

Functional Safety Management Why Human Factors Matter!



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Thank you!

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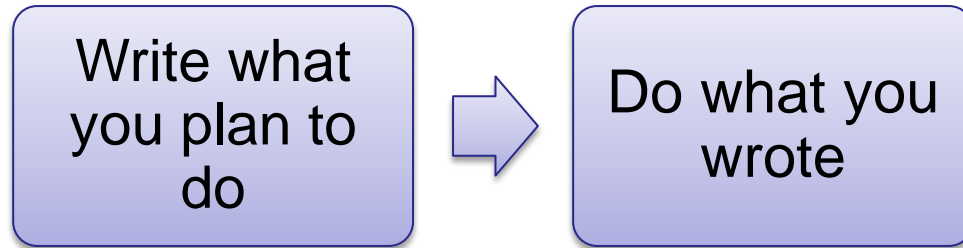


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■ WHAT IS FUNCTIONAL SAFETY MANAGEMENT?

ISA 84 5.2.1.2 *“A safety management system shall be in place so as to ensure that where safety instrumented systems are used, they have the ability to place and/or maintain the process in a safe state.”*

■ Easy?



Principal-Agent Problem

Principle	Agent
Citizens	Governments
Principle	Agent
Shareholders	Managers
Principle	Agent
Residents	Safety Professionals Industry & Government
Principle	Agent
Risk	Conflicting incentives

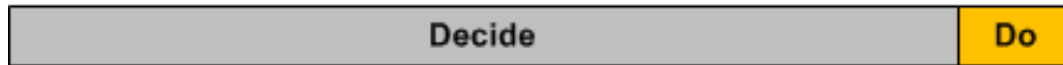
Agent Conflicting Incentives

- Aversion to change
- Path of least resistance
- Short term pain
- Pride

Agents - Operating Company Executives




The way it should be.



The way it usually is.

Miracle Required



Scott Adams (Dilbert)

Agents

Operating
Company PMs

SIS & BPCS
Systems Integrators

EPC Contractor

Commissioning
Team

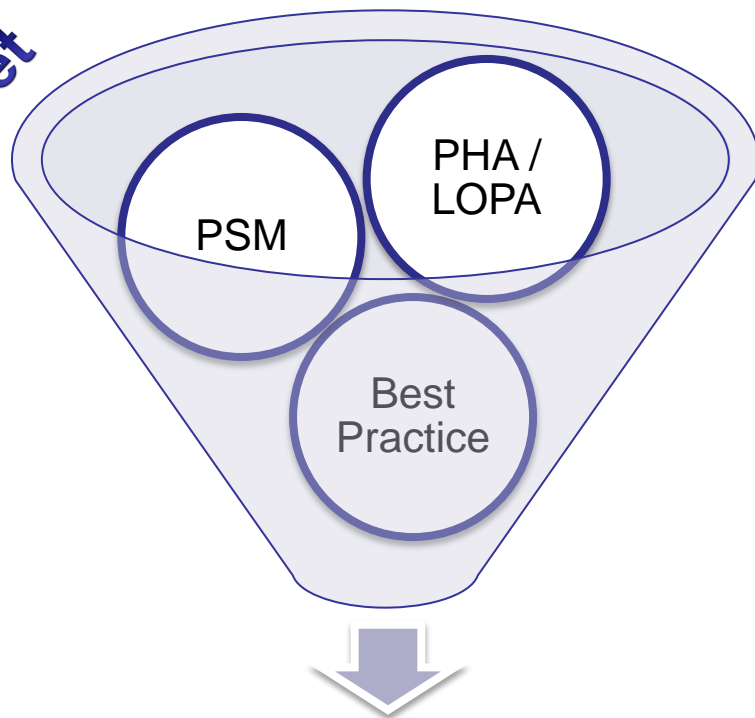
Operations
Project Staff

“Human nature will instinctively modify what should be done into what can be done especially if this makes the job easier or keeps the job moving in some way” – Loss Prevention Bulletin, October 2000

Excerpt from - What Went Wrong? - Trevor Kletz Book

What is our solution?

