Functional safety implemetation in Slovnaft Refinery

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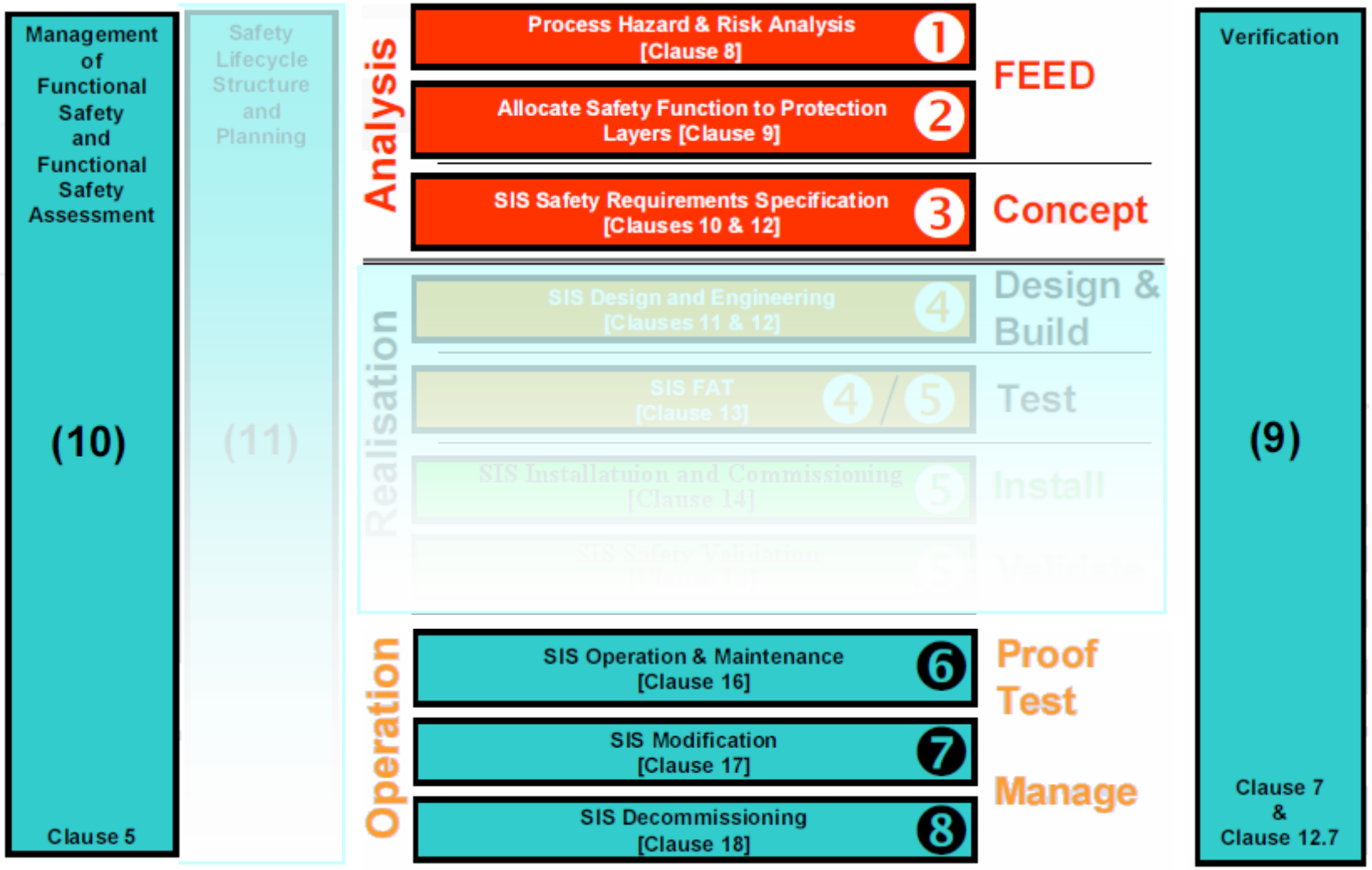
Balatonfüred, May 2010

