Safety …

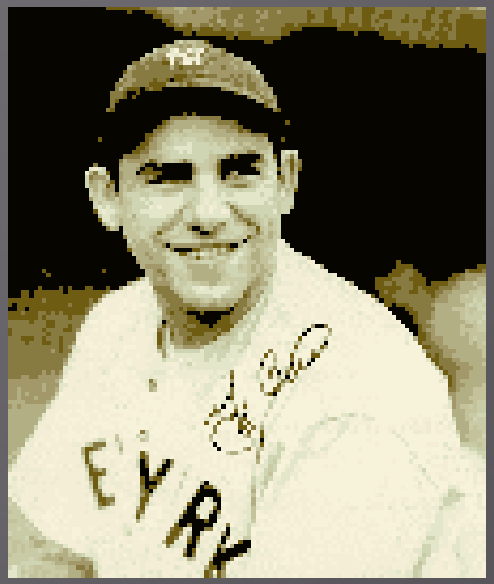
the *Proactive* Way

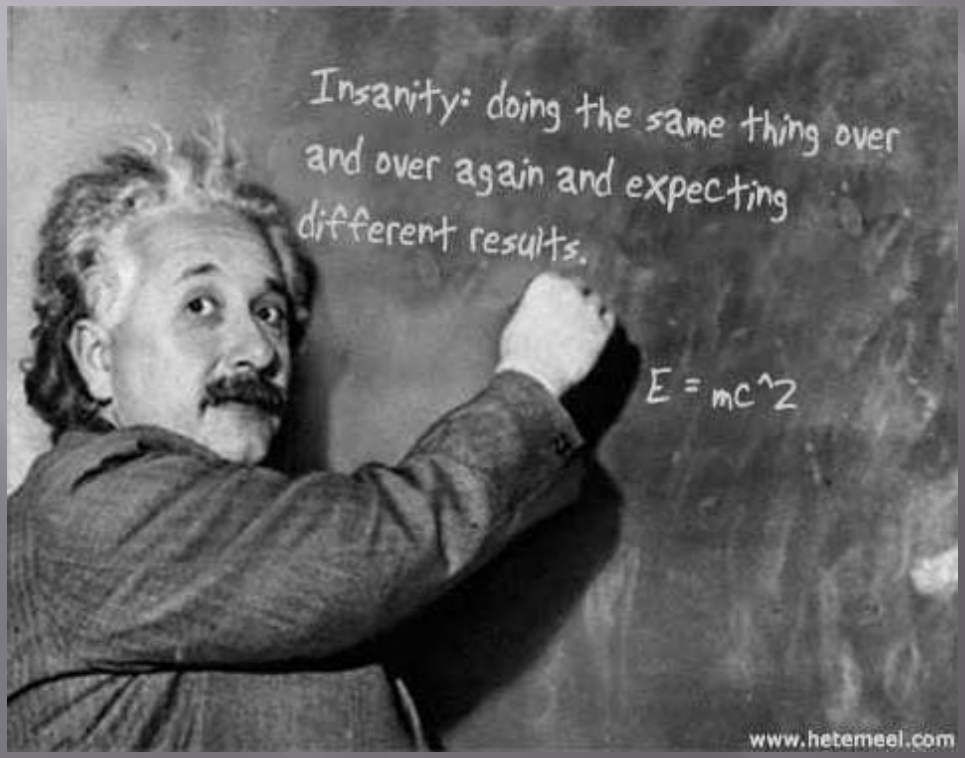
Safety Management Systems (SMS)

Two Wise Men….

"If you keep doing what you're doing…
you're going to keep getting what you got!"

Yogi Berra





Insanity: doing the same thing over and over again and expecting different results.

Albert Einstein, *(attributed)*

An Industry Answer?

Aviation Safety to Fire Operations Safety

SMS

Launching a *common* idea and a *new* approach:

“SMS”

