Joint Industry Project Call for Participation

Topic: Hydraulic Tensioner Load Loss Factors; Stage #2

Goal:
The goal of Stage #2 of the hydraulic tensioner load loss factor project is to extend the original test work performed to include a wider range of flange sizes and classes and a wider range of gasket types (RTJ and sheet gaskets). Stage #2 will also address the required load loss factors for 3 pass tensioning and further examine limits on maximum applied tensioner load due to bolt/nut strength and/or material hardness in SCC environments. The outcome of stage #2 will be a table of load loss factors for 2 and 3 pass tensioning using spiral wound, sheet and RTJ gaskets. Additionally, other considerations will be addressed in the report supplied.

Background:
Stage #1 of the industry JIP (participants: WEL and IES) was conducted to determine the appropriate load loss factors for B16.5 flanges with spiral wound gaskets and the limits that should be applied to ensure bolt integrity in non-SCC environments. This was achieved using mechanical calculations and physical testing of a variety of flange sizes and classes. The results of stage #1, included tables of load loss factors for 2 pass tensioning on spiral wound gaskets were largely published. Some exploratory work was also performed on RTJ gaskets and demonstrated that they are more sensitive to use of the correct load loss factors during assembly. Some of this data has been published in the ASME PVP conference article “Hydraulic Tensioner Assembly: Load Loss Factors and Target Stress Limits”, W. Brown, PVP2014-28685.

Stage 2 Outline:
Stage #2 will include the following:
a. Provide additional testing on at least 4 different joints (with different load loss characteristics as determined by the previous work) over 4 different gasket styles (RTJ, Spiral Wound, Compressed Fiber and Kamprofile). Note that this corresponds to approximately 16 more load factor tests and 6 new flange size/classes. Some of the original flanges will be reused for the alternate RF gasket testing.
b. Use axisymmetric FEA for the RTJ gaskets to determine effective gasket elasticity properties for applicable size/materials and verify this data using the physical testing conducted.
c. Provide load loss factor tables for the above gasket styles in joints that may be typically tensioned.
d. Provide guidance on practical tensioner application with respect to historic practices (tensioner load loss factors used and assembly bolt loads used) versus the new load loss factors (& new target bolt stress).
e. Further examine limitations on load loss factors, particularly with respect to influencing material properties for both SCC and brittle fracture.
f. Examine the effect of flange material on load loss factors and required modifications to tables.
g. Examine load loss factors for 3 pass tensioning.
h. Examine the effectiveness of 25% coverage.
i. Others… (topics as requested by participants)

To Participate in Stage #2:
Contact Warren Brown (wbrown@integrityes.com) for further information.

Participant Cost: US$25,000 per company, which will allow access to both the Stage #1 and Stage #2 results (including load factor tables).
Tensioner manufacturers may be allowed to make an “in kind” contribution of tensioning equipment as part of the fee.

Deadline: Participants must confirm by the end of August 2016. Stage #2 will commence in September 2016 and will be complete in Dec 2016.