



KENNETH M. SMITH, JR., P.E.
SENIOR MANAGING CONSULTANT

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Mr. Kenneth Smith has over 35 years of experience designing and analyzing mechanical systems, managing technical projects, and providing professional consulting services. He has been a project manager for ship design and construction, and has led teams developing shipboard waste processing equipment from concept to product manufacturing. He has audited and assisted in the development of quality assurance programs, and has provided process control and safety audits at industrial and manufacturing facilities. His career has included operations, design, manufacturing, project management, and consulting.

Mr. Smith has performed failure analysis of a variety of incidents, equipment, mechanical systems, and processes. Failure scenarios included unexpected or premature equipment failures, incidents leading to personal injury accidents, and major property losses. Investigations have included finding the causes of damages associated with cargo and passenger transport (ocean, highway, and rail), initiating causes of industrial accidents, and rigging failures. Equipment failure investigations have involved manufacturing equipment, power plant equipment, engines, ship machinery, industrial machinery, cranes, elevators, rigging, and a myriad of consumer products. Mr. Smith has provided written and verbal reports of findings, and has testified as an expert in both state and federal courts.

Areas of Specialization

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| Mechanical Design | Operations |
| Product Liability | Material Handling |
| Failure Analysis | Rigging |
| Workplace Safety | |
| Project and Contract Quality Management and Dispute Resolution | |
| Specialty Vehicles Including: Ships, Cranes, and Industrial Trucks | |

Education

- M.S., Engineering (N.A.M.E.), University of Michigan, 1974
- B.S., Naval Architecture, United States Naval Academy, 1973

Licensed Professional Engineer (P.E.)

- State of Illinois License No. 062-051209
- State of Wisconsin ... License No. E 24343
- State of California License No. M 37192

October 2017

Previous Experience

Mr. Smith has investigated personal injuries associated with consumer products, industrial accidents, rigging accidents, marine cargo and crew claims, specialty vehicle accidents, and aircraft accidents. He has participated in product development, evaluated new products prior to manufacturing, and developed warnings for on-product marking and for technical manuals. He has provided process and equipment design and safety recommendations to facilities operators, and has also authored litigation-related reports and has provided expert testimony. He has investigated and reconstructed accidents related to factory equipment, ships and boats, appliances, consumer products, exercise equipment, weight-handling equipment, elevators, and (OSHA) accidents at construction sites and workplaces.

From 1973 to 1995, Mr. Smith served as an Engineering Duty Officer in the Navy. He began as an operating engineer on a steam ship and a repair superintendent in a shipyard. He progressed through ship construction project officer, on-site owner-representative at a shipbuilder, to Deputy Director of the Navy's shipboard environmental engineering office. Mr. Smith led teams performing QA and industrial safety audits of ten industrial facilities making repairs to marine machinery systems and equipment. Mr. Smith was one of a handful of ship salvage diving engineers and was sent to the scene of several ship strandings and deep-water recovery operations. Acting independently with a team, his task was to remove the stranded vessels or find and recover accident evidence. He wrote the salvage systems handbook for the Navy's salvage ships. He was certified and actively dove in many of the then-active air diving rigs.

Professional Affiliations/Honors

American Society of Naval Engineers

Member

American Society of Mechanical Engineers

Member

American Boat & Yacht Council

Member

National Council of Examiners for Engineering and Surveying

Task Force Member

Society of Naval Architects and Marine Engineers

Member

Marine Forensics Committee Member

Awards

Acquisition Professional

Department of Defense Certification, 1993

Navy Environmental Program Award

Fiscal Year 1998 Winner

Military Awards

Meritorious Service (3)

Positions Held

Engineering Systems Inc., Irvine, California

Senior Managing Consultant, California Office, 2011 – Present
Senior Managing Consultant, Illinois Office, 2010
Senior Consultant, Illinois Office, 1999 – 2009

