

The Aviation Experience

Roadmap into the Future?



DUTCH

EXPERT

GROUP

AVIATION

SAFETY

Strasbourg,

December

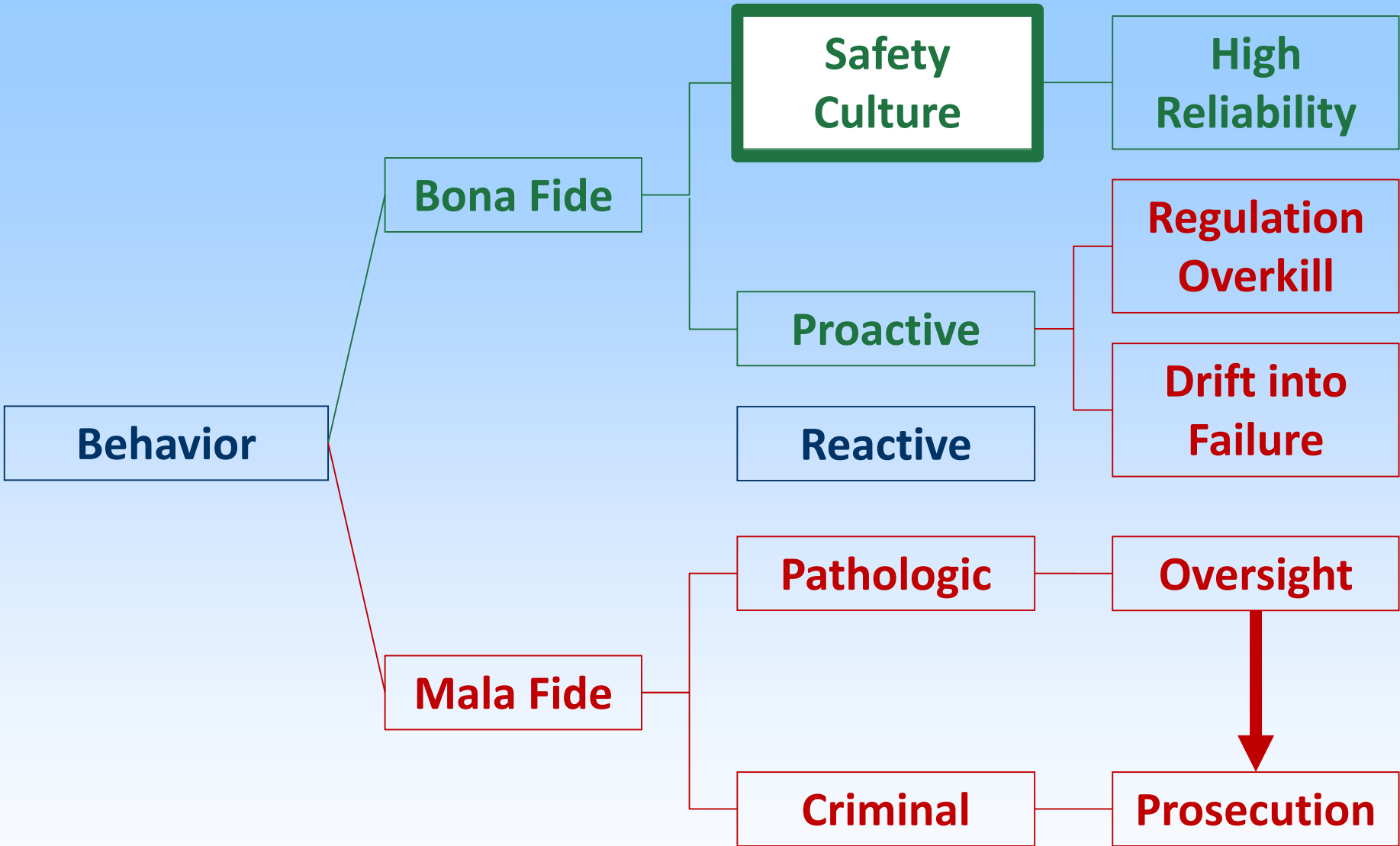
3, 2013



Central Commission for the Navigation of the Rhine

congress 

2013 BRINGING SKILLS TOGETHER
FOR A SUSTAINABLE INLAND NAVIGATION

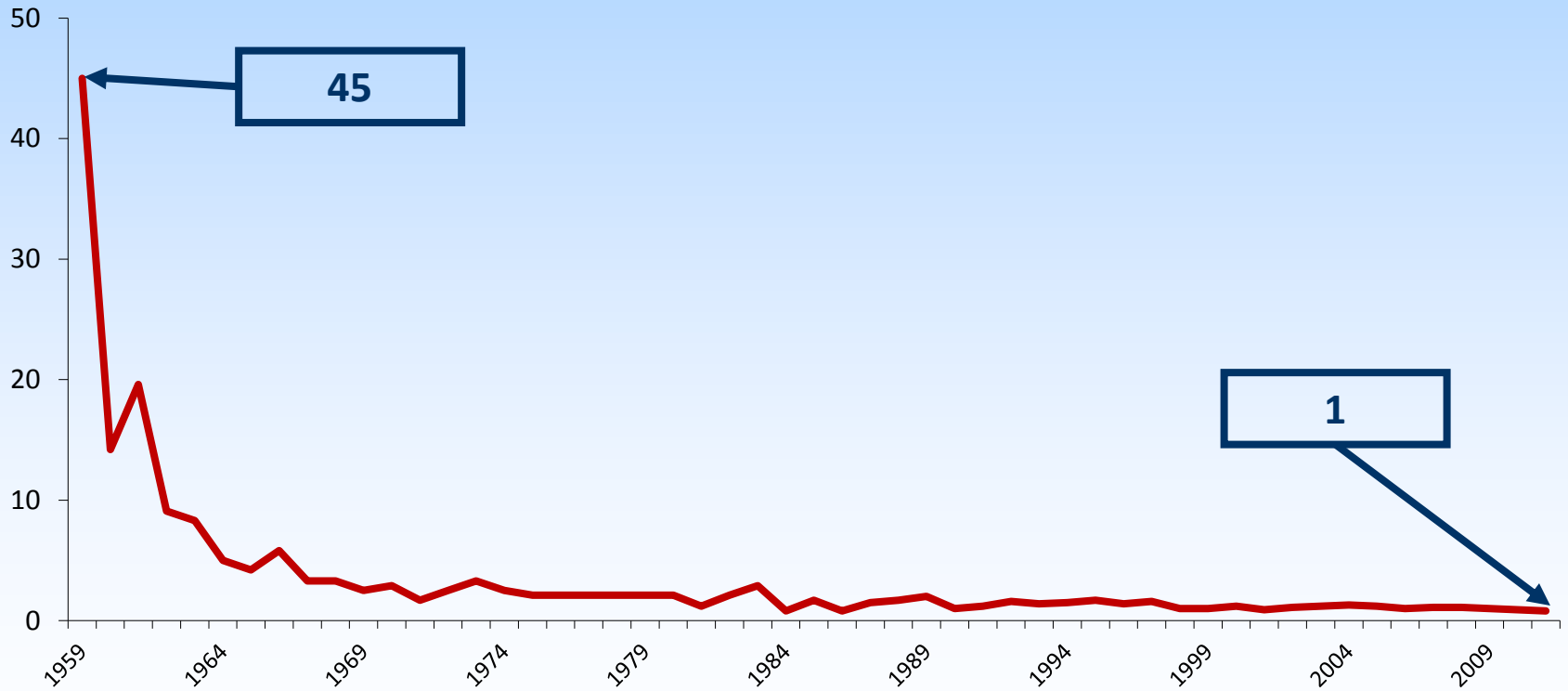


