2025 EQUITY SYMPOSIUM

THE WOODLANDS, TX JANUARY 28-29

Program Overview

Agenda is subject to change without notice.

TUESDAY, JANUARY 28

7:30AM — **Registration Opens and Breakfast**

8:00AM – 8:15AM — **Welcome and Introductions**

Phil Prueter, P.E.

8:15AM – 9:10AM — **Keynote Session - You on Your Best Day**

Michael Allosso, Guest Speaker, You On Your Best Day, Inc.

An energetic journey through leadership and self-awareness.

9:10AM – 9:40AM — **The Equity Engineering Group and Industry Trends: Past, Present, and Future**

David Osage, P.E.

In this presentation, David Osage will describe the evolution of Equity Engineering, from its inception over 20 years ago to becoming a technology-driven leader across the oil and gas, chemical, fertilizer, and power generation industries. Observations relating to pressure equipment lifecycle management trends and developments in industry codes and standards over this timeframe will also be offered. Additionally, a discussion on evolving energy demands and the future of the energy sector will be provided.

9:40AM – 9:50AM — **BREAK**

9:50AM – 10:30AM — **How Our Inspection Programs Have Historically Missed the Mark and Often Still Do**

Brian Jack

This presentation will discuss how plant inspection programs have progressed from a compliance-based focus with mediocre reliability results to an excellence-based focus with good reliability results in terms of low leaks, improved uptime, and low LPO. Excellence-based inspection requires an intimate knowledge of plant damage mechanisms, and implementation of integrity operating windows (IOWs). Development of corrosion control documents (CCDs) is often a good starting point for an excellence-based program. Numerous examples will be provided showing the pitfalls of compliance-based programs and the benefits of excellence-based programs.

Agenda is subject to change without notice.

TUESDAY, JANUARY 28

10:30AM – 11:10AM

Managing Safety Gaps in Codes and Standards

Jim Sowinski, P.E.

Recognized and Generally Accepted Good Engineering Practices (RAGAGEP) are the basis for engineering, operation, or maintenance, activities and are themselves based on established codes, standards, published technical reports or recommended practices or similar documents. RAGAGEP detail generally approved ways to perform specific engineering, inspection, or mechanical integrity activities, such as fabricating a vessel, inspecting a storage tank, or servicing a relief valve. RAGAGEP evolve with the advancement of new technology, the development of improved methods, and in unfortunate cases, in response to an incident or failure. Owner-operators are continuously challenged with closing the gap between rules and regulations and RAGAGEP while managing fixed equipment designed to outdated Codes and Standards. Given the natural evolution of RAGAGEP this results in a moving target in which there can be tremendous benefit of staying one step ahead. This presentation will review these considerations and provide a case study related to a Code deficiency with air cooler design in accordance with ASME Boiler & Pressure Vessel Code Section VIII Division 1 (ASME VIII-1) Mandatory Appendix 13. The upcoming revisions to ASME VIII-1 and ASME VIII-2 will be discussed in addition to the equipment management and risk considerations from the owner's perspective.

11:10AM – 11:50AM

API 579 Part 15 – An Overview of Piping Vibration Screening Methods

Tom Calko, P.E. and Mike Bifano, Ph.D., P.E.

API 579 Part 15, which has now been approved for publication, addresses limitations with legacy approaches to evaluating the severity of piping vibration and provides a comprehensive and tiered assessment approach with increasing degrees of complexity. Similar to all other parts of API 579, the Level 1 through 3 approach is designed for use by everyone from inspectors and vibration technicians to engineers skilled in this technical discipline. The new part provides methods for determining allowable vibration limits for various piping geometries. It also discusses best practices for vibration measurement and methods for categorizing vibration signals. This presentation reviews the content of API 579 Part 15, including how it can be used to improve facility pipe integrity programs.

11:50AM – 12:30PM

LUNCH

12:30PM – 1:10PM

Instrumentation and Control Systems Reliability and Maintenance Best Practices

Rohan Oak, P.E.

