



PHIL RUTHERFORD

RESUME

CURRENT POSITION AND CONTACT INFORMATION	2
EXPERIENCE SUMMARY	2
ENGINEERING AND MANAGEMENT POSITIONS	3
EDUCATION AND TRAINING	4
AWARDS AND RECOGNITION	5
SELECTED PUBLICATIONS	7



CURRENT POSITION AND CONTACT INFORMATION

Phil Rutherford *Consulting*
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Providing consulting services and online resources in radiation safety, environmental radiological risk assessment and nuclear decommissioning.

EXPERIENCE SUMMARY

Forty four years of experience in the nuclear industry, with leadership and management responsibility for many aspects of nuclear plant reliability, safety analysis and probabilistic risk assessment (PRA) for LWRs, LMFBs and nuclear space power systems, health physics, radiation safety, radiological risk assessment, nuclear decommissioning, radiation worker epidemiology studies, community cancer studies, legislative affairs, litigation, waste management & disposal, interpretation of radiological data for soil, groundwater, surface water and air, community relations, media relations, records management, health & safety, DOE compensation programs, historical site assessments, and space nuclear safety.

Recently responsible for Boeing's radiation, health & safety programs at Boeing's Santa Susana Field Laboratory (SSFL), including the Department of Energy's (DOE) radiological cleanup of the Energy Technology Engineering Center (ETEC).

Past member of numerous U.S. DOE committees and working groups relating to nuclear safety and reliability, including the "Joint DOE/Industry Man-Machine Interface Working Group" (1981-82), the "Joint DOE/Industry Reliability Working Group" (1984-1986) and the "Safety Advisory Panel for the New Production Reactor" (1990-1992).

Current member of the Health Physics Society (2000 - present) and Past Chairperson of the California Radioactive Materials Forum (Cal Rad Forum). Past member of the Institute of Physics (UK) (1972-1978), the Institute of Nuclear Engineers (UK) (1973-1978) and the American Nuclear Society (1974-1978).

Invited lecturer on "Occupational and Environmental Radiation Protection" at the School of Public Health, University of California, Los Angeles (1994, 1995, 1998).

Webmaster for three web sites,

- www.philrutherford.com
- www.calradforum.org
- [\\sw\data\ehs_ssfl\radiation_safety](http://sw\data\ehs_ssfl\radiation_safety) (SSFL Radiation Safety web site accessible to only Boeing employees on the Boeing Santa Susana internal network)

Past contributor to one other web site,

- www.etc.energy.gov (DOE's Energy Technology Engineering Center web site)

Complete curriculum vitae available on request.



ENGINEERING AND MANAGEMENT POSITIONS

2006 - 2015 Senior Manager, Health, Safety & Radiation Services, Santa Susana Field Laboratory, The Boeing Company

Led a department of up to 10 professional and technical personnel. Oversaw the health & safety program for the remediation work at the Santa Susana Field Laboratory. Managed the radiological safety program for nuclear facilities undergoing decontamination and decommissioning for the DOE, and ensured compliance with federal, state and local regulations related to both radiological safety and environmental monitoring. Key tasks for the department were the performance of final status radiological surveys of facilities and land to demonstrate acceptability for release for unrestricted use, and subsequent waste management, characterization and disposal of soil and building debris.

2004 Rocketdyne Propulsion & Power, The Boeing Company

Nuclear Safety Integrated Project Team Lead for the Jupiter Icy Moons Orbiter (JIMO) Phase A, Task 2 study contract and the JIMO Phase B proposal to NASA's Jet Propulsion Laboratory (JPL).

1998 - 2006 Senior Manager, Radiation Safety, Santa Susana Field Laboratory, The Boeing Company

Managed a department of 10 professional and technical personnel. The department enforced a radiological safety program for numerous nuclear facilities undergoing decontamination and decommissioning for the DOE, and ensured compliance with federal, state and local regulations related to both radiological safety and environmental monitoring.

1996 - 1997 Senior Manager, Environmental Remediation, Rocketdyne Propulsion & Power, Boeing Space Systems

As part of a re-organizational change the existing radiation protection group (see below) was merged with another group whose function included many forms of chemical remediation. As a result, responsibilities also included groundwater monitoring and remediation and soils remediation for all Rocketdyne facilities. Managed an annual budget of \$7m and a staff of 22 environmental and radiation safety engineers.

1990 - 1995 Manager, Radiation Protection & Health Physics Services, Rocketdyne Division, Rockwell International

Headed a department of up to 22 professional and technical personnel. The department enforced a radiological safety program for several nuclear facilities undergoing decontamination and decommissioning for the DOE, and ensured compliance with federal, state and local regulations related to both radiological safety and environmental monitoring. A key task of the department was the performance of final radiological surveys of facilities and land to demonstrate acceptability for release for unrestricted use.