The Safety Space

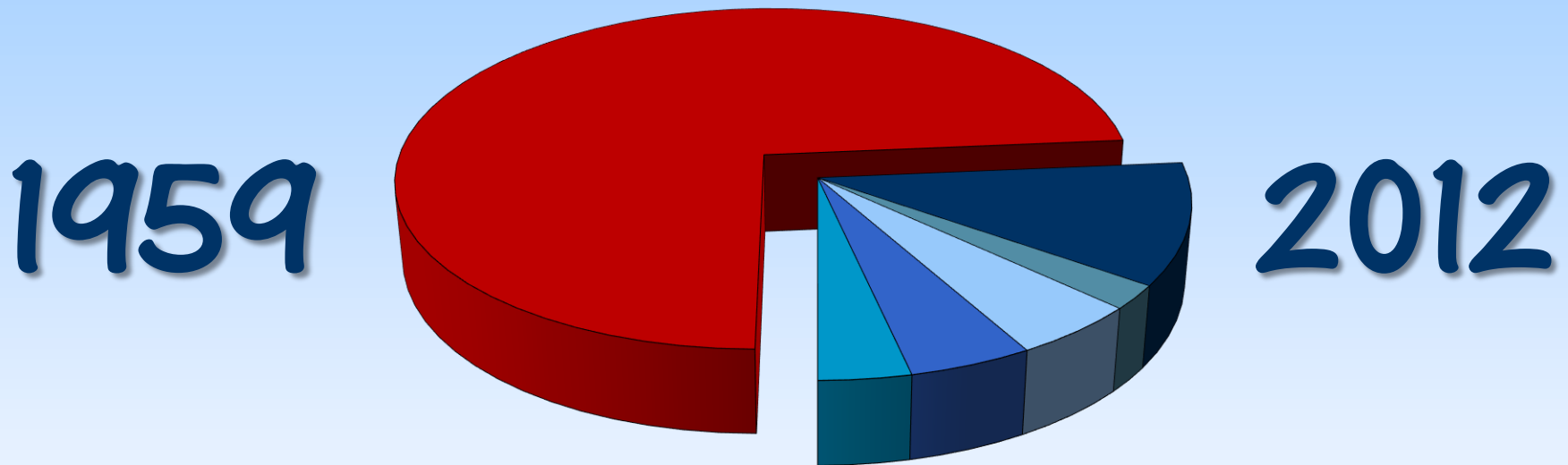


Track Record

Hull loss per million departures

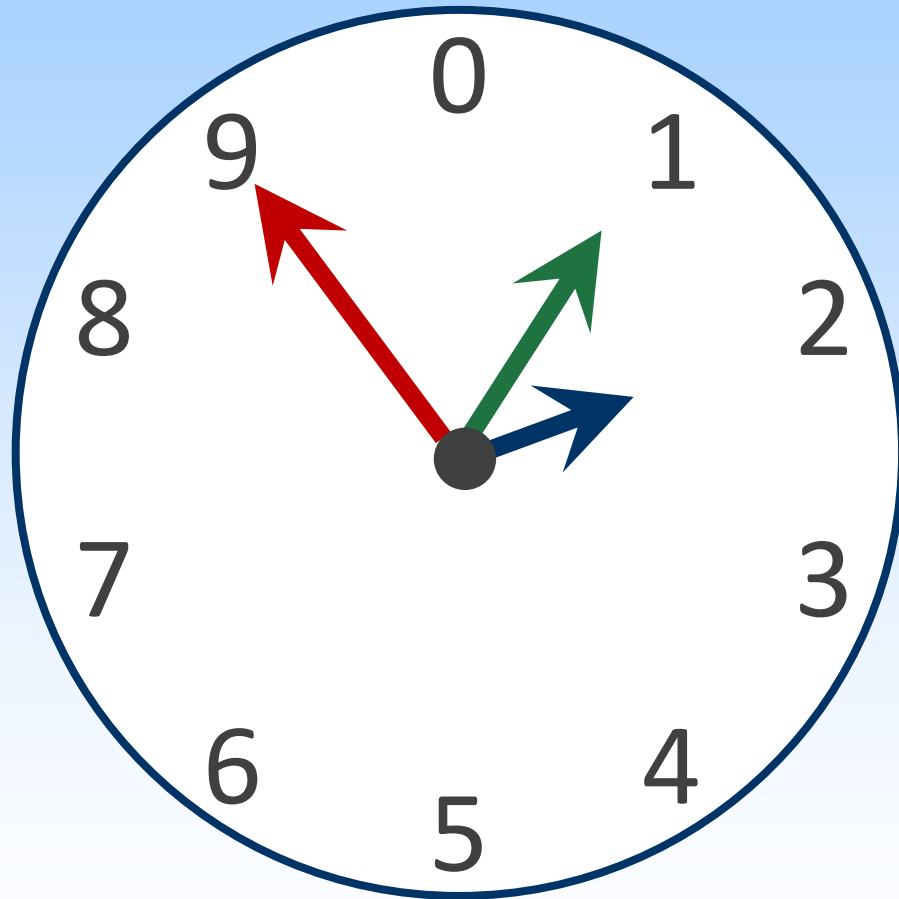


Pilot Error / Human Factor

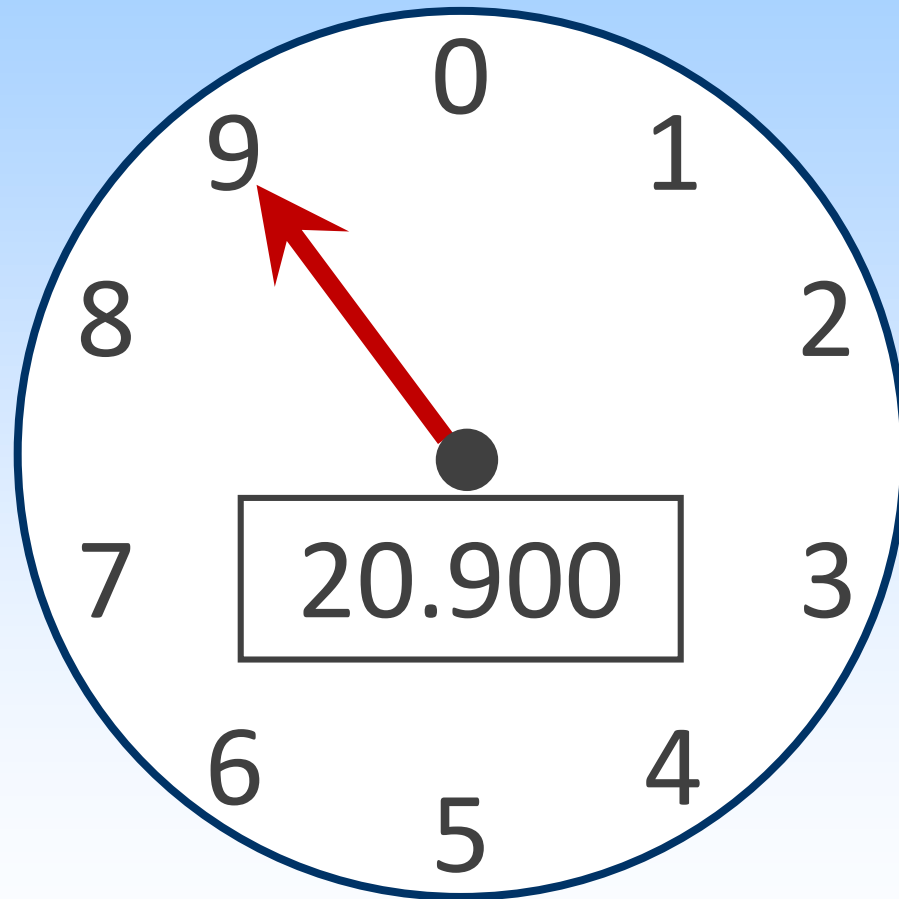


■ crew ■ aircraft ■ maintenance ■ weather ■ airport/ATC ■ other

Classical Pilot Error



Solution



From SHELL ...

