

REFERENCES

- 10 CFR 20.1003. *Standards for Protection Against Radiation, Definitions*. Code of Federal Regulations (CFR) Title 10, Energy, Part 20.1003, December 19, 2002. <http://www.nrc.gov/reading-rm/doc-collections/cfr/part020/> (accessed September 1, 2008).
- 10 CFR 36.57. *Licenses and Radiation Safety Requirements for Irradiators, Radiation Surveys*. Code of Federal Regulations (CFR) Title 10, Energy, Part 36.57, January 1, 2005. <http://www.nrc.gov/reading-rm/doc-collections/cfr/part036/part036-0057.html> (accessed September 1, 2008).
- 10 CFR 50.2. *Domestic Licensing of Production and Utilization Facilities, Definitions*. Code of Federal Regulations (CFR) Title 10, Energy, Part 50.2, January 13, 1998. <http://www.nrc.gov/reading-rm/doc-collections/cfr/part050/> (accessed September 1, 2008).
- 10 CFR 71.4. *Packaging And Transportation of Radioactive Material*. Code of Federal Regulations (CFR) Title 10 (Energy), Part 71.4, September 28, 1995. <http://www.nrc.gov/reading-rm/doc-collections/cfr/part071/full-text.html> (accessed October 24, 2008).
- 10 CFR 820. *Procedural Rules for DOE Nuclear Activity*. Code of Federal Regulations (CFR) Title 10, Energy, Part 820, August 17, 1993. <http://www.hss.energy.gov/enforce/rands/10CFR820.pdf> (accessed October 24, 2008).
- 10 CFR 835. *Occupational Radiation Protection*. Code of Federal Regulations (CFR) Title 10, Energy, Part 835, Subpart E, “Monitoring of Individuals and Areas,” 401, “General Requirements” November 4, 1998. <http://www.eh.doe.gov/radiation/10cfr835/835gpo.pdf> (accessed September 1, 2008).
- 10 CFR 172. *Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans*. Code of Federal Regulations (CFR) Title 49 (Transportation), Subpart E, “Labeling,” 403, “Class 7 (radioactive) material” April 15, 1976, 436, “Radioactive White-I Label,” 438, “Radioactive Yellow-II Label,” 440 “Radioactive Yellow-III Label” December 20, 1991. <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;sid=f5b01bccf82655893c893d14885a307f;rgn=div5;view=text;node=49%3A2.1.1.3.8;idno=49;cc=ecfr#49:2.1.1.3.8.9.25.22> (accessed October 24, 2008).
- 49 CFR 173.433. *Requirements for Determining Basic Radionuclide Values and for the Listing of Radionuclides on Shipping Papers and Labels*. Code of Federal Regulations (CFR) Title 49, Transportation, Part 173.433, September 23, 2005. <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;sid=f5b01bccf82655893c893d14885a307f;rgn=div5;view=text;node=49%3A2.1.1.3.8;idno=49;cc=ecfr#49:2.1.1.3.8.9.25.22> (accessed October 24, 2008).
- Abelquist, E. 2001. *Decommissioning Health Physics: A Handbook for MARSSIM Users*. Institute of Physics Publishing, Philadelphia, PA.

