Duane W. Schmidt, CHP

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Fields of Experience

Environmental radiological assessment, licensing reviews for decommissioning and uranium recovery facilities, technical calculations, development and analysis of decommissioning criteria for license termination, technical monitoring of contracts, probabilistic uncertainty analysis using Monte Carlo simulations, radiological site characterization, final status surveys, environmental radioactivity and radiation measurements, health physics for decommissioning and uranium recovery facilities, general health physics and radiation protection.

Present Position

Health Physicist, Technical Reviewer
Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards (NMSS), Division of Waste Management (DWM), Decommissioning Branch (DCB) (1999–present)

Licensing reviews for facilities undergoing decommissioning; DWM representative to Interagency Steering Committee on Radiation Standards, Sewage Sludge Subcommittee; dose assessments for facility decommissioning; member of Dose Modeling Working Group for the decommissioning rule standard review plan; development of decommissioning guidance; and general health physics for facilities undergoing decommissioning.

Education

M.S., Health Physics — Georgia Institute of Technology, 1985.

B.A., Mathematics — Johns Hopkins University, 1984.

Credentials

Instant Cash Award, Nuclear Regulatory Commission, 1997.

Certified Health Physicist, American Board of Health Physics, 1991, 1995, 1999.

U.S. Department of Energy Health Physics Fellowship 1984–1985.

Health Physics Society, plenary member.

Employment Summary

1999–present	**Health Physicist, Technical Reviewer** Nuclear Regulatory Commission, NMSS/DWM/DCB.
1996–1999	**Health Physicist, Technical Reviewer** Nuclear Regulatory Commission, NMSS/DWM/Uranium Recovery Branch.
1989–1996	**Consulting Health Physicist** d.b.a. Health Physics Applications, Darnestown, Maryland.
1986–1989	**Project Health Physicist** Roy F. Weston, Inc., Albuquerque, New Mexico.
1985–1986 (Winter)	**Student Intern** Oak Ridge National Laboratory, Oak Ridge, Tennessee.
1984 (Summer)	**Intern** U.S. Environmental Protection Agency, Washington, D.C.

Enclosure

Nuclear Regulatory Commission Experience, DWM/ Decommissioning Branch

Tasks Related to Facilities Undergoing Decommissioning:

Evaluate health physics aspects of licensing actions for facilities undergoing decommissioning, including characterization plans, dose assessments for residual radioactivity, final status survey plans, and final status survey results.

Participate as a member of the interoffice Dose Modeling Working Group, to provides technical support related to dose modeling for development of a Standard Review Plan (SRP) for implementation of the license termination rule (10 CFR 20, Subpart E). Prepare and review technical sections of the SRP, Technical Basis Document, and other associated technical support documents.

Reconcentration of Radioactivity in Sewage Sludge and Ash

Participate as the Division of Waste Management representative to the Sewage Sludge Subcommittee of the Interagency Steering Committee on Radiation Standards. The Subcommittee is assisting the NRC and the Environmental Protection Agency in the development of (1) a national survey of radioactivity in sewage sludge and incinerator ash and (2) a guidance document for sewage treatment plant operators regarding radioactivity in sludge and ash. Assisted in finalizing public report on results of pilot survey. NRC lead for finalizing a revised draft of the guidance document for release to the public.

Other Tasks

Coordinated review of the State of New Jersey's proposed regulations providing criteria for cleanup of radioactivity in soils. In addition to technical concerns with the proposed rule and comparison of the rule with existing NRC regulations, an important issue was Federal preemption of non-Agreement State regulations dealing with Atomic Energy Act (AEA)-regulated radioactive materials. Perform various other short-term health physics tasks to support the Decommissioning Branch.

Nuclear Regulatory Commission Experience, DWM/ Uranium Recovery Branch

Uranium Recovery Licensing Reviews:

For the abandoned uranium mill tailings sites of the Uranium Mill Tailings Remedial Action Project (UMTRA Project), performed reviews of health physics aspects of construction completion reports, to assess attainment of regulatory standards of 40 CFR 192. Reviewed radon barrier designs for disposal cells to meet standard on radon emissions, including evaluation of parameters used in radon emission calculations, uncertainty in calculations, and confirmatory calculations of radon emissions. Reviewed soil cleanup and verification to meet standard on residual ^{226}Ra in soil, including evaluation of verification measurement methods, statistical analyses, quality assurance, and uses of supplemental standards (alternatives to cleanup standards). Also reviewed completion reports for vicinity properties, which are properties other than the designated sites.

