

Tuesday May 21

Professional Development Seminars

All sessions take place at the Orlando World Marriott.

Tuesday, May 21, 2013 – 8:30 am to 5:00 pm

What a Reliability Engineer Needs to Know

John Reynolds, Intertek/Moody

Bill Barto, Life Cycle Engineering

Hurlel Elliott, Exxon Mobil Chemical Company

The seminar will begin with fixed equipment reliability/integrity issues covering:

- An overview of what's important in Fixed Equipment Integrity and Reliability (FEI&R)
- An exposure to the huge Body of Knowledge (BOK) for FEI&R (breadth and depth)
- An understanding of the FEI&R Layers of Protection (LOP) needed to prevent fixed equipment failures
- An exposure to and understanding of the wide variety of FEI&R industry codes and standards available to help you in your job
- An appreciation of the fact that effective FEI&R management systems and work practices are vital to FEI&R long term success and sustainability
- An exposure to the top ten FEI&R management systems and the 101 supporting sub-systems
- Some case studies in FEI&R failures

The second part of the seminar will discuss:

The term "Reliability" means different things to different *engineering job functions*; however all can agree that it basically means equipment dependability. Think of the following examples:

- One *engineering job function* defines 'Reliability Engineering' principle as knowing, when, how the equipment fails, and frequency of failure so that statistical/quantitative analysis can be performed to be able to predict the next failure. However, the question is 'why not ensure Equipment Reliability long before the 1st failure?'
- Another *engineering job function* might look at 'Reliability' as setting up the best-in-class maintenance program, sometimes called a 'Reliability Program', yet you, the hard-pressed equipment user, continues to be confronted with repeat failures of pumps, compressors, gearboxes, and whatever. Again we can question 'should there not be a process that can ensure long-term Dependability/Reliability of equipment?'

Topics included

- Lubricant selection
- Lubricant application
- Lubricant preservation (cleanliness)

Machines included:

- Reciprocating compressors
- Turbo-machines compressors and steam turbines)
- Gear speed reducers and speed increasers
- Process pumps

The session will conclude with a presentation discussing Reliability engineering. Reliability engineering has the capacity to exert significant influence over all stages of an asset's life. Ignoring this "cradle-to-grave" approach and focusing only on one or two phases can lead to missed opportunities and a negative impact to your company's value stream. This portion of the workshop will introduce novice reliability engineers to asset management and define their role in bringing value to their company. The facilitator will present some of the most widely used reliability tools and demonstrate the appropriate application in order to ensure the lowest life cycle cost possible.

Tuesday, May 21, 2013 – 9:00 am to 5:00 pm

Using API Standards for Life-Cycle Management of Fixed Equipment: Overview and Background on API 571, 579, 580 and API 581

Dave Osage, The Equity Engineering Group

Owner-users of pressurized equipment including pressure vessels, piping, and tankage are becoming increasingly interested in life-cycle management of equipment to enhance reliability and availability. The fundamental requirements of a life-cycle management process for fixed pressurized equipment are:

- the understanding and consideration of potential damage mechanisms in the design process,
- the selection of appropriate construction codes to ensure reliable designs,
- to establish in-service inspection programs to monitor both anticipated damage and determine the presence of unanticipated damage mechanisms,
- the application of fitness-for-service technology if unanticipated damage is discovered, and
- implementation of effective repair procedures, as required, to ensure mechanical integrity of in-service equipment.

In this context, anticipated damage is damage expected in-service based on the operating conditions, service environment and materials of construction, e.g. corrosion that is accounted for in the design process using a corrosion allowance. Unanticipated damage is typically associated with a change service environment that may lead to accelerated corrosion, erosion, pitting, blisters, and/or cracking.

Course attendees will be introduced to a life-cycle management process showing the inter-relationships between ASME and API Codes and Standards. In addition, attendees will be provided insight into the technology integration between construction codes, in-service codes and standards for inspection and fitness-for-service that is a necessary element for establishing a successful life-cycle management program.

Tuesday, May 21, 2013 – 9:00 am to 5:00 pm

Medium Voltage Adjustable Speed Drives: From The Fundamentals To A Case Study And Everything In Between

Manish Verma, James Nanney, TMEIC

Adjustable speeds drives (ASD) are being applied in virtually every aspect of the Oil & Gas industry. The fundamental characteristic of the ASD to regulate speed of the electric motor enables the process to be regulated without the need to mechanical equipment. However, the application of these electric drive systems is often misunderstood which could jeopardize the reliability of the entire system. This one-day

seminar will educate the plant engineer on how to apply medium voltage drives and motors correctly for their application which leads to very high system reliability. The facilitator will review basic electrical concepts on power systems, motors, adjustable speed drives, evolution and transformers. The pros and cons of an ASD system and why they are so commonly used will be reviewed.

Applying adjustable speed drives and motors for various applications including constant torque and variable torque applications will be discussed. Key aspects of how an ASD/motor and overall design affect the reliability and maintainability of the installed system over its entire life cycle will be addressed.

The seminar will conclude by giving tips on how to specify adjustable speed drives and motors to ensure the most reliable installation with the minimum first cost. Finally, a case study on how obsolescence of equipment can lead to uncertain operation of the equipment and what options are available in the market to enhance the reliability of the VFD (variable frequency device) will be presented. The ASD's discussed will be >1000V and 1000HP.

Tuesday, May 21, 2013 – 9:00 am to 5:00 pm

Valves, Actuators and Controls 101

Greg Johnson, United Valve

Ed Holtgraver, QTRCO

Presented under the auspices of the Valve Manufacturers Association (VMA), Valves & Actuators 101 is a great way to jump-start your career and expand your knowledge of industrial valves, actuators and controls.

We begin with a broad overview of the valve industry, the major valve and actuator types, and various end-user applications. Our introduction includes valve standards, basic piping information, pressure ratings and classes, as well as application issues that are critical to effective valve specification and usage. Then, we review multi-turn valve types—gate and globe valves—along with stems, bonnets and other components. We move on to describe the unique qualities of check valves and explain why correct sizing is so very important. We progress up the valve chain to a discussion of the more complex quarter-turn valve types, including plug, ball and butterfly. Also on the agenda are pressure-relief valves—so critical to plant safety.

The actuator lesson begins with a description of the various actions, such as linear, rotary, etc., that are used to operate the various valves discussed in earlier lessons, and the various actuator types that provide these actions. We also explain electric actuators and associated controls. Last up is a discussion of different control valve types and what they do. Typical control valve components are identified, as are linear valves, actuators and positioners, along with sizing and control valve diagnostics.

Tuesday, May 21, 2013 –5:00 pm to 6:00 pm

Ethics and Excellence for Engineers

Valero Energy Corporation

The ethics workshop will review engineers' roles and responsibilities in applying professional engineering ethics to their professional conduct. The discussion will begin with a definition of ethics and then discuss situations where ethics are brought to bear. This workshop is intended to provide the training needed to maintain a professional engineer's license in those states that require one hour of training per renewal period.