- American National Standards Institute (ANSI) 1989. *Performance Specifications for Health Physics Instrumentation-Portable Instrumentation for Use in Extreme Environmental Conditions*. ANSI N42.17C.
- American National Standards Institute (ANSI) 1994. *Calibration and Usage of Thallium-Activated Sodium Iodide Detector Systems for Assay of Radionuclides*. ANSI N42.12.
- American National Standards Institute (ANSI) 1997. *Radiation Protection Instrumentation Test and Calibration, Portable Survey Instruments*. ANSI N323A.
- American National Standards Institute (ANSI) 1999. *Surface and Volume Radioactivity Standards for Clearance*. ANSI N13.12.
- American National Standards Institute (ANSI) 2003a. *Performance Criteria for Hand-held Instruments for the Detection and Identification of Radionuclides*. ANSI N42.34.
- American National Standards Institute (ANSI) 2003b. *Performance Specifications for Health Physics Instrumentation-Portable Instrumentation for Use in Normal Environmental Conditions*. ANSI N42.17A.
- American National Standards Institute (ANSI) 2004. *American National Standard for Evaluation and Performance of Radiation Protection Portal Monitors for Use in Homeland Security*. ANSI N42.35.
- Beck H.L., Gogolak C.V., Miller K.M., and Lowder W.M. 1980. "Perturbations on the Natural Radiation Environment Due to the Utilization of Coal as an Energy Source," in *Natural Radiation Environment III*, U.S. Department of Energy CONF-780422.
- BIL 2005. "IonSens[®] 208 Large Item Monitor." BIL Solutions.
http://www.bilsolutions.co.uk/pdf/datasheets_new/ionsens208largeitemsmonitor.pdf
(accessed September 1, 2008).
- Canberra 2005a. "Considerations for Environmental Gamma Spectroscopy Systems." Canberra, Inc. <http://www.canberra.com/literature/972.asp> (accessed September 1, 2008).
- Canberra 2005b. "RadSentry[™] Security Portals for SNM and Other Radionuclides." Canberra, Inc. <http://www.canberra.com/products/1211.asp> (accessed September 1, 2008).
- Canberra 2008. "Automatic Conveyor Monitor for Soil and Debris." Canberra, Inc. <http://www.canberra.com/products/795.asp> (accessed September 1, 2008).
- Currie, L.A. 1968. "Limits for Qualitative Detection and Quantitative Determination: Application to Radiochemistry." *Analytical Chemistry* 40(3): 586–593.
- DOE 1987. *The Environmental Survey Manual, Appendix A – Criteria for Data Evaluation*. DOE/EH-0053, DOE, Office of Environmental Audit, Washington, D.C. (DE88-000254), August.
- DOE 1993. *Radiation Protection of the Public and the Environment*. DOE Order 5400.5, Change 2, U.S. Department of Energy, Washington, DC, January.
<http://homer.ornl.gov/oepa/guidance/risk/54005.pdf> (accessed September 1, 2008).

- DOE 2005. *RESRAD Recycle Version 3.10*. U.S. Department of Energy, Argonne National Laboratory. <http://web.ead.anl.gov/resrad/home2/index.cfm> (accessed September 1, 2008).
- Eberline 2004. "Segmented Gate System." Eberline Services. http://www.eberlineservices.com/documents/SGSBrochure_000.pdf (accessed September 1, 2008).
- Eckerman, K.F., Westfall, R.J., Ryman, J.C., and Cristy, M. 1993. *Nuclear Decay Data Files of the Dosimetry Research Group*, ORNL-TM-12350.
- Eicholz G.G., Clarke F.J., and Kahn, B. 1980. "Radiation Exposure From Building Materials," in *Natural Radiation Environment III*, U.S. Department of Energy CONF-780422.
- Electric Power Research Institute (EPRI) 2003. *Operational Changes and Impacts on LLW Scaling Factors*. D. James, EPRI Report 1008017, Electric Power Research Institute, Palo Alto, CA, December.
- U.S. Environmental Protection Agency (EPA) 1980. *Upgrading Environmental Radiation Data, Health Physics Society Committee Report HPSR-1*. EPA 520/1-80-012, EPA, Office of Radiation Programs, Washington, D.C. (PB81-100364), August.
- U.S. Environmental Protection Agency (EPA) 1992a. *Guidance for Data Usability in Risk Assessment, Part A*. Office of Solid Waste and Emergency Response (OSWER) Directive 9285.7-09A, Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, D.C. (PB92-963356), April.
- U.S. Environmental Protection Agency (EPA) 1992b. *Guidance for Data Usability in Risk Assessment, Part B*. Office of Solid Waste and Emergency Response (OSWER) Directive 9285.7-09B, Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, D.C. (PB92-963362), May.
- U.S. Environmental Protection Agency (EPA) 2000. *Evaluation of EPA's Guidelines for Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM)*. Report to Congress, EPA 402-R-00-01, U.S. Environmental Protection Agency.
- U.S. Environmental Protection Agency (EPA) 2001. *Guidance for Preparing Standard Operating Procedures*, EPA QA/G-6. EPA/240/B-01/004, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC, March.
- U.S. Environmental Protection Agency (EPA) 2002a. *Guidance for Quality Assurance Project Plans*, EPA QA/G-5. EPA/240/R-02/009, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC, December.
- U.S. Environmental Protection Agency (EPA) 2002b. *Calculating Upper Confidence Limits For Exposure Point Concentrations At Hazardous Waste Sites*. Office of Solid Waste and Emergency Response (OSWER) Directive 9285.6-10, Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, DC.