The reliability and maintenance of instrumentation and control (I&C) systems are vital to ensure safe, efficient, and uninterrupted operations. Instrumentation and control systems include sensors, logic solvers, and final elements. These components are essential for monitoring and regulating process conditions. A robust and cost-effective reliability and maintenance program for these components is critical to preventing failures that could result in operational downtime, safety hazards, and environmental risks without incurring excessive maintenance expenses. This presentation highlights the key steps for an effective reliability and maintenance program for I&C systems. These steps include criticality assessment; development of maintenance strategies such as corrective maintenance, preventive maintenance, and predictive maintenance; assignment of maintenance strategies; and continuous improvement.

1:10PM – 1:50PM

Ongoing Technology Developments in the Fitness-for-Service (API 579) Joint Committee

Brian Macejko, P.E.

Fitness-for-Service (FFS) technology has significantly evolved since the initial publication of API RP 579 in 2000. With each subsequent edition of the document, there have been significant upgrades to existing technology as well as the introduction of new technology that has proven to provide tremendous value to owner-operators by providing a safe and justifiable means to extend equipment life and optimize mechanical integrity decisions. The API/ASME Fitness-for-Service Joint Committee (FFSJC) is committed to continuing that mission. This presentation will provide an overview of what to expect in the next publication of API 579-1/ASME FFS-1 (API 579) as well as the ongoing activities within the FFSJC that will affect future editions of the international code.

1:50PM – 2:30PM

From Process Safety Management to Pressure Relief Devices – Do We Ever Connect the Two?

Nick Plentovich

Two groups within a processing plant rarely interact, but each has a vested interest in the reliability of pressure relief devices. The PSM group performs process hazards analyses (PHAs) to determine the required safeguards a process needs to meet the company's risk target. A major safeguard for reducing risk is the pressure relief device (PRD), and the PSM group makes critical decisions based on an assumed failure rate for the PRD. The Reliability department, or specifically the Inspection department, is responsible for mechanical integrity of PRDs to ensure that reliability is maintained through a rigorous testing and inspection program. But what testing/inspection frequency should the Inspection department use in order to meet the failure rates assumed by the PSM group during the PHA? This presentation will explore a 2-step approach to setting PRD inspection intervals, which incorporates a simple probability of failure on demand (POFOD) method coupled with quantitative RBI that meets PSM requirements and provides a nice balance between benefits and the resources needed to implement.

2:30PM – 2:40PM

BREAK

2:40PM – 3:20PM

Exploring the Effects of Piping Support Activity on Rotating Equipment Code Compliance

Donald Brown, Ph.D., Daniel Spring, Ph.D., and Kraig Shipley, P.E.

Rotating equipment is sensitive to piping loads, as excessive loads can cause coupling and seal failures. Piping must be designed with sufficient flexibility and suitable restraint to maintain loads to within specified limits on equipment nozzles, under all operating conditions. When modeling pump piping systems, it is important to properly model friction for both accuracy and algorithmic stability. Further, it is critical to capture the activity of the restraints, as different operating conditions and thermal gradients are considered. In fact, there is an interplay between friction and restraint activity as friction may activate or deactivate restraints. In this presentation, restraint activity and friction effects on equipment nozzle loads and their resulting code compliance will be investigated and outlined. A discussion on how friction is modeled in several popular pipe stress analysis software packages will also be offered.

Agenda is subject to change without notice.

TUESDAY, JANUARY 28

3:20PM – 4:00PM

Plant Stories – Leveraging Fitness-for-Service in Asset Integrity Management

Rob Clarke, CorrSolutions, and Kevin LoCascio, P.E.

The presentation will allow the audience to hear practical feedback and insight from reliability and maintenance experts who have hands-on plant experience. Specifically, hear from the perspective of Inspection and Maintenance, Site Engineering, and Corporate Engineering regarding the type of processes they have seen and used to communicate, track, and manage fitness-for-service assessments as they travel from the inspection data management system to the engineering office and back. Stories reflecting real-life trials and tribulations relating to asset integrity management and actionable ideas on best practices will be provided.

