GERRY L. STIREWALT, Ph.D., P.G.
U.S. Nuclear Regulatory Commission
Office of New Reactors – Division of Site and Environmental Reviews
Geoscience and Geotechnical Engineering Branch 2
gerry.stirewalt@nrc.gov

SUMMARY

Ph.D. in Structural Geology and Registered Professional Geologist/Certified Engineering Geologist with extensive experience related to geologic, hydrologic, geophysical, and geotechnical site characterization, geologic hazards analysis, review of applicant Safety Analysis Reports (SARs), and preparation of U.S. Nuclear Regulatory Commission (NRC) Safety Evaluation Reports (SERs) for nuclear power plants; 3D geospatial modeling of HLW and non-HLW sites for the NRC; technical, regulatory, and programmatic review of U.S. Department of Energy (DOE) plans, reports, and related materials for the civilian high-level radioactive waste (HLW) management program; and geologic, hydrologic, and geophysical site characterization and public outreach activities for the DOE civilian HLW management program. Assets significant for planning, managing, coordinating, and performing technical, regulatory, and programmatic activities related to review of license application materials and preparation of SERs for nuclear power plants, presenting review results to a broad spectrum of stakeholders, and managing technical contractors include:

- Knowledge, skills, and experience related to planning, managing, coordinating, performing, and reporting on a variety of tasks in geology, hydrology, geophysics, and engineering geology under regulatory standards and guidelines, including surface and subsurface geologic, hydrologic, paleoseismic, geophysical, and geotechnical field investigations and geologic hazards analysis for characterization of nuclear power plant sites.
- Knowledge of technical principles and practices applied for characterization of site-specific, area, and regional geology, geomorphology, hydrology, paleoseismicity, tectonic and volcanic setting, and site-specific geophysical and geotechnical properties at nuclear power plant sites, including in-situ testing and collection of soil and rock materials for laboratory testing.
- Knowledge, skills, and experience related to collecting and integrating surface and subsurface geologic, hydrologic, paleoseismic, geophysical, and geotechnical site characterization data and reviewing and preparing technical reports, including SARs for nuclear power plant sites, based on these data.
- Knowledge, skills, and experience related to planning, managing, performing, and reporting on 3D geospatial modeling activities for development of conceptual geologic and geohydrologic framework and property models illustrating geology, geomorphology, subsurface fault geometry, stratigraphy, lithologic and hydrologic properties, and contaminant concentrations in space and time.
- Knowledge, skills, and experience related to contract management, including development of budgets and staffing and work plans and review and approval of technical reports.
- Awareness of potential issues related to use of geologic data and conceptual models in risk-informed, performance-based regulatory decision-making.
- Proven ability to function as an effective team leader or team player with excellent interpersonal and managerial skills for supervising and mentoring technical and support staff.
- Superlative oral and written communication skills attained through university teaching; training in hostile audience speaking techniques; presenting technical concepts to a wide range of stakeholders including industrial clients and licensees, technical peers and managers, public citizens, and staff and senior management representatives of NRC and other Federal, State, and Local government agencies; participating in public outreach efforts in the HLW program; writing SER sections; and publication of more than 40 technical papers, abstracts, and/or company reports.
- Working knowledge of regulatory requirements and guidance and standard technical practices related to siting and licensing nuclear power plants, including essential geologic, seismic, and geotechnical content of license application materials (e.g., 10 CFR Part 50, Part 52, and Part 100; NUREG-0800; Regulatory Guides 1.132, 1.138, 1.165, 1.198, 1.206, and 1.208), and to radioactive waste management (e.g., Nuclear Waste Policy Act of 1982, as amended; 10 CFR Part 63; 40 CFR Part 197).

PROFESSIONAL EXPERIENCE

NRC, NRO/DSER/RGS2 February 2007-Present

Senior Geologist: Responsible for leading teams in the safety review of FSAR Section 2.5 for multiple COL applications; performing reviews of FSAR Section 2.5 for multiple applications; preparing the training plan for new NRO geologists and mentoring those individuals; interfacing with USGS staff during safety reviews; and coordinating with seismologists and geotechnical engineers during safety reviews.

Selected Accomplishments:

- Reviewed application materials in Sections 2.5.1 and 2.5.3 of ESP or COL applications for Calvert Cliffs, Comanche Peak, Harris, Lee, Levy County, Nine Mile Point, Summer, Vogtle sites as primary technical reviewer.
- Team lead for review of application materials in Section 2.5 for the Lee, Levy County, and Summer sites.
- Mentored four new geologists who joined NRO.
- Gained qualification as a Certified Technical Reviewer.
- Technical monitor for USGS contract activities related to review of application materials.
- Prepared and presented papers at technical meetings related to integration of geology, seismology, and geotechnical engineering during the application review process.