- U.S. Environmental Protection Agency (EPA) 2002c. *Guidance for Developing Quality Systems for Environmental Programs*, EPA QA/G-1. EPA/240/R-02/008, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC, November.
- U.S. Environmental Protection Agency (EPA) 2006a. *Guidance on Systematic Planning Using the Data Quality Objectives Process*, EPA QA/G-4. EPA/240/B-06/001, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC, February.
- U.S. Environmental Protection Agency (EPA) 2006b. *Data Quality Assessment: Statistical Tools for Practitioners*, EPA QA/G-9R. EPA/240/B-06/002, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC, February.
- U.S. Environmental Protection Agency (EPA) 2006c. *Data Quality Assessment: A Reviewer's Guide*, EPA QA/G-9S. EPA/240/B-06/003, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC, February.
- U.S. Environmental Protection Agency (EPA) 2006d. *Technical Support Center for Monitoring and Site Characterization: Software for Calculating Upper Confidence Limits (UCLs), ProUCL Version 4.00.02*. <http://www.epa.gov/esd/tsc/software.htm> (accessed September 1, 2008).
- European Commission for Nuclear Safety and the Environment (EC) 1998. *Handbook on Measurement Methods and Strategies at Very Low Levels and Activities*. Report 17624, ISBN 92-828-3163-9.
- Fuji 2008. Radioactive Contamination Monitors. Hasegawa, T., Hashimoto, T. Hashimoto, M. Fuji Electronics, <http://www.fujielectric.co.jp/eng/company/tech/pdf/r50-4/05.pdf> (accessed September 1, 2008).
- Gilbert, R.O. and Simpson, J.C. 1992. *Statistical Methods for Evaluating the Attainment of Cleanup Standards*. Pacific Northwest Laboratory Report PNL-7409, Rev. 1, http://www.osti.gov/energycitations/product.biblio.jsp?osti_id=6637176 (accessed November 10, 2008).
- GUM Workbench 2006. GUM Workbench Version 1.2 Demo Installer and User Manual. <http://www.gum.dk/download/download.html> (accessed September 1, 2008).
- Hatch, L. L., Rentos, P. G., Godbey, F. W., and Schrems, E. L. 1978. *Self-Evaluation of Occupational Safety and Health Programs*. DHEW (NIOSH) 78-187," U.S. Department of Health, Education, and Welfare.
- Hobbs T.G. 2000. *Radioactivity Measurements on Glazed Ceramic Surfaces*. J. Res. Natl. Inst. Stand. Technol., 105, 275-283.
- International Commission on Radiological Protection (ICRP) 1989. *Optimization and Decision-Making in Radiological Protection: Annals of the ICRP Volume 20/1*. ICRP Publication 55.

- International Organization for Standardization (ISO) 1988. *Evaluation of Surface Contamination – Part 1: Beta Emitters and Alpha Emitters*. ISO-7503-1 (1st Edition), Geneva, Switzerland.
- International Organization for Standardization (ISO) 1995. *Guide to the Expression of Uncertainty in Measurement*. ISO Guide 98, GUM, Geneva, Switzerland.
- International Organization for Standardization (ISO) 1996. *International Vocabulary of Basic and General Terms in Metrology*. ISO Guide 99, VIM, Geneva, Switzerland, 1996.
- International Organization for Standardization (ISO) 1997. *Capability of Detection – Part 1: Terms and Definitions*. ISO 11843-1, Geneva, Switzerland.
- Knoll, G.F. 1999. *Radiation Detection and Measurement, 3rd Edition*. John Wiley & Sons, Inc., New York, NY.
- Kragten 1994. *J. Analyst*, 119, 2161-2165.
- Laurus 2001. “Gamma Solid Waste Monitor WM-295.” Laurus Systems, Inc.. http://www.laurussystems.com/products/gamma_solid_waste_monitor.htm (accessed September 1, 2008).
- Lewis V., Woods M., Burgess P., Green S., Simpson J., and Wardle J. 2000. *The Measurement Good Practice Guide No. 49: The Assessment of Uncertainty in Radiological Calibration and Testing*. National Physical Laboratory, Teddington, Middlesex, UK, TW11 0LW, February. <http://eig.unige.ch/nucleaire/articles/gpg49.pdf>, (accessed September 1, 2008).
- MARLAP 2004. *Multi-Agency Radiological Laboratory Analytical Protocols Manual*. Nuclear Regulatory Commission NUREG-1576, Environmental Protection Agency EPA 402-B-04-001A, National Technical Information Service NTIS PB2004-105421, July. <http://www.epa.gov/radiation/marlap/links.html> (accessed November 10, 2008).
- MARSSIM 2002. *Multi-Agency Radiation Survey and Site Investigation Manual (Revision 1)*. Nuclear Regulatory Commission NUREG-1575 Rev. 1, Environmental Protection Agency EPA 402-R-97-016 Rev. 1, Department of Energy DOE EH-0624 Rev. 1, August. <http://www.epa.gov/radiation/marssim/obtain.html> (accessed November 10, 2008).
- McCroan 2006. GUMCalc freeware. <http://www.mccroan.com/GumCalc.htm> (accessed September 1, 2008).
- Meyer, K. and Lucas, A. 1995. “Assays of Thick Soil Samples Using Low-Resolution Alpha Spectroscopy.” 41st Bioassay Analytical and Environmental Radiochemistry Conference, 1995. <http://www.lanl.gov/BAER-Conference/BAERCon-41p038.pdf> (accessed September 1, 2008).
- Miller E., Peters J., Nichols D. 2000. “Release Surveying of Scrap Metals with the IonSens™ Conveyor.” Waste Management 2000 Conference, Tucson, AZ, February. http://www.bilsolutions.co.uk/file_download.php?file_id=4 (accessed September 1, 2008).

