

Resume'
Clifton (Cliff) Troy Knight, P.E.
Chief Engineer/President



Professional Summary:

Cliff is President and co-founder of KnightHawk Engineering, Incorporated since 1991. He is a Professional Engineer with 32 years of experience. Besides his corporate responsibilities as President of KnightHawk, Cliff is also Chief Engineer and Supervising Professional for the Engineering Consulting Group. As Chief Engineer, Cliff serves as the lead technical professional for major multidiscipline investigations into industrial static and rotating equipment failures. Cliff has 30 years experience in utilizing computer applications, which include Finite Element Method, Numerical Modeling, Heat Transfer, Pipe Stress Analysis, and Computational Fluid Dynamics. While with KnightHawk, Cliff has developed proprietary tools and methods for performing analysis on pelletizing dies, pressure vessels, heat exchangers, and centrifugal compressors. Cliff is the developer of KnightHawk's failure analysis and troubleshooting methodology called the Integrated Systems Approach. Cliff has received three US patents for static and rotating equipment while at KnightHawk. Before coming to KnightHawk Engineering, Cliff spent ten years at Dow Chemical, U.S.A., where he achieved the position of Sr. Mechanical Engineering Specialist and Group Leader, while receiving two patents and eight company awards. At Dow, Cliff's group specialized in machine design, failure analysis, code and regulatory compliance, heat transfer, pipe stress, rotating and static equipment, troubleshooting, and computer applications involving petrochemical and power facilities. Cliff has a BSME from Louisiana State University 1980. Cliff is a registered Professional Engineer in multiple states and certified by The United State Council for International Engineering Practice for registration in the International Registry of Professional Engineers. Cliff is also certified a Specialized Professional Engineer for Nuclear work under ASME Section III.

Employment History:

1991 to Present: KnightHawk Engineering – Chief Engineer/President

Management (President and Director)

Management responsibilities include the overall supervision of a global high technology Engineering consulting group, Field Services, and Sales Group.

From 1999 to October 2002, KnightHawk Engineering was part of the Babcock BORSIG Group (POWER, Shipbuilding, and Specialty Engineering), Major duties in management include venture development, coordinating efforts with other sister companies and parent company in Germany, assisting parent and sister group companies, strategic planning, and overall development of a corporate vision. Sales Territory responsibility was North America while Engineering Consulting is global. Responsible for the commercial development of BORSIG's Pelletizing Die Venture. The Knight Family acquired majority control of KnightHawk in November 2002 due to the insolvency of Babcock BORSIG. As of December 31, 2003 the Knight family became 100% shareholder of KnightHawk Engineering, Inc.

Technical (Chief Engineer)

Technical duties include on-site failure investigation, failure analysis, research and development, design, and troubleshooting of static and rotating equipment. Cliff serves as expert witness for industrial cases. On-site failure investigations involve initial assessment and development of methodology and logistics to assist client management in determining the course of action to be taken. The main technical areas of specialization are numerical modeling and troubleshooting of mechanical systems. Cliff is an expert in CFD and FEA and serves as the corporation's chief advisor in these fields. Significant projects include analysis of waste heat recovery systems, coal gasification reactors, power boiler systems, furnace coil systems, quench coolers, selective linear exchangers, transient pressure/momentum analysis of relief systems with two phase flow, transient heat transfer of equipment, structural dynamics of machinery/structures, compressor failure analysis, turbine failure analysis, off shore equipment design, and transport models of pelletizing dies. Furnace systems analyzed include Kellogg, ABB Lummus, Stone & Webster, Kinetics Technology Incorporated, and custom client systems. Selective Linear Exchangers and Quench Coolers analyzed include Babcock-Borsig, SHG-Schack (Schmidt'sche), and custom client systems. Pelletizing systems have included WP, RTW, AMN, and JSW systems. Cliff served as lead consultant for BORSIG's pelletizing die project. Compressors have included but are not limited to Man Turbo, GHH-Borsig, Dresser, Elliot, Clark, AC, and Nash. Gas and Steam Turbines have included but are not limited to GE, ALSTOM, and Westinghouse. The author has worked with many different rotating and static equipment applications in design, troubleshooting, and failure analysis. Industries have included nuclear and fossil power, equipment manufacturers, chemical, refinery, pulp and paper, and off shore.

