element

PROCESS VALVE QUALIFICATION PROCEDURE

OF

L&T VALVES API 609 12" CLASS 150 TRIPLE OFFSET BUTTERFLY VALVE

VALVE BODY: ASTM 216, Gr. WCB

L&T VALVE LIMITED
KANCHEEPURAM WORKS
ENATHUR, KANCHIPURAM – 631561
TAMILNADU, INDIA

TESTED IN ACCORDANCE WITH API RP 591
FIFTH EDITION, 2014

JUNE 2016

SUMMARY FINDINGS

Visual examination: passed

Hydrostatic testing: passed.

Tensile testing: passed

Handwheel hammer impact and torque test: passed

Dimensions: passed

Chemistry: All passed with one exception. The manganese content of the disc is 1.47 %, with the material A216 Gr. WCB having a maximum allowed of 1.00%. This test was conducted using PMI.

Hardness: passed

Metallurgical evaluation: passed

Liquid Penetrant examination: passed

Radiographic inspection: passed

Element Materials Technology
3100 North Hemlock Circle
Broken Arrow, OK
74012-1115 USA

P 918 258 6066
F 918 258 1154
T 800 982 8378
info.brokenarrow@element.com
element.com

LABORATORY REPORT

Attn: Terry Wilt
Element Materials Technology - Houston
14805 Yorktown Plaza Drive
Houston, TX 77040

Report No.: **B16070806**
Date Received: **07/26/2016**
Date Reported: **9/27/2016**
P.O. No.: **EHO025080PO-1**

Sample Description: (1) 12" Triple Offset Valve, DWG# 758822-TE-001

Strength Test for Shaft-to-Closure Element Connections

Background and Procedure

Element – Houston, on behalf of L&T Valve, submitted (1) 12" 150 Class Triple Offset Butterfly Valve, Drawing Number 758822-TE-001, for torque testing per API RP 591, Annex B, Paragraph B.2 and Figure B.1.

The Valve had its gearbox and hand-wheel removed, and was bolted to a large steel holding fixture. A custom drive nut was made to apply torque direct to the valve stem using a torque wrench and torque multiplier. The torque multiplier increases the applied torque by a factor of 18.5. A strain gauge was applied to the stem of the valve, with the strain measurement being circumferential to the shaft and orthogonal to the axis of rotation. Torque was applied and released in increasing amounts until permanent deflection was observed through strain gauge output. Calibrated equipment used for testing is presented in Table 1. The valve, as instrumented and setup for testing is presented in Figure 1.

Results

At 3000 ft-lb[1] the strain gauge indicator reported permanent deformation in the valve stem. No visually observable deformation or damage occurred to the valve or its components during testing. The theoretical failure load reported by the manufacturer is 2067 ft-lb.

1 – Rounded to nearest 100 ft-lb.

Note: The sample remains will be discarded 90 days after the date of this report, unless otherwise instructed.

Approved by

Rusty Johnston
Senior Project Engineer