Session No. 1
Basic Contemporary Safety Concepts

SMS Senior Management Workshop

Rome, 21 May 2007

For Starters

- The total elimination of risk is unachievable
- Errors will occur, in spite of the most accomplished prevention efforts
- No human endeavour or human-made system can be free from risk and error
  - ✓ Controlled risk and error are acceptable in an inherently safe system

Concept of safety (Doc 9859)

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

Forensic Safety Management

- Focus on the outcome(s)
- Unsafe acts at the tip of the arrow
- Blame & punishment for failure to “perform safely”
- Address specific safety concern exclusively

The Underlying Paradigm–Rule-based System

Deterministic – The world as it should be

- Aviation system – as pre-specified – is perfect
- Compliance based
- Outcome oriented
  - ✓Accident investigation

Inefficiency and Perversity

The beatings will continue until morale improves

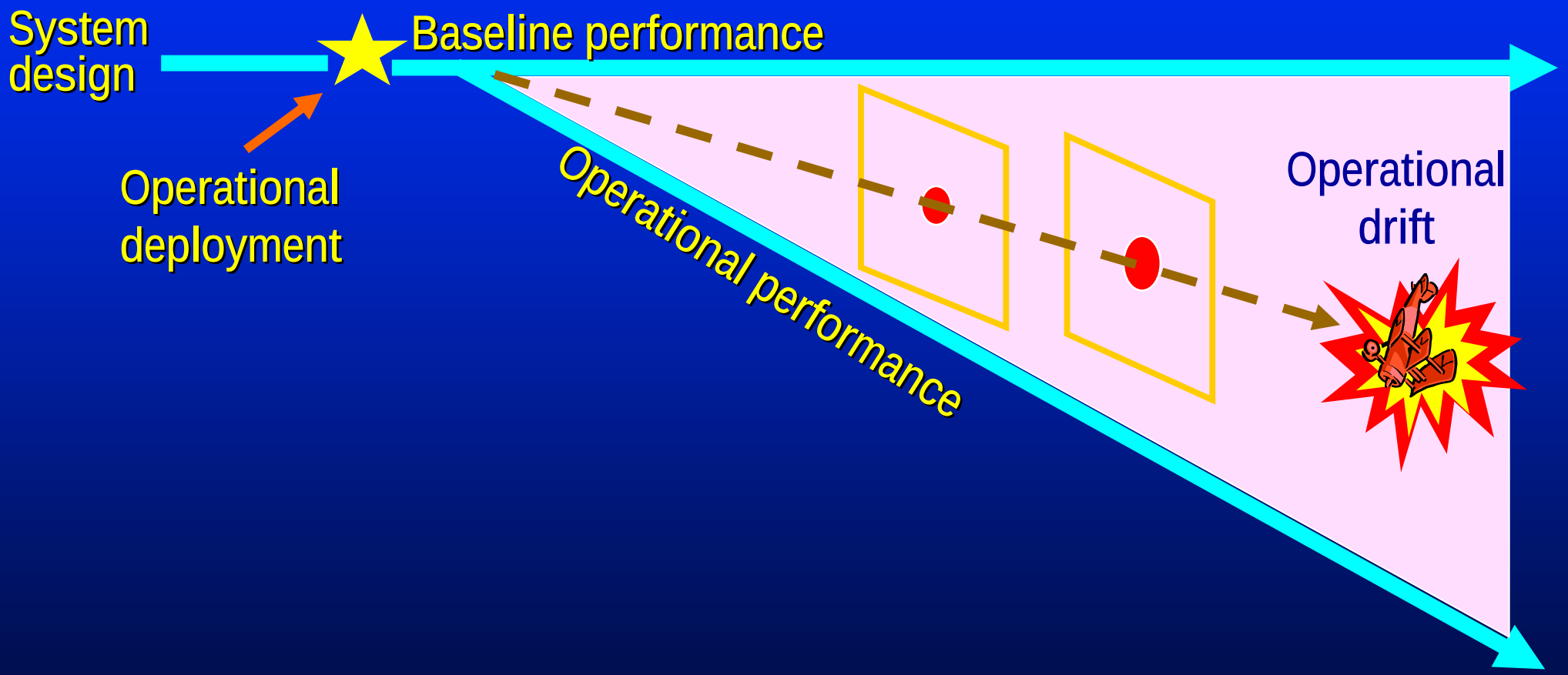
2. Punishment

1. Exhortations to professionalism and discipline

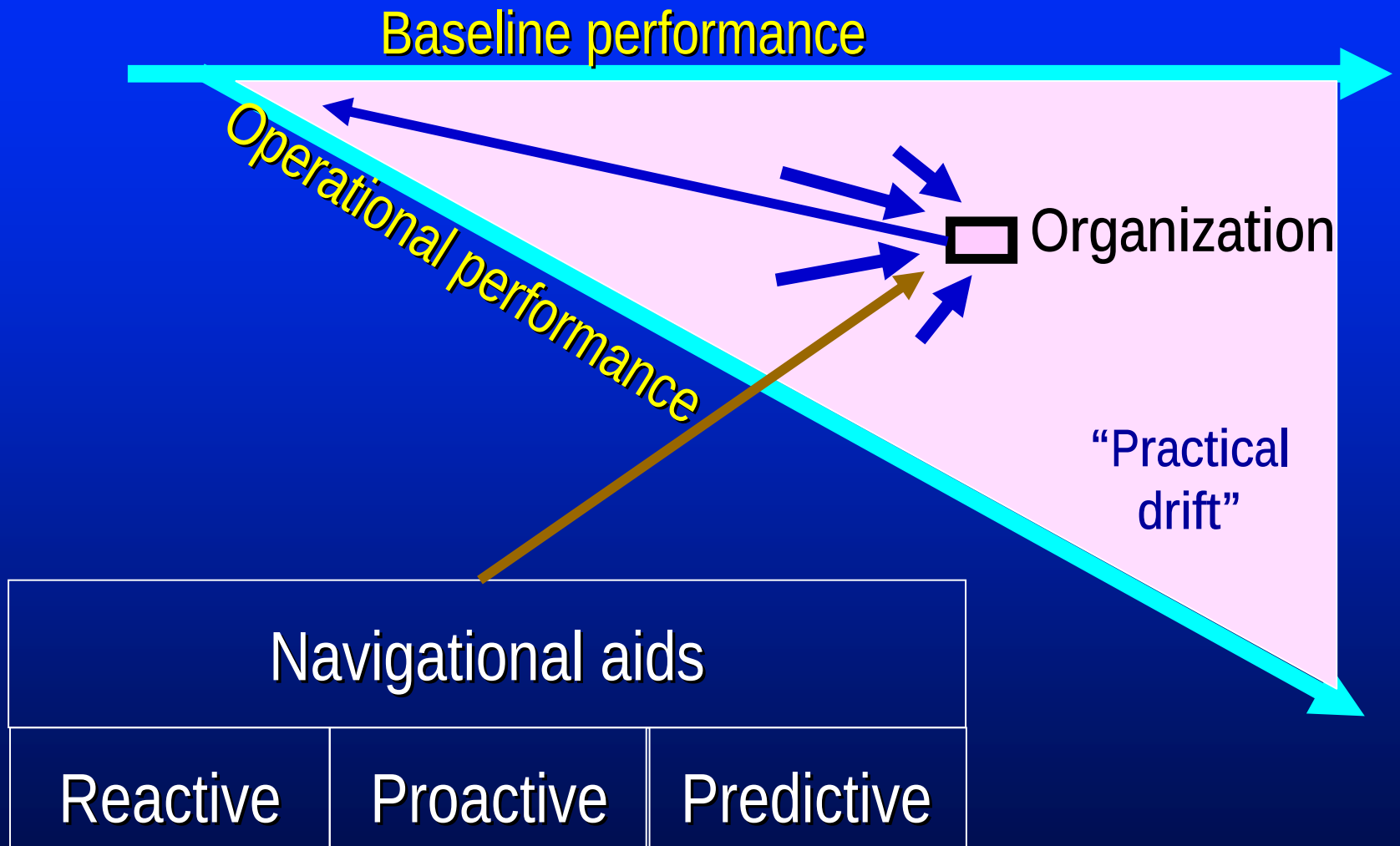
3. Remedial Training

4. Add more procedures & regulations

System Performance “In the Wild”



