

Dennis Engi

Curriculum Vita

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Professional Experience

Strategic Issues Management, Inc. (November 2018 to Present)

Consultant, Research in modeling and analysis of national security issues

- Book in preparation: "Managing Hatred and Insolvability: Governance in a World of Incivility and Complexity"
- Design and analysis of complex systems

New Mexico State University, Las Cruces, NM, (November 2008 to November 2018)

Professor, New Mexico State University

- Teaching graduate-level class in Complex, Adaptive, System of Systems Engineering
- Research in modeling and analysis of national security issues
- Developed and Implemented an Advanced Systems Engineering Program via Distance Education (see -- https://ie.nmsu.edu/ie_distance_ed/)

Sandia National Laboratories, Albuquerque, NM, and New Mexico State University, Las Cruces, NM, *Joint Appointment*, (January 2008 to November 2008)

Senior Scientist, Sandia National Laboratories

Providing corporate-level support on a laboratory-wide basis. Centered on developing the science and engineering base for modeling and analysis of decision making in complex, high-risk, dynamic national security situations.

Professor, New Mexico State University

Teaching graduate-level class in Complex, Adaptive, System of Systems Engineering.

Sandia National Laboratories, Albuquerque, NM (July 2005 to December 2007)

Senior Scientist

Provide corporate-level support on a laboratory-wide basis. Focused on developing a definition and lexicon for Intelligent, Adaptive, and System of Systems concepts. Developing corporate standards for engineering practice at Sandia National Laboratories

Purdue University, West Lafayette, Indiana (2000 to July 2005)

Professor and Head, School of Industrial Engineering (September 2000 to July 2005)

Lead the development and implementation of Strategic Plans, the design for both the undergraduate and the graduate curricula, and the direction of the R&D agenda for the School of Industrial Engineering. Taught the survey course, the capstone design course, and the control theory course. The School was ranked (by USNEWS) 2nd out of over 100 academic Industrial Engineering units throughout the country. The School consisted of the Departments of Human Factors (cognition and ergonomics), Manufacturing (the underlying physics and computer aids), Financial Engineering (engineering economics and portfolio management), Operations Research (stochastic processes and mathematical optimization), and Production Systems (facility layout and supply chain engineering).

Founding Director, Purdue Homeland Security Institute (August 2002 to August 2003)

Lead the effort for Purdue and its partners to integrate their multidisciplinary efforts to realize the vision: *"Safeguard society and protect critical, interdependent infrastructures through Learning, Engagement, and Discovery of innovative concepts, policies and technologies."*

Sandia National Laboratories, Albuquerque, NM (1976 to 2000)

- Senior Scientist (June 1997 to 2000) ~ Provide corporate-level support on a laboratory-wide basis.
- Manager, Strategic Initiatives Department (1995 to 1997) ~ Identify and develop major new corporate-level thrusts for Sandia. The elements of this activity include conceptualizing future options, conducting systems studies to enhance the understanding of these options, and 'marketing' these new thrusts.
- Manager, Strategic Technologies Department (1989 to 1995) ~ Conceptualize, market, manage, and participate in R&D activities associated with International Vital Issues, Assessment of Emerging Energy Technologies, Policy Modeling and Analysis, Technologies for a Sustainable Future, Information Technologies, Water Resources Management, and Natural Disaster Cost Reduction.
- Supervisor, Geo Systems Division (1981 to 1989) ~ Structure, manage, and participate with teams of scientists and engineers engaged in R&D activities ranging through unconventional gas and enhanced oil recovery including onshore, offshore, and arctic environments.
- Manager of the Enhanced Oil Recovery Thermal Processes International Agreement between the United States and the Republic of Venezuela (1984 to 1987).
- Systems Engineer (1976 to 1981) ~ Develop techniques for modeling and analysis of nuclear power reactor systems. Develop program plans and implementation strategies for unconventional fossil fuel R&D programs.
- Staff Instructor ~ Teach courses in Systems Analysis and Markov Processes.

