All projects, including D&D projects, should have clearly defined goals and objectives that support program requirements. Specific objectives include 1) promoting project execution that meets technical, schedule, and cost objectives, 2) meeting all applicable environmental, health and safety, and quality assurance requirements, and 3) avoiding a commitment of major resources before project definition. Good program management techniques should consider D&D costs as part of the life-cycle cost and select a tentative D&D method during the facility design phase.

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Section/Page	Change
10-2	Section V of DOE Order 5400.5, Ch.2, Radiation Protection of the Public and Environment (DOE, 1993c),".
10-3	Change "DOE Order 6430.1A, General Design Criteria (DOE, 1989b), provides design principles that shall be considered when designing radioactive material facilities to facilitate D&D of these facilities. A more detailed discussion of these design principles is found below in Section 10.2. DOE 0 420.1A, Facility Safety (DOE, 2003a), establishes facility safety requirements related to: nuclear safety design, criticality safety, fire protection and natural phenomena hazards mitigation. DOE 0 23 1.1 Environment, Safety and Health Reporting (DOE, 1995b)," to "DOE 0 420.1A, Facility Safety (DOE, 2002a), establishes facility safety requirements related to: nuclear safety design, criticality safety, fire protection and natural phenomena hazards mitigation. DOE 0 23 1.1 Environment, Safety and Health Reporting (DOE, 1996e),". Change "DOE 0 45 1.1, National Environmental Policy Act Compliance Program (DOE, 1995d)" to "DOE 0 45 1.1B, National Environmental Policy Act Compliance Program (DOE, 2001d)".
10-5	Change "and draft ANSI N13.12 (ANSI, 1988b), provide definitive values for acceptable surface contamination levels for termination of operating licenses for nuclear reactors and for materials, equipment, and facilities. Both of these documents are based on the outdated methodology of ICRP Publication 2 (ICRP, 1959) and not the currently used methodology of ICRP Publication 26 (ICRP, 1977) and Publication 30 (ICRP, 1979); therefore, they require updating (see Kennedy and Strenge, 1992). In addition, these documents make no mention of other limits, such as limits for soil contamination or volume sources." to "and ANSI/HPS N13.12 (ANSI, 1999b), provide definitive values for acceptable surface contamination levels for termination of operating licenses for nuclear reactors and for materials, equipment, and facilities." Change "Section 4 of DOE Order 5400.5, Radiation Protection of the Public and Environment (DOE, 1990b), provides the following DOE guidelines for cleanup of residual radioactive material, management of the resulting wastes, and release of property. The basic public dose limits for exposure to residual radioactive material in addition to natural background exposures is a l00-mrem (1 -mSv) effective dose equivalent in a year. The effective dose equivalent in a year is the sum of the effective dose equivalent from exposures to radiation sources external to the body during the year plus the cumulative effective dose equivalent (CEDE) from radionuclides taken into the body during the year. See DOE/CH-890 1, A Manual for Implementing Residual Radioactive Material Guidelines (DOE, 1989a), for

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Section/Page	Change
10-5	procedures for deriving specific property guidelines for allowable levels of residual radioactive material, based on the dose limit of 100 mrem (1 mSv). DOE Order 5400.5 (DOE, 1990b)" to "Section 4 of DOE Order 5400.5, Ch. 2, Radiation Protection of the Public and Environment (DOE, 1993c), provides the following DOE guidelines for cleanup of residual radioactive material, management of the resulting wastes, and release of property. The basic public dose limits for exposure to residual radioactive material in addition to natural background exposures is a 100-mrem (1 -mSv) effective dose equivalent in a year. The effective dose equivalent in a year is the sum of the effective dose equivalent from exposures to radiation sources external to the body during the year plus the cumulative effective dose equivalent (CEDE) from radionuclides taken into the body during the year. DOE Order 5400.5, Ch. 2 (DOE, 1993c)"
10-8	Change "Finally it should be noted that a multi-agency effort is currently proceeding to develop measurement and decision criteria applicable to D&D projects. The Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) has been drafted and provided for public comment in December 1996 (NRC 1996). When MARSSIM is finalized, it should provide detailed techniques applicable to the D&D of DOE facilities. **10.2 DESIGN FEATURES** Design of the facility should allow easy D&D of equipment and materials. Details on designing facilities for ease of decommissioning are found in DOE Order 6430.1A, General Design Criteria (DOE, 1989b) and are discussed in the following sections. 10 CFR 835.1002 and Appendix C of this document provide additional guidance on facility design." to "Finally it should be noted that a multi-agency effort has developed measurement and decision criteria applicable to D&D projects. The Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) has been published (DOE, 2000b). It provides detailed techniques applicable to the D&D of DOE facilities. **10.2 DESIGN FEATURES** Design of the facility should allow easy D&D of equipment and materials. Details on designing facilities for ease of decommissioning are discussed in the following sections. 10 CFR 835.1002 and Appendix C of this document provide additional guidance on facility design."