K+P Agile, Inc., Naperville, Illinois

Consulting Engineer, Program Manager, Vice President, 1995 – 1999

Active Duty in the U.S. Navy

Engineering and Acquisition Specialist. Salvage Diving Officer
Attained rank of Commander, 1973 – 1995
Naval Sea Systems Command, Design and Engineering, Arlington, Virginia
Deputy Director, Shipboard Environmental Engineering, 1992 – 1995
Commander, Naval Surface Forces, U.S. Pacific Fleet, San Diego, California
Force Marine Engineer and QA Officer, 1989 – 1992
Supervisor of Shipbuilding, Sturgeon Bay, Wisconsin
Marinette Resident Inspection Office Manager, Marinette, WI, 1985 - 1989
Auxiliary and Special Mission Ships Project Office (PMS 383), Arlington, Virginia
Assistant Program Manager, Salvage Ships, 1982 – 1985
Naval Sea Systems Command, Design and Engineering, Arlington, Virginia
Project Manager/Engineer, Gas Turbines and Waste Heat Boilers 1980 – 1982
Long Beach Naval Shipyard, Long Beach, California
Design Engineer, Piping Systems 1978 – 1979
Ship Superintendent, 1977 – 1978
USS Towers (DDG 9)
Main Propulsion Assistant, 1975 – 1977

Continued Education

“Understanding Bloodstain Pattern Analysis – An Introduction to the Discipline of BPA,” by Bevel Gardner & Associates, May 2017

SNAME Maritime Convention, October 2014

“LNG as a Marine Fuel in North America: a Focus on LNG Products,” by Fred Loomis

SNAME Maritime Convention, October 2014

“A Marine Forensic Analysis of Fishing Vessel Lady Mary,” by T.O. Phillips, K.P. McAvoy

SNAME Maritime Convention, October 2014

“Human Factors Considerations on Costa Concordia and Ferry Safety Issues,” by Brian Emond

SNAME Annual Meeting, November 2013

“LNG Fuel for Ships – Opportunities and Challenges,” by Steve Kemp, Gary van Tassel and Spencer Schilling

SNAME Section Meeting, April 2013

“Forecasting and Hindcasting Wind Driven Wave Environments,” by Justin E. Stopa

Lifecycle Cost Forum, SNAME Southwest, February 2013

“Through-Life Offshore Repair and Maintenance-Challenges and Solutions”

by Peter Noble, CONOCO-PHILLIPS

“LNG Technology and Economics for Marine Applications”

by Quentin Stewart, Wartzila Defense

International Marine Forensics Symposium, April 2012

“Some Legal Issues Related to Marine Forensics” by Willa Francs, ESQ & PE

“An Introduction to Marine Forensics and an Overview of the Marine Forensics Guidelines” by Sean Kerry

“The Forensic Investigation of Marine Fire and Explosions” by Dr. John G. Atherton,
BSC, PHD, CENG, CCHEM

“Introduction to Elevators and Escalators” (PD100) (2 days)

Chicago, IL, 2009

“How to Perform Elevator Inspections Using ASME A17.2” (PD102) (3 days)

Chicago, IL, 2009

ASME International Mechanical Engineering Congress & Expo

Boston, MA, 2008

ASME Rail Transportation Division Bearings Conference

Chicago, IL, 2007

Determination and Documentation of Construction Delay teleconference

Lorman Education Services, Aurora, IL, 2007

Vehicle Accident Reconstruction Methods Seminar, Course ID# C0416, (2 days)

SAE International (Society of Automotive Engineers), Fort Myers, FL, 2007

Basic Orientation Plus – Refinery safety training and practices, (1 day)

Contractors Safety Council of Texas City, Texas City TX, 2005

Lift Truck Operator Training (1 day), for lift truck operator license at ESI

Material Handling Services, Inc., 2001, 2005, 2008

ABYC (American Boat and Yacht Council) Warranty/Liability Issues (2 days)

American Boat and Yacht Council Seminar, Northbrook, IL, 2001

Metallurgical Failures in Boilers (1 Day), Dr. David French, Naperville, IL, 2001

Shipboard Environmental Engineering Seminar (3 days)

