Certificate / Certificat
Zertifikat / 合格証

NAF 1006013 C001

exida hereby confirms that the:

NAF – Trunnball DL Ball Valves

DN 150 – DN 900 (6” – 36”)
PN 10 – PN 40 (ANSI Class 150 & 300)

Flowserve – NAF AB
SE-581 87 Linköping, Sweden

Has been assessed per the relevant requirements of:

IEC 61508 : 2010 Parts 1-2

and meets requirements providing a level of integrity to:

Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A, Route 2_H Device

PFH/PFD_{avg} and Architecture Constraints must be verified for each application

Safety Function:
The Ball Valve will move to the designed safe position per the actuator design within the specified safety time.

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

The manufacturer may use the mark:

Revision 2.3 February 10, 2022
Surveillance Audit Due
April 1, 2024

ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17065
PRODUCT CERTIFICATION BODY
#1004

Evaluating Assessor

Certifying Assessor

Certificate / Certificat / Zertifikat / 合格証

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Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A, Route 2_H Device

PFH/PFD_{avg} and Architecture Constraints must be verified for each application

Trunnball DL Series
Trunnion Mounted
Ball Valves

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_H.

IEC 61508 Failure Rates in FIT[1] Static Applications

Application/Device/Configuration	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Full Stroke, Clean Service	0	0	0	558
Tight Shut-Off, Clean Service	0	0	0	1246
Open on Trip, Clean Service	0	131	0	428
Full Stroke, Severe Service	0	0	0	1015
Tight Shut-Off, Severe Service	0	0	0	2308
Open on Trip, Severe Service	0	248	0	767

[1]FIT – 1 failure/10^9 hours

SIL Verification:

The Safety Integrity Level (SIL) of an entire Safety Instrumented Function (SIF) must be verified via a calculation of PFH/PFD_{avg} 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: NAF 07/07-21 R005 V5R1 (or later)

Safety Manual: NFENDS4168

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Sellersville, PA 18960