Tool Set



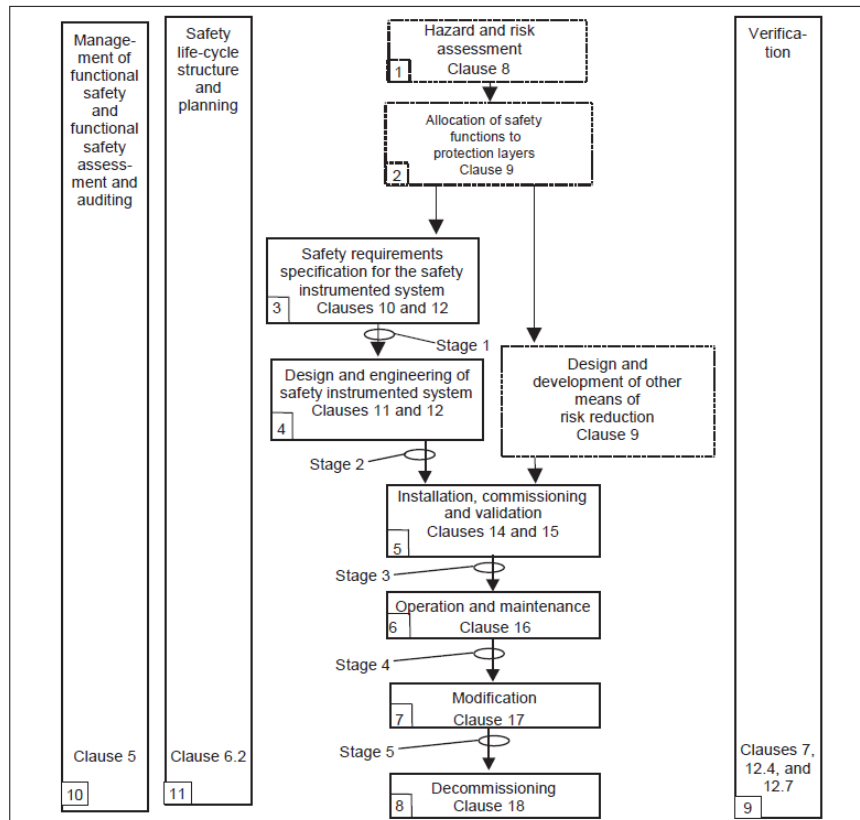
Human Factors

- 1) Functional Safety Plan
- 2) Lead
- 3) Disarm
- 4) Accountability
- 5) Educate & Motivate

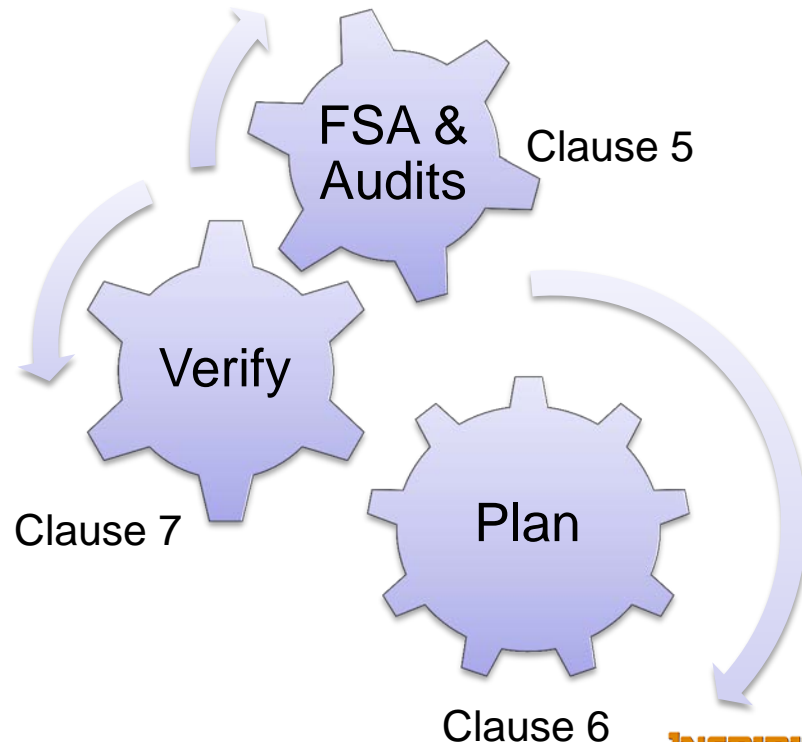
1) Functional Safety Plan

ANSI/ISA-84.00.01-2004 Part 1 (IEC 61511-1 Mod)

