KYLE ROSS

EDUCATION:

M.S.M.E. *May 1987. The University of New Mexico, Albuquerque, NM*

- Formal concentration in fluid mechanics/thermodynamics
- Complimentary courses in control system design

B.S.M.E. *May 1982. The University of New Mexico, Albuquerque, NM.*

QUALIFICATIONS:

- 20+ years of continuous involvement in safety analysis of nuclear reactor systems - thermal hydraulic analysis, severe accident modeling, real-time computer simulation
- 5 years of experience in computational fluid dynamics (CFD) modeling
- Proficiency with RELAP, MELCOR, TRACE and Flow-3D computer codes
- Proficiency in computer aided drafting (CAD)
- 5 years of involvement in current NRC State-of-the-Art Reactor Consequence Analysis (SOARCA) project
- 5 years of experience in optical, opto-mechanical, and laser systems design/installation
- Competency in performing accident analyses for non-reactor nuclear facilities
- Active DOE Q clearance

EXPERIENCE:

Principle Member of Technical Staff: Sandia National Laboratories, Albuquerque, NM, December 2010 to present

- Lead technical role on numerous computer modeling efforts associated with simulating severe accidents in varied nuclear reactor systems.
- Continuous mentoring tasks in the disciplines of thermal hydraulics, heat transfer, and nuclear reactor systems operation.

Technical Staff Member: Los Alamos National Laboratory, Los Alamos, NM, November 2005 to December 2010

- Performing thermal hydraulic analyses with TRACE in support of LANL's design efforts on the Hyperion reactor.
- Supporting Sandia National Laboratories in MELCOR severe accident modeling efforts associated the current NRC SOARCA project.
- Performing hazard and accident analysis for DOE non-reactor nuclear facilities.

Senior Engineer: Alion Science & Technology, Albuquerque, NM, January 2001 to Novemeber 2005

- Supervised (for 3 years) a group of 5 engineers and a draftsman performing debris generation and transport calculations for numerous nuclear power plants addressing the emergency sump operability concerns of current NRC Generic Safety Issue 191 (GSI-191).

- Developed a methodology for performing CFD analyses to predict the transport of insulation and other debris that would occur in the pool formed on a pressurized water nuclear reactor (PWR) containment floor during re-circulation through the emergency sump following a loss of coolant accident.
- Performed CFD analyses to demonstrate the how silt, sand, and pebbles move into and through or settle in the cooling water intake of Cooper Nuclear Station. Designed structural modifications to the intake to reduce settling (a reshaped weir wall and an array of flow-turning vanes in the Missouri River).
- Performed transient analyses (thermal hydraulic and core melt progression) of various postulated severe accidents in PWR nuclear power plants with the MELCOR computer code. Analyses performed for Sandia National Laboratories. Emphasis on exercising code enhancements and developing improved modeling strategies.
- Contributed to the NRC GSI-191 knowledgebase report authoring the sections on thermal hydraulic response and debris transport in a containment pool.

Senior Engineer: OMICRON Safety and Risk Technologies, Inc., Albuquerque, NM. November 1998 to January 2001.

- Supported Los Alamos National Laboratory (LANL) in their NRC research tasks related to the resolution of GSI-191.
- Performed source term and consequence analyses of postulated accidents at non-reactor nuclear DOE facilities at LANL.
- Performed aerodynamic and hydrodynamic CFD simulations related to varied non-reactor nuclear facility safety concerns and to GSI-191.
- Provided consulting services to the Palo Verde Nuclear Generating Station, Comanche Peak Steam Electric Station, and the Salem nuclear power plant regarding their operator training simulators.

Senior Engineer: Science Applications International Corporation (SAIC), Albuquerque, NM. November 1989 to December 1998.

- Responsible for developing, interfacing, and installing real-time engineering grade software in nuclear power plant simulators. (Two-phase thermal hydraulic calculations coupled with space and time dependent neutronic calculations running in real time with valve positions, control rod insertions, boron concentrations, etc., manipulated interactively by operators in a control room identical to the actual control room at the plant.) Lead responsibility for simulator projects at the Palo Verde Nuclear Generating Station, Comanche Peak Steam Electric Station, Cooper Nuclear Station, and the Salem nuclear power plant.
- Developed software models for testing replacement digital feedwater control systems for the Hope Creek and Browns Ferry nuclear power plants. Contributed to the interfacing of the models with the physical controllers to form real-time platforms with which to exercise the controllers over a wide range of plant transients prior to their being installed.

Assistant Systems Engineer: United Technologies Optical Systems, High Energy Laser Systems Test Facility, White Sands Missile Range, New Mexico. February 1987-November 1989.

Provided mechanical design and installation support for high-energy laser damage and vulnerability testing. Efforts included compressed air delivery system design, vacuum system installation, wind tunnel design, and kinematic optical pedestal design.

Graduate Research Assistant: The University of New Mexico, Albuquerque, NM. Summer and Fall 1986.

Researched correlations between defects in laser beam quality and properties of large-scale coherent turbulent flow structures in the optical path. Tasks required becoming adept in the methods and application of laser Doppler anemometry.

Mechanical Engineer: High Energy Laser Program Office, High Energy Laser Systems Test Facility, White Sands Missile Range, NM. June 1982-November 1984.

Provided on site integration management for the installation of laser beam diagnostic instrumentation. Reviewed in-process designs of fluid storage and piping systems for the Mid-Infrared Advanced Chemical Laser.

PUBLICATIONS AND PRESENTATIONS:

NUREG/CR-7110, State-of-the-Art Reactor Consequence Analyses Project, Volume 2, Surry Integrated Analysis, Rev. 0, January 2012.

Experimental Validation of CFD Analyses for Estimating the Transport Fraction of LOCA Generated Insulation Debris to ECCS Sump Screens, Nuclear Technology, Volume 146, Number 3, June 2004, American Nuclear Society – 2004.

NUREG/CR-6762, Technical Assessment: Summary and Analysis of US Pressurized Water Reactor Industry Survey Responses and Responses, Volume 2, US NRC – 2002.

NUREG/CR-6770 - GSI-191: Thermal-Hydraulic Response of PWR Reactor Coolant System and Containments to Selected Accident Sequences, US NRC – 2002.

NUREG/CR-6808, Knowledge Base for the Effect of Debris on Pressurized Water Reactor Emergency Core Cooling Sump Performance, US NRC – 2003.

Mowrey, J., S. I. AbdelKhalik, and Ross, K. W., "Use of a Real-Time RELAP5 Model to Dynamically Test a Digital Feedwater Control System for a Boiling Water Reactor," Nuclear Technology, Vol. III, No. 2, pp. 283-302, August 1995.

Ross, K. W., and Mowrey, J., "The Real-Time Union of a Physical Feedwater Controller and an Interactive RELAP BWR Model," RELAP5 International User's Seminar, Baltimore, Maryland, August 29, 1994.

Ross, K. W., "TRAC Analyses of Postulated Loss-of-Pumping Accidents Involving Savannah River Site K Reactor Operating at 720 MW," SAIC 92/6515, Science Applications International Corporation, Albuquerque, New Mexico, December 1992.

Amos, C. N., Kim, S. H., and Ross, K. W., "The Development of MELSRP: A Computer Code for Core Meltdown Accident Analysis of Savannah River Site Reactors," SAIC 90/6502, Science Applications International Corporation, Albuquerque, New Mexico, December 1991.

Geary, J. M., Ross, K. W., and Suter, K. J., "Infrared Presensitization Photography at Deuterium Fluoride Laser Wavelengths," Optical Engineering, Vol. 28, No. 9, pp. 978-981, September 1989.