Slovnaft

MEMBER OF THE MOL GROUP



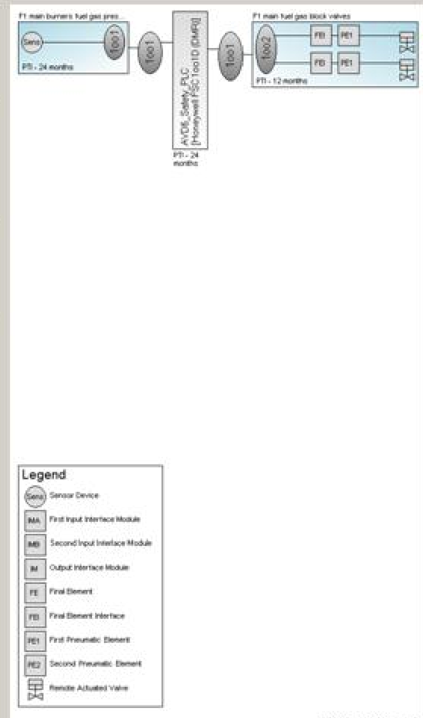
IEC 61 511 - Safety LifeCycle

exSILentia

SIL verification Summary

ADV6_F1_SIF_04 F1 main burners fuel gas pressure high

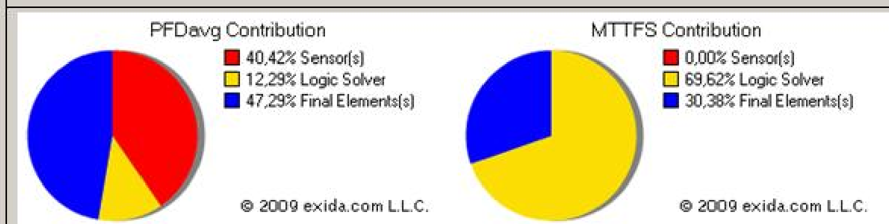
Project Name	AVD6_Furnaces_V1
Project ID	6
Unit Name	AVD6
SIF Tag	ADV6_F1_SIF_04
SIF Description	F1 Furnace main burners fuel gas pressure high: Close main burners fuel gas block valves
SIF Reference	1.2.2 - 1.2.2
Responsible	MJ
Analysis Date	18 march 2009
Mission Time	2 years



Safety Instrumented Function Performance	
Achieved SIL	**2**
PFDavg	7,45E-04
SIL (PFDavg)	3
SIL (Arch. Constraints IEC 61511)	2
Achieved RRF	1342
MTTFS (years)	7,63

	PFDavg	MTTFS	SILac
Sensor Part	3,01E-04	-	2
Logic Solver Part	9,16E-05	10,95	2
Final Element Part	3,52E-04	25,11	2

Remarks: The SIF operates in Low demand mode.



Note: The results shown in this SIL verification Summary are based on detailed calculation. All SIL verification assumptions like reliability data are documented in the detailed exSILentia report.

Risk Analysis (1)

...e 8]

...al regulation for Management of FS:

...its were completely analyzed

...s, FDs, TDs, WIs

...rs 2006 – 2009

...projects & Operation

...SIFs were analysed

...STN IEC/EN 61511

...ied trip tests

...management standards:

...S and OOS philosophy

...N 746-2 : Safety requirements for combustion ... handling systems

...requirement specification

...agement of change

... for the 2nd phase

...N 767 : Automatic forced draught burners for

...over engineered

...ineers became TÜV FS Engineers

...under engineered

...isk Matrix

...findings:

...knowledge

...Transmitters

...technologists,

Maintenance (6)

...& ESD common loops

...ication (7)

...aces

...studies

...IL instrumentation

...issioning (8)

...ocation

...culation

Requirement Specification

...idation

Verification (9)

Clause 7 & Clause 12.7

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Thank You for Your Attention.