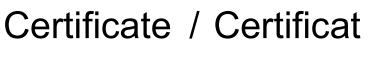


Revision 1.1 August 31, 2018 Surveillance Audit Due September 5, 2020



# Zertifikat / 合格証

GEO 1607097 C001

exida hereby confirms that the:

# S760 Trip Manifold Assembly

# GE Oil & Gas Longmont, CO - USA

Has been assessed per the relevant requirements of:

IEC 61508 : 2010 Parts 1-7

and meets requirements providing a level of integrity to:

## Systematic Capability: SC 3 (SIL 3 Capable)

# Random Capability: Type A, Route 2<sub>H</sub> Device

PFH/PFD<sub>avg</sub> and Architecture Constraints must be verified for each application

#### Safety Function:

The Trip Manifold Assembly will connect the supply header to the drain header within the specified safety time.

#### **Application Restrictions:**

The unit must be properly designed into a Safety Instrumented Function per the Safety Manual requirements.



ANSI Accredited Program ISO/IEC 17065 PRODUCT CERTIFICATION BODY #1004



**Evaluating Assessor** 

Certifying Assessor

Page 1 of 2

#### S760 Trip Manifold Assembly

## Certificate / Certificat / Zertifikat / 合格証

### GEO 1607097 C001

### Systematic Capability: SC 3 (SIL 3 Capable)

### **Random Capability: Type A, Route 2<sub>H</sub> Device**

PFH/PFD<sub>avg</sub> and Architecture Constraints must be verified for each application

#### Systematic Capability:

The product has met manufacturer design process requirements of Safety Integrity Level (SIL) 3. These are intended to achieve sufficient integrity against systematic errors of design by the manufacturer.

A Safety Instrumented Function (SIF) designed with this product must not be used at a SIL level higher than stated.

#### **Random Capability:**

The SIL limit imposed by the Architectural Constraints must be met for each element. This device meets exida criteria for Route  $2_{\rm H}$ .

#### IEC 61508 Failure Rates in FIT\*

S760 Trip Manifold Assembly components, S760BB and S760BBRP Versions, No Online Testing

Component	$\lambda_{SD}$	λ <sub>su</sub>	$\lambda_{DD}$	λ <sub>DU</sub>
Electronic Trip Device				
Solenoid (1 per ETD)	0	381	0	336
Dump Valve (2 per ETD)	0	148	0	207
Stop Valve (2 per ETD)	0	0	0	116
Relay (1 per ETD)	0	0	0	141
ETD Total	0	676	0	1121
Check Valves	0	122	0	138

\* FIT = 1 failure / 10<sup>9</sup> hours

<sup>†</sup> PVST = Partial Valve Stroke Test of a final element Device

#### SIL Verification:

The Safety Integrity Level (SIL) of an entire Safety Instrumented Function (SIF) must be verified via a calculation of PFH/PFD<sub>avg</sub> considering redundant architectures, proof test interval, proof test effectiveness, any automatic diagnostics, average repair time and the specific failure rates of all products included in the SIF. Each element must be checked to assure compliance with minimum hardware fault tolerance (HFT) requirements.

The following documents are a mandatory part of certification:

Assessment Report: GEO 16-07-097 R002 V1R2 (or later)

Safety Manual (User Manual): GECS10004, GECS10005, GECS10007, SIL 3 GECS Adendum



Sellersville, PA 18960

80 N Main St

T-062, V3R1