

PLANT VIBRATION FUNDAMENTALS & SOLUTION DEVELOPMENT, PROVIDED BY STRUCTURAL INTEGRITY ASSOCIATES

CLASSROOM INSTRUCTORS

Andrew Crompton

P.E. (B.S. Mechanical Engineering, South Dakota School of Mines and Technology) has worked for Structural Integrity Associates since May of 2007. He has participated in various projects addressing nuclear power plant issues. Mr. Crompton has performed several engineering evaluations related to Thinning Handbooks, Pressure/Temperature Operating Curves, ASME Section III 3200 and 3600, design of a dissimilar metal weld overlays, B31.1 piping, vibration condition assessments, and development of Class 1 and Class 2/3 vibration acceptance criteria. He has managed installations for measuring vibration and corrosion at Hydro, Fossil, and Nuclear and is a Project Management Professional (PMP) and registered professional engineer (PE).

Mark Jaeger

P.E. (B.S. Mechanical Engineering, South Dakota School of Mines and Technology) has 10 years of experience assessing and mitigating issues related to vibration and other forms of cyclic loading. He is an expert at applying state-of-the-art instrumentation and analysis techniques to resolve a variety of challenging problems, such as flow-induced vibration (FIV) of piping, valve chattering, pump/motor/structure resonance, and branch line failures. He routinely supports customers with highly-visible, time-sensitive projects, ranging from operability evaluations to litigation support. (see p.3 for highlights of information related to their Accreditations/Industry Leadership).

CONTACT INFORMATION

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INTENDED AUDIENCE

Design engineers, system engineers, maintenance engineers, project engineers and predictive maintenance personnel who seek a comprehensive understanding of vibration principles and practical knowledge for solving vibration-related failures in the field



TYPE

Classroom Training



DURATION

Two and a half days (18 DH)

LEARNING OBJECTIVES

Resolution of problems related to vibration and other forms of high-cycle loading can be extremely challenging. Issues can appear without warning, often in unexpected places, and require immediate response. Problems can originate due to acute changes, such as varied operating states, system alignment(s), and component replacement(s), or on account of occasional exposure to atypical yet damage-inducing conditions. The mechanisms which drive vibration failures are not always well understood and are not covered within standard engineering academic curricula or in typical rotating equipment vibration training courses.

Structural Integrity can help by offering plant employees an introduction to vibration solutions through this course. Training is provided in an interactive, hands-on manner, using actual case studies and live demonstrations to reinforce basic vibration principles and encourage retention of advanced concepts. This course ties in concepts of structural dynamics, stress analysis, applied mechanics/materials, and instrumentation and testing to develop a comprehensive understanding of vibration mechanisms and equip students to solve vibration problems in the field.

Structural Integrity's vibration engineers have years of experience marrying instrumentation and testing services to core engineering capabilities such as structural dynamics, stress analysis of piping and components, and applied mechanics/materials science. We work on projects ranging from single-component failures (bearings, branch lines, etc.), to general vibration assessment (T-G sets, fans, piping systems, etc.), to large-scale, distributed monitoring nodes with sensors characterizing system responses.

This course provides the student with an integrated approach to solving real-world problems.

Topics Covered:

- Basic vibration theory and fundamentals
- Common vibration problems
- Significant Industry Events (OE)
- Testing and Data Analysis
- Vibration problem resolution process
- Introduction to Dynamic Piping Analysis
- Industry Guidance Review
- Applicable industry and regulatory guidance
- Piping vibration mitigation strategies
- Working Case Study

KEY INDUSTRY DOCUMENTS

- INPO IER 14-30, Analysis of Vibration -Induced Piping and Tubing leaks
- Materials Reliability Program: Fatigue Management Handbook (MRP-235, Revision 2)
- ASME OM-S/G, Standards and Guides for Operation and Maintenance of Nuclear Power Plants, an American National Standard - Part 3: Vibration Testing of Piping Systems

OTHER RELATED INFORMATION

Larry Nottingham

- Accreditations/Industry Leadership:
 - Authored and co-authored multiple technical papers for EPRI and ASME Pressure Vessels and Piping Conferences

Mark Jaeger, P.E.

- Accreditations/Industry Leadership:
 - Authored and co-authored multiple technical papers for EPRI and ASME Pressure Vessels and Piping Conferences