4:00PM – 4:40PM

A Case Study of WRC 452 Local Post-Weld Heat Treatment Procedures

Joan Wood, Dan McArthur, Ph.D., P.Eng., and Phil Prueter, P.E.

Current industry practice for local post-weld heat treatment (PWHT) relies heavily on the guidance contained within WRC Bulletin 452 – “Recommended Practices for Local Heating of Welds in Pressure Vessels.” These procedures have been used with good success for multiple decades and are generally regarded as “unofficial” code. However, compliance with the WRC 452 guidelines does not guarantee a sufficient reduction in the weld residual stress field. Application of the WRC 452 guidelines may induce further residual stresses over and above the baseline residual stress field from welding. The objective of this presentation is to determine the final residual stress field of an insert patch designed per ASME PCC-2 from direct application of WRC 452 as well as develop recommendations for minimization of the net residual stresses. Additionally, a summary of recent updates to WRC 452 and other industry trends in PWHT practices will be offered.

4:40PM – 4:50PM

Day One Symposium Wrap-Up

6:00PM

Networking Reception, RSVP Required

Agenda is subject to change without notice.

WEDNESDAY, JANUARY 29

7:30AM — **Registration and Breakfast**

8:00AM – 8:40AM — **Small-Bore Connection Vibration: Effective Approaches for Developing Proactive Inspection Programs**

Reina Hasumi, P.Eng. and Mike Bifano, Ph.D., P.E.

Equity Engineering has partnered with multiple clients on developing and executing initiatives for proactive inspection and remediation of small-bore connection vibration risks. Such initiatives include scope development, project planning, qualitative inspection and identification of risks, relative risk ranking of findings, quantitative screening and triage using the upcoming API 579 Part 15 Level 1 and 2 screening assessments, and development of mitigation plans. This presentation shares recommended approaches and lessons learned to complete similar initiatives, as well as case studies showing their effectiveness.

8:40AM – 9:20AM — **Materials and Corrosion Considerations for Renewable Diesel Units and Industry Trends in Biofuels**

Chris Aguayo and Nate Sutton, P.E.

The presentation will discuss industry trends in renewable diesel fuel, including hydroprocessing unit conversions. A discussion on contaminants in biofuel feedstocks, including feed quality and degradation, and the corresponding implications on equipment damage mechanisms, fuel storage, and pretreatment considerations will be provided. Good engineering practices relating to re-using existing hydroprocessing equipment for biofuel applications will also be offered.

9:20AM – 10:00AM — **Tips, Tricks, and Best Practices to Expedite and Maximize the Value of Fitness-for-Service Assessments**

Anthony Feller and Steph Dux

FFS technology is used to optimize run, repair, or replace decisions for equipment containing flaws or defects. API 579-1/ASME FFS-1 (API 579) is the international code that provides Level 1, Level 2, and Level 3 FFS procedures to assess various damage mechanisms. This presentation will provide the novice or intermediate experienced FFS practitioner an overview of various tips, tricks, and best practices to expedite and maximize the value of FFS assessments. Case study examples will be presented to demonstrate the benefits of knowing when and how to leverage these tools. Topics that will be covered include, but are not limited to when and how to justify less limiting allowable stress criterion, benefits of employing alternative design-by-rule procedures, damage characterization best practices, assumptions to simplify or expedite assessments, and benefits of proactive FFS activities.

10:00AM – 10:10AM — **BREAK**

Agenda is subject to change without notice.

WEDNESDAY, JANUARY 29

10:10AM – 10:50AM

Developments in Aboveground Storage Tank Engineering Solutions

Derek Slovenec, Ph.D., P.E.

