



SEETRU Single-Shot Condition Rating™ Test

Office: **Coventry**

Date: **29 June 2007**

This certificate is issued to Seetru Limited, to certify that the undersigned surveyor did attend at their premises at Hanover Place, Bristol, on 11th June 2007 for the purpose of reviewing the Seetru Condition Rating™ of Safety Valves using the Single-shot Technique.

The Seetru Single-shot Condition Rating™ test is conducted along with a standard in-situ Tru-test® operation with the addition of an acoustic sensor firmly attached to the safety valve under test. The test requires the proprietary Seetru Tru-test equipment and the proprietary Seetru Tru-test software package.

The stated aim of the Condition Rating™ test for spring loaded pressure safety valves, as developed and patented by Seetru Limited, is the assessment of the serviceability of the safety valves. This is based on the determination of the start-to-leak point against the start-to-open point of the safety valve, and the closer these points are to each other the better the condition of the valve. The acoustic sensor picks up the start-to-leak point and the acoustic curve can be overlaid on the safety valve lift force curve and the disk lift curve within the proprietary Seetru Tru-test software package.

The output from the acoustic Condition Rating™ is a ratio expressed as a Q number, and the Seetru procedure SES 011 (currently at revision 2) recommends that in the case of 10% accumulation pressure safety valves, a Q number less than 9 is acceptable, while greater than 9 is unsuitable for future use in its current condition. The procedure notes that ASME Section I valves with a 3% accumulation can be calculated pro-rata.

Seetru Engineering Services Operating Procedures reviewed.

- Tru-test® on-line test procedure SES 001 Revision 005 dated 8th May 2007
- Condition Rating™ Measurement Using the Single-shot Technique and the Tru-test® Equipment SES 011 Revision 002 dated 8th May 2007
- Tru-test® and Condition Rating™ suitability review and common risks SES 013 Revision 001 dated 6th May 2007

Condition Rating™ in conjunction with the Seetru Tru-test® was witnessed on two valves as listed in the table below; one old/used valve, and one new valve selected at random.

Manufacturer	Type No.	Serial No.	Seat Area	Nominal Set Pressure	Status	Condition Rating (Q)
Leser	459	96.77684.9/1	452 mm ²	61 barg	Used	>13.5%
Leser	441	10172806	2153.3 mm ²	19.9 barg	New	0.21%

The accuracy of the measurement of valve seat areas was noted to be critical to the accuracy of the Condition Rating™. During the tests witnessed, the valve seat area was calculated using the Seetru Tru-test® software by carrying out a cold test (no system pressure) and a hot test (with system pressure), using the manufacturer's nominal seat area as a starting point.

As a result of the tests and a review of the Condition Rating™ testing procedure combined with the Tru-test®, it is concluded that the Seetru Condition Rating™ method is acceptable for assessing the condition of spring loaded pressure safety valves when carried out strictly in accordance with Seetru Limited test procedures SES 011 and SES 001 by fully trained operators knowledgeable in the application and interpretation of the test.

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