NRC, NRR/ADES/DE/EGCB, Rockville, MD June 2006-February 2007 (Rotation to Permanent)

Geologist: Responsible for reviewing geologic and geotechnical sections of NUREG-800; preparing materials for employee orientation to assist new EGCB staff possessing expertise in geology with technical review of new reactor license applications; participating in visits to new reactor sites for assessing geologic and geotechnical site characterization programs of tentative licensees; and reviewing sections of the Vogtle ESP application.

Selected Accomplishments:

- Reviewed Sections 2.5.1 (Basic Geologic and Seismic Information), 2.5.3 (Surface Faulting), and 2.5.4 (Stability of Subsurface Materials and Foundations) in NUREG-0800 (i.e, Standard Review Plan for Review of Safety Analysis Reports for Nuclear Power Plants).
- Prepared materials for orientation of new EGCB employees possessing expertise in geology and provided those materials to ADM-503 (New NRR Employee Orientation Guide) and ADM-50X (NRR two locations. Specific activities included participation in briefings by the applicants on regional geologic and tectonic setting and status of site characterization programs; examination of rock core to assess rock quality (RQDs); and appraisal of geologic, hydrologic, geophysical, and geotechnical site characterization investigations.
- Lead technical reviewer for Sections 2.5.1 (Basic Geologic and Seismic Information) and 2.5.3 (Surface Faulting) of the Early Site Permit application for Vogtle (GA).

NRC, NRR/ADRA/DNRL/NEPB, Rockville, MD April 2006-June 2006 (Rotation)

Project Manager: Responsible for reviewing program plans and draft Regulatory Guide DG-1145, and preparing materials for employee orientation to assist new NEPB staff possessing expertise in hydrology, meteorology, and GIS with technical review of new reactor license applications.

Selected Accomplishments:

- Reviewed draft Pacific Northwest National Laboratory (PNNL) Program Plan for Environmental Review of Nuclear Reactor New Deployment to assess suggested mix of technical staff for environmental reviews and proposed plans for management of Geographic Information Systems (GIS) database developed by PNNL to assist environmental reviews.

- Reviewed Sections C.I.3.7.1 (Seismic Design Parameters), C.I.3.7.2 (Seismic System Analyses), C.I.3.7.3 (Seismic Subsystem Analyses), C.I.3.7.4 (Seismic Instrumentation), and C.I.3.9.3 (ASME Code Class 1, 2, and 3 Components and Component Supports, and Core Support Structures) in draft Regulatory Guide DG-1145 (i.e., Combined License Applications for Nuclear Power Plants-LWR Edition).
- As Task Force member who prepared materials for orientation of new NEPB employees possessing expertise in hydrology, meteorology, and GIS, provided these materials to ADM-503 (New NRR Employee Orientation Guide) and ADM-50X (NRR Qualification Plans).

NRC, NMSS/HLWRS/LID/PMSB, Rockville, MD March 2005-April 2006

Project Manager: Responsible for planning, managing, coordinating, and performing work related to communicating with a broad spectrum of stakeholders about independent regulatory role of the NRC and technical issues related to geology, tectonism, volcanism, and hydrology of the YM site and region in the HLW program. Specific activities included preparing materials for multiple Congressional hearings, internal management briefings, and management presentations for national and international meetings, writing the HLW section of the NRC 2005-2006 Information Digest; developing and writing the NRC 2005 HLW Agency-Wide Communications Plan in response to OIG audit directives; and discussing NRC role in the HLW program and technical issues with staff of State and Tribal Governments and other Federal Agencies, international visitors, and public citizens.

Selected Accomplishments:

- Participated in public meetings with the Inyo County, CA Board of Supervisors and its staff in Independence, CA and concerned citizens in Tecopa, Inyo County, CA to discuss independent regulatory role of NRC in the HLW program.
- Participated in meetings with National Park Service staff in Death Valley National Park, CA to discuss perceived concerns about groundwater flow and transport pathways from YM to springs in Death Valley.