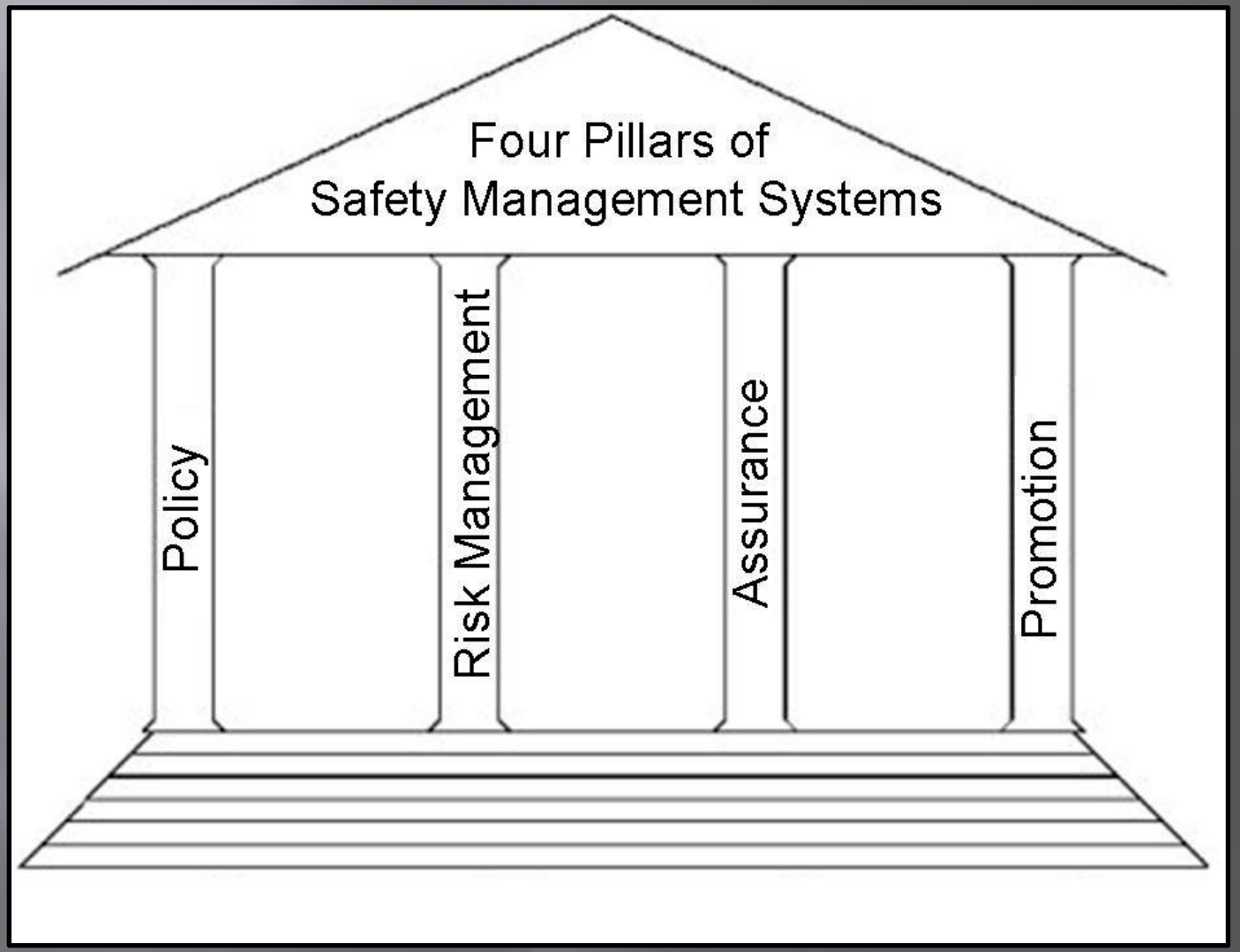
A systematic and continuous ***Management*** process based on proactive identification of ***Hazards***, and analyses of their ***Risk***

SMS requires knowledge of Human Error Mechanisms

Human Error accounts for 60-80% of all Aviation Accidents. SMS is about managing the manageable, so it requires knowledge of how, what, and why human errors occur.

