



8940 Old Annapolis Road
Suite L
Columbia, 21045
Phone: 410-884-3266

MICHAEL J. RAMOTOWSKI, MSME

EDUCATION:

M.S., Mechanical Engineering, Drexel University, Philadelphia, PA, 1992.

B.S., Mechanical Engineering, Drexel University, Philadelphia, PA, 1990.

MASTER THESIS:

Ramotowski, M.J., "The Oxidation of Propane and n-Butane at Elevated Pressure in the Region of Negative Temperature Coefficient", Drexel University, Philadelphia, PA, October 1992.

PROFESSIONAL EXPERIENCE:

Principal Engineer/Senior Engineer, April 2004 to present Combustion Science & Engineering, Inc., Columbia, MD.

Managed multiple projects using commercial gas turbine hardware to evaluate emissions performance of conventional fuels including home heating oil, diesel, kerosene, JP-8 and naphtha; alternative fuels including synthetic JP-8 and renewable fuels including biodiesel and ethanol using LPP Technology. Managed programs to develop and optimize the design of several prototype LPP Combustion vaporizers. Managed the design and construction program for a pilot scale (2,000 kWth) LPP Combustion technology demonstration unit evaluated at a major turbine OEM facility.

Set-up a laboratory scale high pressure (10 atm) swirl stabilized burner facility with air pre-heat to test both gaseous and liquid fuels under simulated gas turbine combustor inlet conditions. Led the field test program to evaluate the performance of a flare used to burn VOC vapors created during the dehydration of raw natural gas. Performed CFD modeling & analysis of gas turbine fuel injection systems, dry low emission (DLE) combustion systems, a liquid fuel conditioning device (vaporizer) and a gas turbine burner with detailed kinetics for hydrogen and methane combustion.

Project Manager/Project Engineer, February 2001 to April 2002 John Zink Company, LLC, Shelton, CT. Todd Combustion Group

Responsible for product design and management of low NO_x combustion equipment orders for package and utility boilers firing gaseous and liquid fuels for both new and retrofit applications. Managed more than a dozen projects at a time totaling approximately 2.5 million dollars. Performed project to standardize and reduce costs of burner windboxes. Primary activities included interfacing with design/drafting, purchasing, manufacturing, Vendors, the Customer and End-Users. Participated in proposal efforts and field service troubleshooting.

Lead Engineer, January 2000 to February 2002 General Electric Power Systems, Schenectady, NY. Generator Technology, Fluid Dynamics & Heat Transfer Group

Performed CFD analyses on the effects of blade angle, number of blades, tip clearance, airfoil profile and blade aspect ratio to support performance/efficiency/cost trade-off studies for the design of axial fans for large air and hydrogen-cooled industrial generators. Developed a new test procedure for determining axial fan performance with greater certainty and lower cost by implementing new procedures during standard factory acceptance tests. Performed conjugate heat transfer analyses of ventilated copper coils in generator rotors to determine "hot-spots" in new lower cost designs.

Group Leader/Project Manager, July 1998 to October 1999

Arthur D. Little/Epyx Corporation, Cambridge, MA.

Combustion & Chemical Engineering Group

Project Manager of a \$900,000 modular pressurized multi-fuel reformer test facility for conducting R&D on fuel reforming technology for fuel cell power systems. Group leader of the Combustion & Chemical Engineering group (5 people). Responsible for coordinating system and process modeling, CFD analyses, investigations into fuel reforming technology issues, test planning, execution and reporting. Involved with the design, development and shakedown testing of a 10 kWe multi-fuel reformer based fuel cell power system for stationary power and transportation applications.

Supervising Engineer/Senior Engineer, December 1995 to July 1998

ADAPCO: Analysis and Design Application Company, LTD., Melville, NY.

Computational Fluid Dynamics Consulting Group

Supervisor of several projects including: 1) Transient analysis of fuel/air mixing in an industrial gas turbine fuel manifold, 2) Two-phase flow analysis of a flue gas desulfurization (FGD) scrubber for a coal fired boiler. Project leader of several projects including: 1) A two-phase compressible flow analysis of a pulverized coal burner for a tangentially fired boiler, 2) A two-phase flow design optimization study of a blade cooling air circuit sand particle separator for a gas turbine engine, 3) A transient moving mesh analysis of a multi-stage liquid hydrogen fuel pump containing detailed impeller blade geometry.

