

JointTech: A Total Solution for Joint Leakage Problems

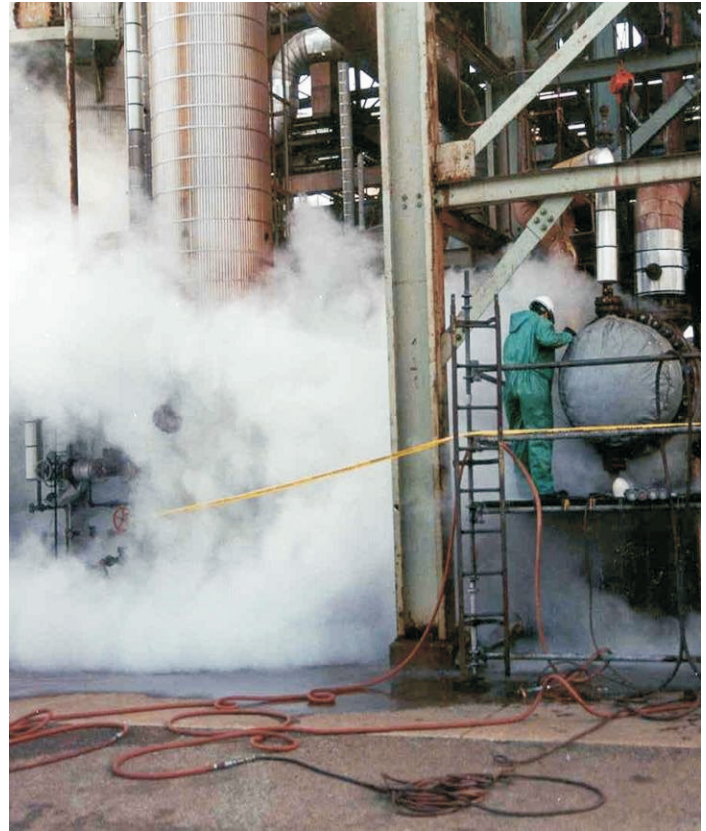
The only program of its kind on the market today

No one should accept the lost dollars from joint leakage or expensive assembly procedures as normal operating costs. Every joint can be sealed permanently with the technology available today. But most standard solutions don't consider the "total joint" when assessing problems, providing only assembly-focused, gasket-focused or analysis-focused solutions.

The JointTech™ solution incorporates knowledge in all the areas required to effectively identify the root cause of a leakage problem:

1. Actual gasket behavior and modes of failure
2. Effects of temperature on gasket, bolts and operational loads
3. Real-world assembly procedures, methods and parameters
4. Advanced analysis methods, including FEA with advanced gasket properties

The Equity Engineering Group, Inc. (E²G) has in-depth operational experience with flanged joint specification and operation. Internationally recognized in the refining and petrochemical industries as a leader on aging infrastructure services and support, E²G pioneered the development of advanced Fitness-For-Service technologies (API RP 579-1/ASME FFS-1, API RP 571), documents that form the basis for most FFS assessments performed in the U.S. today.



Case Study: Coker Slide Valve Joint

Root cause analysis plugs a \$250K per day leak

A refinery client installed a new flanged 72" diameter valve on the bottom head of their coker. Upon unit start-up, the joint leaked, resulting in a fire. The unit was subsequently brought down for an extended outage (\$250K per day lost production) to determine the cause. The client's flange reliability expert asked us to determine the root cause of the leaking by performing a transient thermal analysis of the joint. The client suspected that a hotspot at a near-by inlet nozzle was contributing to leakage and that differential radial growth of the flanges could be causing bolt yield.