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Section/Page	Change
10-11	Change "Other features discussed in DOE Order 6430.1A, General Design Criteria (DOE, 1989b) include the following:" to "Other features include the following:"
10-12	Change "DOE Order 4700.1, Project Management System 4.a (DOE, 1992e), contains the requirements by which all DOE projects must be managed; Section 2, A.3 .c, requires that a project management plan be developed for major system acquisitions and major projects; Item 2.d of Attachment II-4 states that environment, safety, and health technical requirements for project design and implementation should be included in the work-plan section of the project management plan." to "DOE Order 430.IA, Lifecvcle Asset Management (DOE, 1998d), contains the requirements by which all DOE projects must be managed; It requires that a project management plan be developed for major system acquisitions and major projects and states that environment, safety, and health technical requirements for project design and implementation should be included in the work-plan section of the project management plan."
10-13	Delete "In addition, Section 5, 3.d.(3) of DOE Order 5820.2A (DOE, 1988'0) states that a decommissioning project plan shall be prepared according to DOE Order 4700.1 and shall include the following: -- development of a health and safety plan for decommissioning and -- projections of occupational exposure,"
11-29	Change references to reflect changes. Change '(ORNL, 1970) Oak Ridge National Laboratory. 1970. Design, Construction, and Testing of High Efficiency Air Filtration Systems for Nuclear Application. ORNL-N5 1L-65. U.S. Atomic Energy Commission, Washington, D.C." To "(**ORNL**, 1970) Oak Ridge National Laboratory. 1970. Design, Construction, and Testing of High Efficiency Air Filtration Systems for Nuclear Application. ORNL-NSIC-65. U.S. Atomic Energy Commission, Washington, D.C."
A-1	Change "**airborne radioactivity area:** Any area where the measured concentration of airborne radioactivity, above natural background, exceeds or is likely to exceed 10% of the derived air concentration (DAC) values listed in Appendix A or Appendix C of 10 CFR 835. (**10 CFR 835)**" to **"airborne radioactivity area:** Any area, accessible to individuals, where: (1) The concentration of airborne radioactivity, above natural background, exceeds or is likely to exceed the derived air concentration (DAC) values listed in Appendix A or Appendix C of this part; or (2) An individual present in the area without respiratory protection could receive an intake exceeding 12 DAC-hours in a week. (**10 CFR 835**)".

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Section/Page	Change
A-2	Change "**contamination area:** Any area where contamination levels are greater than the values specified in Appendix D of 10 CFR 835, but less than or equal to 100 times those levels. (**10 CFR 835)"** to "**contamination area:** Any area where removable contamination levels are greater than the removable values specified in Appendix D of 10 CFR 835, but less than or equal to 100 times those levels. (**10 CFR 835**)".
A-3	Delete "10 CFR 835" from definition of "continous air monitor". Change "**controlled area**: Any area to which access is managed in order to protect individuals from exposure to radiation and/or radioactive material. Individuals who enter only the controlled area without entering radiological areas are not expected to receive a total effective dose equivalent of more than 100 mrem (0.001 sievert) in a year. **(10 CFR 835)"** to **"controlled area:** Any area to which access is managed in order to protect individuals from exposure to radiation and/or radioactive material. **(10 CFR 835)**".
A-5	Change **"high contamination area: Any** area where contamination levels are greater than 100 times the values specified in Appendix D of 10 CFR 835. (**10 CFR 835)"** to **"high contamination area:** Any area where removable contamination levels are greater than 100 times the removable values specified in Appendix D of 10 CFR 835. **(10 CFR 835)".**
A-7	Change **"radioactive material area:** An area where radioactive material is used, handled, or stored. **(Posting and Labeling IG)** **radiological area:** Any area within a controlled area which must be posted as a "radiation area," "high radiation area," "very high radiation area," "contamination area," "high contamination area," or "airborne radioactivity area" in accordance with 10 CFR 835.6093. **(10 CFR 835)**" to **"radioactive material area:** Any area within a controlled area, accessible to individuals, in which items or containers of radioactive material exist and the total activity of radioactive material exceeds the applicable values provided in Appendix E of 10 CFR 835. **(10 CFR 835)**
A-7	**radiological area: Any** area within a controlled area which must be posted as a "radiation area," "high radiation area," "very high radiation area," "contamination area," "high contamination area," or "airborne radioactivity area" in accordance with 10 CFR 835.603. (**10 CFR 835)".**
A-8	Delete "10 CFR 835" from definition of "survey".