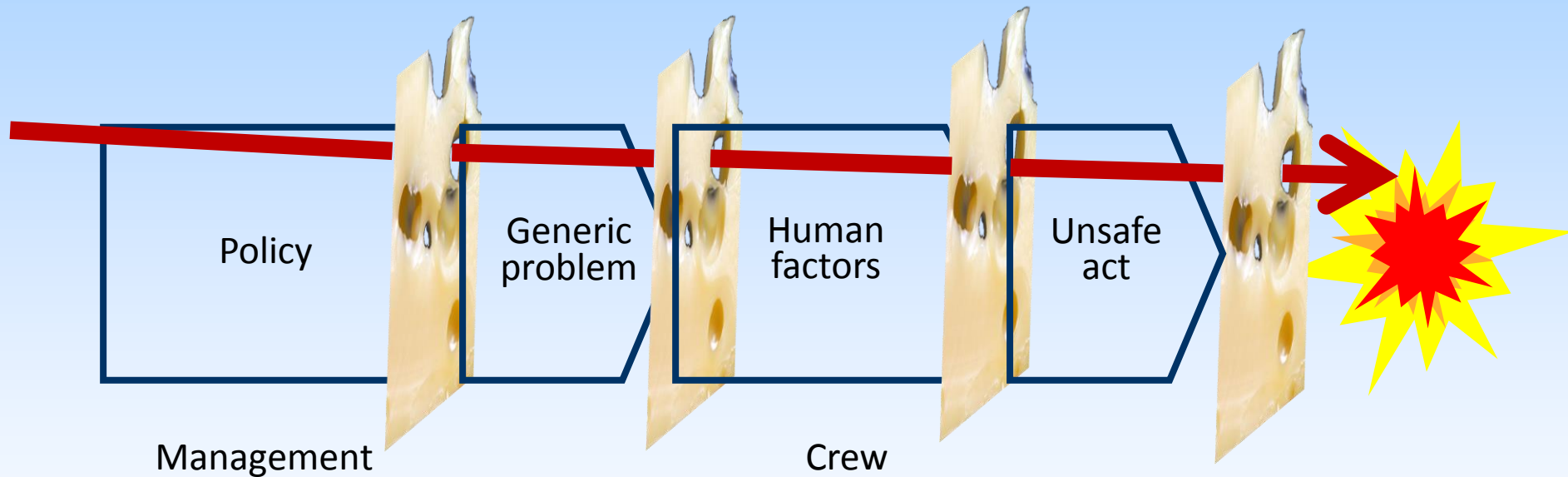


Source: Frank Hawkins

Human Factors in Flight

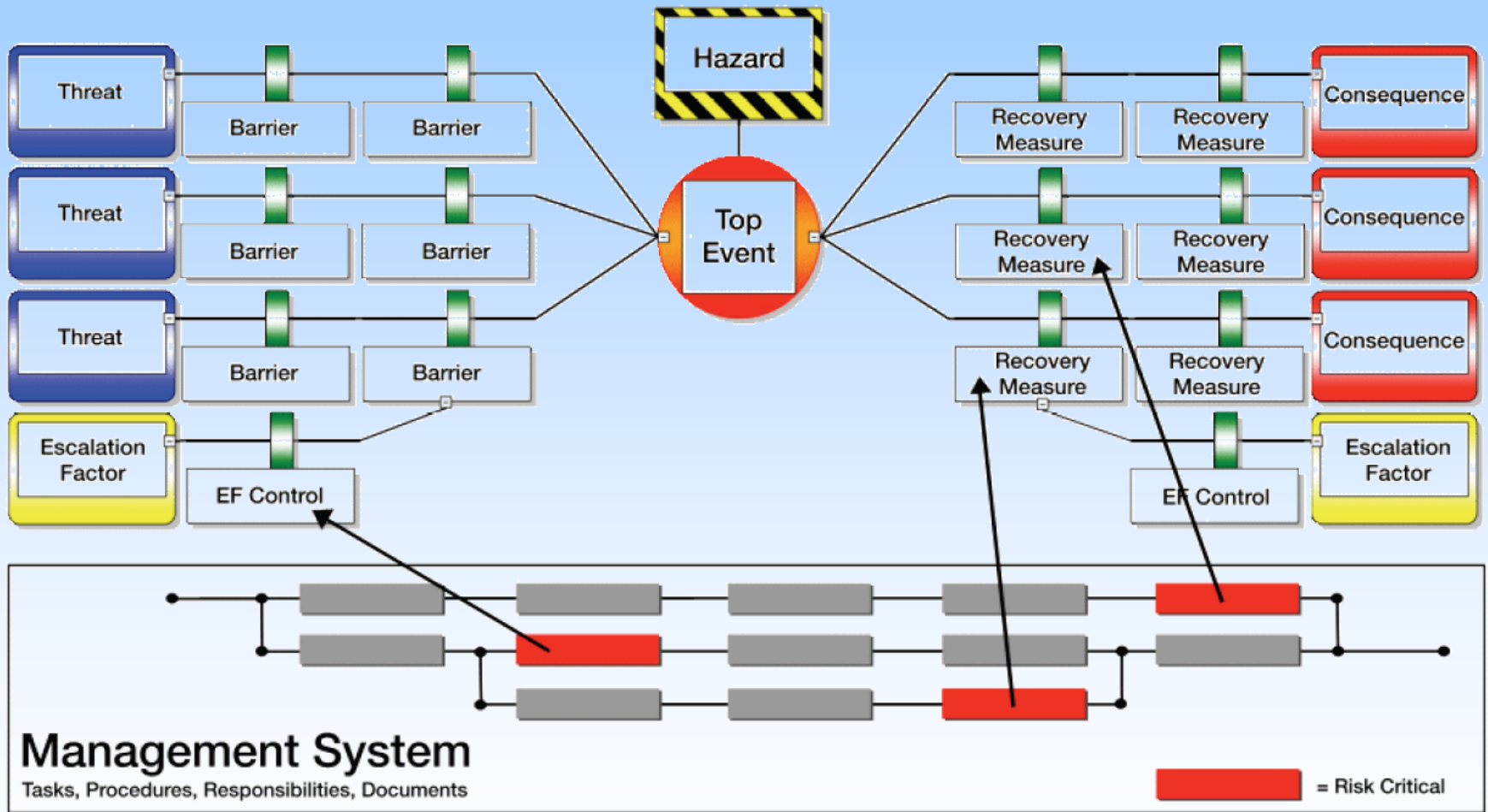
Ashgate (1987) (based on Edwards, 1972)

... via Tripod ./. Swiss Cheese ...

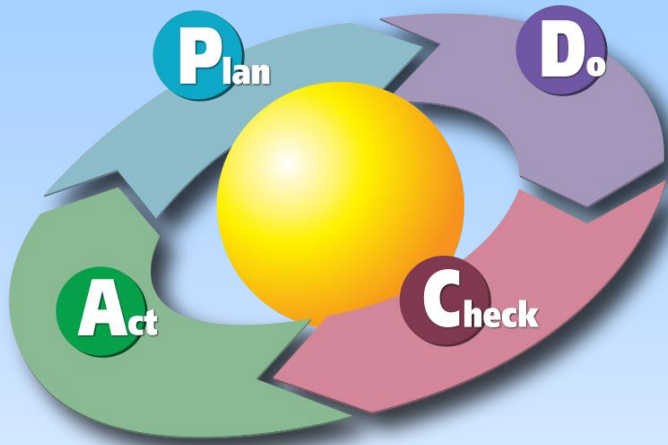


Source: Wagenaar, Hudson and Reason
Cognitive Failures and Accidents
Applied Cognitive Psychology, vol. 4, 273 – 294 (1990)