- National Academy of Sciences (NAS) 1999. *Evaluation of Guidelines for Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM)*. Committee on Evaluation of EPA Guidelines for Exposure to Naturally Occurring Radioactive Materials, National Research Council, National Academy of Sciences, National Academy Press, p. 72.
- National Bureau of Standards (NBS) 1963. *Experimental Statistics*. NBS Handbook 91, National Bureau of Standards, Gaithersburg, MD.
- National Council on Radiation Protection and Measurements (NCRP) 1988a. *Exposure of the Population in the United States and Canada from Natural Background Radiation*. NCRP Report No. 94, Bethesda, MD.
- National Council on Radiation Protection and Measurements (NCRP) 1988b. *Exposure of the U.S. Population from Consumer Products and Miscellaneous Sources*. NCRP Report No. 95, Bethesda, MD.
- National Council on Radiation Protection and Measurements (NCRP) 1993. *Limitation of Exposure to Ionizing Radiation*. NCRP Report No. 116, MD.
- National Council on Radiation Protection and Measurements (NCRP) 2002. *Managing Potentially Radioactive Scrap Metal*. NCRP Report No. 141, Bethesda, MD.
- National Institute of Standards and Technology (NIST) 1994. *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*. NIST Technical Note 1297, Gaithersburg, MD. <http://physics.nist.gov/Document/tn1297.pdf> (accessed September 1, 2008).
- National Institute of Standards and Technology (NIST) 1996. *Tables of X-Ray Mass Attenuation Coefficients and Mass Energy-Absorption Coefficients*. Hubbell, J.H. and Seltzer, S.M., Gaithersburg, MD, April. <http://physics.nist.gov/PhysRefData/XrayMassCoef/cover.html> (accessed September 1, 2008).
- National Institute of Standards and Technology (NIST) 1998. *XCOM: Photon Cross Sections Database*. <http://physics.nist.gov/PhysRefData/Xcom/Text/XCOM.html> (accessed September 1, 2008).
- National Institute of Standards and Technology (NIST) 2006. "NIST/SEMATECH e-Handbook of Statistical Methods." <http://www.itl.nist.gov/div898/handbook/> (accessed September 1, 2008).
- Novelec 2001a. "Technical Information Systems and Machines." Novelec Nuclear Instrumentation, 2001. <http://www.novelec.fr/descriptionUK-CRL01.htm#T2C%20and%20T2C-AB> (accessed September 1, 2008).
- Novelec 2001b. "Technical Information Radiation Survey." Novelec Nuclear Instrumentation, 2001. <http://www.novelec.fr/descriptionUK-MSA.htm#MSA-P and MSA-C> (accessed September 1, 2008).