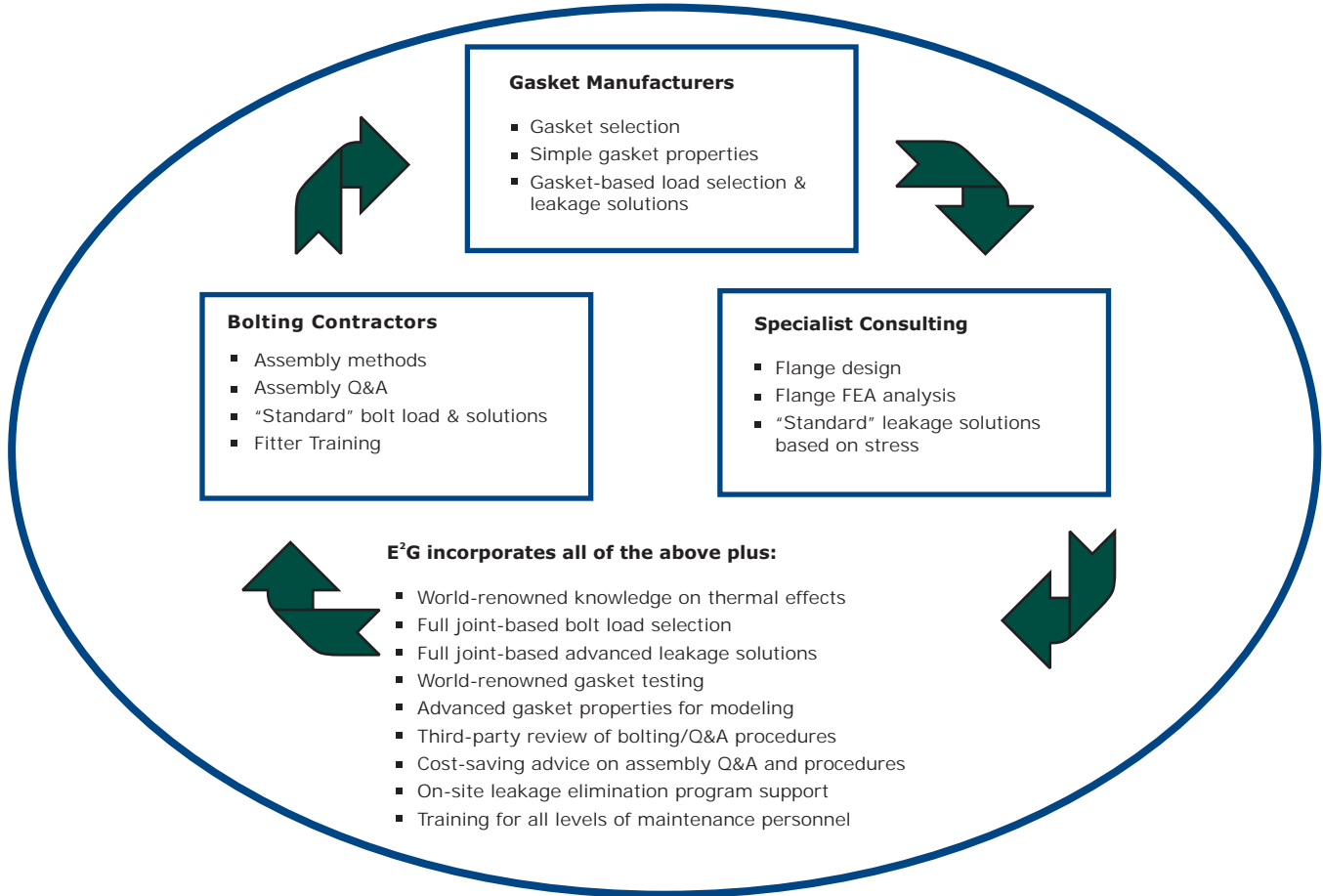
Analysis indicated that the joint was severely under-designed for the thermal loading, and design modifications were suggested to rectify this problem. The thermal transients seen during operation were causing significant reductions in gasket stress, and operational flange rotation caused excessive re-distribution of the gasket stresses. The inlet nozzle was also shown to be a secondary factor in causing leakage and a thermal-sleeve design was proposed to eliminate this problem. The analysis confirmed that bolt yielding due to differential growth was not an issue. Subsequent design modifications made by the client incorporating our findings have eliminated the leakage concerns.

The JointTech difference:

- Identification of possible root causes through advanced analysis and thorough knowledge of the impact of thermal transients on gasket sealing.
- Ability to work with the client to eliminate possible causes in a practical manner.

Looking at the “Total Joint” for 100% Leak-free Status

Extensive knowledge of joint sealing technology, plus advanced analysis techniques, gives E²G the edge on resolving joint leakage problems. By looking at the “big picture”, the JointTech approach can decrease workload and reduce maintenance costs on the joint.



Compared to competitors, who offer “black box” consulting solutions and are often limited to their own experience with problems, JointTech offers:

- The correct solution for the root cause, first time, every time -- no plant- based experimentation or wasting of maintenance budget.
- A proven track record in solving difficult joint leakage problems.
- Consideration of all components and the full joint life-cycle to determine the root cause and optimal solution.
- A link between the highly technical and practical, incorporating both to achieve an effective solution.
- Extensive reality-based testing -- knowledge of current test procedure limits and how to apply their results
- Knowledge of gasket-type performance as well as performance differences between gasket manufacturers.
- Extensive testing and implementation of assembly procedures and lubricants -- practical advice on what to use and where, not focused on only one “perfect” way of doing things.

With the JointTech solution, we will show you how to achieve “100% Leak-Free” status -- and along the way improve personnel safety, receive EPA credits, eliminate costly leak-sealing/joint clamping operations and keep your plant running smoothly.

For more information, please check our website at www.equityeng.com or contact Greg Alvarado at gcalvarado@equityeng.com and 281-537-8848 or Ryan Jones at rrjones@equityeng.com and 216-658-4781.

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