1981 – 1991: Dow Chemical USA

Provided global engineering support in hydrocarbon, methanes, plastics, power, coal gasification, glycol, chlor-alkali, cellulose, and solvents plants including marine facilities. Based in the Dow Plaquemine Plant, Knight performed design and failure analysis for sites in Germany, Holland, Canada, and all major plant sites in the United States.

1990 – 1991: Group Leader in Mechanical Technical Support. Senior Mechanical Specialist with supervision of three mechanical engineers, one process engineer, and three mechanical designers. Group worked with pressure vessels, heat exchangers, failure analysis, machine design, and rotating equipment. Tools utilized in the group included finite element analysis, pipe stress, custom, and computational fluid dynamics. The group was in charge of the Dow polymer gear pump design for polyethylene service and the Dow coal gasification burner design.

1986 – 1990: Mechanical Specialist with significant technical projects involving polymer gear pump design, die design, base plate design, acoustical vibration, structural vibration, thermal fatigue, transient pressure momentum, high temperature equipment design, mechanical seal design, rotating equipment vibration analysis, heat transfer, polymer valve design, and specialized reactor design, Borsig quench cooler, fracture mechanics, fatigue in shaft, and gas turbine troubleshooting. Finite element and computational fluid dynamics for design, troubleshooting, and failure analysis of static and rotating equipment was performed in this position.

1984 – 1986: Senior Mechanical Engineer with duties that included project engineering, failure analysis, machine design, finite element analysis, pipe stress, and special projects. Major capital projects included an LPG import facility, coal gasification plant, and cryogenic storage system.

1982 – 1983: Mechanical Engineer: Assistant project engineer and performed stress analysis and machine design.

1981 – 1982: Development Engineer

1980 – 1981: Texas Utilities

Assigned to Comanche Peak and served as a development engineer for a two-unit nuclear power plant.

Professional Registration:

Louisiana	21425
Texas	71448
Mississippi	11932
Alabama	19780
Florida	47486
California	M29205
Maryland	30907
Arkansas	12456
Oklahoma	22248
Indiana	10607182
Nebraska	E-12389
Pennsylvania	PE076217
Alaska	ME 12105
Arizona	49477
Kentucky	26552
New York	087640
Ohio	E-73829
Kansas	21348
Minnesota	48451
Georgia	PE035911
Illinois	062.063667
Iowa	20665
NCEES Record	36918

Certified as Specialized Professional Engineering for Nuclear work under ASME Section III.

Serves as supervising professional for KnightHawk Engineering

Education: Louisiana State University, Baton Rouge, LA; BSME 1980

Professional Societies:

ASME – American Society of Mechanical Engineers
NSPE – National Society of Professional Engineers
TSPE- Texas Society of Professional Engineers
SPE – Society of Plastic Engineers
SPE International – Society of Petroleum Engineers
AIChE – American Institute of Chemical Engineers
AWS – American Welding Society
SMRP – The Society for Maintenance and Reliability Professionals
AIAA – American Institute of Aeronautics and Astronautics
ASM – American Society of Metals
AADE – American Association of Drilling Engineers
MTS – Marine Technology Society

Patents:

LOW PRESSURE DROP, MODULAR COEXTRUSION FEEBLOCK; Number 4,708,615; November 24, 1987 - Assigned to Dow Chemical USA; Technology licensed commercially by Dow.

TWO-FLUID NOZZLE FOR ATOMIZING A LIQUID SOLID SLURRY AND PROTECTING NOZZLE TIP; Number 4,952,218; August 28, 1990; Assigned to Dow Chemical USA; Technology licensed commercially by Dow for the Coal Gasification Industry.

INTRA-BODY FLOW DISTRIBUTOR FOR HEAT EXCHANGERS; Number 6,845,813; January 25, 2005; Assigned to KnightHawk Engineering, Inc.