... and Bow-Tie ...

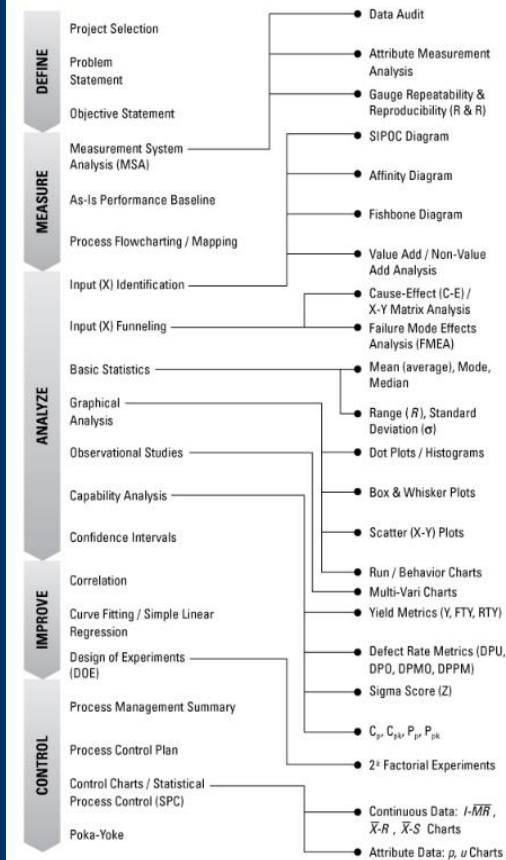


... with PDCA and Six Sigma to SMS



The Tools-Methods Landscape of Six Sigma

Having the right tools and knowing how to apply them to your Six Sigma projects will help you produce accurate, acceptable, and reusable outcomes. Here's an overview of the Six Sigma landscape:



Food for
Thought,
not for
Operations.