1989 - 1990 Manager, Nuclear Safety & Reliability Engineering, Rocketdyne Division, Rockwell International

Led a team of technical specialists in the safety and reliability arena that performed such design-specific engineering activities as failure modes and effects analyses, nuclear system/component reliability assessments, radiological consequence assessments for nuclear accidents, risk assessments, and safety assessments of ground based and space nuclear systems.

1978 - 1989 Member of Technical Staff, Rocketdyne Division, Rockwell International

Responsible for the planning, managing and performance of all reliability and risk assessment programs of Rocketdyne's terrestrial and space nuclear projects. These included the Large-Scale Prototype Breeder (LSPB), the Sodium Advanced Fast Reactor (SAFR), the Multi-Megawatt Terrestrial Power Plant (MTP) and the Dynamic Isotope Power Subsystem (DIPS). Areas of expertise included reliability and PRA code development and analysis, common cause failure analysis, man-machine interface, lessons learned from LWR operating experience, core and containment response analysis, sodium fires and aerosols, radiological transport and dose analysis, reactor physics and heat transfer.

**1973 - 1978 South African Atomic Energy Board (AEB)**

Senior scientist in the regulatory branch of the AEB, responsible for core physics and accident analysis for the Koeberg Nuclear Power Station. Specific projects included development of computer codes for fuel clad swelling and rupture, and fission product release following loss-of-coolant accidents. Performed the first probabilistic risk assessment for the Koeberg PWR.

1974 - 1975 General Electric's Nuclear Energy Division

Visiting engineer for one year, performing core physics and transient analyses for the Shoreham and Brunswick BWRs. These included reactivity insertion accidents, critical control rod patterns, shutdown margins, plant transients and reactor vessel overpressure protection.

EDUCATION AND TRAINING

Year(s)	Degree	Subject	Institution
1971	M.A.	Physics	University of Oxford (UK)
1972	M.S.	Nuclear Engineering	University of Birmingham (UK)
1974 -1975		Numerous nuclear engineering classes	General Electric's Nuclear Energy Division
1978 - 1996		Numerous company training classes	Rockwell International Corporation
1981	Diploma	Human Reliability	University of Wisconsin
1983	Diploma	Risk Management	University of California, Los Angeles
1987	Diploma	Project Management	West Coast University
1990	Diploma	DOE Orders Training	U.S. Department of Energy
1992	Diploma	Analysis of Environmental Radioactivity	Georgia Institute of Technology
1993	Diploma	Environmental Regulations	Executive Enterprises Inc.
1994 - 2010		Numerous continuing education classes	Health Physics Society (HPS)
1996 - 2015		Numerous company training classes	The Boeing Company
1998	Diploma	MARSSIM Radiological Survey Protocols	Oak Ridge Institute of Science & Education
2001	Diploma	RESRAD, RESRAD-Build and RESRAD Probabilistic	Argonne National Laboratory
2015	Certificate	Requirements for Shipping Radioactive Material (DOT, NRC, IATA)	Dade Moeller Training Academy



AWARDS AND RECOGNITION

- Certificate of Appreciation from the Boeing Law Department, "For outstanding service to the company and support to our legal efforts." October 22, 2015.
- Boeing Recognition Program, "This award is presented to show the Law Department's appreciation for the special effort and support you gave to litigation matters. Your knowledge and hard work contributed to the resolution of these matters. Thank you for your dedication and diligence in supporting the Law Department." May 23, 2014.
- Service Award, "In appreciation of 35 years of valued service with The Boeing Company. Thank you for being an integral part of building our future as global enterprise." September 20, 2013.
- Certificate of Recognition, "In appreciation of your effort in securing the Department of Energy contract extension." December 2011.
- Boeing Recognition Program, "In recognition of your outstanding performance and invaluable contributions as a member of the SB 990 Litigation Team. Your skills and efforts have contributed immeasurably to our success in overturning Senate Bill 990." October 26, 2011
- Boeing Recognition Program, "In recognition of your exceptional leadership efforts while supporting the Crisis Management Working Group during the aftermath of the Japan earthquake, tsunami and Fukushima nuclear crisis." June 14, 2011.
- Boeing Recognition Program, "In recognition of your outstanding performance and invaluable contributions to the Environmental Remediation Program. Your skills and efforts have contributed immeasurably to our success. Thank you for your dedication." October 9, 2009.
- Boeing Recognition Program, "In recognition of your contributions to the successful capture of DOE's ETEC Site Closure Contract." July 9, 2009.
- Safety Recognition Award, "For your outstanding contribution to the promotion of safety throughout SSFL. Your efforts have resulted in a safer workplace." December 12, 2006.
- Achievement Award, "For your significant contributions to the Rocketdyne Nuclear Training Course." June 13, 2005
- Certificate of Appreciation, "In recognition of your sustained, outstanding contributions toward the Boeing Team's capture phase and proposal for the Jupiter Icy Moons Orbiter Project." October 2004.
- Service Award, "In appreciation of 25 years of valued service to The Boeing Company." September 20, 2003.
- Excellence Award, "In Recognition of Continued Excellence in the Ongoing Support of Communicating Radiological Issues to Elected Officials, the Media and the Community." December 2002.



