

# Safety Management

## Systems, Risk, Performance, and Regulatory Strategies

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# Safety

“Safety is the state in which the **risk of harm** to persons or property is reduced to, and maintained at or below, an **acceptable level** through a continuing process of **hazard identification and risk management**”

ICAO Doc 9859



# Safety: Operational Definition

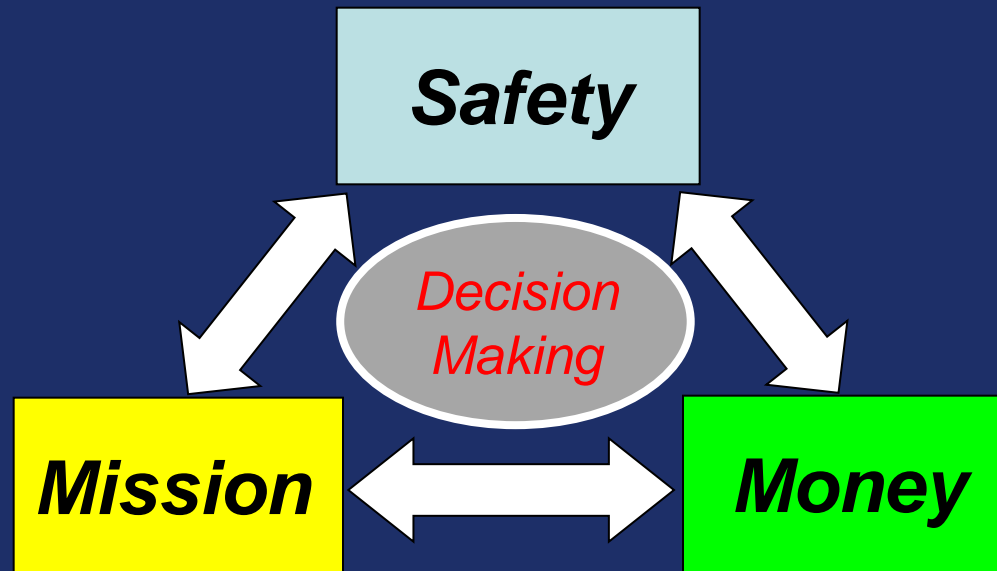
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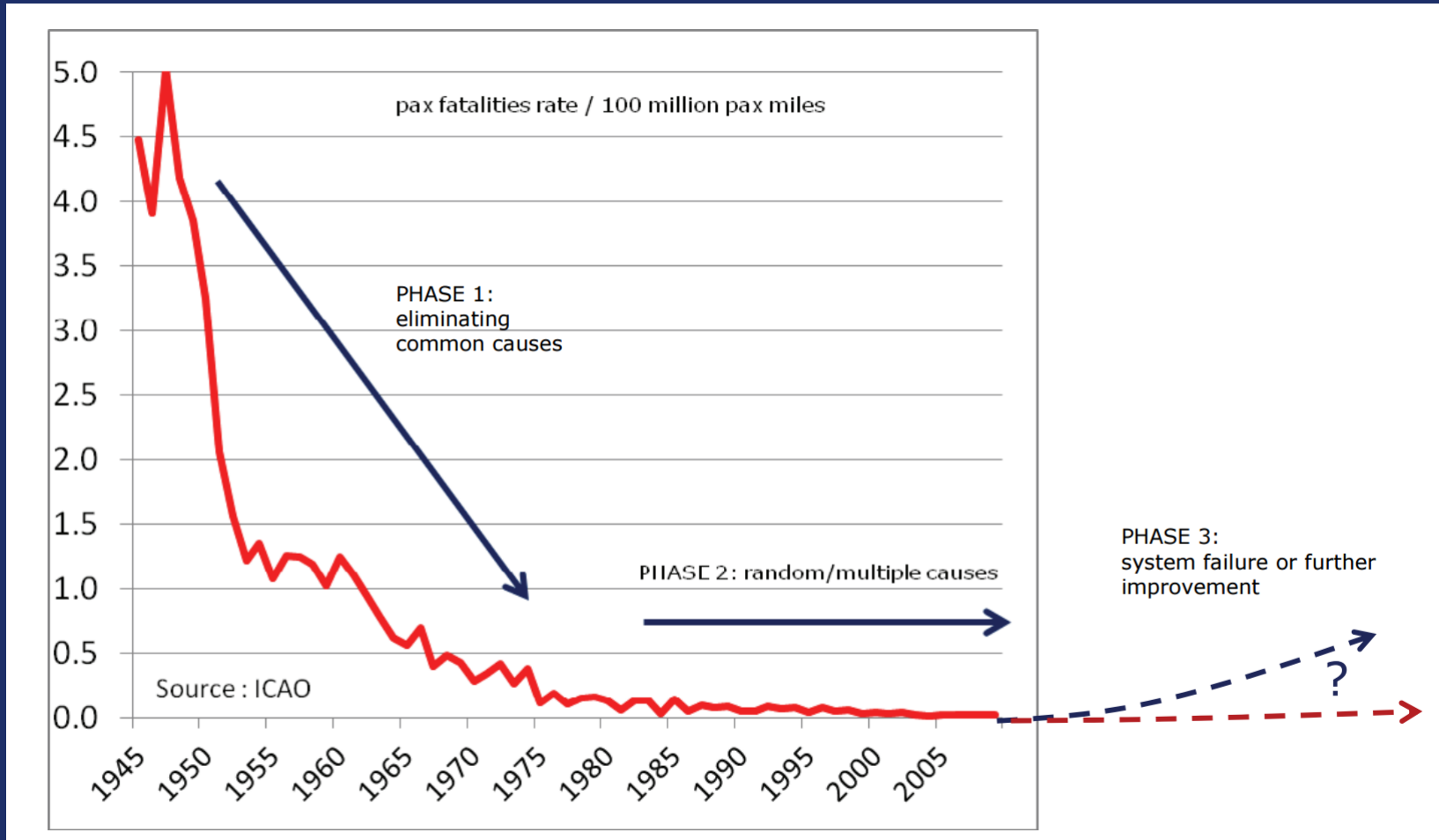
*Operationally defined...*