Norfolk, VA. 1995

Boiler and Diesel Inspector Seminar (3 days)

Fleet Training Center, San Diego, CA, 1993, 1994

Contract Management and Administration, Ship Acquisition Contracts (5 days)
Portsmouth, VA, 1986

Reliability Engineering (5 days)
Naval Sea Systems Command, Arlington, VA, 1981

Diving School, Salvage Diving Officer (10 weeks)
Washington Navy Yard, DC, 1978

Salvage Diving Officer Seminar (3 days)
Naval Sea Systems Command (OOC), Arlington, VA, 1978

Fiberglass and Composite Design (5 days)
Marshall Consulting, Long Beach, CA 1978

Engineering Duty Basic School (4 weeks)
Mare Island, CA, 1977

Shipboard Firefighting (5 days)
Navy Fleet Training Center, San Diego, CA, 1975

Chief Engineer, Steam (8 weeks)
Navy Fleet Training Center, San Diego, CA 1975

Peer Reviewer

International Marine Forensics Conference, 2012. Papers chairman.

NCEES Panel Member. Task Force, Professional Engineering Examination, Naval Architecture and Marine Engineering practice. 2008-present.

Publications/Presentations

“The Role of Investigation – Moving toward accident-free operations,” by Aaron D. Miller, Kevin Breen and **Kenneth M. Smith Jr.** Published in Marine Technology “The Changing Ferry Accelerating innovation,” July 2015.

“Free-Floating Object Trajectory Analysis in the Gulf of Mexico” by **Kenneth M. Smith, Jr.**, Jean Slane and Robert Winn, 2013 SNAME Annual Meeting & Expo & Ship Production Symposium, November 6-8, 2013

“The Sinking of the Tour Boat ETHAN ALLEN – Accident Reconstruction and Human Factors Methodology” by Kevin Breen, Casey Breen, and **Kenneth M. Smith, Jr.**, International Marine Forensics Symposium, April 2012.

“A Marine Forensic Analysis of the Loss of DKM BISMARCK” by James Cameron, Bill Garzke, Bob Dulin, and **Kenneth M. Smith, Jr.**, International Marine Forensics Symposium, April 2012.

“Analysis and Testing of Freezing Phenomena in Plastic Piping Systems,” IMECE2009-10071 by Dale B. Edwards, P.E., **Kenneth M. Smith, P.E.**, Donald E. Duvall, Ph.D., P.E., and Joseph F. Grzetic. Presented at 2009 ASME International Mechanical Engineering Congress and Exposition Lake Buena Vista, FL, USA.

“Failure Analysis of the Estonia,” by Dr. Kent L. Johnson and **Kenneth M. Smith, Jr.** Published in ASM “Advanced Materials & Processes,” Volume 167, Issue 6, June 2009.

“Stepladder Spreader Bar Structural Integrity and the Impact on Accidents,” IMECE2009-11487, by Michael P. Van Bree, Erick H. Knox, PhD, PE, **Kenneth M. Smith, Jr., P.E.** and Joseph T. Eganhouse. Presented at 2009 ASME International Mechanical Engineering Congress and Exposition Lake Buena Vista, FL, USA.

“Analysis and Testing of Freezing Phenomena in Piping Systems,” IMECE2008-69109 by **Kenneth M. Smith, Jr., P.E.**, Michael P. Van Bree and Joseph F. Grzetic. Presented at ASME International Mechanical Engineering Congress and Exposition, Boston, MA, November, 2008.

“Safety Analysis of Sling and Strap Failures,” by Dennis B. Brickman, P.E. and **Kenneth M. Smith, Jr., P.E.** Presented at ASME International Mechanical Engineering Congress and Exposition, Seattle, WA, November 2007.