Professional Activities

Purdue University activities fall generally into the categories of administration, advancement, learning, engagement, and discovery. During my time at Purdue, the School of Industrial Engineering at Purdue was ranked 2nd in undergraduate programs and 3rd in graduate programs out of over 50 academic programs in Industrial Engineering throughout the nation.

Administrative responsibilities included the management of the School of Industrial Engineering with 27 faculty members, 18 staff, 470 undergraduate students and 180 graduate students.

Advancement responsibilities included the development and implementation of a plan to raise \$40M for facilities and endowments. Nearly \$20M has been raised since 2001 through contributions from alumnae of Purdue's School of Industrial Engineering. Most of these contributions have been used to support university-wide initiatives.

Learning responsibilities included revising the undergrad and graduate curricula as well as teaching courses in Introduction to Industrial Engineering, Control Theory, and the Capstone Engineering Design Course. The Industrial Engineering curriculum includes the fundamental areas of human factors, manufacturing processes, operations research (both optimization and stochastic processes), production systems, and financial engineering.

Engagement responsibilities included the development and implementation of an agreement between Purdue University and the Afghanistan Minister of Higher Education to help rebuild the Higher Education Infrastructure throughout the country of Afghanistan.

Discovery responsibilities included helping develop initiatives in healthcare engineering and in homeland security. The healthcare initiative has resulted in the establishment of the Regenstrief Center for Healthcare Engineering at Purdue University; a one million dollar per year research Center that was established during 2004.

Sandia National Laboratories activities typically involved conceptualizing, marketing, staffing, managing, contributing technically, providing deliverables, and following through to completion...

Principal Investigator for developing a mathematical framework for the modeling and analysis of Social Movement Theory as it relates to Radicalization (2007 through 2008).

Project Manager for System of Systems Engineering of Command Wire Detonated Improvised Explosive Devices (2006 through 2007).

Project Manager for Global Approaches to Infrastructure Assurance (1996 to 2000), [see <http://www.igaia.sandia.gov> for overview]

Information Technologies Project Manager for Sandia's Energy and Environment Sector (1994 to 1995).

Project manager and developer of the Vital Issues Process for teaming with government, citizens interest groups, academe, and the industrial sectors (1990 to present).

Project Leader of Analysis and Simulation for the Demand Activated Manufacturing Architecture for the American Textile Consortium (1993 to 1995).

Project Manager for designing and constructing a knowledge-based system for enhancing welding operations (1993 to 1995).

Project Manager for development of an Expert System for materials selection associated with designing future Cadillac models (1992 to 1994)

Task Force Member on the Governor's Technical Excellence Committee to structure an investment portfolio for the State of New Mexico (1992).

Task Force Leader for developing U.S. responses to Iraqi use of oil as a weapon during Desert Shield and Desert Storm (1991).

Member of the planning committee for the Industrial Ecology Colloquium sponsored by the National Academy of Sciences (1991).

Program Manager for Developing an Industrial Waste Reduction Program (1990).

Chairman, Technical Advisory Committee of the New Mexico Energy Research and Development Institute (1983 to 1989). Appointed by three state Governors.

Manager of the Enhanced Oil Recovery Thermal Processes International Agreement between the United States and the Republic of Venezuela (1984 to 1987).

Director, Central New Mexico Chapter of the Institute of Industrial Engineers (1981 to 1982).

Professional Awards

Outstanding Industrial Engineer by the Faculty of Industrial Engineering, Purdue University

Paper of the Year awarded by the International Association for Mathematical Geology.

Letter of Commendation from the Secretary of Energy.

Intelligence Community Seal Medallion awarded by the Director of Central Intelligence.

Certificate of Appreciation awarded by the Department of Energy Director of Intelligence.

Sandia National Laboratories Award(s) for Excellence.