SMS

IS BUILT AROUND FOUR PILLARS



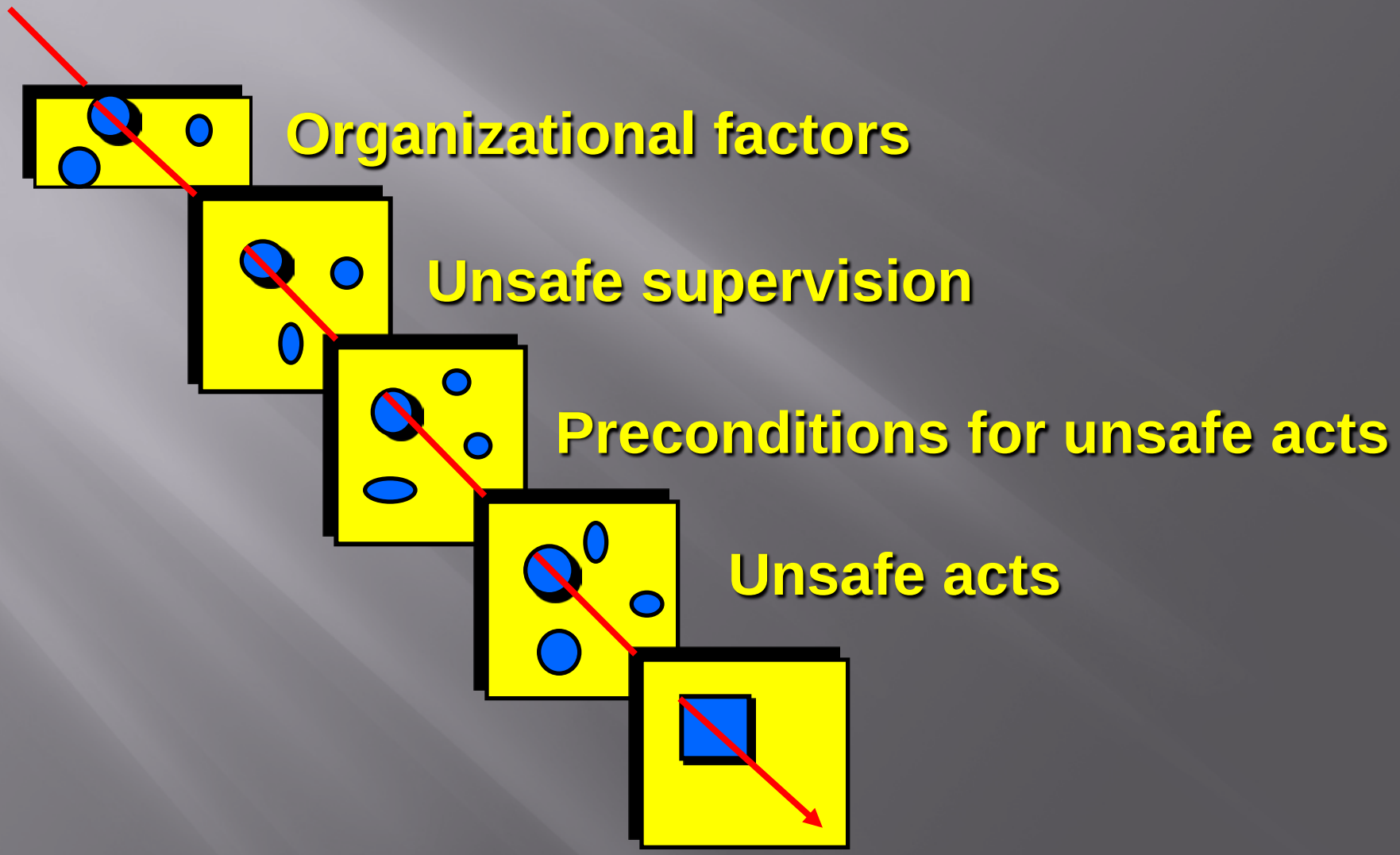

•POLICY
•Doctrine
•Practices
•Principles
•Risk Management
•Proactive
•Prevention
SAFETY CULTURE
•Assurance
•Reporting
•Investigations
•Audits
•Promotion
•Learning
•Communication
•Training
•Reporting

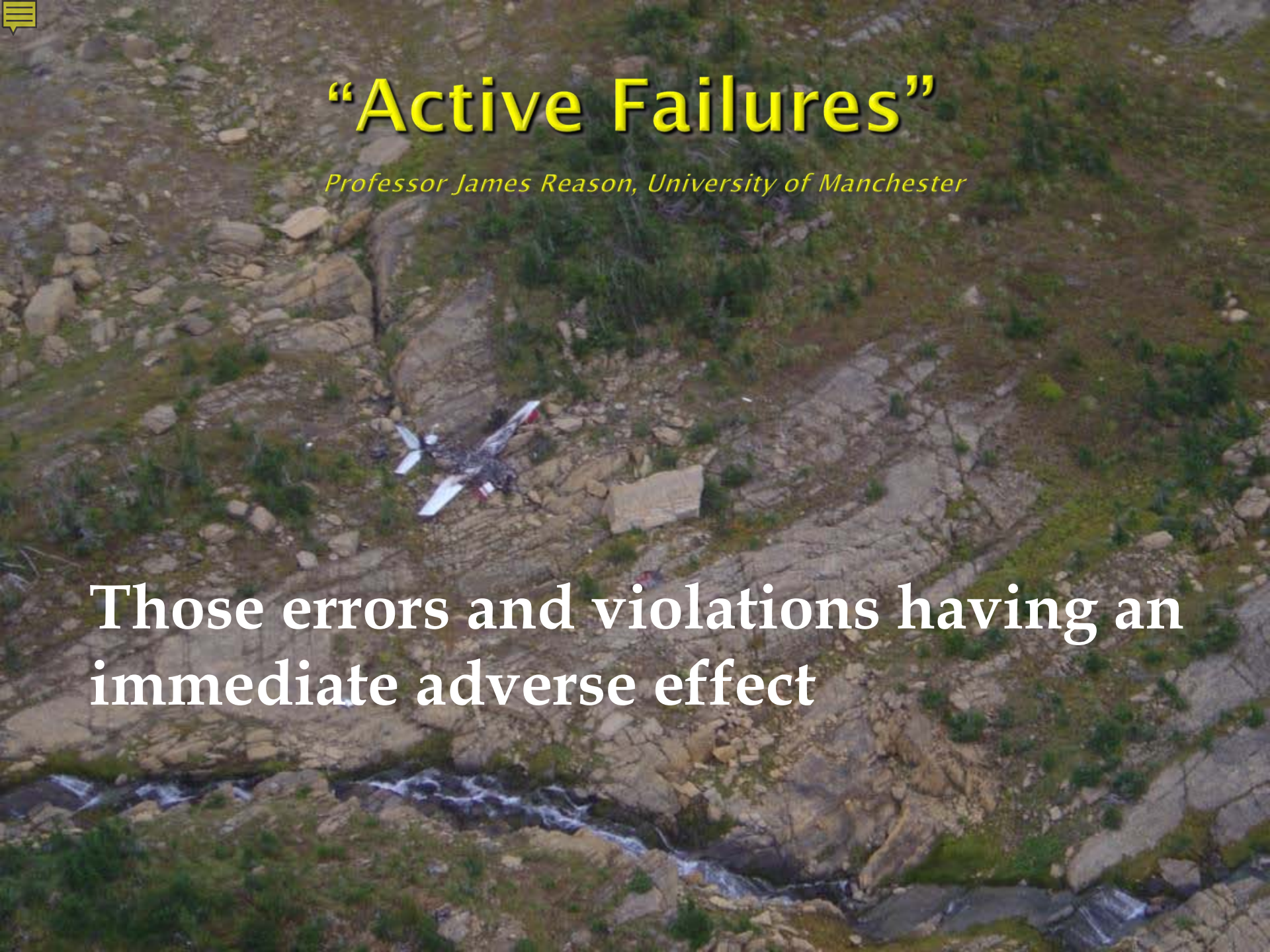
SMS Features

- Systematic – Safety management activities are in accordance with a pre-determined plan, and applied in a consistent manner throughout the organization.
- Proactive – An approach that emphasizes hazard identification and risk control and mitigation, before events that affect safety occur.
- Explicit – All safety management activities are documented and visible.