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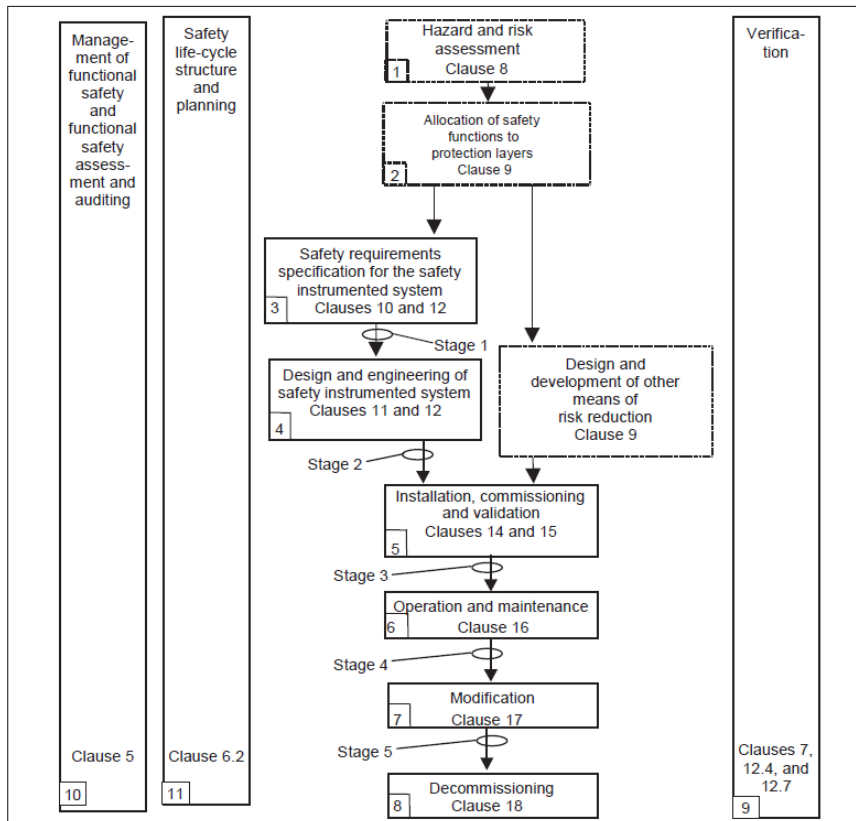
Activities spanning the Entire Lifecycle



1) Functional Safety Plan – Be Specific

ANSI/ISA-84.00.01-2004 Part 1 (IEC 61511-1 Mod)

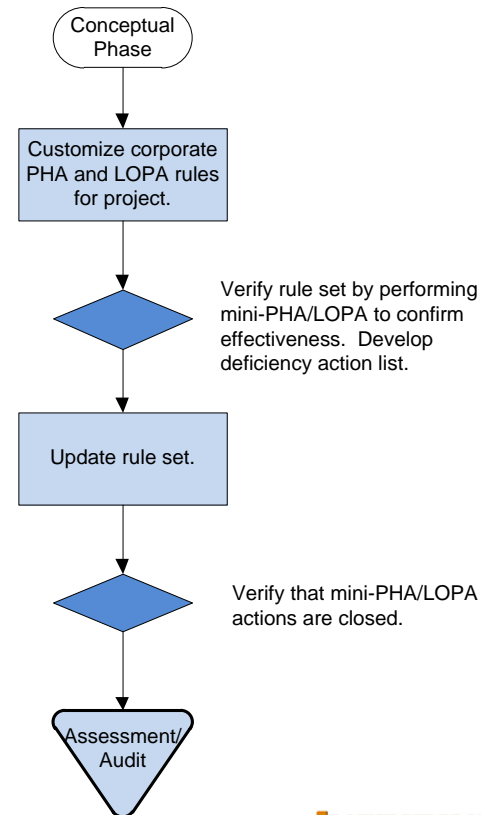
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Convert Philosophical Requirements



To project specific Requirements



1) Functional Safety Plan

- Specific
- Easy to understand
- Considers human factors and decision making
- Integrated
- Auditable
- Collaborative

2) Leadership

Every functional safety plan needs an owner/leader

- Motivates teams to work together
- Prevents “Silos Mentality”
- Gets Support from Management



3) Disarm - Poison Pills and Antidotes

Poison Pill

The Veto

Antidote Vision Statement

“No veto without an effective replacement.”

Poison Pill

“That’s not the way we do it.”

Antidote Vision Statement

“Improve in existing designs and apply lessons learned”

Poison Pill

KISS

Antidote Vision Statement

“Design for simplicity of operation over simplicity of design.”

3) Disarm - Poison Pills and Antidotes

Poison Pill

"We don't consider double jeopardy"

Poison Pill

"Spurious trips will not be a problem; the instruments we select are reliable."

Poison Pill

"We don't need a review; we will take care of it."

Antidote Vision Statement

"Add layers of protection proportional to risk."

