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Couplings and Rotating Machines

Steven Pennington, Mark O'Neil,
Chuck Sakers, Ray Vollmer

john crane



UTC Aerospace
Systems



TEXAS A&M
UNIVERSITY



TURBOMACHINERY LABORATORY
TEXAS A&M ENGINEERING EXPERIMENT STATION

Steven Pennington

- Steven Pennington is the Global Engineering Coupling Manager at John Crane, he manages a team of design engineers in Manchester controlling product standards and research and development.
- Products are verified using FEA and the technology lab containing static and dynamic test rigs able to recreate steady and cyclic conditions.
- Steven has over 30 years of engineering experience in power transmission and rotating equipment.
- Steven has a Mechanical Engineering degree from Manchester University, he is a Chartered Mechanical Engineer of the Institution of Mechanical Engineers (IMechE)
- He is a member of the API 671 task force.



Mark O'Neil

- Director of Engineering Altra Couplings, including Ameridrives, Bibby Turboflex, Guardian, Huco, Lamiflex, and TB Woods
- 37 years experience in the Turbomachinery Industry.
- The 6 years with Terry Steam Turbines and 2 years with General Dynamics-Electric Boat, and Ameridrives/Altra for 19 years of the last 28 years
- Graduated BS Mechanical Engineering from the University of Rhode Island, an M.S. degree (Mechanical Engineering) from Rensselaer Polytechnic Institute and an MBA from Pennsylvania State University.
- Member of API 671 Coupling committee since 1991
- Member of API 611 GP Steam Turbine committee since 2016
- Presented several papers and regular Discussion Group Leader at Texas A&M Turbo Machinery Symposium



Chuck Sakers

- Chuck Sakers is the Couplings Technology Leader for Kop-Flex, a Regal Power Transmission Solutions brand.
- During his 22 years in the coupling business, Chuck has led global engineering teams focused on design of new products, advanced analysis, as well as proposal and order execution.
- Chuck graduated from the University of Maryland: College Park with a degree in Mechanical Engineering.
- He is a member of the API 671 task force.



Ray Vollmer

- Ray Vollmer is the Design Engineering Supervisor for the industrial couplings group at UTC Aerospace Systems in Rome, NY
- Ray has been a member of the industrial couplings team at UTC Aerospace Systems for 10 years, responsible for design and analysis of diaphragm couplings and research and development activities
- Ray has a Mechanical Engineering degree and MBA from Clarkson University
- Ray is a member of the API 671 task force



Abstract

This course covers the design and application of high performance couplings and rotating machines. Initially the Turbomachinery driver and driven machines are analysed together with their characteristics and how they affect the coupling. The various types of coupling in the market are covered next, including metal membranes and diaphragms and how these characteristics are utilised. Selection is reviewed next and how this affects the coupling design, including shaft end, balancing and materials. The oil and gas requirement to API671 are investigated and which coupling attributes are important. The course concludes with Installation and failure analysis and reviews the main factors affecting failures from misalignment through to torsional vibrations.