“Safety” is ***How well risk is managed***

# Balancing the Priorities: Finding the “Hard Limits”



# Evolving Nature of Causality

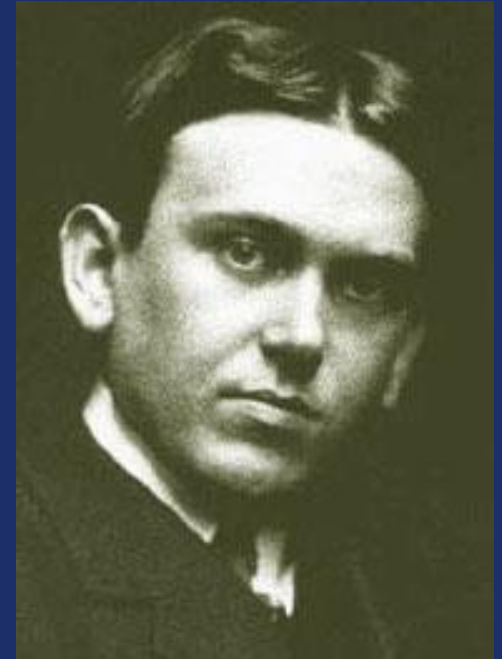


# So where do we go from here?

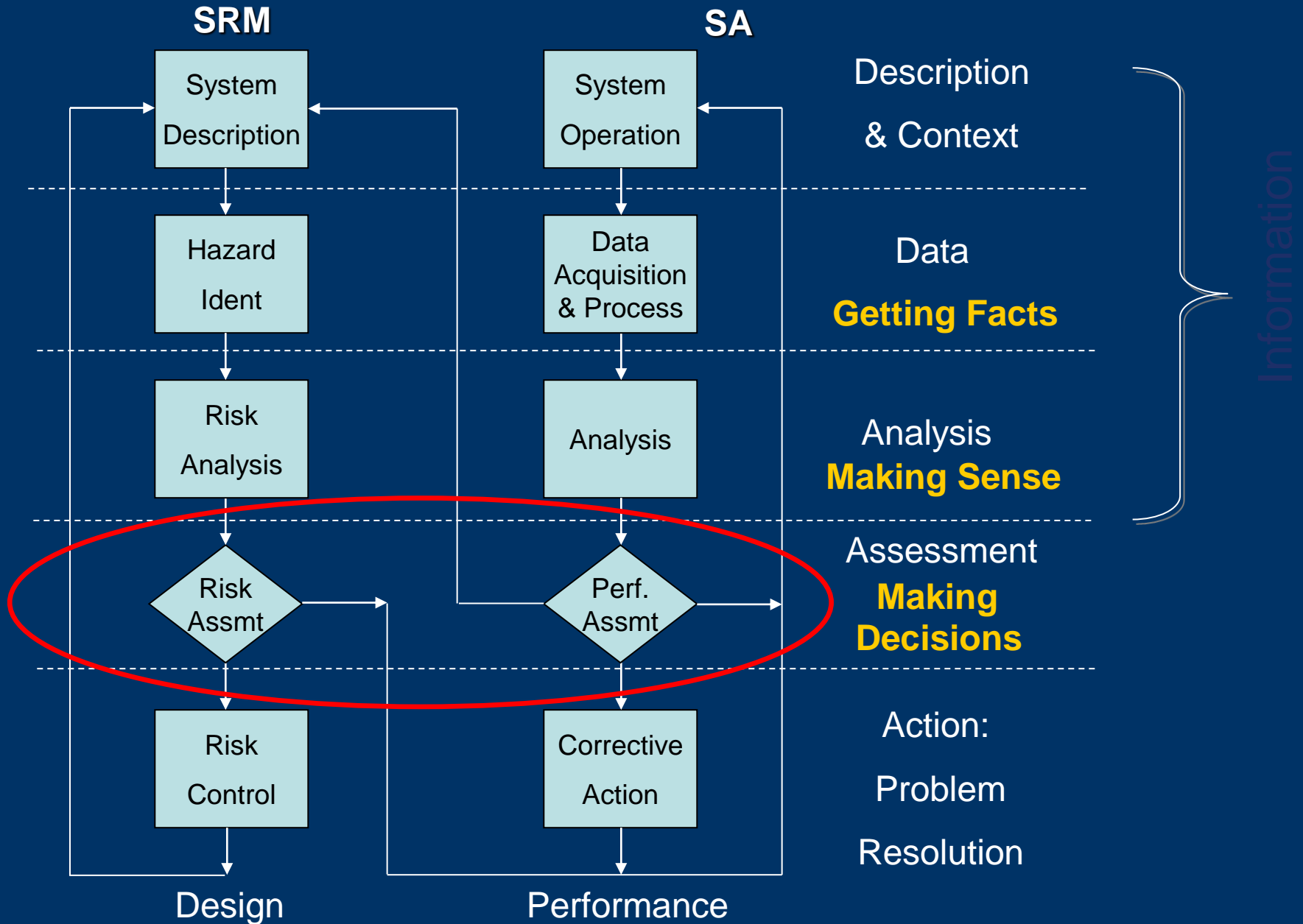
For every complex question  
there's a solution that's  
clear, simple...

...and wrong.

