



ENGINEERING SAFETY CONSULTANTS

The Global Provider of Functional Safety Expertise and Technical Consultancy

Certificate of Conformity to IEC 61508:2010 & IEC 61511:2016 Safety Integrity Level (SIL) 3

Functional Safety of Safety-Related Programmable Electronic Systems

The **Petronash, Saudi Aramco (SA) Hasbah (HSBH) Wellhead Platform (WHP) 72/75 High Integrity Protection System (HIPS)** has been assessed and is considered capable for use in a low demand Safety Function up to SIL 3, with regard to random hardware failure and architectural constraints.

The assessment was based on the assumptions, data provided, and recommendations given in:

- **ESC Ltd Report: K076_SV001 rev. 2.**

The product was assessed against the following failure mode:

- Upon detection of high high pressure via 2oo3 Pressure Transmitters (PTs), the HIMA Planar 4 Logic Solver (LS) will close 1oo2 Gate Valves (GVs) on all four flow arms of the WHP, each GV will be operated via 1oo2 Solenoid Operated Valves (SOVs), a Quick Exhaust Valve (QEV) and a Hydraulic Actuator.

The assessment was carried out to determine compliance with IEC 61508 with regards to:

- Random Hardware Failure (Predicted PFD: 3.2E-04) with a Mean Repair Time (MRT) of 72 hours, a Proof Test Interval (PTI) of one year (8760 hours), a Proof Test Coverage (PTC) of 95% and Mission Time of 10 years;
- Architectural Constraint based on the requirements of Route 1_H.

IMPORTANT: It should be noted that this assessment does not include confirmation of the response time of the device. For response times (along with any relevant assumptions) reference should be made to the Safety Manual of each device and the total SIF response time **MUST** be compared against the process safety time for the specific application.

Chairman: Kenneth G L Simpson
Member of the IEC 61508 committee
Assessment Date: October 2020, valid to October 2022
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Reg: 12Q12086

ENGINEERING SAFETY CONSULTANTS LTD
Tuition House
27-37 St George's Road Wimbledon London SW19 4EU UK
Telephone/Fax: +44 (0)20 8542 2807
E-Mail: info@esc.uk.net Web: www.esc.uk.net
Registered in England and Wales: 7006868
Registered Office: 27-37 St George's Road Wimbledon London SW19 4EU