Aboveground storage tank (AST) engineers must contend with an ever-evolving landscape of operational requirements, environmental loads, inspection technologies, and industry best practices to achieve reliability goals. These dynamic factors affect all phases of AST lifecycle management, and proper foresight is needed to beneficially leverage the coming changes. This presentation will use real-world case studies to illustrate the motivation and impact of relevant code changes, as well as highlight proposed advancements in AST FFS methodologies. Updated ASCE 7 load procedures affecting tanks will be discussed in detail, including snow, seismic, wind, and (newly added) tornado loads. Opportunities for technology advancement in the areas of hydrostatic test exemption and Level 3 FFS assessment will be showcased alongside committee progress reports. The goal of this discussion is to empower engineers and decision stakeholders alike to extend storage tank service life and reduce risk by illuminating what lies ahead in the world of storage tanks.

10:50AM – 11:30AM

Leveraging Recent Advancements in Brittle Fracture Technology to Optimize Equipment Pressurization Limits

Brian Macejko, P.E., Antonio Seijas (Phillip 66), and Luis Ganhao (Motiva)

The 2021 edition of API 579-1/ASME FFS-1 (API 579) included several significant technology enhancements to Part 9 Assessment of Crack-like Flaws. These enhancements can be employed in a fracture mechanics-based approach to optimize minimum allowable temperature (MAT) or minimum pressurization temperature (MPT) limits even for equipment subject to toughness degradation mechanisms such as temper embrittlement or hydrogen embrittlement. Optimization of equipment MAT/MPT limits may result in faster unit start-ups and shutdowns without compromising safety. This presentation will provide a summary of the recent modifications to API 579 Part 9 (and its associated annexes) and will provide insight into future procedural updates that the Fitness-for-Service Joint Committee (FFSJC) is considering. Lastly, the presentation will include several case study examples demonstrating implementation of the API 579 procedures to establish MAT/MPT limits for various equipment, including heavy wall hydroprocessing reactors.

11:30AM – 12:10PM

High-Temperature Creep Assessment Methodology and Case Studies

Kevin Haley, P.E. and Raj Patadia, P.E.

FFS assessment of components operating at elevated temperatures in the creep regime can pose several challenges. The results of any assessment are highly sensitive to the key analysis inputs – stress, temperature, time, and material properties. Unfortunately, many times, historical operating process data is required to accurately capture these inputs, and the end results when using conservative assumptions versus accurate inputs are often the difference between predicting component end of life or predicting significantly longer allowable time in service, respectively. This presentation will discuss approaches for performing creep rupture life analysis, addressing critical data requirements, and evaluating the sensitivity to analysis inputs. Additionally, methods to refine input data, as well as alternative analysis methods, from closed-form calculations to detailed inelastic finite element analysis, will be provided. Case studies will be presented to highlight each end of the analytical spectrum, and commentary on the value of performing physical creep tests on ex-service fired heater tube or other component samples will be offered.

12:10PM – 12:50PM **LUNCH**

Agenda is subject to change without notice.

WEDNESDAY, JANUARY 29

12:50PM – 1:30PM

Industry Trends in Low-Temperature Hydrogen Damage Inspection and Assessment Methods

Phil Prueter, P.E., Kevin Haley, P.E., and Brian Macejko, P.E.

This presentation will provide an overview of low-temperature hydrogen damage mechanisms, including wet H_2S-driven cracking and hydrogen embrittlement. Additionally, API 579-1/ASME FFS-1 (API 579) Part 7 provides assessment procedures to evaluate equipment that is susceptible to low-temperature hydrogen damage. Although volumetric inspection capabilities have significantly evolved since the introduction of FFS procedures in the 2000 and 2007 Editions of API 579, the damage characterization rules and FFS assessment procedures have remained largely unchanged. The purpose of this presentation is to facilitate an open discussion where owner-operators can provide feedback on challenges and successes associated with hydrogen damage characterization, lessons learned for data collection, data processing, and damage mitigation approaches. Feedback received from this discussion may also be used to identify opportunities for improvement for the existing low-temperature hydrogen damage FFS rules. Audience participation and knowledge sharing are encouraged.