Real World Operations

- Safety is created by Physical Acts
 - not by procedures
- Procedures are a Must-Have
 - but not sacrosanct
- The World is Fundamentally Unpredictable
 - Fallible Human - Guardian Angel

Checklists
Procedures
Teamwork



Three Guiding Principles ...

1. Rules are Tools
2. Safety is Part of a Whole
3. Resilience is the Backstop

... Six Building Blocks:

Guiding Principle One:

Rules are Tools



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Building Blocks 1-4



If **you** choose to break the rules,
you choose not to work here



Compliance: Does Punishment Help?

- Slips

- Do what you *did not* intend to do

- Omissions

- *Don't* do what you intended to do

- Mistakes

- Misunderstood, therefore done wrong

- Violations

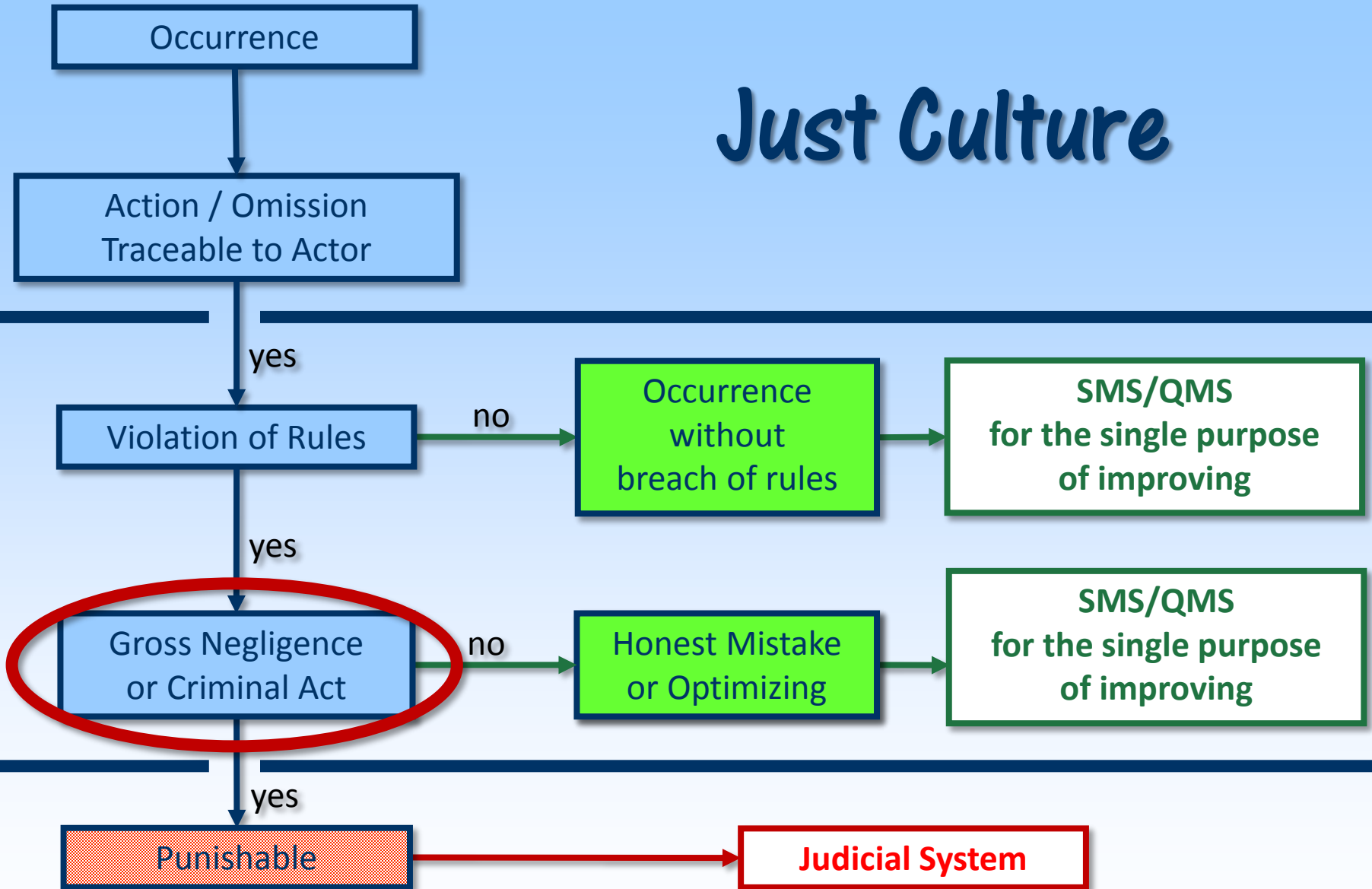