Education

PhD Industrial Engineering/Operations Research, May 1976, Purdue University, West Lafayette, Indiana

MS Industrial Engineering/Operations Research, May 1974, Purdue University, West Lafayette, Indiana

BS Mathematics/Physics, June 1971, Purdue University, West Lafayette, Indiana

Graduate education centered on a program of operations research/systems engineering with an emphasis on stochastic models and mathematical programming including experience with computer simulation and heuristic modeling of complex systems.

Military Training/Service (U.S. Army, 1966 to 1969)

Basic Combat Training (Ft. Dix, NJ), Advanced Infantry Training (Ft. Dix, NJ), Jump School (Ft. Benning, GA), Jungle School (Canal Zone, Panama), Communications School (Ft. Knox, KY), Ranger Training (Ft. Benning, GA), Recondo School (Nha Trang, South Vietnam).

Military Occupational Specialty : Infantry Operations and Intelligence Specialist. Served as a Patrol Leader in an Airborne Ranger Company in the Republic of South Vietnam. Rank: Sergeant. Decorated for Valor. Discharge: Honorable.

Personal Information

U.S. Citizen

Birthplace: Wewoka, OK

Birth date: March 30, 1946

Height/Weight: 6'0"/190lbs

Married

Three Grown Children

Physical Limitations:None

Health: Excellent

References

Provided upon request

Inventions

The Vital Issues Process

This is a facilitated, rapporteured process with a qualitative (synthesis) component and a quantitative (analysis) component that uses stakeholder input to develop a recommended investment portfolio for an organizational enterprise with ill-defined goals and objectives. This process was developed during 1990 and has been used since on over 50 applications ranging through environmental quality, economic well being, national security, health care, and environmentally conscious manufacturing with customers ranging from the Department of Energy through the U.S. Textile Industry. The qualitative component is based on real time textual analysis which facilitates deconstruction of the relationships among the participating stakeholders, and the identification and definition of portfolio objectives and elements through consensus- and culture-building techniques. The quantitative component generates a cardinal ranking that can be used in nonlinear optimization and a second moment (level of agreement among stakeholders) that is intrinsically valuable for risk assessment.

The Contribution ~ Compensation Alignment Procedure

This is a stochastic optimal control methodology used to achieve the alignment of relative compensation of employees with their relative value of contribution to the corporate enterprise. This methodology was developed during 1987 and is still in use for adjusting salaries for the technical staff at Sandia National Laboratories. The algorithm runs on desktop computers. Other applications being explored include public school systems, dental offices, and commercial banking institutions.

A Spherical-Stochastic Methodology for Microseismic Event Location

This technology was developed during 1986 and has been used since in a variety of applications ranging from hydraulic stimulations of oil and gas reservoirs through acid stimulation of geothermal reservoirs. It is implemented on IBM desktop computer environments and provides real-time diagnostics of reservoir stimulations useful for controlling the recovery process.

Brief Adversary Threat Loss Estimator

This is a Discrete-State Continuous-Time Semi-Markov Process used to predict the effectiveness of security forces at nuclear facilities. Developed during 1977 and 1978, this 'model' has been used over the last 30 years and is still in use today. The model has been implemented on platforms including mainframes, desktop computers, and handheld calculators. Implementation modes include stand-alone closed form solutions as well as imbedded modules within Monte Carlo simulations.

Publications

Book in Preparation

“Managing Hatred and Insolvability: Governance in a World of Incivility and Complexity”. Our country is struggling with many issues that play a vital role in the survival of our system of government. These vital issues range from Pandemics to Global Climate Change to Immigration to Nuclear Weapons Proliferation. The complexity of these intertwined issues along with the unprecedented rancor among our political leaders has made governance intractable to the extreme. This book presents a framework for resolving these myriad issues. The complexity is resolved via a framework of advanced modeling and analysis techniques coupled to an artificial intelligence architecture. The incivility is addressed by finding net positive value in the positions of each of the factions by each of their opposing factions. In managing both the complexity and the incivility the driving principle is to pay heed to the First and Second Laws of Systems; i.e., (1) the whole is more than its parts and (2) the behavior of a system cannot be understood by simply understanding its subsystems.