MANDEX, INC. AT NRC, Rockville, MD 1997-February 2005

Site Program Manager/Lead Modeling Specialist and Senior Engineering Geologist: Responsible for planning, managing, and performing 3D geospatial modeling and GIS activities at the NRC and interfacing with NRC staff on technical issues related to geology, tectonism, volcanism, and hydrology at YM and non-HLW sites. Specific activities included construction of original 3D geospatial models using EarthVision (EV) software for pre-licensing and other regulatory review activities for both HLW and non-HLW sites; development, maintenance, and management of electronic technical databases, including metadata, for 3D geospatial modeling; preparation of reports documenting modeling results; detailed analysis of 3D geospatial models developed by DOE for YM to illustrate subsurface stratigraphy, faults, hydrologic properties, and mineralogical variations (i.e., Geological Framework Models, Versions GFM 1.0, 2.0, 3.0, 3.1, and GFM2000, and the Integrated Site Model, ISM3.1); and presenting 3D models and GIS products to NRC staff and management, technical overview committees, and licensees. Fully responsible for developing budgets and staffing and work plans.

Selected Accomplishments:

- Developed original 3D geospatial property models to enable analysis of distribution of subsurface contaminants in space and time for low-level waste (LLW) and decommissioning sites under review by NRC. Demonstrated these models for NRC technical staff and management, the ACNW, and licensees.
- Prepared a proposal that won MANDEX a 5-year contract for 3D geospatial modeling and GIS activities at the NRC.

SOUTHWEST RESEARCH INSTITUTE, CNWRA, Arlington, VA and Rockville, MD 1990-1996

Principal Geoscientist: Responsible for planning, managing, and performing technical and programmatic tasks related to assessment of site-specific, site area, and regional geologic, tectonic, and volcanic characteristics of the potential DOE HLW repository site at YM for the NRC. Specific activities included reviewing and collecting technical data for development of GIS databases for tectonics and volcanism in the YM region; assisting with assessment of volcanic and tectonic hazards at YM; constructing original 3D geospatial models of subsurface geology and hydrostratigraphy at YM using EV software; and reviewing DOE study plans, geologic site characterization field activities, and investigative results for YM and preparing reports to critically assess plans, activities, and results in light of regulatory compliance standards.

BATTELLE MEMORIAL INSTITUTE (BMI), Columbus, OH and Willowbrook, IL 1981-1990

BMI, Office of Waste Technology Development (OWTD), Willowbrook, IL (1986-1990)

Principal Geoscientist: Responsible for technical and programmatic tasks in the DOE waste technology development program in support of the Office of Civilian Radioactive Waste Management (OCRWM), including preparation, review, and approval of internal and external work plans, staffing assignments, budgets, schedules, and technical reports. Specific activities included functioning as technical and managerial liaison between DOE and U.S. Geological Survey project staff with responsibility for budgets and scheduling, reviewing, and approving deliverables; conducting public meetings in States affected by tentative DOE plans for siting a potential HLW repository in crystalline rock in the Eastern U.S.; actively participating in programs for sample collection, surface and subsurface site characterization, and exploratory drilling at the Canadian Underground Research Laboratory (URL) crystalline rock site in Manitoba, Canada.

BMI, Office of Crystalline Repository Development, Columbus, OH (1982-1986)

Principal Geoscientist: Responsible for technical and programmatic tasks in the DOE crystalline rock site exploration program in support of OCRWM. Specific activities included preparation, review, and approval of internal and external work plans, staffing assignments, budgets, schedules, and technical reports; and development of final screening methodology for selection of crystalline rock regions, areas, and sites in the Eastern U.S..

BMI, Office of Nuclear Waste Isolation, Columbus, OH (1981-1982)

Chief Staff Geoscientist: Responsible for technical and programmatic tasks in the salt and crystalline rock repository site exploration programs of DOE, including preparation, review, and approval of internal and external work plans, staffing assignments, budgets, schedules, and technical reports.

EBASCO SERVICES INCORPORATED, Greensboro, NC 1977-1981

Principal Engineering Geologist: Responsible for planning, scheduling, budgeting, managing, performing, and reporting on activities for a variety of geologic, hydrologic, and geotechnical site characterization projects following regulatory requirements and industry standards, including nuclear and fossil fuel power plant siting studies. Specific activities included geologic mapping of excavations, assessment of fault characteristics, geotechnical investigations such as exploratory and design drilling and core logging, surface and subsurface sample collection, geophysical investigations, and groundwater monitoring. Served as supervisor and mentor to junior staff. Regularly presented results to clients and provided geologic input for SAR sections.

