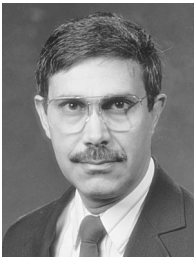


SHORT COURSE 1
on
BASIC PUMP HYDRAULICS WITH A MINIMUM OF MATHEMATICS



Robert J. (Bob) Hart, Consultant, was previously employed by the Dupont Company (28 years) and retired as a Principal Consultant in the Rotating Machinery Group in the Engineering Department. His primary responsibilities were to define Corporate pumping system philosophy and procedures, provide technical guidance on special pumping applications, chaired the Pump Standards effort, chaired the Dupont Corporate Pump Committee, and provided technical leadership in the major Dupont Pump Supplier Alliance.

Mr. Hart is Chairman of the ANSI B73 Pump Committee and a former member of the Texas A&M Turbomachinery Laboratory's International Pump Users Symposium Advisory Committee. He was previously employed for 13 years in the Engineering Department of Cooper Bessemer and served four years in the U.S. Navy aboard various ships.



John P. Joseph II is an independent consultant with Rotating Equipment Systems Technical Associates, in Houston, Texas. He was previously with BP Amoco where he provided technical and maintenance support for rotating equipment systems to existing asset organizations in BP Amoco, and to Project Management on new projects. Prior to that, Mr. Joseph was with the Amoco Petroleum Products Refinery, in Texas City, Texas. He supervised the rotating equipment engineers and the rotating equipment specialists for the refinery. Mr. Joseph spent six and one half years as Superintendent of Central Shops and three years in Amoco's Refining and Transportation Engineering Department, in Chicago, Illinois. Previous assignments at the Amoco Texas City refinery also included the Rotating Equipment Consulting Group, the Project Engineering Group, and as a Maintenance Engineer on the Hydrocracking Unit.

Mr. Joseph received his B.S. degree (Mechanical Engineering, 1972) from the University of Texas at El Paso.

SHORT COURSE 2
on
THE RELATIONSHIP OF VIBRATION TO PROBLEMS IN CENTRIFUGAL PUMPS



William D. Marscher is President and Technical Director for Mechanical Solutions, Inc., in Parsippany, New Jersey. He has held senior positions at Dresser Pump, Pratt & Whitney, and Concepts NREC, and is one of the founders of Mechanical Solutions, Inc. He has spent his career of 32 years involved in the design, development, and troubleshooting of pumps and all kinds of turbomachinery. His capabilities and experience include finite element analysis, rotordynamic analysis, experimental modal analysis, vibration testing, predictive maintenance, and the mechanical design of fluid systems. His machinery vibration test procedures won the Dresser Creativity Award, and his rotor bearing rub analysis method won the ASLE Hodson Award. He has authored and coauthored chapters for several technical books, and is coauthor of the book, *Centrifugal Pumps*, published by Oxford University Press.

Mr. Marscher has BSME and MSME degrees from Cornell University, where he was a NASA Fellow, and an M.S. degree from RPI.

SHORT COURSE 3
on
SHAFT SEAL DESIGN AND APPLICATION (ADVANCED)



Henri V. Azibert is the Chief Engineer of the Fluid Sealing Division of the A.W.Chesterton Company, in Groveland, Massachusetts. He is responsible for the design and development of mechanical seals and related products. He has 22 patents granted on mechanical seal designs and improvements. He has lectured extensively to maintenance engineers all over the world.

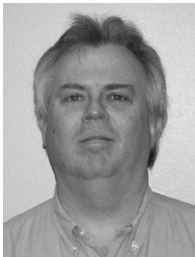
Mr. Azibert received a B.A. degree (Political Science) from the University of Massachusetts, a Jurisprudence Doctor degree from Boston College and a Masters degree (Mechanical Engineering) from Northeastern University.

Mr. Azibert maintains his standing in the Massachusetts Bar. He is a member of STLE, a member of the API 682 Task force, and the Chairman of the Standardization Task Group for the Fluid Sealing Association.



Joseph (Joe) Boylan is Vice President - Business Development at Morgan AM&T, in St. Marys, Pennsylvania. He has held several positions in his 17 years in the mechanical carbon industry, including Test Engineer, Manager of Manufacturing Engineering, Product Engineer, and Director of Application Engineering. Mr. Boylan has been responsible for the design, development, and marketing of the various carbon-graphite and silicon carbide materials. With the addition of the product testing responsibilities, he has an extensive background in the field of self-lubricating materials.

Mr. Boylan received his B.S. degree (Electrical Engineering, 1984) from the Pennsylvania State University. He is a member of SAE, SME, and STLE.



Bob Goodenberger is a Regional Engineer in the South Central Region of the United States for John Crane Inc., in Webster, Texas. As Regional Engineer, his job responsibilities include application engineering, onsite troubleshooting of sealing applications, and customer training and assistance in installation of seals for critical services. Prior to joining John Crane, he was a Rotating Equipment Engineer for a major refining company at a large integrated refinery and petrochemical company.