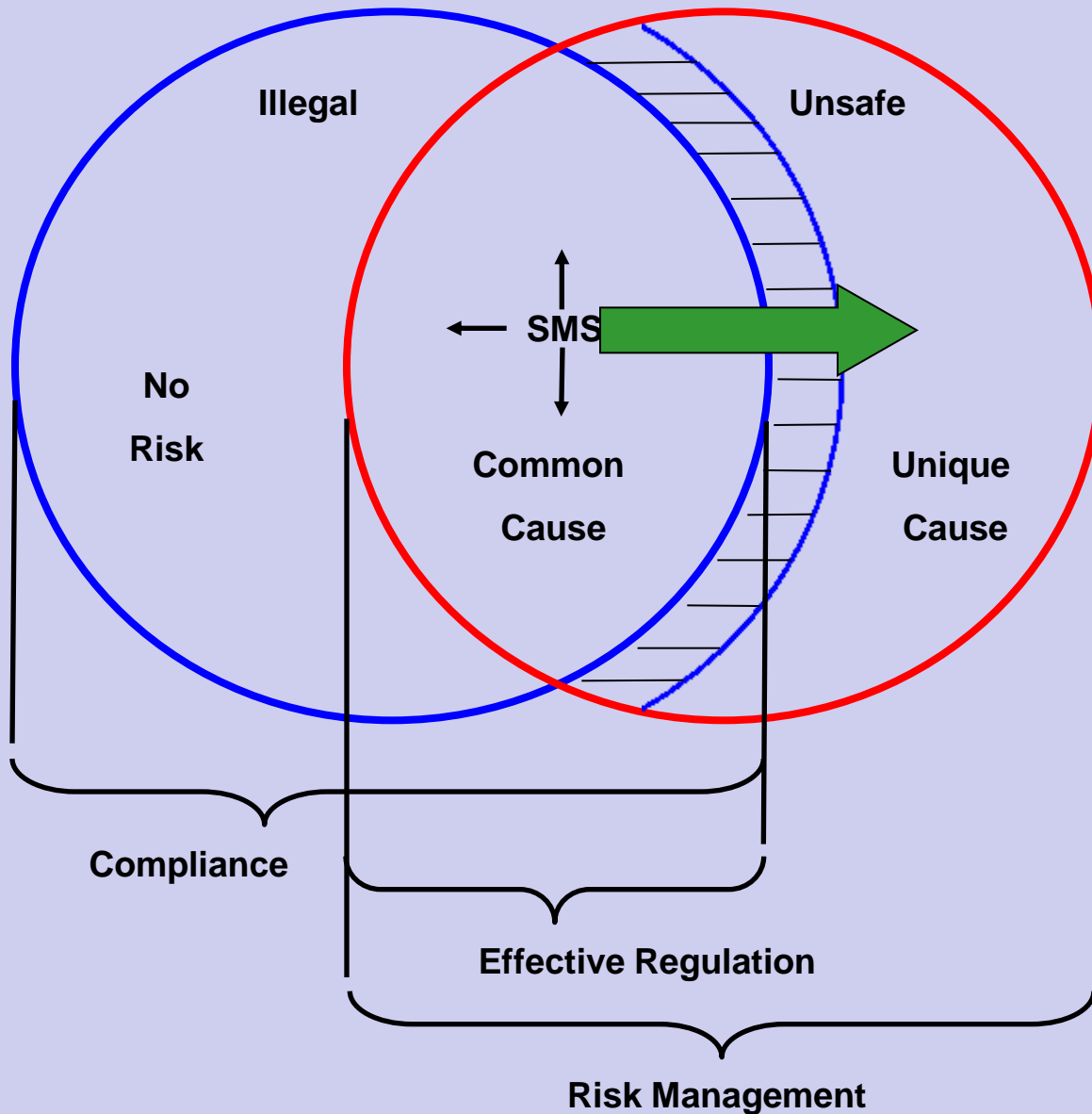
*H. L. Mencken*



# Safety Management: Core Processes



# Compliance and Risk Management





# Control Strategies

- **Regulatory Action (Required)**
- **Formal Voluntary Programs**
- **Collaborative (Defined Voluntary)**
- **Promotion, Education, and Awareness**



# Regulatory Strategies

- **Prescriptive (“Compliance-Based”)**
  - Typical for Common Cause Risks
- **Performance-Based**
  - More flexible for Diverse Populations
- **Risk Based**
  - Focused on Risk Control
- **Process Based (Blended Approach)**
  - Prescribed Processes
  - Flexible implementation and specific performance