LOW TURBULENT FLOW HIGH SPEED CUTTER KNIFE; Number 6,848,639; February 1, 2005; Assigned to Borsig GmbH, Berlin, Germany

PELLETIZING DIE; Number 6,976,834; December 20, 2005; Assigned to Borsig GmbH, Berlin, Germany

Professional Recognition:

Industry Achiever – BIC Publishing – Earl Heard and Brady Porche – Incorporated into book for engineering achievements in industry - 2008

Dow Technology Center Awards: Coal Gasification - 1988, Solution Polyethylene - 1989, Louisiana Gasification Technology - 1990

Dow Excellence in Engineering Awards: Louisiana Division - 1989, 1990, 1991, USA - 1990

Dow Energy/Waste Reduction Award; Louisiana Division - 1990

Presentations and Publications:

ENVIRO EXPO, February 26, 1992, New Orleans, LA. *A Unique Merger for Our Environment: Air Water, Soil, andMechanical Technology.*

Society of Reliability of Engineers, October 6, 1992, Baton Rouge, LA, *Practical Application of Finite Element Analysis*

3rd Annual Pump Equipment Symposium, January 17, 1995, Baton Rouge, LA, *The Integrated Systems Approach to Resolving Pump Problems.*

First Annual Forum, May 16, 1996, Center for Excellence in the Chemical Industry, Alvin Community College, *Transformation of Tools and Technology, and Tools of Current Science and Technology for Rotating Equipment.*

First International Symposium on Innovative Approaches for Improving Heat Exchanger Reliability, November 2-4, 1998, Houston, Texas. *Using Computational Fluid Dynamics to Solve an Exchanger Problem.*

CITGO Sponsored Rotating Equipment Technology Conference, May 17, 2000, Lake Charles, LA, *Tools of Current Science and Technology in Rotating Equipment.*

Stone & Webster Ethylene Forum, February 22, 2001, Baton Rouge, LA, *New Technology in Linear Quench Systems.*

Hydrocarbon Processing, December 2001, "Seven rules for successful simulation."

AIChE – 2002 Spring National Meeting, March 10 –14 - Ethylene Furnace Maintenance Roundtable, Panelist

Hydrocarbon Processing, August 2002, "Avoid Open Impeller Failures".

Pelletizer Knife Technical Conference, February 3, 2003, Houston, "Pelletizing Die Analysis"

PPG – Lake Charles - Quarterly Site Reliability Progress Meeting, January 21, 2003 – "Pipe Stress in Critical Systems and Related Reliability Implications" – Outside Speaker

International Conference on Polyolefins 2003, February 25, 2003, "Advances in Pelletizing Die Technology".

AIChE Paper, April 3, 2003, "Using Computational Fluid Dynamics (CFD) for Analysis of Transfer Line Exchangers" – Spring Meeting – New Orleans

Vibration Institute, May 16, 2006 – "Static and Rotating Equipment Case Studies – Vibration Diagnostics and Solutions" – Chapter Meeting – Houston

ExxonMobil, May 17, 2006 – "Melt Pump Failure Analysis and Die Plate Design/Analysis" – Annual Worldwide Mechanical and Finishing Network Meeting – Galveston

Vibration Institute, October 10, 2006 "Rotating Equipment Case Histories" – Triplex Chapter Beaumont

Chemical Processing, September 2007, "Succeed At Simulation"

ASME, April 27, 2010 “Compressor Open Face Impeller Failure Analysis & Design ” – Apollo Subsection

Middle East Turbomachinery Symposium, February 16, 2011 – “*Centrifugal Compressor Failure Analysis*” – Doha, Qatar

EUCI Conference on: Deepwater Operations, Technology, and Regulations, June 14, 2011 – “*Numerical Methods for Deepwater Applications*” – Houston, TX

SMRP – MARS 2011, August 18, 2011, Maintenance & Reliability Symposium “ *Static and Rotating Equipment Failure Analysis*” – Galveston, TX

Publisher of KnightHawk Engineering Monthly Newsletter called KnightHawk TechNotes

Guest Author of “Engineering Spec” for Business & Industry Connection Trade Magazine

Guest Author for Inspectioning Journal

Courses Conducted/Taken:

University of Alaska – School of Engineering – Completed Fundamentals of Arctic Engineering – ES AS030 – 2008

Institute for Management – IMT Berlin, Germany – Advanced Management Program – June 2001

Louisiana State University, September 1994 and 1995, Baton Rouge, LA. Taught Power Cycle Applications - LSU Short Course

Louisiana State University, September 1994 and 1995, Baton Rouge, LA. Taught Heat Transfer Applications - LSU Short Course

Sports: Golf, Motorcycles, and Boating

Other: Member of the Board of Directors of the Clear Lake Food Pantry since 2004