Mr. Goodenberger received his B.S. degree (Mechanical Engineering, 1980) from Northern Arizona University.



Michael B. Huebner is a Staff Engineer at Flowserve Corporation, Flow Solutions Division, in Deer Park, Texas. He has more than 20 years experience in the design of mechanical seals, centrifugal and positive displacement pumps, and fluid conditioning equipment. For Flowserve, he has served in design, testing, and application functions in both the U.S. and Europe.

Mr. Huebner is a member of the International Pump Users Symposium Advisory Committee and the API 682 Task Force. He received his B.S. degree (Engineering Technology) from Texas A&M University.



William E. (Bill) Key, is Manager of Research for the Fluid Sealing Division of Flowserve Corporation, in Temecula, California. Prior to joining Borg-Warner (Flowserve) in 1974, he held positions in North American Aviation and TRW Systems Group. He is responsible for development of new sealing technology and the generation of mathematical models of seal performance. Mr. Key is a member of STLE Seals Technical Committee and the Advanced Projects Subcommittee, and is a former Chairman of the STLE Seals Course. He is a lecturer in the International Pump Users Symposium Advanced Seals Course.

Mr. Key received his B.S. and M.S. degrees (Mechanical Engineering) from the University of California at Berkeley and did graduate work in Biophysics at the University of Western Ontario, Canada.



James R. (Jim) Wasser is the Product Engineering Manager with John Crane Mechanical Seals, located in Morton Grove, Illinois. Before John Crane, he worked as a Design Engineer at Magenta Corporation, a custom molder of thermoplastics. He is currently responsible for new product development in North America and has been with John Crane since 1986. Mr. Wasser holds six patents in the field of dry running seal technology and has written papers for the International Pump Users Symposium, STLE, and AICHEM.

Mr. Wasser received his B.S. degree (Mechanical Engineering, 1985) from Illinois State University.

SHORT COURSE 4
on
CENTRIFUGAL PUMP AND SYSTEM INTERACTION



Michael Volk is President of Volk & Associates, Inc., a consulting firm specializing in pumps and pump systems, in Oakland, California. Holding B.S. and M.S. degrees in Mechanical Engineering, Mr. Volk is a registered Professional Engineer in the State of California with over 25 years of practical pump experience. He is the author of *Pump Characteristics and Applications*, published by Marcel Dekker, New York, New York, now in its sixth printing. Prior to forming his own consulting firm in 1982, Mr. Volk had experience in pump system design with Bechtel Corporation, held various engineering and marketing positions with Goulds Pumps, and started up and managed a Goulds pump repair center in Houston, Texas. His consulting activities with Volk & Associates have included teaching hundreds of pump courses in the U.S. and a dozen other countries; assisting users and consultants with pump system design and specification development; and evaluating, troubleshooting, and testing installed pumps.

SHORT COURSE 5
on
PUMPING SYSTEM OPTIMIZATION



R. Barry Erickson is with ITT Industries, Fluid Technology Group, in Seneca Falls, New York. He has been involved in the pump industry for 25 years. His professional activities have included chairmanship of numerous Hydraulic Institute technical committees, ASME committees, and teaching as an Adjunct Assistant Professor at the University of Cincinnati.

Dr. Erickson received his Ph.D. (Mechanical Engineering, 1971) from the University of Cincinnati.



Judy E. Hodgson is a Pump Consultant in the Rotating Machinery Group in Engineering at DuPont, in Wilmington, Delaware. Her specialty is modeling and analyzing pumping systems. She has been a pump consultant since 1997. Prior to that, she had project, maintenance, and research and development assignments with DuPont.

Ms. Hodgson received her B.S. degree (Mechanical Engineering, 1991) from Penn State University.



Trey Walters founded Applied Flow Technology Corporation (AFT) in 1993, in Woodland Park, Colorado. He is currently the President and Director of Software Development. He is responsible for commercial software development of new and existing pipe system modeling products. Mr. Walters' development work at AFT has been in the areas of incompressible and compressible pipe flow, waterhammer, and pump system optimization. He is also involved in thermal/fluid system consulting and customer training. Previously he was a Research Engineer for Babcock & Wilcox in Alliance, Ohio, in steam/water system design, and a Senior Engineer with General Dynamics in San Diego, California, in cryogenic rocket design. He has 15 years of experience in thermal/fluid system engineering, and has published 11 papers.

Mr. Walters holds a BSME (1985) and MSME (1986), both from the University of California, Santa Barbara. He is a registered Professional Engineer in the State of California.

