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Client Site Gasket, Flange Assembly and Flange Design Training Programs

A bolted joint is comprised of flanges, bolts and a gasket. All three components must be designed, selected, fabricated and installed properly in order for the bolted joint to provide satisfactory performance. A recent **Six Sigma** Greenbelt project conducted by VSP Technologies, Inc. has identified **Gasket Specification, Craftsman Knowledge of Materials, and Installation** as the three most significant gasket-use process variables that must be controlled in order to ensure safe, reliable and repeatable performance of bolted, flanged connections. After working with client engineering, maintenance and purchasing staff to update their gasket specifications, VSP Technologies strongly encourages site maintenance personnel and Area, Mechanical Integrity and Reliability engineers attend one or more of the following training courses:

#1) Site Gasket Materials

An interactive, practical review of the current site gasket materials and standards with emphasis on their identification, handling and use characteristics, performance limitations and failure mode, recognition and avoidance. The class duration is typically one hour, depending upon the number of gasket materials in use at the site.

This course was developed for Maintenance, Planning and Engineering personnel.

#2) Fasteners, Torque and Flange Assembly Best-Practices

An informative, hands-on class which, through demonstrations and practical examples, teaches important concepts of fasteners, torque, and flange assembly. The use of special test fixtures and equipment including Skidmore Load Tension Testers and a Strain Gauged Flange Fixture result in very meaningful, eye opening examples with long lasting impact on the attendees. The class duration is typically 1-1/2 hours, and addresses the following topics:

Bolt/Fastener Identification and Head Markings - **Demonstration**

Bolt Strength (Yield, Tensile, Ultimate) - **Demonstration**

Bolting Materials (Stainless, Alloy, Carbon Steel)

Bolt Loads:

-Torque Relationship - **Demonstration**

-Effect of Thread and Nut Lubrication - **Demonstration**

-Effect of Nut and/or Bolt Re-Use - **Demonstration**

Flange/Component Assembly:

-Flange Alignment and Surface Condition

-Flange Assembly

Effect of (Improper) Single Pass Bolt Loading - **Demonstration**

Comparative Performance of Star Pattern Bolt Loading - **Demonstration**

Force x Distance (Torque Estimate) Assembly - **Demonstration**

This course was developed for Maintenance and Planning personnel.

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#3) Bolted Flange Connection Engineering and Potential Pitfalls (2 PDHs)

A review of the ASME design rules for flanged connections and pipe flanges including an in-depth understanding of the caveats that contribute to many of the sealing and reliability issues with pressure vessel flanges. Subtitled- "What You Didn't Learn In College," this training session presents a fundamental review of real-world experiences and understanding of:

- Flange Design & Selection
- Gasket Materials
- Pressure Vessel Fasteners
- Assembly Bolt Torque Calculation Methods
- Assembly

The class duration is typically 1-1/2 hours, depending upon the questions and application discussions that arise.

This course was developed for Engineering personnel.

The cost for these seminars is shown below. VSP TECHNOLOGIES strongly encourages a maximum class size of (15) people.

Site Gasket Materials - \$475

Fasteners, Torque and Flange Assembly Best-Practices - \$850.

Combined "Site Gasket Materials" & "Fasteners, Torque and Flange Assembly Best-Practices"- \$1,200

Bolted Flanged Connection Engineering and Potential Pitfalls-\$950

These training courses are offered free of charge to clients participating in VSP's Comprehensive Fluid Sealing Management Program.

Instructors:

VSP Technologies' technical personnel are internationally recognized Bolted Flanged Connection experts with active involvement in a number of Technical and Standards committees including:

- Pressure Vessel Research Council (PVRC)
 - o S/C Bolted Flanged Connections
- Association of American Railroads (AAR)
 - o TG Flange Assembly
- ASTM
 - o Committee F-3 Gaskets
- ASME
 - o B16 S/C Gaskets
 - o Post Construction Committee, S/C Flange Assembly
 - o Section XII, Transport Equipment
 - o Section VIII, SWG BFJ Design Rules
 - o Pressure Vessels & Piping Division

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