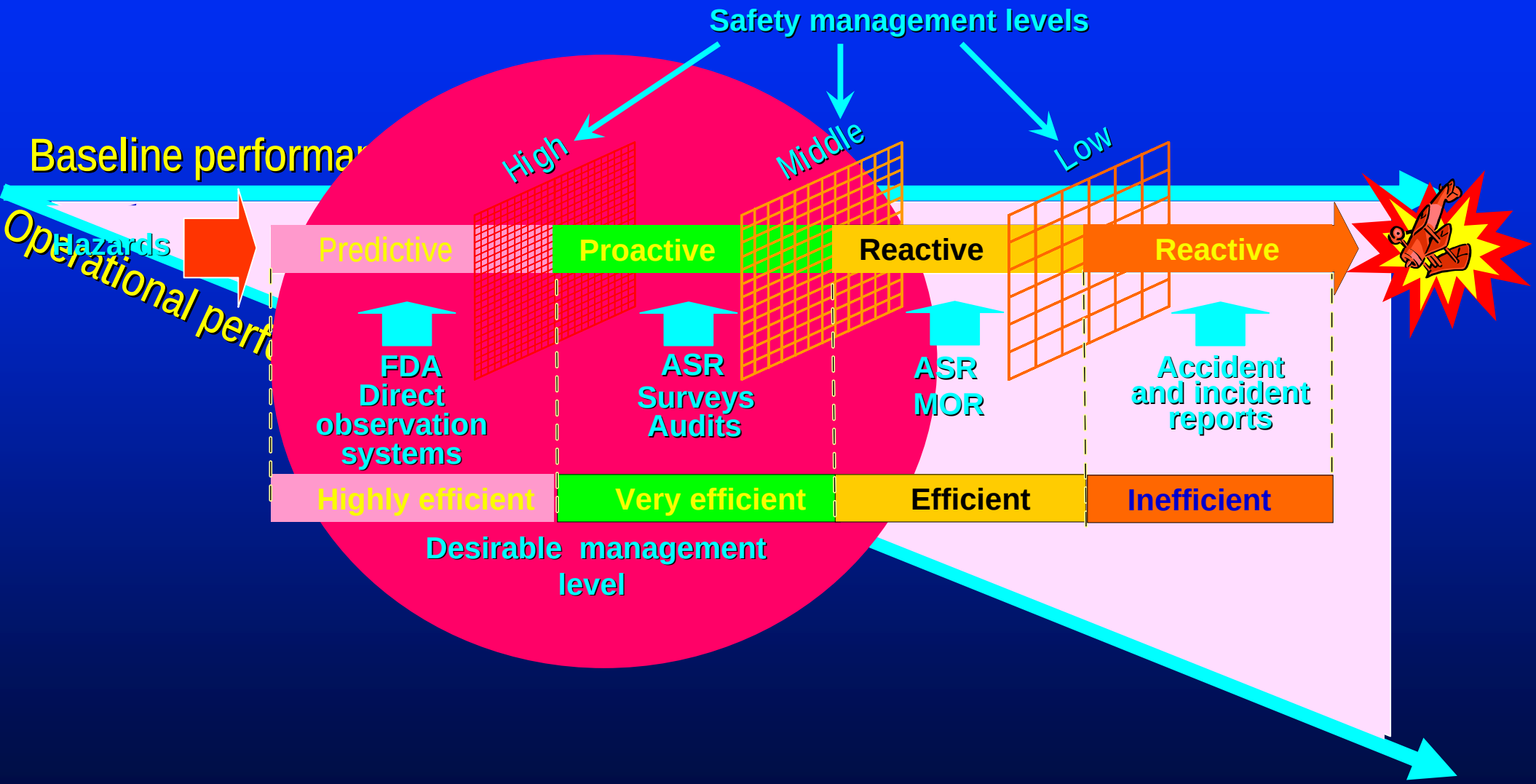
Managing Safety–Navigating the Drift



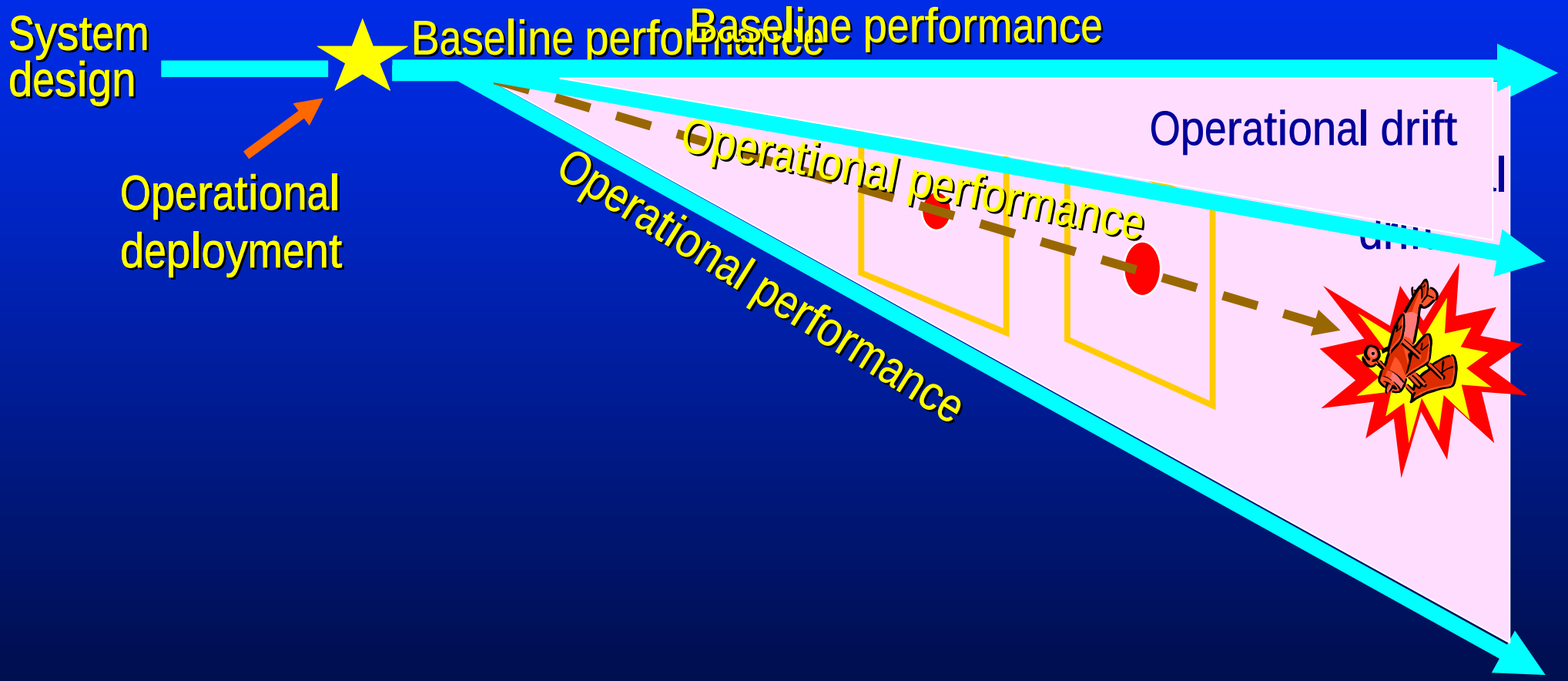
The Navigational Aids

- Reactive systems
  - ✓ Accident investigation
  - ✓ Incident investigation
- Proactive systems
  - ✓ Mandatory reporting systems
  - ✓ Confidential reporting systems
  - ✓ Voluntary self-reporting systems
- Predictive systems
  - ✓ Electronic safety data acquisition systems
  - ✓ Direct observation safety data acquisition systems