SHORT COURSE 6

on

POSITIVE DISPLACEMENT PUMPS



James R. (Jim) Brennan is Projects Manager for Imo Pump, in Monroe, North Carolina. His responsibilities include worldwide marketing and technical support for pumping applications. He has more than 30 years of service with Imo Industries. Engineering manager for five years, Mr. Brennan has spoken at a number of conferences worldwide and has published more than three dozen technical articles and papers.

Mr. Brennan is a 1973 graduate of Drexel University in Philadelphia and a member of the Society of Petroleum Engineers.



Steve A. Larson is a Professional Engineer at Cat Pumps Corporation, in Blaine, Minnesota. He is responsible for designing and troubleshooting complete water systems. He has worked his way up in the engineering department from the R&D test lab to a lead engineering position.

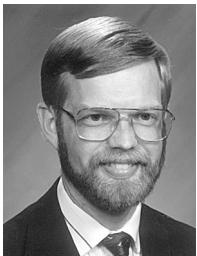
Mr. Larson graduated (Hydraulics and Pneumatics) from Alexandria Technical College. He then joined Cat Pumps and, at the same time, attended the Institute of Technology at the University of Minnesota. He graduated with a B.S. degree with Honors (Mechanical Engineering). Mr. Larson is a registered Professional Engineer in the State of Minnesota and has been with Cat Pumps for 17 years.



Lev Nelik is President of Pumping Machinery, in Bridgewater, New Jersey. He has over 20 years of engineering, manufacturing, sales, field, and management experience in the pump industry. He has previously worked at Liquiflo, Roper Pump, Ingersoll-Rand, and Goulds Pumps.

Dr. Nelik is a registered Professional Engineer and has published over 50 papers, including a pumps section for the *Encyclopedia of Chemical Technology*, a section for the *Handbook of Fluids Dynamics*, and a book *Centrifugal and Rotary Pumps: Fundamentals with Applications*.

Dr. Nelik is a member of the International Pump Users Symposium Advisory Committee, an Advisory Board Member of *Pumps & Systems* and *Pumping Technology* magazines, and a former Associate Technical Editor of the *Journal of Fluids Engineering*. He is a full member of ASME, and a Certified APICS (CIRM). He is a graduate of Lehigh University with an M.S. degree (Manufacturing Systems) and a Ph.D. degree (Mechanical Engineering).



John E. Petersen is Vice President, Technical Customer Service, for Viking Pump, Inc., in Cedar Falls, Iowa. His responsibilities include application, troubleshooting, and technical support for gear, lobe, and gerotor type rotary pumps. Previous responsibilities at Viking include Project Engineer, Chief Design Engineer, Chief Engineer-Research and Development, and Vice President, Engineering.

Mr. Petersen received his B.S. degree from Iowa State University (1970) and is a registered Professional Engineer in the State of Iowa. He is a member of the Hydraulic Institute and serves on the Rotary Pump Committee.



Lez Warren is a Director of Cat Pumps (U.K.) Limited, manufacturers of high pressure triplex pumps, in Hampshire, England. He runs their European Technical Centre and has been responsible for a number of unique developments within the high pressure pumping industry.

Mr. Warren graduated from Loughborough England with first class honors in Aeronautical Engineering. He then joined the British Ministry of Defence as an Aerospace Research Scientist, specializing in materials and heat transfer. He then worked for two specialist material suppliers before joining Cat Pumps some 26 years ago.

SHORT COURSE 7

on

MEETING EMISSION REGULATIONS WITH THE SCIENCE OF SEALING TECHNOLOGY



Terry Balmer is a Rotating Equipment Specialist for the Rohm & Haas Company, in Louisville, Kentucky. His responsibilities include providing technical support for the design, specification, installation, and startup of new rotating equipment; troubleshooting; upgrading bad actors; managing the Mechanical Seal & Pump Alliances; and developing and delivering rotating equipment training to operators, mechanics, and engineers. Additional responsibilities are developing and implementing rotating equipment standards, and Mr. Balmer serves as a member of the Corporate Process Development Network Team. During his 16-year career with Rohm & Haas, he has held positions as a mechanic, planner scheduler, and maintenance team manager of the predictive/preventive maintenance team.

Mr. Balmer holds journeyman millwright status through apprenticeship, is certified by the McNally Institute for Pumps and Mechanical Seals, and has earned a Manufacturing Reliability License from the University of Dayton's Center for Competitive Change. He also holds certificates of completion for pump and mechanical seal training.



K.M. (Michael) Bisbee is Principal Mechanical Engineer with Fluor, in Sugar Land, Texas. He has been with Fluor for two years. Prior to joining Fluor, he worked for Technip for two years and Parsons (S.I.P.) for 19 years. Before joining Parsons, he was with DeLaval in new equipment sales and in engineering with the Deltex facility. Mr. Bisbee is responsible for developing specifications, selecting equipment, reviewing drawings and testing, developing modifications, and performing field followup on many different types of rotating and associated equipment.