1:30PM – 2:10PM

Electromagnetic Interference Between Overhead Power Lines and Pipelines

Kristi Brooks, P.E.

This presentation explores the electromagnetic interference (EMI) issues that arise between overhead power lines and adjacent oil & gas pipelines, with a focus on the mechanisms of inductive coupling, conductive coupling, and capacitive coupling. These interactions can have significant impacts on the integrity of pipelines, leading to potential metal loss and increased risk of leakage due to alternating current (AC) corrosion. Inductive coupling occurs when varying magnetic fields generated by overhead power lines induce currents in nearby pipelines, potentially leading to elevated voltages that accelerate corrosion processes. Conductive coupling arises when there is direct electrical contact between the power line grounding system and the pipeline, further exacerbating corrosion risks. Capacitive coupling contributes to the problem by allowing voltage transfer between the power line and pipeline through the air, even without direct contact. This discussion will highlight how these forms of EMI can lead to localized corrosion, which compromises the structural integrity of pipelines. It also examines the conditions under which AC corrosion is most likely to occur. The findings highlight the importance of understanding and managing EMI to ensure the long-term safety and reliability of oil & gas infrastructure.

2:10PM – 2:50PM

Designing Pressure Relief Systems for Heat Exchanger Tube Ruptures

Phil Henry, P.E.

When designing pressure relieving systems for heat exchangers, the potential for internal tube failure needs to be considered, particularly if there is a significant difference in design pressure between the shell-side and tube-side of the exchanger. As per API STD 521, Pressure Relieving and Depressuring Systems, if the operational pressure on one side exceeds the corrected hydrostatic pressure of the other side, it is necessary to size the overpressure protection system of the low-pressure side considering the possibility of a tube rupture scenario. Sizing for the tube rupture scenario leads to increased costs, whether it involves a new design or retrofitting existing systems. However, API 521 permits users to consider the tube rupture scenario as non-credible following a comprehensive assessment of the heat exchanger, known as the tube rupture credibility assessment (TRCA). This assessment encompasses various critical aspects related to the potential of tubes to withstand an instant full-bore rupture, such as vibration phenomena, required wall thickness, susceptibility to erosion, corrosion, or credible degradation mechanisms. Often, the TRCA results indicate that implementing a tube inspection program is a fundamental measure to mitigate and address damage mechanisms that could lead to a sudden tube break.

2:50PM – 3:00PM

Symposium Closing Thoughts

2025 EQUITY PRACTICES USER GROUP JANUARY 29-30

START

Agenda is subject to change without notice.

WEDNESDAY, JANUARY 29

3:00PM – 3:10PM **BREAK**

3:10PM – 3:30PM **Overview and Evolution of the Equity Engineering Practices**

Joel Andreani, P.E. and Susie Symanski

3:30PM – 4:10PM **Recent ASME Section VIII Code Updates and How They Influence Engineering Practices**

Jim Sowinski, P.E.

This presentation will provide updates on recent developments and revisions affecting the ASME Boiler & Pressure Vessel Code. Specifically, the basis behind enhancements to Section VIII Divisions 1 and 2 will be summarized, and the resulting impact on engineering best practice documents and pressure equipment design approaches will be described.

4:10PM – 4:50PM **Leveraging Artificial Intelligence in Engineering Best Practices**

Joel Andreani, P.E. and Tom Seffernick

Artificial intelligence is an emerging technology that is being leveraged across the energy sector. This presentation will show how artificial intelligence can be leveraged to efficiently utilize the valuable technical content contained in Engineering Best Practice documents. This technology can dramatically improve the ease of access to vast amounts of information relating to design, construction, maintenance, and reliability of plant equipment.

TECHNOLOGY FORWARD
+1.216.283.9519 // Sales@E2G.com // www.E2G.com
The Equity Engineering Group, Inc.