Organizational Failure Model

Professor James Reason, University of Manchester

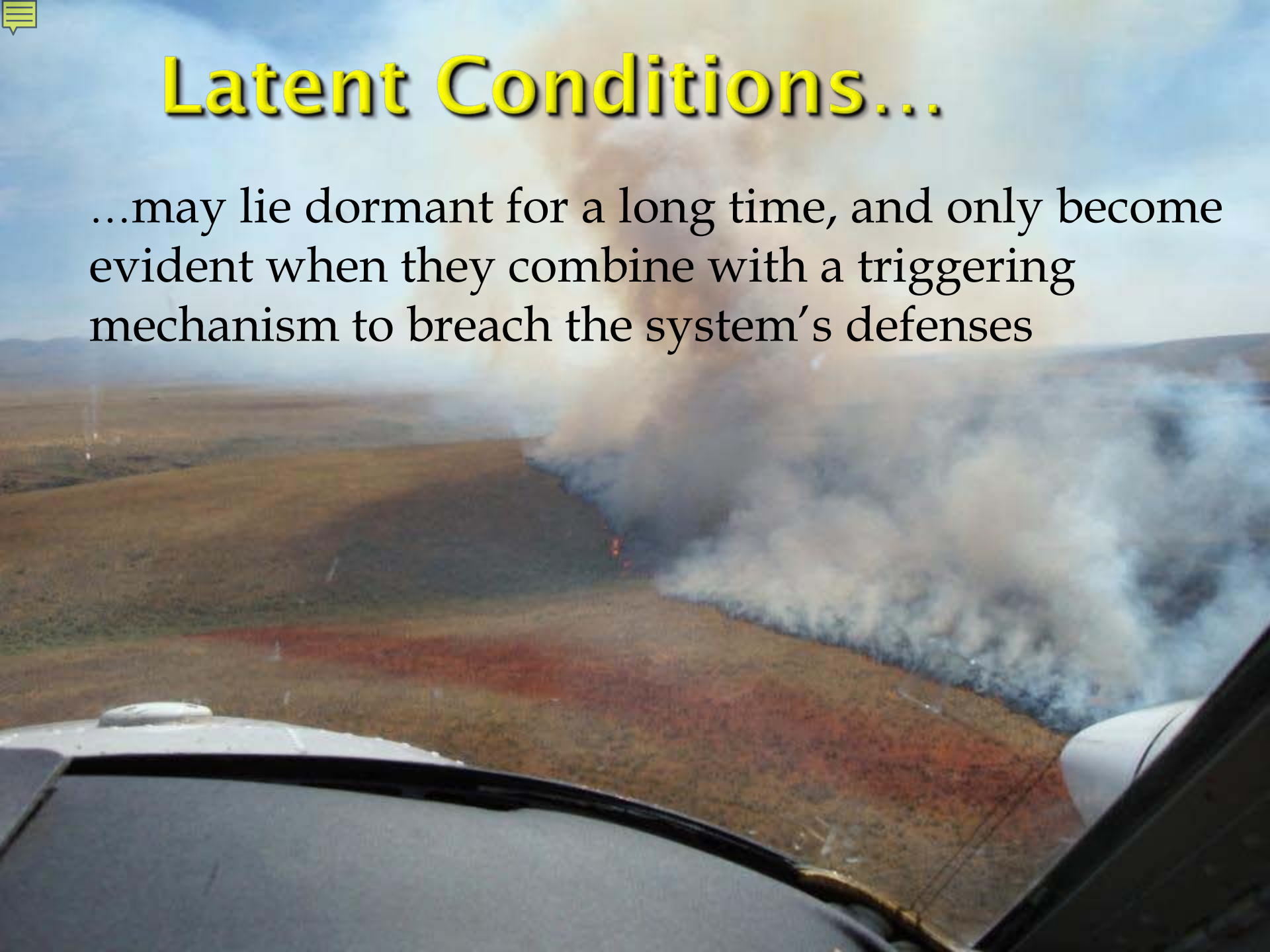




"Active Failures"

Professor James Reason, University of Manchester

Those errors and violations having an immediate adverse effect



Latent Conditions…

…may lie dormant for a long time, and only become evident when they combine with a triggering mechanism to breach the system's defenses

The Path to Latent Conditions

- Latent conditions can be created by:
- Corporate climate and values
- How corporate decisions are made
- Corporate priorities
- Who influences the decision-making chain
- How the decision-making process is recorded and performance tracked
- Not measuring results against expectations

Problems and Solution

- Current safety approaches can't keep up with complexity growth
- We need a new approach for our safety management and oversight problems

A SMS Organization…

Develops a "Just culture" or "Safety Culture" to:

- ✓ **Capture the operational knowledge and experience of the employees**
- ✓ **Involve the employees in the safety achievement process**

- **Person Model**

  - •Name
  - •Blame
  - •Shame
  - •Retrain
  - •Write Another Procedure
  - •Fire the Perpetrator

- •We Ask Who?