- Deliberate Deviation

deviation **seems** to be **Better**

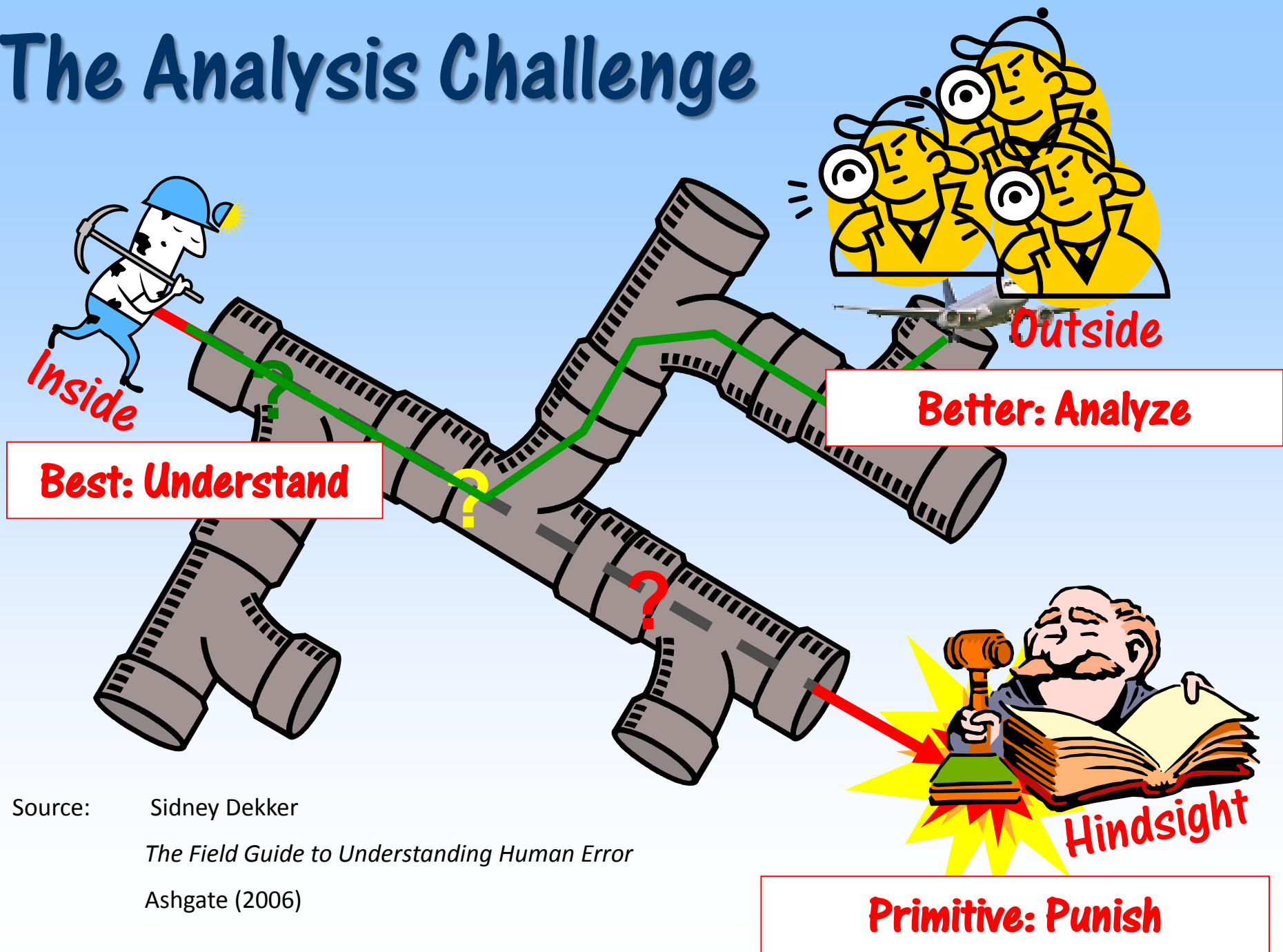
cost **seems** to be **Unnecessary**

deviation **seems** **Unavoidable**

Just Culture



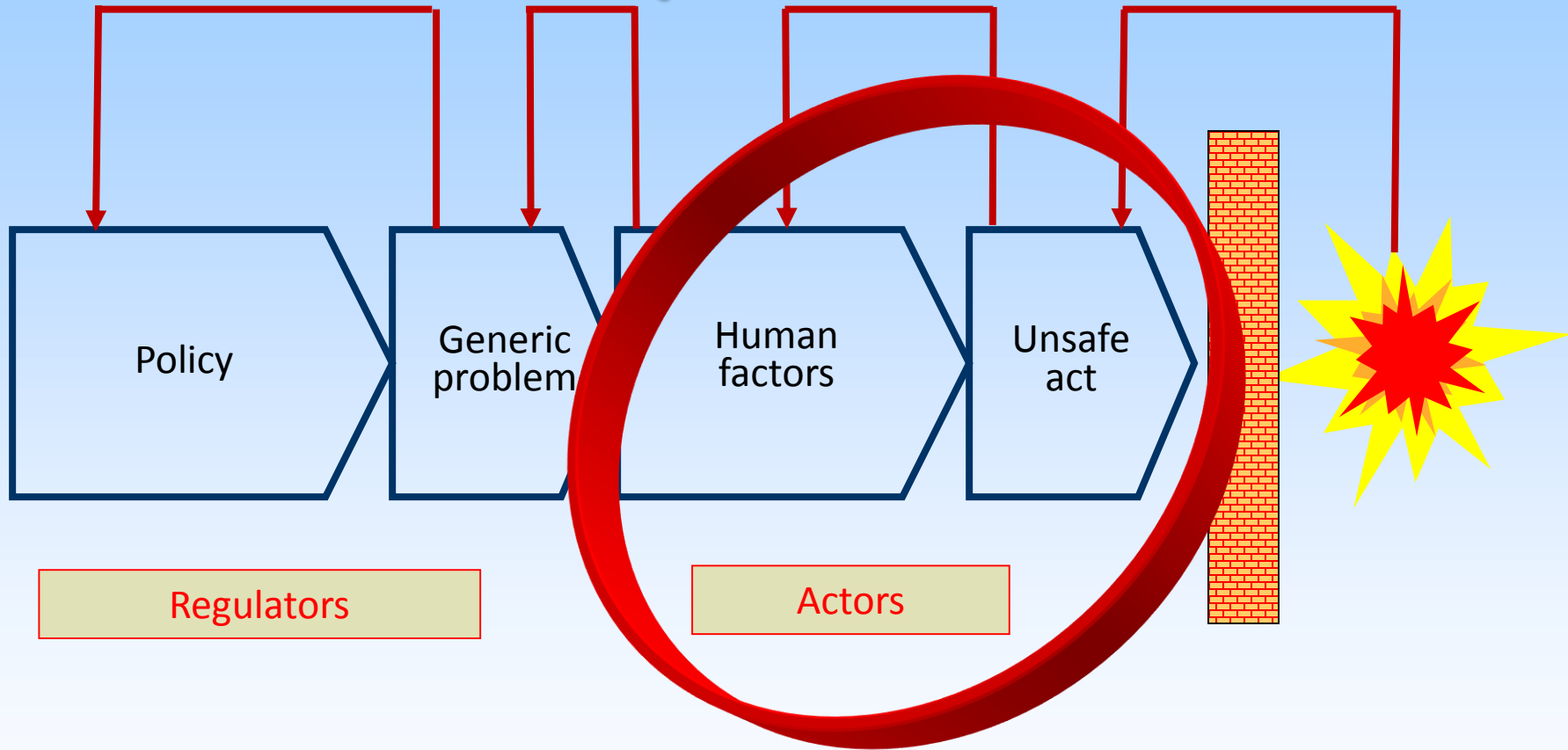
The Analysis Challenge



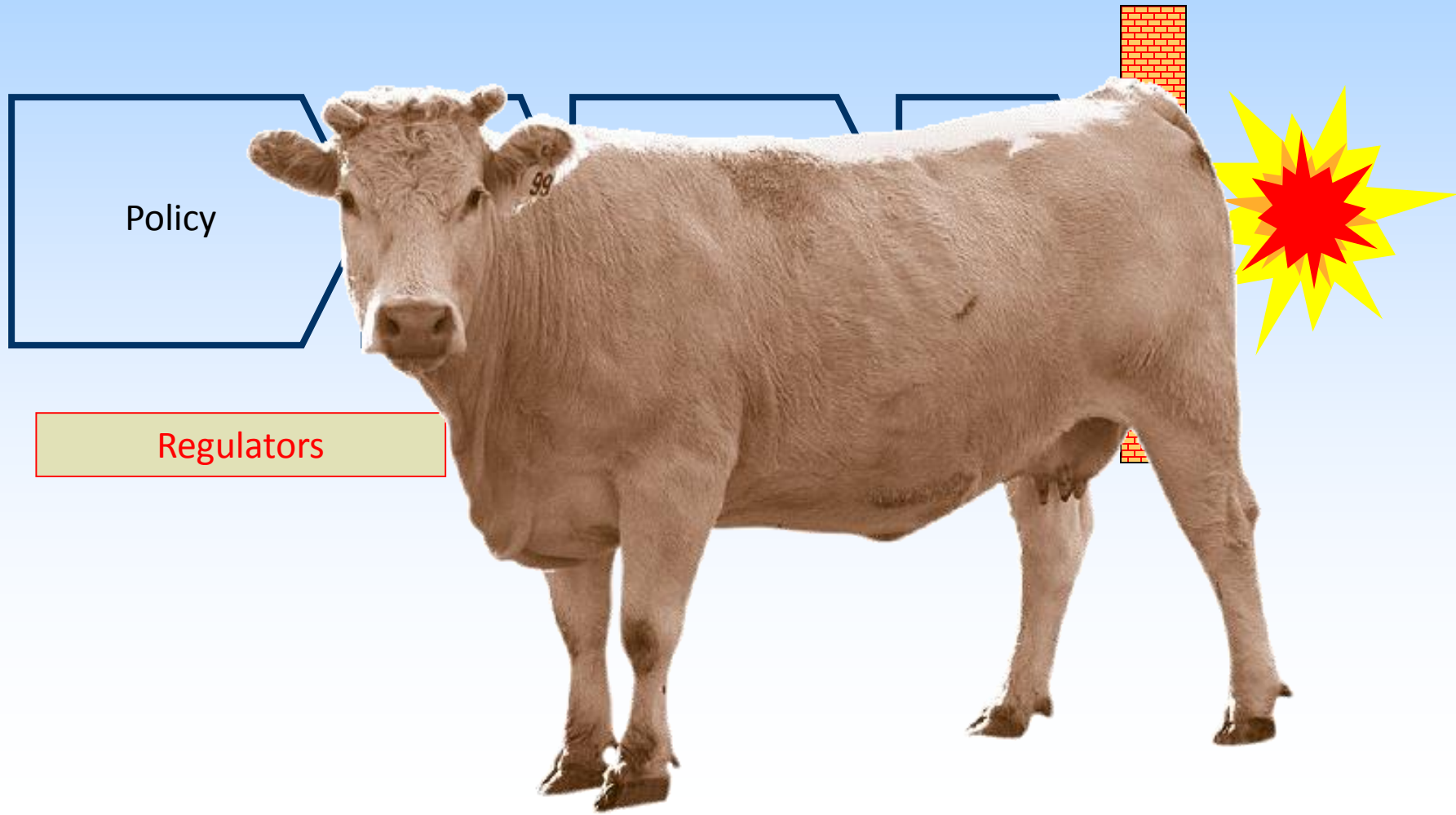
Source: Sidney Dekker
The Field Guide to Understanding Human Error
Ashgate (2006)