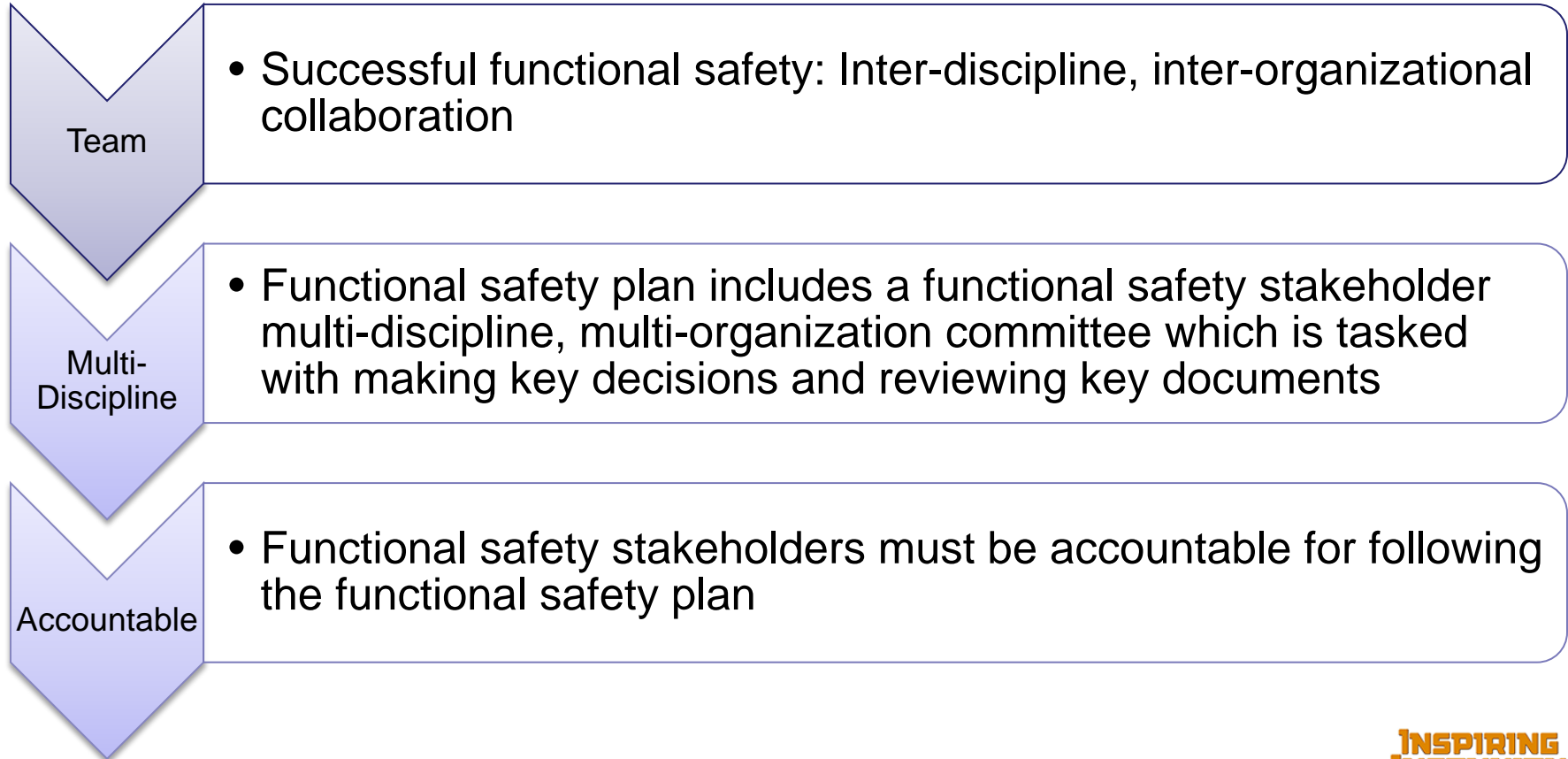
Antidote Vision Statement

"Meet safety, environmental and asset risk targets but also design to maximize operational integrity (minimize spurious trips)."

Antidote Vision Statement

"Trust but verify."

4) Accountability



5) Motivate, Educate and Incentivize

Educate all team members – Functional Safety Plan

Develop a culture of understanding the reasoning for each step

- Why do PHA and LOPA?
- Why create Safety Requirement Specifications (SRS)?
- Why involve Operations during SRS design?
- Why test field devices?
- Why capture instrument field failure data?

5) Motivate, Educate and Incentivize

Create Process Safety incident reporting mechanism to capture S84 Safety Lifecycle Gaps.

Recognize and Reward team members:

- Efforts to document Gaps
- Efforts to intervene & improve S84 compliance
- Efforts to address Gaps in Systematic way

5) Motivate, Educate and Incentivize

Final Goal!

HSE Office Safety Compliance & reporting

Hold Handrail while using stairs
Clean spills immediately
Open Doors slowly, someone can be on other side

Create the same level of awareness and recognition

S84 Compliance & reporting

Ensure operators are part of SRS design
Train operators on alarm response that are considered IPLs
Perform required periodic tests for field instruments

Summary

- Functional safety is art and science – a fusion of technology and leadership.
- Consider – both Tools and Human Factors.
- Create culture of understanding of core values of functional safety.

Where To Get More Information

- ANSI/S84.00.01-2004 - Functional Safety: Safety Instrumented Systems for Process Industry
- Principal-agent problem – Wikipedia
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Thank You for Attending!

Enjoy the rest of the conference.

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