Book Chapters

Advances in Homeland Security, Volume 1, The Science of Homeland Security, "Understanding, Measuring, and Modeling, Risks to our Security", Purdue Press, 2006.

Advances in Homeland Security, Volume 2, Guiding Future Homeland Security Policy- Directions for

Scientific Inquiry, "A Qualitative Architecture for Investigating the Quantitative Aspects of the Impact of Public Policies Related to Homeland Security", **Purdue Press**, 2006.

Environmental Technology and Cleaner Biofuels, "The Vital Issues Process: Managing Critical Infrastructures in the Global Arena", **Taylor & Francis**, 2000.

Energy and Climate Change, 29 Authors from 11 Institutions (my primary contributions are in Chapters 1 and 2), **Lewis Publishers**, April 1990.

Refereed Journal Articles

11. “Discovering Patterns of Emergence of Transnational Islamic Activism and Radicalization through a Federation of Social Movement Theory with Dynamic System Modeling and Analysis,” **Interdisciplinary Research on Terrorism and Political Violence**, Routledge Taylor & Francis Group, Published on behalf of the Society for Terrorism Research, Submitted for Publication, November, 2008.
10. “A Preliminary Investigation of the Impact of Public Policies Related to the Interdependent Energy and Telecommunications Infrastructure on the Quality of Life,” **IEEE Engineering in Medicine and Biology Magazine**, Spring 2004.
9. “Industrial Engineering Design Course. True Benefits Delivered to Society,” **Journal of Industrial Engineering Design**, Fall 2003.
8. “Disaster Management System for Southwestern Indiana,” *Natural Hazards Review*, Volume 3, February 2002.
7. Engi, D. and L. Icerman, “Impacts of Energy R&D Strategies of OECD Members on the U.S.”, **Energy - The International Journal**, Volume 20, Number 12, pp. 1251 - 1264, December 1995.
6. Engi, D., “A Spherical-Stochastic Methodology for Microseismic Event Location”, **Computers and Geoscience**, Volume 15, Number 7, pp. 1037 - 1052, December 1989. *Note: this paper received the Paper of the Year Award in 1989.*
5. Hart, C. M., D. Engi, R. P. Flemming, and H. E. Morris, “Fracture Diagnostics Results for the First Multi-Well Experiment’s Paludal Zone Stimulation”, **SPE Formation Evaluation**, pp. 320 - 326, September 1987.
4. Engi, D., “Maintainability Analysis Using Q-GERT Network Simulation”, **Journal of the Society for Computer Simulation**, Volume 44, Number 2, pp. 67 - 74, February 1985.
3. Engi, D., “Reliability Analysis Using Network Simulation”, **Proceedings of 1st Symposium on Space Nuclear Power Systems**, January 1984.
2. Engi, D., “Goal Setting and Strategic Planning for a Shale Oil Recovery R&D Program”, **Energy Systems and Policy**, Volume 8, Number 1, pp. 29 - 66, 1984.
1. Engi, D., D. W. Sasser, M. K. Snell, and D. S. Ullman, “Employee Availability Improvements Through Personnel Control System Design”, **Nuclear Materials Management**, pp. 30 - 36, Winter 1981.

Conference Proceedings

25. Predictive Analysis for Social Processes, **AAAI Spring Symposium on Technosocial Predictive Analytics**, Sponsored by the Association for the Advancement of Artificial Intelligence, Stanford University, March 23 – 25, 2009.
24. Overview of Homeland Security Institute Activities, *National Air & Space Intelligence Center, 5th Annual Future Forces Conferenc*, May 6, 2003
23. “Machine Learning Approach to Urban Riot Modeling”, **International Conference of Production Research**, November 2002.
22. The Value of Interdisciplinary Concepts in Managing Civil Infrastructures, **White House Office of Science and Technology Policy and the National Science Foundation Workshop on Critical Infrastructures**, June 14, 2001.