System Model

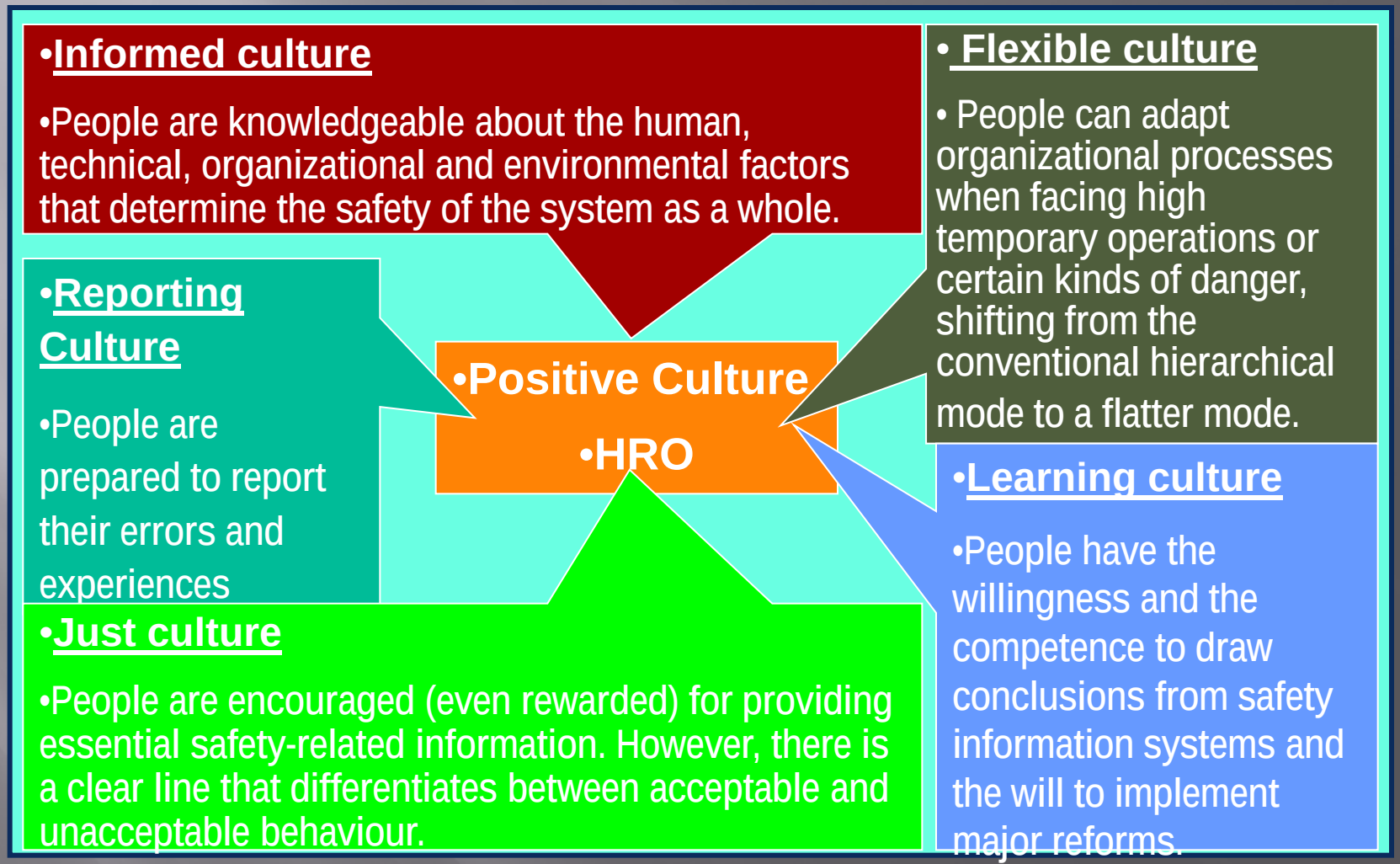
Remedial attention focused on the task and the work place

- •Organization
- •Supervision
- Managing the manageable

•We Ask Why?

•James Reason & Alan Hobbs (2003)

Aspects of a Positive Safety Culture



•James Reason (1997)