Primitive: Punish

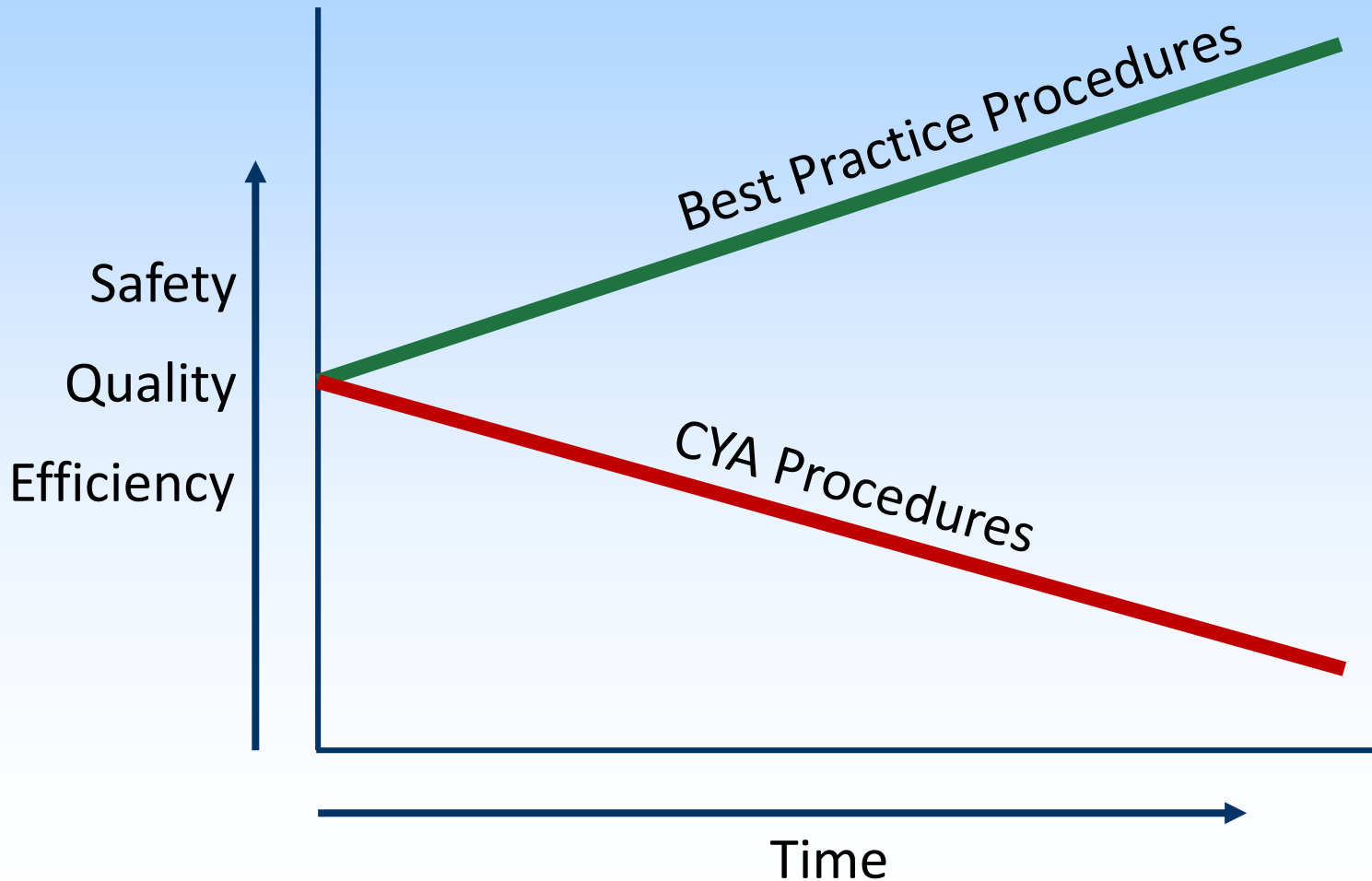
Solidified Experience



Solidified Distrust



Rules as Solidified Experience



The First Four Building Blocks

1. Just Culture
2. Occurrence Reporting
3. In-depth Analysis
4. Rules and Procedures as Solidified Experience

Guiding Principle 2:

Safety is Part of the Whole



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Building Block 5

Operational Reality

Limited Time - Information Incomplete - Must Act



Source: Erik Hollnagel
The ETTO Principle
Ashgate (2009)

A Common Misperception

Google

"Safety is our number one priority"

Search

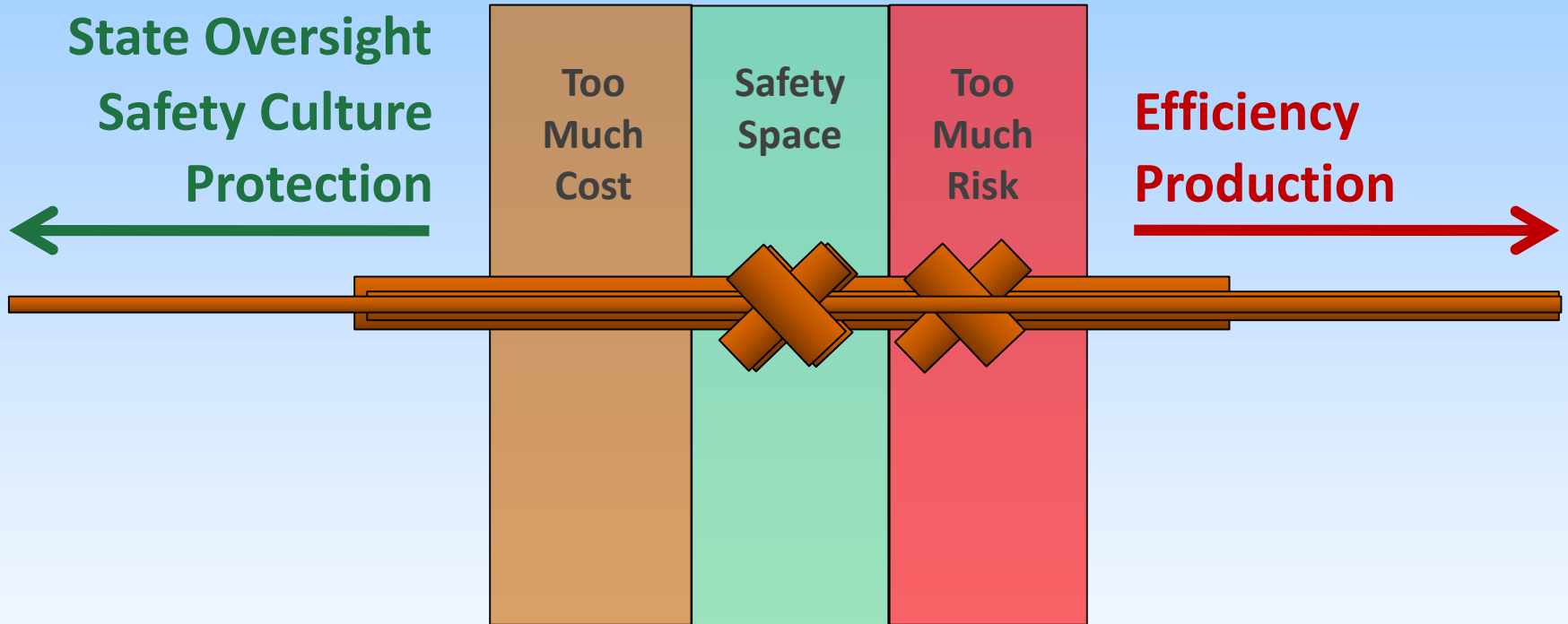
About 1,690,000 results (0.11 seconds)

The Real World

- Safety can **Never** be the first priority



The Knotted Rubber Band



Source: James Reason
The Human Contribution
Ashgate (2008)

Guiding Principle 3:

Resilience as Backstop



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Building Block 6

Resilience

- Hardware
 - redundant, fail-safe
- Procedures
 - reality check, branching
- People
 - knowledge, skills, tools

Individual Knowledge and Skills

Basic training

- Initial training
- Type rating
- Route training

Recurrent training

- Simulator
 - Recurrent: twice per year
 - Prof-check: twice per year
- Real Life
 - Line-check: once per year

Tools for the Fallible Human

- Checklists
 - simple but critical acts
- Standard Operating Procedures
 - best practices
- Teamwork
 - use all available eyes, ears and knowledge

Knowledge and Skills based



Into the Future

The Roadmap

Thank you !

Just Culture

Incident Reporting

In-depth Analysis

Resilience

Part of a Whole

Rules are Tools