*Facilitated 85 Vital Issues Panel Discussions from 1989 through 2008.
Most of these were international.
Each of these produced a report of the Proceedings not listed below.*

21. "A Qualitative Architecture for Understanding Policy Responses to Global Change", **Proceedings, 9th Miami International Congress on Energy and Environment**, December 1989.
20. "Seafloor Responses for Two Southern California Earthquakes", **Proceedings of the 1987 SEM Spring Conference on Experimental Mechanics**, June 1987.
19. "Seafloor Measurement of Seismic Activity", **Proceedings of the DOE Arctic and Offshore Contractor's Review Meeting**, SAND86-0690C, March 1986.
18. "Characterization of Advanced EOR Processes", **Proceedings of the DOE Peer Review on EOR**, SAND85-2653, January 1986.
17. "Seafloor Seismic Data Study", **Proceedings of the DOI/MMS Research Program Report**, January 1986.
16. "Fracture Diagnostics", **Proceedings of the DOE Western Gas Sands Program Review Meeting**, November 1985.
15. "Thermal EOR Process Research and Development", **Proceedings: Enhanced Oil Recovery Symposium, Invited Paper**, Maricaibo, Venezuela, February 1985.
14. "Integrated Real-Time Fracture Diagnostics Instrumentation System", **Western Gas Sands Subprogram Review Technical Proceedings**, January 1984.
13. "Fracture Diagnostics Results for the Multi-Well Experiment's Paludal Zone Stimulation", SPE12852, **SPE/DOE/GRI Unconventional Gas Recovery Symposium**, Pittsburgh, PA, 1984.
12. "Mapping the Acid Stimulation in the Beowawe Geothermal Field Using Surface Electrical Potentials", **Proceedings of the Ninth Workshop in Geothermal Reservoir Engineering**, December 1983.
11. "A Comprehensive Fracture Diagnostics Instrumentation Fielding Program", **Proceedings of the SPE/DOE Joint Symposium on Low Permeability Gas Reservoirs**, March 1983.
10. "SNAP: A Tool for Nuclear Physical Protection System Modeling", **Proceedings of the American Nuclear Society**, San Francisco, CA, November 1979.
9. "Safeguards Network Analysis Procedure", **Institute of Nuclear Materials Management Proceedings**, July 1979.
8. "Safeguards Methodology Development History", **Proceedings of 1st Annual Symposium on Safeguards and Nuclear Materials Management**, Brussels, Belgium, July 1979.
7. "Safeguards Network Analysis Procedure (SNAP)---Overview", SAND79-0438, **20th Annual Meeting of the Institute of Nuclear Materials Management**, June 1979.

6. "A Network Modeling and Analysis Technique for the Evaluation of Nuclear Safeguards Effectiveness", **Simulation Conference Proceedings**, December 1978.
5. "Safeguards Automated Facility Evaluation", **Institute of Nuclear Materials Management Proceedings**, June 1978.
4. "Valued Renewal Processes", **Proceedings of the American Institute for Decision Sciences**, February, 1978.
3. "The Use of ISEM in Studying the Impact of Guard Tactics on Facility Safeguards System Effectiveness", **Institute of Nuclear Materials Management Proceedings**, June 1977.
2. "Nuclear Facility Safeguards System Modeling Using Discrete Event Simulation", **Simulation Conference Proceedings**, April 1977.
1. "Safeguards System Effectiveness Modeling", **Institute of Nuclear Materials Management Proceedings**, June 1976.