“Minimizing the Risks of Litigation in the Construction and Repair of Yachts,” by **Kenneth M. Smith, Jr., P.E.**, and Brad J Rosello, P.E., Society of Naval Architects and Marine Engineers, SMTC&E, Fort Lauderdale, FL, October 2006

“Marine Accident Investigation Techniques: Finding the Root Causes,” by **Kenneth M. Smith, Jr., P.E.**, and Frederick E. Schmidt., Jr., Ph.D., C.E.F., Society of Naval Architects and Marine Engineers, October 2005. Republished as a part of Marine Forensics Handbook, SNAME and Marine Technology Society, 2012.

“Marine Forensics – Historic Shipwrecks,” by **Smith**, Garske, Dulin, Bemis and Filling, Oceans Technology Conference (OCEANS ‘05), September 20, 2005.

“Investigation of a Boiler Explosion Caused by Natural Gas Detonation.” Technical paper, ASME Pressure Vessel and Piping Conference, Boston, MA , August 1-5, 1999, with Ogle and Strack.

Technical Presentations

“Ship Collisions: What You Need to Know,” Review of investigation requirements, information sources, and a case study. Presented to SNAME Southwest Chapter, May 2017.

“A Century from RMS TITANIC to MS COSTA CONCORDIA – Lessons to be Learned from the Marine Forensic Process” Panel discussion, panel member, International Marine Forensics Symposium, April 2012.

“ESTONIA Car Ferry Sinking Analysis” presentation by **Kenneth M. Smith, Jr.** and William H. Garzke, International Marine Forensics Symposium, April 2012.

- “Forensic Engineering, an Introduction” Guest lecturer, presented to Webb Institute of Naval Architecture, Westport, New York, April 2011.
- “Further Metallurgy – Samples from Wreck of the Ferry ESTONIA,” by Kent L. Johnson, Ph.D., P.E., FASM, CWI, and **Kenneth M. Smith, Jr., P.E.** Presented at The *ESTONIA* Debate, International Workshop, Glasgow, UK, May 11, 2007.
- “ASTM Evidence Standards and Engineering Systems Inc. Artifact Handling Procedures,” by **Kenneth M. Smith, Jr., P.E.**, Erick H. Knox, Ph.D., P.E. and Peter C. Bouldin, E.I.T. Presented at Engineering Systems Inc., Aurora, Illinois, April 2007.
- “Boat Fuel Systems: Designing for Evaporative Emissions and Ethanol-Extended Fuels,” (Aluminum fuel tanks and ethanol) by Harold Haskew, Rich Kolb, John McKnight, and **Kenneth Smith, Jr.** Presented at IBEX 2006 (International BoatBuilders Exhibition & Conference), Miami Beach Convention Center, Florida, November 2006.
- “DKM Bismarck, A Marine Forensic Analysis,” by James Cameron, William Garzke, Jr., William Jurens, and **Kenneth Smith, Jr.**, Presented to SNAME (Society of Naval Architects & Marine Engineering) Marine Technology Committee at SMTC&E meeting, Ft. Lauderdale, FL, October 2006.
- “Marine Accident Investigation Techniques: Finding the Root Causes” Presented at SNAME (Society of Naval Architects & Marine Engineering) Great Lakes/Great Rivers Section Meeting, September 18, 2003. Published in SNAME Marine Technology, Volume: 42, Number: 4, October 2005.
- “Solid and Liquid Waste Treatment Design for the UK Future Surface Combatant” by Ross and Oakley, SNAME Annual Meeting 1999. Presented comments.
- “Concurrent Design of Castings”
Presentation, Modern Shipbuilding Technologies Demonstration and Information Exchange, Arlington VA, July 14-15, 1998.
- “Ammonia and Propane”
Presentation, Propane Defense Association, San Diego, CA, March 1997.

Selected Project Experience

Product Development or Evaluation - Non-Litigation Consulting

Safety Analysis and Audit, multi-site manufacturing facility.

Pre-release testing of a recreational marine seat for the designer.

Lifting system design for a diesel engine conversion company. (Rigging and lift eye design)

Root cause analysis of a prototype marine main propulsion engine that failed during testing.

Failure analysis of several large diesel engines in service as generators and as vessel main propulsion engines.

Failure analysis of a thrust bearing on a large oil tanker.