Development Engineer/Staff Engineer, June 1993 to November 1995

Foster Wheeler Energy Corporation, Clinton, NJ.

Combustion and Environmental Systems Group

Responsible for the design, testing and written reports documenting a prototype scroll insert for use with low NO_x pulverized coal burners to improve performance. Project Coordinator for a two-phase cold flow modeling facility, responsible for test programs and reports, prototype designs, model procurement and project scheduling. Prepared boiler emission optimization test programs and evaluated test data to verify that contractual guarantees were met. Performed CFD analyses on boiler windboxes and low NO_x burners.

ADDITIONAL EXPERIENCE:

Graduate Research Assistant, Drexel University, Philadelphia, PA, August 1990 to October 1992.

Test Engineer, General Dynamics: Electric Boat Division, Groton, CT, June 1990 to August 1990.

CO-OP Engineer, General Dynamics: Electric Boat Division, Groton, CT, March 1989 to September 1989.

CO-OP Engineer, Naval Underwater Systems Center, New London, CT, January 1988 to June 1988.

CO-OP Engineer, Naval Underwater Systems Center, New London, CT, January 1987 to June 1987.

CO-OP Engineer, Naval Underwater Systems Center, New London, CT, June 1986 to September 1986.

HONORS/ACHIEVEMENTS:

Augusta H. Hess Combustion Research Scholarship (1990 - 1992)

Mechanical Engineering and Mechanics Honor's Program (1988 - 1990)

Drexel University Dean's list for academic year 1987, 1988, 1989 and 1990

Completion of Engineer in Training Exam, April 1990

GE Power Systems Award (November, 2000)

GE Six-Sigma Green Belt (January, 2001)

PROFESSIONAL AFFILIATIONS:

Member of the Combustion Institute
Member of the American Society of Mechanical Engineers (ASME)
Member of the Society of Automotive Engineers (SAE)

SELECTED PUBLICATIONS:

Ramotowski, M.J., Klassen, M.S., Eskin, L.D. and Roby, R.J., “*Burn Biofuels in Gas Turbines with Improved Heat Rate and Natural Gas Emissions*”, to be presented at the PowerGen International, Orlando, FL., December 2008.

Klassen, M., Ramotowski, M., Eskin, L. and Roby, R., “*Clean Combustion of Liquid Biofuels in Gas Turbines for Renewable Power Generation*”, presented at the CTSI Conference, Boston, MA., June 2008.

Ramotowski, M.J., Roby, R.J., Eskin, L.D., and Klassen, M.S., “*Fuel Flexibility for Dry Low Emission Gas Turbines – Cleanly Burning Biofuels, Coal Liquids and Petroleum Fuels*”, presented at PowerGen International, New Orleans, LA., December 2007.

Eskin, L.D., Roby, R.J., Klassen, M.S., and Ramotowski, M.J., “*A Novel Approach for ‘Clean’ Power Generation Using Coal Liquids and the LPP Combustion Process in an Integrated Gasification Combined Cycle (IGCC) System*”, presented at the 24th Annual International Pittsburgh Coal Conference, Johannesburg, South Africa, September 2007.

Roby, R.J., Klassen, M.S., Eskin, L.D., Ramotowski, M.J. and Gaines, G. “*LPP Combustion – How to Burn Liquid Fuels as Cleanly as Natural Gas*”, presented at the Electric Power Conference, Chicago, IL., May 2007.

Gokulakrishnan, P., Ramotowski, M.J., Gaines, G., Fuller, C., Joklik, R., Eskin, M.S., and Roby, R.J., “*Experimental Study of NO_x Formation in Lean, Premixed, Pre-vaporized Combustion of Fuel Oils at Elevated Pressures*”, paper GT2007-27552, presented at the ASME Turbo Expo 2007: Power for Land, Sea and Air, Montreal, Canada, May 2007.