# All Safety Rules should be “Risk Based”

- **Legislative/Regulatory charters** directed toward safety – reducing risk
- **Defining the Risk**
- **Compliance**
  - “If”: *Simple compliance* (“letter of the law”)
  - “How”: *Effective compliance* (managing the risk)
- **Certification, licensing, approval processes must stress effective means of compliance**

# All Rules are Prescriptive

- Rules, “prescribe” **acceptable behaviors**
- **Objective** (“black and white”)
- Address “**common cause,**” technical issues
- Relevance to population **narrowly defined**
- Lack of fit problems
- **Limited flexibility**
- Assumption of “**effective compliance**”

# All Rules are Performance Based

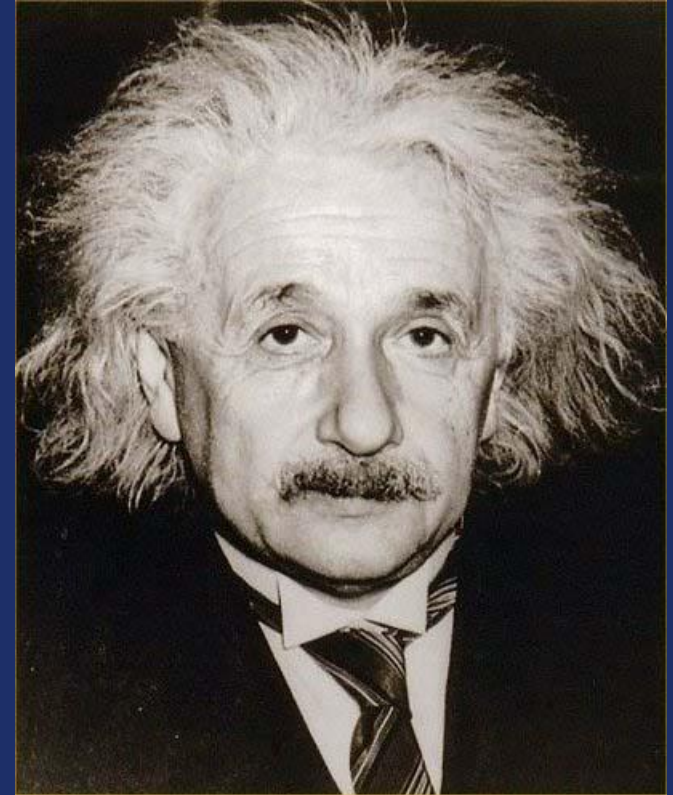
- All rules have **expectations for outcomes**
- “Performance based” rules can be more **flexible to variables** in population
- Depend on defining **performance standards**
- Ultimate outcomes (accidents) are reactive
- Immediate outcomes dependent on **assumptions of causality**
- Measures **and oversight strategy** must not be overlooked

# Safety Performance Measures : Challenges

Everything that counts  
can't [always] be  
counted...

...everything that can be  
counted doesn't  
[necessarily] count.

*Albert Einstein*



# Measurement Considerations

- **Performance of all types of approaches should be measured and assessed:**
  - Defining performance
  - Validity of measures
  - Reliability of data
  - Qualitative and quantitative data
  - Classification systems
  - Trending

# Traits of a Healthy Culture: High Reliability Organizations (HROs)

- Preoccupation with failure (track small failures)
- Reluctance to (over)simplify
- Sensitivity to operations
- Commitment to resilience (ability to recover)
- Deference to expertise

*Weick & Sutcliffe*





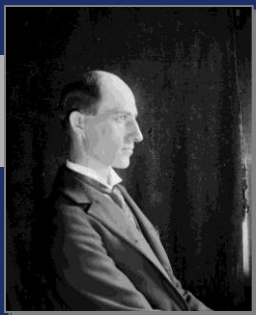
***“Carelessness and overconfidence are more dangerous than deliberately accepted risk”***  
**Wilbur Wright, 1901**

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Wilbur Wright gliding, 1901  
Photographs: Library of Congress