Evaluation of service quality and process management for a marine engine manufacturer during the performance of a Navy maintenance contract.

Perform regular audit-tracking/assessing implementation of a quality assurance process at an electronics manufacturer selling to the Federal Government.

Design of a case for a consumer quality saber saw for new product development.

Design cast housings for valve bodies.

Reverse engineer, design, produce, and supply replacement x-ray tube housings.

Performed consulting services for in-service operating failures of an airport people-moving system (Airport Transit System (ATS)). This included reverse engineering and production of brake system components, resolution of reliability issues in the control system, and hardware upgrades for equipment foundations on the vehicles on an unmanned, rubber wheeled, elevated train.

Reverse engineer and produce replacement boiler recirculation pumps.

Designed, managed, and reported on a four-phase examination of contamination of a fuel product. This investigation included a sampling plan to determine the extent of distribution of the contaminated product to distributors, and a sampling plan to determine the extent of contamination to the user level. A laboratory-testing program investigated the consequences of contamination on systems in service, and a sampling program looked for signs of the consequences of contamination on consumer products.

Managed a program for development of a family of shipboard solid waste processing equipment for 230 ships, from technology development to manufacturing and in-service evaluation.

Performed annual safety and production control audits at ten industrial facilities performing repair and maintenance of marine equipment.

Managed a ship acquisition project from program initiation to release of a request for proposal for design and construction.

Managed a four-ship ship construction project from award of contract through first ship delivery.

Workplace Accident, Machinery, and Systems Failure Investigations

Mr. Smith has conducted over 300 investigations of failed machinery, equipment, or accidents that led to material loss or personal injuries in the workplace.

Workplace accident investigations involving material handling, field equipment like wood chippers, industrial trucks, rigging equipment, crane operations, and crane mechanical failures.

Failure investigations of rigging accidents, involving practices, and material related failures: straps, slings, chains, and lift system components.

Accident investigations involving crane components, crawler crane tip-over accidents, and human errors in rigging/inadvertent fouling.

Accidents and losses involving hydraulic systems and components including loading dock and material handling systems, hoists, man-lifts, elevators, and control system actuators.

Mechanical failures of hydraulic and wire rope components on cranes, mobile construction equipment, man-lifts, and material hoists, as well as material lifts and elevators.

Accidents and losses involving material transport machinery. This includes baggage carts at airports, industrial trucks (both automated and manual) in manufacturing plants, conveyors, loaders, loader-stackers moving bulk materials, and maintenance related injuries involving this type of equipment.

Industrial equipment accidents including machinery malfunction, personal injuries, guarding, entrapment, and pinch injuries.

Marine loss investigations which include crew injuries, cargo damage, ship propulsion or generation equipment failures, accidents during cargo unloading operations, and accidents at terminal facilities and involving specialty cranes and container handling equipment.

Marine fire, stability and sinking, collision, and allision investigations including drifting accidents, vessel collisions, and cargo fires.

Processing equipment and boiler failures. This includes explosions in chemical plant reactors, failure of steam generators and boilers, failures and fires at gas pumping stations, and control system failures leading to subsequent failures of boilers. Some investigations have involved food-processing equipment such as sausage manufacturing equipment, dairy protein processing equipment, and boilers and machinery at dairies, grain elevators, and at large bean and corn processing plants.

Product Liability and Consumer Products

Mr. Smith has investigated several dozen losses or injuries alleged to have been caused by consumer products or exercise equipment. This includes treadmills, weight machines, elliptical trainers, exercise bicycles, spin bikes, and accidents at fitness centers and physical therapy centers involving other mechanical equipment.

Appliance investigations include consumer and industrial laundry machines, pressing machines, and household appliances.



His experience in manufacturing technology and quality assurance has assisted clients where manufacturing defects or design defects are alleged in their products.

Project Management and Contract Disputes

Investigation of contract disputes involving design and installation of new industrial production equipment.

Ship and boat construction and repair disputes.

Work place safety and practices, and responsibility of prime and sub-contractors.