Performed reviews of health physics aspects of licensing actions for currently licensed uranium mills and uranium in situ leach (ISL) solution extraction facilities, which are facilities that extract uranium from the ore body by pumping lixiviant (mining fluid) through the ore body, and extracting uranium from the circulating lixiviant. Reviewed a new application for an ISL facility. Duties included evaluation of radiation safety programs, changes to safety programs proposed by licensees and applicants, and evaluation of proposed waste treatment and waste disposal methods for radioactive wastes from the facilities.

NRC Experience, DWM/ Uranium Recovery Branch (continued)

Development of Decommissioning Rules and Guidance:

Participated as Uranium Recovery Branch (URB) staff member on development of the final rule on decommissioning criteria for license termination. Reviewed drafts of statements of consideration and rule text and made changes to support URB objectives for the rule. In response to Commission Staff Requirements Memorandum to address separately the criteria for uranium recovery facilities, assisted in writing the separate Federal Register Notice asking for additional comments on criteria for uranium recovery facilities.

Lead technical staff for initial phase of final rule on decommissioning criteria for uranium recovery facility license termination. Involved in writing the Commission Paper to describe alternatives for proceeding to a final rule. Assessed doses for contaminants in soil at uranium recovery facilities, to support the rulemaking.

Member of the Division of Waste Management working group (in 1997) to evaluate the models, parameter distributions, and approach to setting default values (for screening calculations) for dose calculations to meet the decommissioning criteria for license termination.

Development of ISL Standard Review Plan:

Health physicist on the team developing the Standard Review Plan (SRP) for ISL uranium recovery facility applications, renewals, and amendments. Responsible for radiation safety and radiation dose impacts sections of the SRP. Reviewed and commented on contractor submittals and wrote some sections of the SRP.

Technical Monitoring of Contract to Update MILDOS-AREA Code:

Technical Project Manager for the contract to update the MILDOS-AREA code, which is software to calculate the transport of airborne, radioactive emissions from uranium recovery facilities and the radiation doses from these emissions. Initial phase of the contract was to update the air concentration limits used in the code and to develop example source term calculations for ISL facilities. The second phase of the contract was to develop a graphical user's interface and a user's manual for the software. Duties included performing technical reviews of contractor submittals; making presentations about the work; and contract management, including preparing statements of work and tracking the schedule and spending.

Other Tasks:

As member of a review panel, evaluated the Differing Professional Views (DPVs) of two staff members, regarding a proposed plan to change the classification of certain waste streams from ISL facilities. Reviewed the DPVs, subject Commission Paper, and associated historical documents. Developed recommendations to resolve the DPVs and prepared a report describing the panel's evaluation.

Managed the development of a course on health physics for uranium recovery facilities, presented to URB staff. Evaluated staff needs, developed outline, evaluated contractor's plans and lecture materials, and presented a lecture for the course.

Consulting Experience, Radiological Assessments Corporation Team

Centers for Disease Control and Prevention, Fernald Dosimetry Reconstruction Project, with RAC (1990–1996):

Member of the team for this project to assess historical radiation doses to members of the public living around the Feed Materials Production Center (FMPC) in Fernald, Ohio, due to releases from the FMPC. Searched historical records stored at Fernald for documents relevant to the project. Developed report identifying and verifying release points and release point characteristics.

Consulting Experience, RAC Team (continued)

Developed and implemented model for calculations of historical releases of ^{222}Rn and radon daughters from the Fernald plant, to make use of the limited data available. Used Monte Carlo simulations to concurrently calculate uncertainties in release quantities. Compiled historical environmental monitoring data for ^{222}Rn and radon daughters around the FMPC, and compared to model predictions.

Compiled historical monitoring data for uranium in groundwater south of the FMPC site. Developed an empirical model to estimate groundwater uranium concentrations for years prior to the start of groundwater monitoring.

Wrote technical sections of project reports, detailing radon and groundwater aspects of the project. Presented results at public meetings.

Colorado Department of Public Health and Environment, The Rocky Flats Plant Dose Reconstruction Project, Phase II, (1993–1996):

Member of the team for this project to assess exposures, to chemicals and radionuclides, of members of the public around the Rocky Flats Plant, outside Denver, Colorado, due to releases from the Plant. Responsible for reviewing and analyzing historical environmental monitoring records related to pollutants in soils around the plant. Compiled data and prepared report on background concentrations of plutonium in soils around the Rocky Flats Plant.