Just Culture

A just culture has a documented disciplinary policy

- Define clear lines between the acceptable and the unacceptable

- Blame culture promotes hiding
- Just culture promotes partnership

•A roadmap to a just culture

Three possible organizational cultures

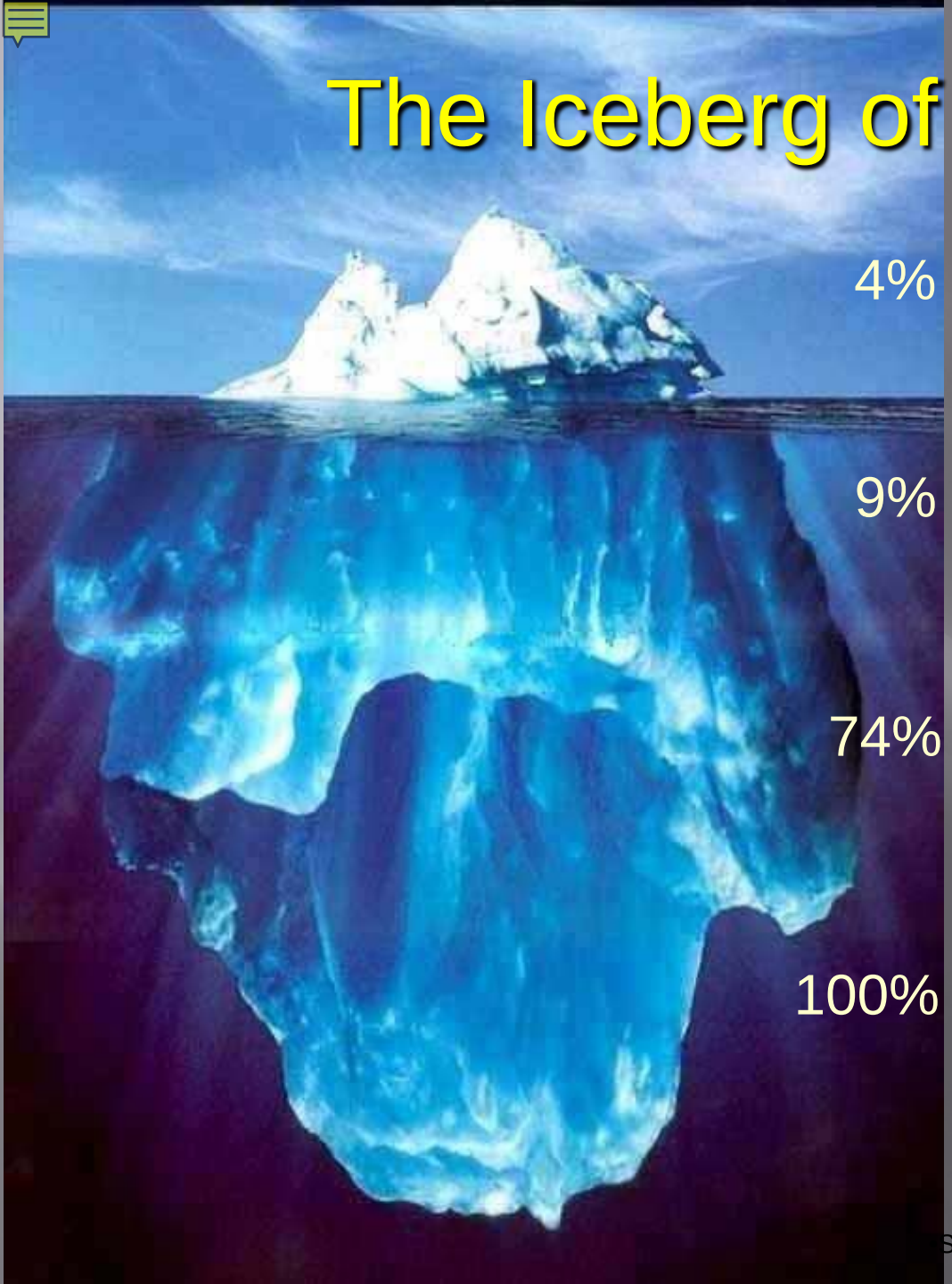
	•Pathological	•Bureaucratic	•Generative
•Information	•Hidden	•Ignored	•Sought
•Messengers	•Shouted	•Tolerated	•Trained
•Responsibilities	•Shirked	•Boxed	•Shared
•Reports	•Discouraged	•Allowed	•Rewarded
•Failures	•Covered up	•Merciful	•Scrutinized
•New ideas	•Crushed	•Problematic	•Welcomed
•Resulting •organization	•Conflicted Organization	•"Red tape" Organization	•Highly Reliable Organization

The Issue of *Focus*

What do Interagency Aviation Managers want?

- A Safe and Efficient safety system
- Effective and Strong providers

The Iceberg of Ignorance



4% Problems known to top management

9% Problems known to middle/“*line*” Management

74% Problems known to supervisors

100% Problems known to rank and file MX personnel

Source: Yoshida, Shuichi, 2nd Intl Quality Symposium, 1989

Cultural Shift

- The FS and DOI aviation programs are making progress with strategic risk assessments and doctrinal revisions in policy.
- We are seeing significant support in the ranks as a result of recent field inspections, the use of gap analysis tools in maintenance circles, and the interest at all levels in operational risk management.


SMS…emphasizes
Risk Management
EVERGREEN
…It integrates safety with
Line Management

Heavy Airtanker Program System - Human Factors

Sub-systems	Hazards	Pre Mitigation Likelihood	Pre Mitigation Severity	Pre Mitigation Outcome	Mitigation	Post mitigation Likelihood	Post mitigation Severity	Post mitigation Outcome	Mitigation Achieved? Yes or No	Additional Local Mitigation	Post Mitigation Value
Pilot Proficiency and Training	Lack of fire mission training and Lack of proficiency flight time.	Probable	Catastrophic	High	Vendors have instituted training programs such as CRM, risk management, and flight safety with the intent to standardize cockpit procedures. Increase the scope and complexity of the NAFA program, develop the McClellan training center for fire environment.	Occasional	Critical	Serious			
	Aircraft performance planning for successful outcome in a high rate of descent, level off, and climb out profile.	Probable	Catastrophic	High	Address airtanker pilot training and proficiency to reduce frequency of accidents occurring from CFIT.	Occasional	Critical	Serious			
	High number of target fixation and tactical maneuvering errors.	Probable	Catastrophic	High	Address human factors including target fixation, situational awareness, task overload, performance/tactical planning errors.	Occasional	Critical	Serious			

