CAPABILITY STATEMENT

Robert A. Leishear, Ph. D., P.E., PMP
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CAREER SUMMARY

Robert A. Leishear, Ph. D., P. E., PMP is a Fellow of the American Society of Mechanical Engineers (ASME), a Consulting Engineer for Leishear Engineering, LLC, a licensed Professional Engineer in South Carolina, and a member of several ASME international piping and pressure vessel committees. He has traveled far from his days of walking on four inch I-beams, 500 feet in the air without fall protection, to his present position as a Doctor of Engineering. His wide range of skills developed along the way are tools to troubleshoot piping system, pump, and fluid flow problems to increase industrial business successes. As an Engineering Consultant, his current research interests are dedicated primarily to investigations for water main breaks, gas pipeline explosions, and nuclear power plant explosions.

Recent research at Pantex, a nuclear weapons assembly plant in Amarillo, Texas was performed to investigate 22 years of piping failures in a fire suppression system. Water hammer was identified and corrective actions were implemented. Underground water main breaks were nearly eliminated when partial recommendations were implemented.

Dr. Leishear troubleshoots technical problems and has solved long misunderstood engineering problems by inventing new theory as required – some failure problems were misunderstood for more than a century. In short, diverse experience as a tradesman and engineer, along with 24 years of night school, were earned to design, build, and operate industrial systems, with a specialty in Fluid, Structural, and Machinery Dynamics. As a lead research, design, and test engineer on many projects, he applied inventive solutions to engineering problems, and saved Savannah River Site (SRS) well in excess of $78,000,000 over twenty four years.

To document project successes, he wrote an ASME book along with more than 85 publications that included Conference and Honors Journal papers, along with articles in the Mensa World Journal, the AWWA Opflow magazine, the NACE Materials Performance Magazine, and the ASME Magazine that were printed to 280,000 members in 158 countries in total. Research topics included: pump and piping design; fluid mechanics; mixing; fluid transients; non-Newtonian fluids; mass transfer: nuclear reactors; nuclear reactor accidents; explosions; machinery and structural failure analysis; vibrations; vacuums; structural dynamics; and stress analysis.

Skills include teaching experience, a sheet metal mechanic apprenticeship, welding and electrician training, a Bachelor's degree in Mechanical Engineering from Johns-Hopkins University, membership in ASME piping committees, attendance in ASME piping courses, completion of two years of Process Engineer training for nuclear facilities, and Masters and Doctorate degrees in Mechanical Engineering from the University of South Carolina (USC), which targeted industrial and nuclear processes. A second PhD for a Doctorate in Nuclear Engineering is in process.

Dr. Leishear also earned a dozen corporate awards, several ASME awards, and a Mensa Intellectual Creativity Award. His skills, continuing education, and his major accomplishments are summarized below.

KEYWORDS

Troubleshooting, Fluid Flow, Vibrations, Failure Analysis, Piping Design, Corrosion, Pumps, Mechanical Seals, Gas Flow, Fires, Explosions, Machinery, Mixing, Pilot Scale Testing, and Piping Failures.

Leishear Engineering LLC

Major Accomplishments: Failure Analysis and Design

Troubleshooting Skills	Problem Definition	Cost Savings	Publications	Awards
Machinery Vibration Analysis	1.3 Million dollar pump failures	$20,000,000 Six σ Analysis	ASME: Journals and Conferences	SRS V.P. Award
Piping Failure Analysis	200 Piping failures over 40 years	$15,000,000	ASME Book, "Fluid Mechanics, Water Hammer, Dynamic Stresses, and Piping Design" ASME: Honors Journal papers	ASME Fellow: 3% of 140,000 members are Fellows
Pilot Scale Experiments, Mixing and Mass Transfer	Experimental testing: Mixing of one million gallon tanks	$3,500,000	ASME: Magazine, Journal, and Conferences AIChE Conferences	SRS Vice President's Award
Engineering Design, Testing, Installation, and Operations	Remotely operated robotic arm used in a high radiation area	$40,000,000	Department of Energy: Conference	SRS Vice President's Award
Fires and Explosions	Explosions and fires in nuclear reactor plants – Fukushima, Three Mile Island	In progress	ASME: Magazine, Conferences, and Journals Mensa World Journal	Mensa Award for Intellectual Achievement
Engineering Design	Electronic connector for first strike nuclear protection on military aircraft radar	n/a	Installed worldwide on all personal computers and printers for many years, and still used extensively	U.S. Patent. Westinghouse President's Award
Trades	Electrician, HVAC	Welder, Fitter	Sheet Metal Mechanic	Carpenter

Ph. D. / Postgraduate Studies: Failure Analysis and Design

Fluid Mechanics	Fluid Flow and Gas Dynamics	Mass Transfer, Diffusion, and Heat Transfer	Water Hammer	Advanced Thermodynamics	Thermal Hydraulics
Structures and Machinery	Fatigue and Fracture Mechanics	Machinery and Building Vibrations	Metallurgy, Journeyman Sheet Metal Mechanic	HVAC Design and Servicing, Electrician	Structural Shock Waves and Acoustics
Computer Modeling	Fluent	Ansys Structural	AFT, Water Hammer	Matlab	Autodyne
Combustion	Combustion Kinetics	Combustion Physics	Explosions	Combustion CFD Modeling	Explosion CFD Modeling
Nuclear Engineering	Reactor Materials	Reactor Design and Fuel Cycles	Safeguards and Security	Radiation Shielding	Risk and Safety Analysis
Nuclear Reactor Modeling	Heat and Fluid Flow: Relap5, Trace	Reactor Core Modeling: Parcs	Reactor Fuel Depletion: Origen	Reactor Physics: Polaris, Triton, Keno, Mavrik	Uncertainty Analysis: Tsunami
Process Engineer	Steam Systems, Safety Valves	Power Distribution	Instrumentation and Process Control, VFDs, Motors	Heat Exchangers, Fans, Diesel Generators	Compressors, Valves, Pumps, Regulators
Piping and Pump Design	ASME B31.1, B31.3 Piping, and Section VIII Pressure Vessels	High Temperature and High Pressure Design of Piping	Non-destructive Analysis, Pressure Vessel Inspector, Piping Failure Analysis	Piping Dynamics and Earthquake Design, Fitness for Service	Pump Design, Mechanical Seal Design, and Mixing Technology
Codes	NQA-1	ASTM, API	DOT, DOE, DOD	ISO, NIST	Hydraulic Inst.
NACE Corrosion	Pipeline Corrosion	Corrosion Design	Cathodic Protection	Protective Coatings	Coating Inspections