- ALARA Award, "In appreciation for your presentation supporting the 4th Hanford ALARA Workshop." Richland, Washington, October 21-23, 2002,
- Certificate of Appreciation, "To everyday heroes in education." Los Angeles Unified School District Volunteer Program. May 2, 2002.
- Career Day Award, "For outstanding community spirit as a participant in Welby Way Elementary School's Annual Career Day Celebration." April 27, 2001.
- Career Day Award, "For outstanding community spirit as a participant in Welby Way Elementary School's Annual Career Day Celebration." June 1, 2000.
- Certificate of Recognition, "In Recognition of Your Involvement in Support of Boeing Canoga Park Community Outreach Programs." 2000.
- Bias for Action Award, "For Outstanding Customer Focus in Exceeding Expectations for the Release of the Chemical Portion of the Worker Health Study", November, 1999.
- Customer Satisfaction Award, "Worker Health Study Team." November 1999.
- Nominated for the Rocketdyne "Jack Weil Leadership Award", September 1998.
- Rocketdyne Safety, Health & Environmental Affairs Award, "Communicating the Results of the Rocketdyne Worker Health Study to Employees and the Community", May, 1998.
- Team Recognition Award, "For your outstanding contribution to develop and implement a comprehensive strategy for communicating the Worker Health Study results, which accomplished reputation management, financial risk limitation, customer satisfaction and employee communication." December 1997.
- Certificate of Appreciation, "Recognizing your outstanding contribution to Rocketdyne's 40th Anniversary Open House Celebration." 1996.
- Rocketdyne Special Achievement Award, "Keeping the Santa Susana Field Laboratory Area IV Environmentally Sound and Compliant with All Regulations", January 1994.
- Rocketdyne Achievement Award, "Outstanding Contribution to the Space Power and DIPS Proposals", January 1988.
- Best Paper Award, 1982 Winter Meeting of the American Nuclear Society, "Lessons Learned from Major Core Damage Accidents." October 1982



SELECTED PUBLICATIONS

Authored or co-authored numerous papers, presented at local, national and international conferences and seminars, some of which are presented below.

- P. D. Rutherford, "[Radiation Risks in Everyday Life.](#)" Presented at the 2010 Health Physics Society Midyear Meeting on Radiation Risk Communication to the Public. Albuquerque, New Mexico, January 27, 2010
 - [Abstract](#)
- P. D. Rutherford, "[Radiological Operations and Cleanup at SSFL Area IV - ETEC Closure Project.](#)" Presented to the Southern California Chapter of the American Industrial Hygiene Association, California State University, Northridge. March 12, 2009.
- P. D. Rutherford, "[Radiation Risk & Cleanup Standards.](#)" Presented at the 2007 Health Physics Society Midyear Topical Meeting on Decontamination, Decommissioning and Environmental Cleanup. Knoxville, Tennessee. January 23, 2007.
 - [Presentation.](#) [DOE Source.](#)
 - [Paper.](#) [DOE Source.](#)
- P. D. Rutherford, M. E. Lee, R. Marshall, E. R. McGinnis, B. Sujata and D. M. Trippeda, "[Radiological Remediation at the Department of Energy's Energy Technology Engineering Center.](#)" Presented at the 50th Annual Health Physics Society Meeting. Spokane, Washington. July 14, 2005
- P. D. Rutherford, "[Radiological Remediation in Area IV of the Santa Susana Field Laboratory.](#)" Presented to the Board of Directors of California Radioactive Materials Management Forum. La Jolla, California. October 28, 2004.
- P. D. Rutherford, "Radiation and Radioactivity." Presented to the Radiation Monitoring Workshop of the City of Los Angeles Environmental Affairs Department." August 28, 2003.
- P. D. Rutherford, E. R. McGinnis and N. Liu, "[Implementation of the ALARA Process in the DOE Cleanup and Closure of the Energy Technology Engineering Center.](#)" Presented to the 4th Annual ALARA Workshop, Richland, Washington, October 21-23, 2002
- P. D. Rutherford, "[Environmental Assessment of the Cleanup and Closure of the Energy Technology Engineering Center.](#)" Invited lecture given to the Southern California Chapter of the Health Physics Society, Los Angeles, March 20, 2002.
- S. N. Shah, R. B. Hardy, M. E. Lee, A. Klein, M. J. Sullivan, J. G. Barnes, and P. D. Rutherford, "[A Regulatory Perspective of the Restoration for the Former Sodium Disposal Facility at the Energy Technology Engineering Center.](#)" Presented at the Waste Management Conference (WM2000). Tucson, March 1, 2000.
- P. D. Rutherford, J. G. Barnes and A. Klein, "[Remediation of a Radioactively Contaminated Sodium Disposal Facility.](#)" IAEA-SM-359/P-20. International Atomic Energy Agency Symposium on Restoration of Environments with Radioactive Residues. Washington D.C. November 29 - December 3, 1999.