- U.S. Nuclear Regulatory Commission (NRC) 1977. *Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable*. Regulatory Guide 8.10. Washington, DC.
- U.S. Nuclear Regulatory Commission (NRC) 1982. *Information Relevant to Ensuring that Occupational Radiation Exposures at Medical Institutions Will Be As Low As Reasonably Achievable*. Regulatory Guide 8.18. Washington, DC.
- U.S. Nuclear Regulatory Commission (NRC) 1984. *Lower Limit of Detection: Definition and Elaboration of a Proposed Position for Radiological Effluent and Environmental Measurements*. NUREG/CR-4007. Washington, DC.
- U.S. Nuclear Regulatory Commission (NRC) and Oak Ridge Associated Universities 1992. *Manual for Conducting Radiological Surveys in Support of License Termination, Draft Report for Comment*. NUREG/CR-5849. Washington, DC.
- U.S. Nuclear Regulatory Commission (NRC) 1993. *ALARA Levels for Effluents from Materials Facilities*. Regulatory Guide 8.37. Washington, DC.
- U.S. Nuclear Regulatory Commission (NRC) 1994. *Background as a Residual Radioactivity Criterion for Decommissioning, Draft Report*. NUREG-1501. Office of Nuclear Regulatory Research, Washington, DC.
- U.S. Nuclear Regulatory Commission (NRC) 1995. *Proposed Methodologies for Measuring Low Levels of Residual Radioactivity for Decommissioning*. NUREG-1506, Draft Report for Comment. Washington, DC.
- U.S. Nuclear Regulatory Commission (NRC) 1998a. *A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys (Revision 1)*. NUREG-1505 Rev. 1. Office of Nuclear Regulatory Research, Washington, DC.
- U.S. Nuclear Regulatory Commission (NRC) 1998b. *Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions*. NUREG-1507. Office of Nuclear Regulatory Research, Washington, DC.
- U.S. Nuclear Regulatory Commission (NRC) 2000. *Low-Level Waste Classification, Characterization, and Assessment: Waste Streams and Neutron-Activated Metals*. NUREG/CR-6567, D.E. Robertson, C.W. Thomas, S.L. Pratt, E.A. Lepel, and V.W. Thomas, Pacific Northwest Laboratory.
- U.S. Nuclear Regulatory Commission (NRC) 2002a. *Radiological Surveys for Controlling Release of Solid Materials*. NUREG-1761. Office of Nuclear Regulatory Research, Washington, DC.
- U.S. Nuclear Regulatory Commission (NRC) 2002b. *Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Mills Will Be As Low As Is Reasonably Achievable*. Regulatory Guide 8.31. Washington, DC.
- U.S. Nuclear Regulatory Commission (NRC) 2003a. *Radiological Assessments for Clearance of Materials from Nuclear Facilities*. NUREG-1640. Office of Nuclear Regulatory Research, Washington, DC.

- U.S. Nuclear Regulatory Commission (NRC) 2003b. *Radiological Toolbox Version 1.0.0*. Eckerman, K.F. and Sjoreen, A.L. <http://www.nrc.gov/about-nrc/regulatory/research/radiological-toolbox.html> (accessed September 1, 2008).
- Occupational Safety and Health Administration (OSHA) 2002. *Job Hazard Analysis*. OSHA Publication 3071. <http://www.osha.gov/Publications/oseha3071.pdf> (accessed September 1, 2008).
- Pacific Northwest Laboratory (PNL) 1988. *Health Physics Manual of Good Practices for Reducing Radiation Exposure to Levels that are As Low As Reasonably Achievable (ALARA)*. Munson, L.H., et al. PNL-6577, UC-610, , Richland, Washington. <http://www.pnl.gov/bayesian/refs/ALARAMAN88.PDF> (accessed September 1, 2008).
- Srom, D.J. *Counting Statistics Utility for Comparing Eight Decision Rules*. <http://www.pnl.gov/bayesian/strom/strompub.htm> (accessed September 1, 2008).
- Thermo 2005. "SAM11 Small articles and tools monitor for low level gamma measurement" Thermo Fisher Scientific, Inc. http://www.thermo.com/eThermo/CMA/PDFs/Product/productPDF_23747.pdf (accessed September 1, 2008).
- Thermo 2008. "FHT 3031 CCM Contamination Monitor." Thermo Fisher Scientific, Inc.. <http://www.thermo.com/com/cda/product/detail/0,1055,15815,00.html> (accessed September 1, 2008).
- United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) 2000. *Sources and Effects of Ionizing Radiation*. Report to the General Assembly, ISBN 92-1-142238-8. <http://www.unscear.org/unscear/en/publications.html> (accessed September 1, 2008).
- Vetter, T.W. 2006. *Quantifying Measurement Uncertainty in Analytical Chemistry – A Simplified Practical Approach*. <http://www.cstl.nist.gov/acd/839.03/Uncertainty.pdf> (accessed September 1, 2008).