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Section/Page	Change
C-1	Change "While there is little probability that large new plutonium facilities will be constructed, there may be significant modification to existing facilities. Facility design criteria for DOE plutonium facilities can be found in DOE Order 6430.1A, General Design Criteria (DOE, 1989b). While all of the General Design Criteria manual is applicable to the design of new facilities or modification of existing facilities, Division 1300, "Special Facilities," parts 1304 and 1305, are especially pertinent to plutonium-facility design. Additionally, 10 CFR *835* Subpart K Design and Control also provides requirements for the design of radiological facilities. This appendix provides guidance in the design of plutonium facilities. This guidance should be used to supplement the required criteria in DOE Order 6430.1A, the guidance of the DOE Radiological Control Manual (DOE, 19941), and other DOE Orders and standards." to "While there is little probability that large new plutonium facilities will be constructed, there may be significant modification to existing facilities. Additionally, 10 CFR 835 Subpart K Design and Control also provides requirements for the design of radiological facilities. This appendix provides guidance in the design of plutonium facilities. This guidance should be used to supplement the guidance of the DOE Standard, Radiological Control (DOE, 1999a), and other DOE Orders and standards."
C-2	Change "The design criteria in Divisions 1304 and 1305 of DOE Order 6430.1 A, General Design Criteria (DOE, 1989b), which pertain specifically to plutonium facilities, shall be applied for all new facilities that contain substantial quantities of plutonium. A facility that will handle more than 1 gram of plutonium, under certain specific conditions, shall also meet the security requirements of DOE Order 5632. 1C, Protection and Control of Safeguards and Security Interests (DOE, 1994q). The design of a plutonium facility should consider the requirements and analyses described in DOE Order 5480.23, Nuclear Safety Analysis Reports (DOE, 1992d), to ensure compatibility. DOE Order 420.1 Facility Safety (DOE, 1995c) contains several requirements important to facility design. The following DOE standards may also be useful: • DOE-STD-1024-92 Guidelines for Use of Probabilistic Seismic Hazard Curves at DOE Sites. (DOE, 1992b)" to "The following DOE standards may also be useful:"

Changes to DOE-STD-1128-98, "Guide for Occupational Radiological Protection in Plutonium Facilities

Section/Page	Change
C-3 C-12	Change "DOE-STD-1020-24 National Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities. (DOE, 1994i)" to "DOE-STD-1020-2002 Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities. (DOE, 2002b)". Change "The design of a plutonium facility shall achieve the following objectives [from DOE Order 6430.1A, General Design Criteria (DOE, 1989b)]:" to "The design of a plutonium facility should achieve the following objectives:"
C-5	Delete "The results of safety analysis reports required by DOE Order 5480.23, Nuclear Safety Analysis Reports (DOE, 1992d) will provide necessary information for design parameters."
C-6	Delete "Human-factors engineering, as described in Part 1300-12 of DOE Order 6430.1A, General Design Criteria (DOE, 1989b), is applicable to the design of the work environment and human-machine systems at DOE facilities. Additional guidance is provided by reference in Part 1300-12."
C-7	Change "The safety analyses should be performed in accordance with the following DOE Orders: -- DOE Order 5480.22, Technical Safety Requirements (DOE, 1992g); -- DOE Order 5480.23, Nuclear Safety Analysis Reports (DOE, 1992d); and -- DOE Order 6430.1A, General Design Criteria (DOE, 1989b)." to "The safety analyses should be performed in accordance with 10 CFR 830, *Nuclear Safety Management* (DOE, 2001e)."
C-10	Delete "[DOE Order 5480.23, Nuclear Safety Analysis Reports (DOE, 1992d]".
C-14	Change "DOE Order 5400.5 (DOE, 1990b)" to "DOE Order 5400.5, Ch. 2 (DOE, 1993c).
C-22	Change "Storage facilities in the process areas should be designed to prevent the exposure of operating personnel and to meet the requirements for security and safeguards as given in DOE Order 5632.16, Protection and Control of Safeguards and Security Interests (DOE, 1994q), and other DOE Orders in the 5630 series that comprises the DOE safeguards program to guard against theft or unauthorized diversion of special nuclear material. **C.4.3.4 Shielding** Provisions should be made to accommodate the shielding of all items in the process area. All structures (e.g., floors, walls, and glove boxes) may require additional shielding during the lifetime of the facility because of increased throughput or higher radiation levels of the material being processed.

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C-22	DOE Order 6430.1A, General Design Criteria (DOE, 1989b) establishes a radiation level of 1 rem/y to the whole body as a design guide. However, the DOE Radiological Control Manual (DOE, 1994l), Article 128, "Facility Modification and Radiological Design Considerations," states that "individual worker dose should be ALARA and less than 500 mrem per year." The design of a routinely occupied portion of a process area should never be based on anticipated dose rates in excess of 100 mrem/h." to "Storage facilities in the process areas should be designed to prevent the exposure of operating personnel and to meet the requirements for security and safeguards. **C.4.3.4 Shielding** Provisions should be made to accommodate the shielding of all items in the process area. All structures (e.g., floors, walls, and glove boxes) may require additional shielding during the lifetime of the facility because of increased throughput or higher radiation levels of the materials being processed."
C-38	Change "Design criteria for effluent monitoring and sampling and elements for consideration in effluent radioactivity measurement are described in DOE/EP-0096, A Guide for Effluent Radiological Measurements at DOE Installations (DOE, 1983)." to "Design criteria for effluent monitoring and sampling and elements for consideration in effluent radioactivity measurement are described in DOE/EH-0173T, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance (DOE, 1983)."
C-44	Change "(DOE, 1994g)" to "(DOE, 1999f)".