Papers and Reports

69. AAU, NMSU, METEC Systems Engineering Initiative, NMSU Report, September, 2013. (see https://ie.nmsu.edu/ie_distance_ed/)
68. Transnational Islamic Activism and Radicalization: Patterns, Trends, and Prognosticators, Unlimited Release, SAND2009-0325, June 2010.
67. "The Use of Health Physics Related Information to Detect Potential Proliferation Activities", Secret/NOFORN, HCS-206-006/08, Sandia National Laboratories, October, 2008.
66. "A Science and Technology Roadmap for Decision Making in Complex, High-Risk, Dynamic National Security Situations", SAND2007-7770, September 2007.
65. "Detection of Improvised Explosive Devices that are Command-Wire Detonated: Volume I ~ Report of a Subject Matter Expert Meeting (December 2006) and Volume II ~ A System of Systems Solution (January 2007)."
64. "Modeling, Simulation, & Optimization of the Landing Craft Air Cushion Fleet Readiness", October 2006, SAND2006-7218.
63. "Assessment of the Reliability and Quality of INTEQ's AutoTrak G-3 Product Life Cycle", Official Use Only, August 2006, SAND2006-7219.
62. "Indiana Homeland Security Forum on Information Sharing", Research Report, February 20, 2003
61. "Ultra Terrorism Using Asymmetric Warfare", Research Report – Official Use Only, September 2002.
60. "Strategies for the War on Terrorism: Results of a Special Study", Research Report, August 2002.
59. "Analytic Models for Cooperative Utilization of Critical Resources: A Rationalization of Investments in Natural Gas and Electricity Transmission between the Former Soviet Union and European States", SAND2001-1556P, May 2001.
58. "Managing the Environmental Infrastructure of the Northern Caspian Sea Region; Development of the Dynamic Model," August 2000
57. "Surety Assessment of the Zinc Isotope Production Facility," October 2000.

56. "Global Approaches to Infrastructure Assurance: A Work in Progress", SAND00-2543, October 2000.
55. "Southwestern Indiana Disaster Resistant Community Initiative", Volumes I, II, & III, January 2000.
54. "Analytic Verification of Treaties, Protocols, and International Agreements", SAND99-2585, September 1999.
53. "Energy Resources R&D Portfolio Analysis, Volumes I, II, & III, August 1999.
52. "Managing Nicaraguan Water Resources: Definition and Relative Importance of Information Needs," SAND98-2828, January 1999.
51. "Managing Senegalese Water Resources: Development and Deployment of an Advanced Information System," SAND98-1950, September 1998.
50. "Modeling the Infrastructure Dynamics of China – Water, Agriculture, Energy, and Greenhouse Gases", SAND98-1715, August 1998.
49. "Information Needs for Managing the Vulnerabilities of the North American Power Grid," SAND97-3119, January, 1998.
48. "Understanding the Dynamics of Water Availability and Use in China," SAND97-1626, July 1997.
47. "The Science and Technology of Environmental Security in Drylands, Summary Report", July 1977.
46. "Evaluation of Transboundary Environmental Issues in Central Europe", February 1997.
45. "Report of the DOE Fossil Energy Training Exercise for the Vital Issues Process", October 1995.
44. "Optimizing the DOE Fossil Energy Portfolio for Five Selected Target Budgets ", October 1995.
43. "Developing New Mexico Health Care Policy -- An Application of the Vital Issues Process", SAND94-0545, June 1995.
42. "The Vital Issues Process: Strategic Planning for a Changing World", SAND95-0845, May 1995.
41. "Middle Rio Grande Basin Water Resources Initiative", April 1995.
40. "Historical and Projected Costs of Natural Disasters", SAND94-2686, April 1995.
39. "Environmentally Conscious Manufacturing Vital Issues ... Volumes I & II", June 1993.
38. "Toxicological Effects of Kuwaiti Oil Fires", SAND91-1982, June 1992.
37. "A Hypothetical ANFO Threat", SAND91-0630, June 1992.
36. "Intelligence Opportunities: New Strategies for a New World", U.S DOE Office of Foreign Intelligence, Video, March 1992.
35. "Market Hub Concepts for Natural Gas", Tejas Power Corporation, January 1992.
34. "Potential Impacts of Iraqi Use of Oil as a Defensive Weapon", SAND91-0184, January 1991.
33. "The Contribution~Compensation Alignment Procedure", SAND90-0622, March 1990.