- P. D. Rutherford, "[Rocketdyne Worker Health Study](#)", Invited Paper presented to the Low-Level Radioactive Waste Forum, San Diego, February 11, 1998.
- P. D. Rutherford, "[Rocketdyne Worker Health Study](#)", Invited Paper presented to the Southern California Chapter of the Health Physics Society, Los Angeles, October 10, 1997.
- P. D. Rutherford, "Field Soil Segregation of Mixed Hazardous Waste at ETEC's Sodium Disposal Facility", presented at the Third National Meeting on the Department of Energy EM-30 Hazardous Waste Moratorium, Salt Lake City, April 8, 1993.
- P. D. Rutherford, "Overview of ETEC's Response to the DOE Hazardous Waste Moratorium", presented at the Third National Meeting on the Department of Energy EM-30 Hazardous Waste Moratorium, Salt Lake City, April 8, 1993.
- S. M. Azizi and P. D. Rutherford, "[Automation of the Markov Theorem for the Solution of Multistate System Probabilities](#)", presented at the 17th Inter-RAM Conference for the Electric Power Industry, San Francisco, May 1990.
- P. D. Rutherford, D. S. Burgess and S. Robb, "[Reliability Assurance of Turbine Energy Conversion Systems](#)", American Nuclear Society 1989 Winter Meeting, San Francisco, November 1989.
- S. M. Azizi, G. E. Berg, J. H. Burton, R. E. Durand, E. M. Larson, D. J. Pepe, and P. D. Rutherford, "Fort St. Vrain Fuel Handling System RAM Analysis", American Nuclear Society 1989 Winter Meeting, San Francisco, November 1989.
- P. D. Rutherford, "[An Assessment of the Low Seismic Risk of the Inherently Safe Sodium Advanced Fast Reactor](#)", 1988 Topical Meeting on the Safety of the Next Generation Power Reactors, Seattle, Washington, May 1988.
- R. D. Rogers, R. T. Lancet, J. E. Mills and P. D. Rutherford, "Inherent Safety Features and Licensing Plan of the SAFR Plant", International ANS Conference on Fast Breeder Systems, Richland, Washington, September 1987.
- P. D. Rutherford, J. C. Mills, R. T. Lancet and P. Nourjah, "[A Risk Assessment of the Sodium Advanced Fast Reactor \(SAFR\) Plant](#)", International ANS/ENS/SNS Topical Conference on Probabilistic Safety Assessment and Risk Management, Zurich, Switzerland, September 1987.
- W. E. Kastenbergh and P. D. Rutherford, "[Economic Risk Models for Advanced Liquid Metal Reactors](#)", International ANS/ENS/SNS Topical Conference on Probabilistic Safety Assessment and Risk Management, Zurich, Switzerland, September 1987.
- J. E. Mills, R. T. Lancet and P. D. Rutherford, "Inherent Safety Means Near Zero Risk for the SAFR Plant", ASME Annual Meeting, Anaheim, California, December 1986.
- P. D. Rutherford, H. W. Ho, J. A. Hartung and W. E. Kastenbergh, "[A Rationale for Reduced Tornado Design Bases](#)", 1985 International ANS/ENS Topical Meeting on Fast Reactor Safety, Knoxville, Tennessee, April 1985.



- J. Hartung, H. Ho, R. Lancet, P. D. Rutherford and E. Vaughan, "The Statistical Correlation Model for Common-Cause Failures", 1983 Annual Conference of the Society for Risk Analysis, New York, August 1-3 1983.
- J. A. Hartung and P. D. Rutherford, "[Lessons Learned from Major Core Damage Accidents](#)", 1982 ANS Winter Meeting, Washington DC, Transactions of the American Nuclear Society 43, 676, December 1982. Award Winner.
- P. D. Rutherford, "Operating Experience Evaluation", Joint LWR/LMFBR Workshop on Man-Machine Interface, Santa Clara, California, November 1982.