Centers for Disease Control and Prevention, Savannah River Site Dose Reconstruction Project, Phase I, with RAC (1993–1995):

Member of the team for this project to assess past exposures, to chemicals and radionuclides, of members of the public living around the Savannah River Site (SRS) near Aiken, South Carolina. Goals of this first phase were to identify, retrieve, and assess the quality of records that might be useful for the dose reconstruction to follow. Searched through collections of historical records at the SRS, to locate pertinent documents and data. Cataloged information in computer databases.

Chem-Nuclear Systems, Inc., Illinois Low-Level Radioactive Waste Disposal Facility Project, with RAC (1990–1991):

Assisted preparation of preliminary performance assessment for a proposed site for the Illinois LLW disposal facility. Prepared reports of literature reviews and dose assessment. Dose assessment utilized the PRESTO-EPA model and code.

Savannah River Site (SRS), with RAC (1990–1992):

Involved in revising and editing the SRS Environmental Reports for 1989, 1990, and 1991. Revised chapters that were written by SRS staff, to assure the technical accuracy and readability of the report. Analyzed, summarized, and graphed environmental monitoring data, for presentation in the reports.

Carolina Metals, Inc., with RAC (1989–1990):

Prepared a health and safety training program outline for this uranium processing facility. Wrote procedures for new employee training for radiation workers. Developed learning objectives for the radiation protection aspects of the program. Training materials were researched for the program as needed.

Evaluated this facility's radiation protection program, with a detailed review of the air sampling program. Recommended bioassay sampling frequencies and investigation levels for assessments of chemical and radiological uranium doses.

Other Consulting Experience

BP Chemicals, with Chem-Nuclear Environmental Services, Inc. (1990):

Assisted in preparation of the decommissioning plan for this chemical plant, under NRC license. Calculated potential doses to people following unrestricted release of uranium-contaminated chemical reactor components, utilizing pathways analysis, for justification of a proposed alternative release limit. Developed an alternative disposal plan for contaminated soils.

Weston Experience

Environmental Restoration Program:

Completed Preliminary Assessment and planning for the Site Investigation (PA/SI) for potential radiologically and chemically contaminated release sites at Technical Area 46 at Los Alamos National Laboratory (LANL). Developed characterization plans for scoping level site investigations in preparation for the Remedial Investigation (RI) at Technical Area 33 at LANL.

U.S. Department of Energy, Uranium Mill Tailings Remedial Action Project (UMTRA Project), Technical Assistance Contractor (TAC):

Managed the TAC environmental radon monitoring program for the project, including planning, quality assurance, data analysis, and report preparation.

Designed, managed, and implemented the radiological characterization of the Spook UMTRA Project site. Developed sampling plans, managed and participated in sample collection, performed field sample screening analyses, coordinated laboratory analyses, analyzed data, and prepared the site characterization report.

For remedial action plans for UMTRA Project sites, assessed cleanup criteria, calculated excavation areas and volumes, and designed radon barrier covers.

Assessed impacts of radiation and radioactivity at UMTRA Project sites for Environmental Assessments, including calculations of doses and risks to site workers and members of surrounding populations.

Assisted with development of, and implemented risk assessment techniques for residual hazardous metals at UMTRA Project sites. Characterized chemical source terms and performed pathways analyses and risk assessments.

Analyzed transportation regulations and developed procedures for shipping samples and bulk quantities of radioactive materials for the UMTRA Project. Responsible for training employees in the proper shipping of radioactive materials.

Publications

Killough G.G. and D.W. Schmidt. 2000. “Uncertainty Analysis of Exposure to Radon Released from the Former Feed Materials Production Center.” *Journal of Environmental Radioactivity* **49**(2): 127–156.

Meyer K.R., P.G. Voillequé, D.W. Schmidt, S.K. Rope, G.G. Killough, B. Shleien, R.E. Moore, M.J. Case, and J.E. Till. 1996. “Overview of the Fernald Dosimetry Reconstruction Project and Source Term Estimates for 1951–1988.” *Health Physics* **71**(4): 425–437.

Turner J.E., R.N. Hamm, M.L. Souleyrette, D.E. Martz, T.A. Rhea, and D.W. Schmidt. 1988. “Calculations for Beta Dosimetry Using Monte Carlo Code (OREC) for Electron Transport in Water.” *Health Physics* **55**(5): 741–750.

Schmidt D.W. 1988. “UMTRA Project Radon Programs.” In Duray J.R., ed. *Meeting Notes, U.S. Department of Energy Radon Forum, February 24-25, 1988, Grand Junction, Colorado.* Report CONF-880287, UNC Geotech, Grand Junction, Colorado.