32. "FALSIM: A Numerical Simulation of a Space-Based FALCON (Fission Activated LASER) Platform", SAND89-0696, March 1989.
31. "Geotechnology for Energy Options", Energy Security R&D Program, November 1987.
30. "Fission Activated LASER CONcepts (FALCON) ... System Integration", SDI R&D Program, January 1987.
29. "A Numerical Signal Processing Technique for Borehole Seismic Fracture Diagnostics", SAND86-1865, January 1987.
28. "Subsidence Due to Fluid Withdrawal: A Survey of Analytical Capabilities", Final Report of the US DOE/Venezuela Implementing Agreement, SAND86-1532, August 1985.
27. "An Expert System for Hydraulic Fracture Diagnostics and Control", IEEE Conference on Artificial Intelligence, Invited Paper, August 1984.
26. "Geophysical Mapping of In Situ Processes", Engineering Foundation Workshop on Compressibility Phenomena in Subsidence, Invited Paper, Henniker, NH, July 1984.
25. "A Model for Economic Evaluation of High Energy Gas Fracturing", Gas Research Institute Publication, SAND84-0908, May 1984.
24. "Safeguards Network Analysis Procedure Users' Guide", SAND80-0315, August 1981.
23. "Maintainability Analysis Procedure", SAND80-2297, August 1981.
22. "PATHfinding Simulator Users' Guide", SAND80-1626, July 1981.
21. "SAFE Users' Manual, Volumes I, II, and III", SAND79-22471/2/3, June 1981.
20. "Brief Adversary Threat Loss Estimator", SAND80-0952, May 1981.
19. "Goal-Setting and Strategic Planning for an Oil Shale R&D Program", SAND81-0722, April 1981.
18. "A Combined SAFE/SNAP Approach to Safeguards Evaluation", SAND80-0529, August 1980.
17. "Fixed Site Neutralization Model Programmers Manual---Volumes I & II", SAND79-2242, December 1979.
16. "Fixed Site Neutralization Model Users' Manual", SAND79-2241, December 1979.
15. "Human Effects Aspects in Simulating Hostile Attacks Against Nuclear Facilities", SAND79-2237, December 1979.
14. "Markov and Semi-Markov Modeling of Small Engagements", SAND79-2013, December 1979.
13. "A Study of the Fixed-Site Neutralization Model", NUREG/CR-0787, July 1979.
12. "Criteria for Evaluating Proposed Guard Force Response Tactics", SAND79-1198, July 1979.
11. "An Analytical Engagement Model with Human Factors Considerations", ORSA/TIMS Conference, November 1978.
10. "Insider Safeguards Effectiveness Model (ISEM) Users' Guide", SAND77-0043, November 1977.

9. "A Small Scale Engagement Model With Arrivals", NUREG-0238, April 1977.
8. "Simulation of Personnel Control Systems with the Insider Safeguards Effectiveness Model", SAND76-0682, April 1977.
7. "The Characterization of Directed Trees by Decomposition", SAND76-0706, January, 1977.
6. "A Concept and Preliminary Definition of an Engineered Safeguards System for a Mixed-Oxide Fuel Fabrication Facility", SAND76-0528, September 1976.
5. "A Graph-Theoretic Decomposition of Markovian Networks", Doctoral Dissertation, Purdue University, West Lafayette, Indiana, May 1976.
4. "The Modeling and Analysis of Intra-Building Travel", Masters Thesis, Purdue University, West Lafayette, Indiana, May 1974.
3. "The Analysis of Intra-Building Travel", ORSA/TIMS Conference, Boston, Massachusetts, April 1974.
2. "Applying Trip Distribution Models to Define Movements and to Allocate Space in 'Self-Contained' Buildings", NSF Grant No. GI 34978, Purdue University, West Lafayette, Indiana, January 1974.
1. "A Survey of Trip Distribution Models and Their Potential for Analyzing Movement within a Building", NSF Grant No. GI 34978, Purdue University, West Lafayette, Indiana, January 1974.