Mr. Bisbee is a graduate of Texas Tech University and holds B.S. and M.S. degrees (Industrial Engineering). He is a registered Professional Engineer in the State of Texas.



William A. (Alan) Evans is Manager of Engineering for the Mechanical Seal Division of A.W. Chesterton Company, in Stoneham, Massachusetts. During his eight years with the company, he has held several positions. He has spent 20 years in the field of rotating equipment, focusing primarily on pumps and turbomachinery. He gained broad experience as an end-user of rotating equipment during his 14 years as maintenance/reliability engineer in process industries. Mr. Evans' technological background and experience cover a wide range of topics, including tribology, machine design, predictive maintenance, and reliability engineering. He has conducted lectures, seminars, and presentations on improving reliability as it relates to pumps/seals and pumping systems. He has published articles for STLE, of which he is a member.

Mr. Evans received his MBA from Northeastern University and his BSME from Rochester Institute of Technology. He also has an Associates degree in Applied Science from Pennsylvania State University.



Michael B. Huebner is a Staff Engineer at Flowserve Corporation, Flow Solutions Division, in Deer Park, Texas. He has more than 20 years experience in the design of mechanical seals, centrifugal and positive displacement pumps, and fluid conditioning equipment. For Flowserve, he has served in design, testing, and application functions in both the U.S. and Europe.

Mr. Huebner is a member of the International Pump Users Symposium Advisory Committee and the API 682 Task Force. He received his B.S. degree (Engineering Technology) from Texas A&M University.



Kenneth R. (Ken) Laplant is with John Crane Inc. in Broomall, Pennsylvania. Mr. Laplant provides input on mechanical seal design, application, and problem solving as it applies to pumps and compressors. Mr. Laplant was formerly employed by Oxy Petrochemicals, Inc., before being a rotating equipment consultant where he worked on pump and seal applications. He was involved in troubleshooting, specification, repair, and upgrade of plant machinery. Mr. Laplant also took a special interest in optimizing pump and mechanical seal reliability. This involved implementation of new designs that made use of current technology resulting in improved equipment run times. He also has been involved in plant startups, turnarounds, and problem analysis while in the maintenance departments of three different plants.

Mr. Laplant has a B.S. degree (Mechanical Engineering, 1974) at the University of Vermont. He is a registered Professional Engineer in the State of Texas.

Jennifer J. Mouton works as a Senior Environmental Scientist in the Surveillance Division of the Louisiana Department of Environmental Quality. She is responsible for providing technical assistance to the Administrator and for providing guidance to the surveillance staff relative to air quality environmental matters. Ms. Mouton began her career as an air quality specialist with LDEQ 10 years ago. During her career, she conducted numerous air quality compliance inspections and complaint investigations. She also served as team leader on multiprogram major source inspections and has participated in joint federal and state compliance inspections. She has been a presenter at state, EPA, and industry workshops and conferences.

Ms. Mouton has a B.S. degree (Agronomy) and an M.S. degree (Environmental Science) from McNeese State University.



Anthony F. (Tony) Soby is a Senior Staff Engineer with Shell Global Solutions (US) Inc. He has more than 20 years experience in rotating equipment technical support, and is currently involved in the development of integrated condition monitoring systems and technical support to process plant locations within Shell Oil Products and Motiva Enterprises LLC. Mr. Soby has been a leader in the development of Corporate Condition Monitoring and Alarm and Shutdown Guidelines. Currently, he is leading an effort to implement online thermodynamic performance analysis for process compressors.

Mr. Soby has a B.S. degree (Fuel Technology) from Penn State University, and an MSME from the University of Cincinnati. He is a registered Professional Engineer in the State of California.

Dana Poppa Vermillion is a Technical Specialist in the Chemical New Source Review Section of the Air Permits Division, with Texas Natural Resource Conservation Commission, in Austin, Texas. She has been with the agency since 1989. In addition to her present position, she has served as a permit engineer, Project Leader, and Team Leader in the Chemical Section. Prior to joining the agency, she was employed for several years by a service company for the oil and gas industry.

Ms. Vermillion received her B.S. degree (Chemical Engineering, 1984) from Texas A&M University and is a registered Professional Engineer in the State of Texas.

SHORT COURSE 8
on
FUNDAMENTALS OF MIXING TECHNOLOGY



Bernd (Bernie) Gigas is Principal Research Engineer at LIGHTNIN, in Rochester, New York. Over the past 16 years he has held various positions in Process Engineering, Application Engineering, and Research & Development. His current research focus is on process and mechanical reliability improvements for mixers in high power, high volume gas-liquid-solid applications and process intensification.

Mr. Gigas earned a B.S. degree (Chemical Engineering) from the University of Rochester and has completed graduate work (Mechanical and Chemical Engineering) at Rochester Institute of Technology and the University of Rochester.