Heavy Airtanker Program System - Policy, Procedure, and Doctrine

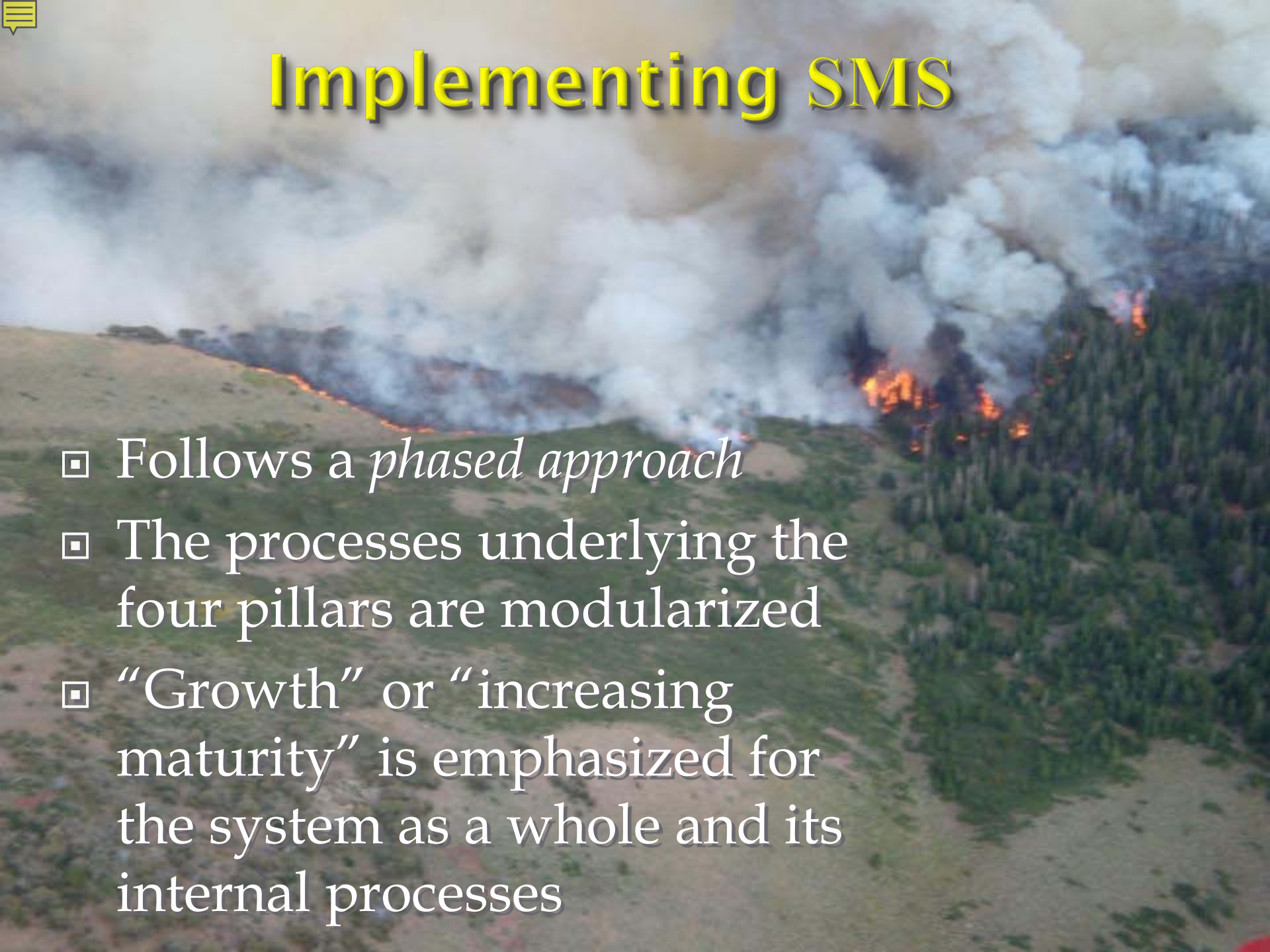
Sub-systems	Hazards	Pre Mitigation Likelihood	Pre Mitigation Severity	Pre Mitigation Outcome	Mitigation	Post mitigation Likelihood	Post mitigation Severity	Post mitigation Outcome	Mitigation Achieved? Yes or No	Additional Local Mitigation	Post Mitigation Value
Management Oversight	No requirement to implement a system safety program that is common between the contractor and the agency.	Probable	Catastrophic	High	Establish a requirement to initiate a safety management system between the contractor and the agency. Require the contractor to designate a safety officer.	Remote	Marginal	Medium			
Agency Culture	"Can do" philosophy has developed aviation programs with minimal budgets and staffing.	Probable	Critical	High	The Blue Ribbon Panel stated: "significant funding will provide adequate knowledge of aircraft conditions, training and maintenance, that will serve to improve the safety record."	Remote	Marginal	Medium			
	A culture of acceptable loss has evolved in the agency regarding airtanker losses.	Probable	Critical	High	Establish a higher expectation beyond minimum requirements for safety with a lower tolerance for accidents. This will encourage a cultural change away from one of acceptable loss.	Remote	Marginal	Medium			
Quality Assurance and Inspections	Lack of an operative quality assurance and inspection program.	Probable	Critical	High	Develop a QA program for improved oversight of the contracted fleet ranging from improved checkrides, workforce efficiency, adequate staffing of trained inspectors, and standardized procedures.	Remote	Marginal	Medium			
Public Perception	Influence on the agency	Probable	Marginal	Serious	Establish doctrine	Remote	Marginal	Medium			

A SMS Organization…

Adopts Risk Management Practices to:

- Adapt to change
- Manage resource application
- Understand the pitfalls of the operating environment

