

## Engineering Bulletin 031

### Quality Control Issues with Crosby Relief Valves

Issuing Manager/Department: - Tony Stonehewer - GNI  
Approved: - 4/12/08

#### Incident – Quality control issues with Crosby series 900 relief valves

Glenmavis LNG facility recently purchased and installed a batch of 12 Crosby (Tyco) Series 900 thermal relief valves for cryogenic service on the LNG export system. The valves (model 9511117D) were manufactured in France and calibrated and tested to a test pressure at 20 deg C of 86 barg by Messrs. GRISS prior to despatch. The valves were sent directly to site and arrived safely and securely packaged with the relevant test certificates and were not subject to any further testing prior to installation.



Following installation and during commissioning, three valves lifted when the system pressure was approximately 80 barg resulting in a discharge of a small quantity of LNG to atmosphere. There was no indication of any pressure surge in the system and it appeared that the valves had genuinely lifted at a pressure of approximately 80 barg.

The entire batch of 12 valves was removed from the system and subjected to lift tests in the Glenmavis workshops and subsequently at Tyco's facility in Aberdeen. The latter tests confirmed the earlier preliminary test results and showed a spread of lift pressures of between 80 and 92 barg, with one valve being so badly damaged that an effective seal could not be maintained above approximately 10 barg. Although the three valves found to be in the worst condition were those that had lifted in service, a fourth valve that had yet to be commissioned on LNG service failed with excessive leakage.

When stripped down, the valve discs were found to be damaged and the stems marked. The valves are being overhauled and re-tested while investigations are ongoing into the cause of the problems.

During the course of the investigation, it became apparent that there were a number of inconsistencies between relief valve set pressures and the pressure rating of the pipework such that there is no coherent overall relief philosophy in place.

#### Requirements

1. Until Tyco can confirm the consistency and accuracy of their testing regime, all model 900 valves sourced from their French facility should be subject to further testing prior to installation. Tyco have undertaken to provide this service.
2. At this stage it is not known if the issues are restricted purely to this model of valve. Until further information is available all valves from the factory affected shall be subject to independent tests and a record kept of the results to allow any trends to be discerned.

**Action by 15/12/08 - LNGS Operations Manager to ensure this Bulletin is briefed to staff and systems are introduced to control independent testing as defined above until further instruction.**

3. Review the results from the independent testing and provide recommendation to GEPIG in July 2009 on the requirements to carry out independent testing of relief valves.

**Action by Jason Smalley 31/7/2009**

For further information regarding this Bulletin please contact your Line Manager or **Jeremy Hunns, 07825 842544.**