EBASCO OVERSEAS CORPORATION, Makati, Rizal, Philippines 1975-1977

Senior Engineering Geologist: Responsible for planning, scheduling, managing, performing, and reporting on geologic, hydrologic, geophysical, and geotechnical site characterization activities for a nuclear power plant siting project in the Philippines following regulatory requirements and industry standards. Supervised American and Philippine geologists, hydrologists, geotechnical and soils engineers, geophysicists, seismologists, and drilling crews. Served as mentor to junior staff. Functioned as an active team member to

conduct geologic, geomorphic, hydrologic(including groundwater monitoring), and geophysical field investigations; geologic hazards analyses for faulting, seismicity, and volcanism; exploratory and design drilling; core logging; and surface and subsurface sample collection. Regularly presented results to client and provided geologic input for SAR sections. Participated in a hearing related to site-specific, site area, and regional geologic characteristics bearing on site suitability.

UNIVERSITY OF NORTH CAROLINA, Chapel Hill, NC 1974-1975
Visiting Assistant Professor of Geology

SOUTH CAROLINA HERITAGE TRUST PROGRAM 1974
Consulting Environmental Geologist for statewide selection of natural scenic sites

FURMAN UNIVERSITY, Greenville, SC 1974
Visiting Associate Professor of Structural Geology - Tectonics

SOUTH CAROLINA ELECTRIC AND GAS COMPANY, Columbia, SC 1973-1974
Consulting Structural Geologist at the V.C. Summer nuclear power plant site

UNIVERSITY OF NORTH CAROLINA, Chapel Hill, NC 1973-1974
Research Associate for coastal erosion studies

UNIVERSITY OF BRITISH COLUMBIA, Vancouver, British Columbia, Canada 1971-1973
Visiting Lecturer in Structural Geology

EDUCATION

Continuing Education Courses

Geophysics for Engineering Geologists - A Practical Guide to Application, Limitations, and Benefits: Association of Engineering Geologists, Vail, CO, September 2003

WFM2 - Advanced Techniques in EarthVision: Dynamic Graphics, Inc., Lebanon, NH, October 2002 (Version 7.0)

GMS - Groundwater Modeling System Introductory Training Course: U.S. Army Corps of Engineers at NRC, Rockville, MD, April 2002 (Version 3.1)

Uncertainty Assessment Methodology for Dose Assessment Modeling Training Workshop: P. Meyer of Pacific Northwest National Laboratory at NRC, Rockville, MD, October 2001

GoldSim Training Course: Golder Associates at NRC, Rockville, MD, September 2001

A Comprehensive Strategy of Hydrogeologic Modeling and Uncertainty Analysis for Nuclear Facilities and Sites Training Workshop: S. Neuman of University of Arizona, at NRC, Rockville, MD, August 2001

WFM2 - Advanced Structure Modeling and the WorkFlow Manager: Dynamic Graphics, Inc., Alameda, CA, June 1999 (Version 5.0)

WFM1 - EarthVision and the WorkFlow Manager: Dynamic Graphics, Inc. at NRC, Rockville, MD, February 1999 (Version 5.0)

FracMan - Discrete Feature Data Analysis, Geometric Modeling, Exploration Simulation, and Flow and Transport Modeling: Golder Associates at NRC, Rockville, MD, 1999

Introduction to Geostatistical Gridding in EarthVision: Dynamic Graphics, Inc., Alameda, CA, 1998

Geologic Structure Builder in EarthVision: Dynamic Graphics, Inc., Alameda, CA, 1998 (Version 4.0)

Geospatial Modeling and Analysis in EarthVision: Dynamic Graphics, Inc., Englewood, CO, 1997 (Version 4.0)

ASTM Standard Practice E1527-97 for Phase I Environmental Site Assessments: Government Institutes, Inc., Washington, DC, 1997
Geologic Structure Builder in EarthVision: Dynamic Graphics, Inc., Rockville, MD, 1995 (Version 2.9 Beta)
Geospatial Modeling and Analysis in EarthVision: Dynamic Graphics, Inc., Rockville, MD, 1995 (Version 2.9 Beta)

Postdoctoral Studies

Structural Geology and High-Temperature Experimental Deformation, University of British Columbia, Vancouver, British Columbia, Canada, 1971-1973
Structural Geology and Petrofabrics, Lemont-Doherty Geological Observatory of Columbia University, Palisades, NY, 1969-1971

Ph.D., Structural Geology, University of North Carolina at Chapel Hill, Chapel Hill, NC, 1970
B.A., Geology and Mathematics, Catawba College, Salisbury, NC, 1964

PROFESSIONAL REGISTRATIONS

Registered Professional Geologist and Certified Engineering Geologist (#229/E229), State of Oregon
Registered Professional Geologist (#896), State of North Carolina

PROFESSIONAL SOCIETY MEMBERSHIPS

American Geophysical Union
Association of Engineering Geologists
Geological Society of America
International Association of Engineering Geology

PUBLICATIONS CHRONOLOGY

List of publications available upon request