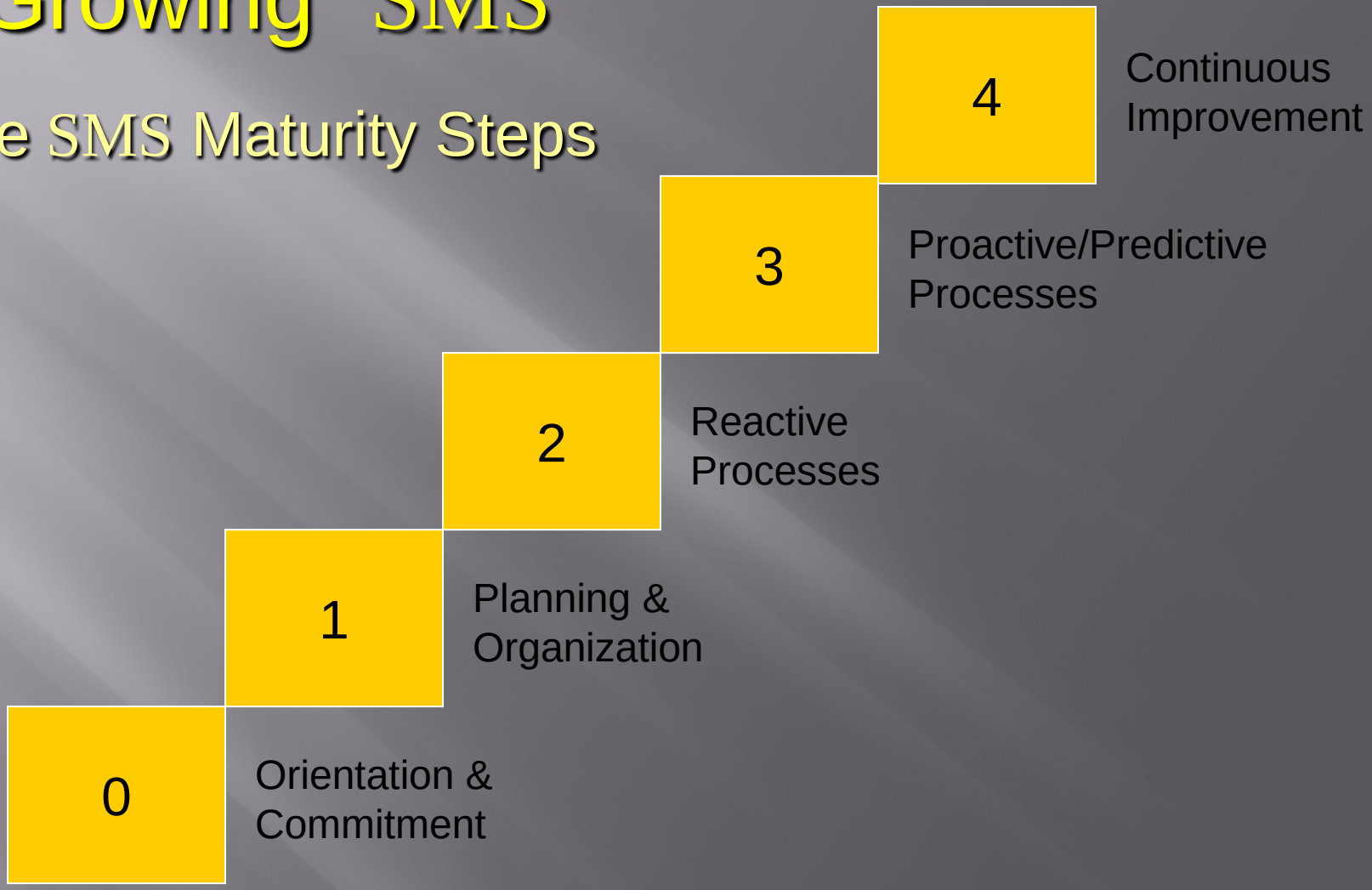
Implementing SMS



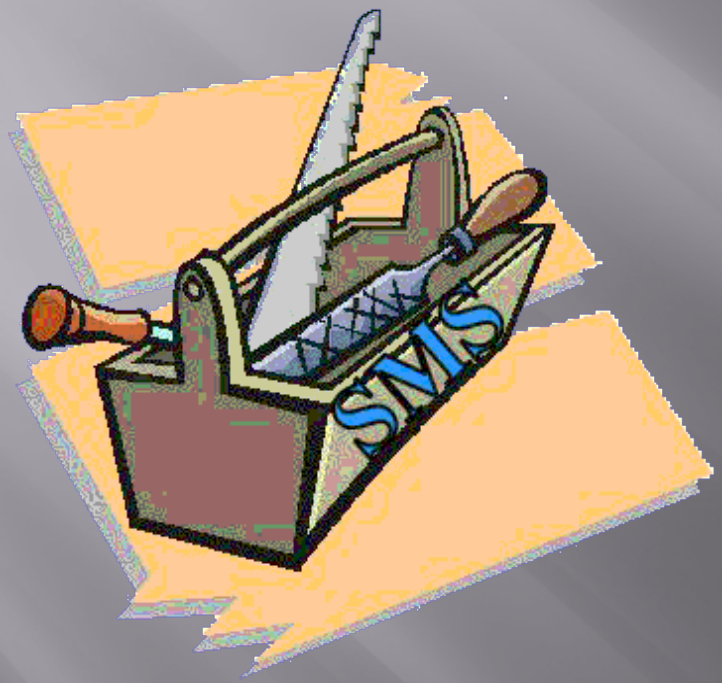
- Follows a *phased approach*
- The processes underlying the four pillars are modularized
- "Growth" or "increasing maturity" is emphasized for the system as a whole and its internal processes

“Growing” SMS”

The SMS Maturity Steps



SMS is the toolbox for…



- Policy & Management Practices
- Safety Assurance processes
- Safety promotion practices
- Risk Management process