SIL Verification Summary

Safety related alarm inert gas blancketing tankpit 6

REV	DATE	APPROVED	DESCRIPTION OF CHANGE
	5/22/2019		

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1 Purpose and Scope

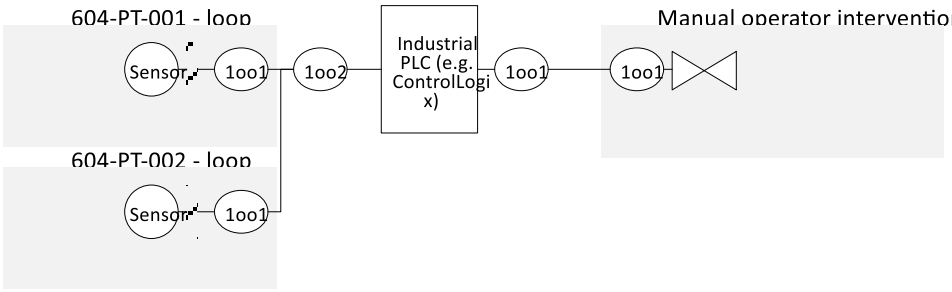
This document, automatically generated by the exida exSILentia® software, summarizes the results of the conceptual design verification for the Safety Instrumented Functions (SIF) for the Safety related alarm inert gas blancketing tankpit 6 project.

1.1 General Project Information

Project Identification:	Safety related alarm inert gas blancketing tankpit 6
Project Name:	Safety related alarm inert gas blancketing tankpit 6
Project Description:	Risk reduction rate calculation safety related alarm TP6 TTR terminal Vopak

2 Pressure monitoring Typical TP6

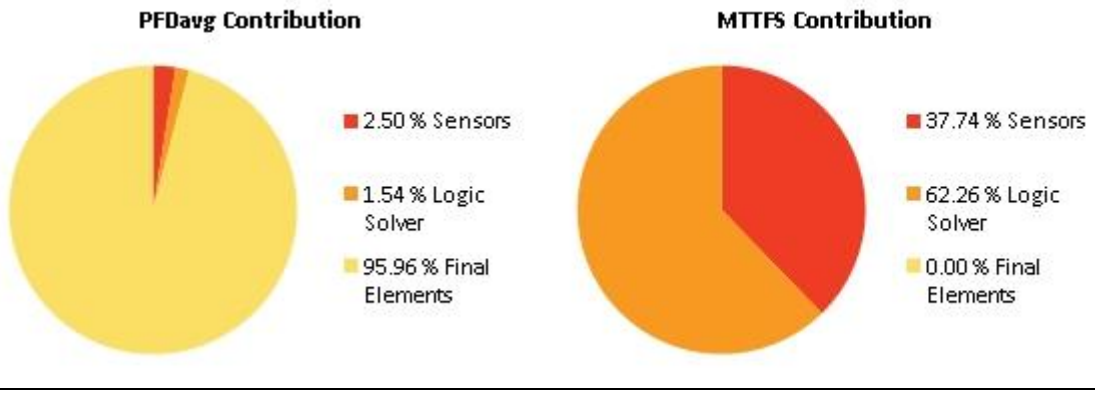
Project Name	Safety related alarm inert gas blancketing tankpit 6	**SIF Tag**	
Unit / Process Area		**SIF Name**	Pressure monitoring Typical TP6
Mission Time	15 years		



SAFETY INSTRUMENTED FUNCTION PERFORMANCE	
Target SIL	**1**
Target RRF	10
Achieved SIL	**1**
PFDavg	3.60E-02
SIL (PFDavg)	1
SIL (Arch. Constraints IEC 61508)	1
SIL (Systematic Capability)	N/A
Achieved RRF	28
MTTFS (years)	21.84

	PFDavg	MTTFS	SIL Limit	
			AC	CAP
Sensor Part	9.03E-04	57.87	2	N/A
Logic Solver Part	5.54E-04	35.07	1	N/A
Final Element Part	3.46E-02	∞	1	N/A

REMARKS	The SIF operates in Low demand mode.



Note: *The results shown in this SIL verification Summary are based on detailed calculations. All SIL verification assumptions including used reliability data are documented in the SIL verification Details report.*

3 Abbreviations and Definitions

3.1 Abbreviations

MTTFS	Mean Time To Fail Spurious
MTTR	Mean Time To Restore
PFD	Probability of Failure on Demand
PFD_{AVG}	Average Probability of Failure on Demand
PFH	Probability of a Dangerous Failure per Hour
PTI	Proof Test Interval
RRF	Risk Reduction Factor
SIF	Safety Instrumented Function
SIL	Safety Integrity Level
SIS	Safety Instrumented System

4 Disclaimer, Assumptions, Equipment Data

4.1 Disclaimer

The user of the exSILentia® software is responsible for verification of all results obtained and their applicability to any particular situation. Calculations are performed per guidelines in applicable international standards. *exida.com L.L.C.* accepts no responsibility for the correctness of the regulations or standards on which the tool is based. In particular, *exida.com L.L.C.* accepts no liability for decisions based on the results of this software. The *exida.com L.L.C.* guarantee is restricted to the correction of errors or deficiencies within a reasonable period when such errors or deficiencies are brought to its attention in writing. *exida.com L.L.C.* accepts no responsibility for adjustments made by the user to this automatically generated report.

4.2 Assumptions SIL verification (SILver™)

A detailed list of assumptions upon which the exSILentia®'s SILver™ SIL verifications are based are documented in the user guide. The user guide is available as PDF as well as embedded within the exSILentia® software Help menu. The user is assumed to be knowledgeable with regard to the parameter selections and the, potential, impact on the operation of the respective Safety Instrumented Functions and Safety Instrumented System.

Conceptual design selection details are included in the SIL verification Details report.