Safety Data Systems and Levels of Intervention



Managing Safety: Collapsing the Drift



Emerging Paradigm–Performance-Based System

Deterministic – The world as it should be

- Aviation system – as pre-specified – is perfect
- Compliance based
- Outcome oriented
  - ✓Accident investigation

Ecological – The world as it is

- Aviation system – as pre-specified – is imperfect
- Performance based
- Process oriented
  - ✓Safety data captured from daily, normal operations

Performance-based Safety

Activities over which any organization has a reasonable degree of direct control

Performance-based Safety

Conditions present in the system before the accident, made evident by triggering factors

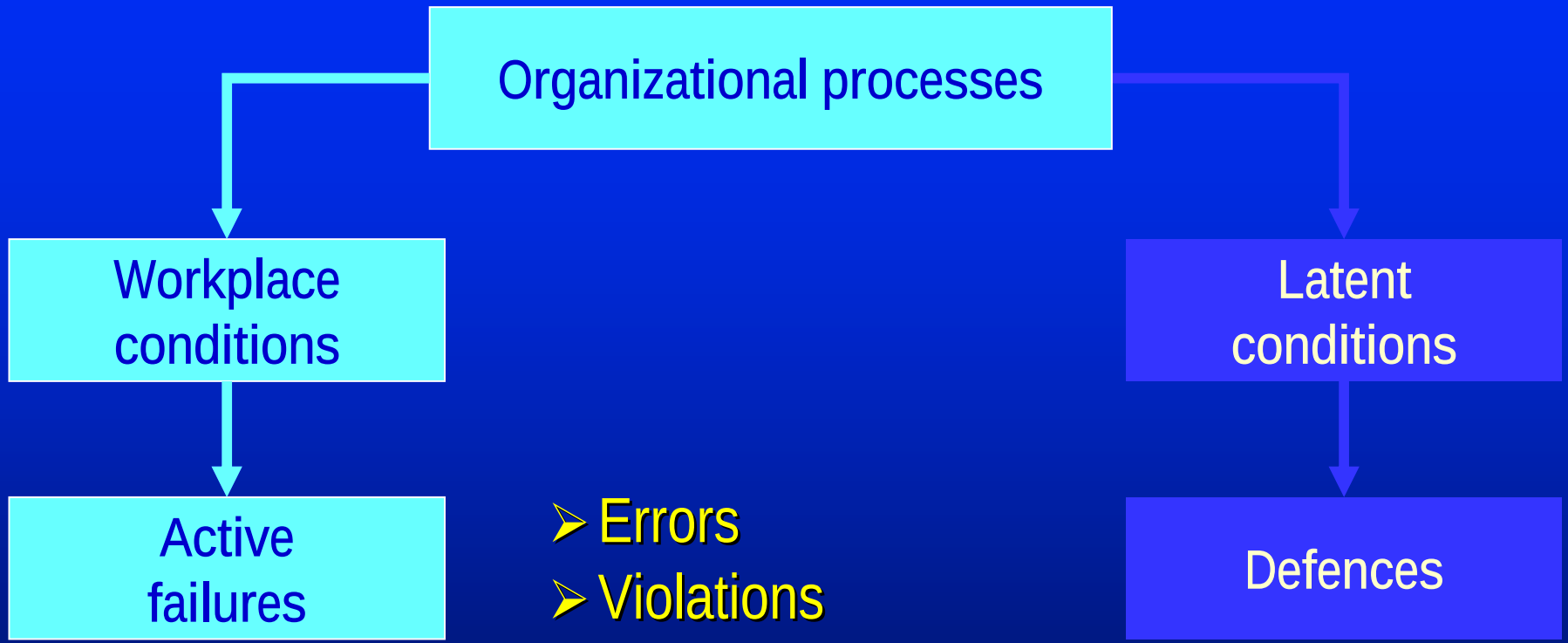
Performance-based Safety

Resources to protect against the risks that organizations involved in production activities must confront

Performance-based Safety

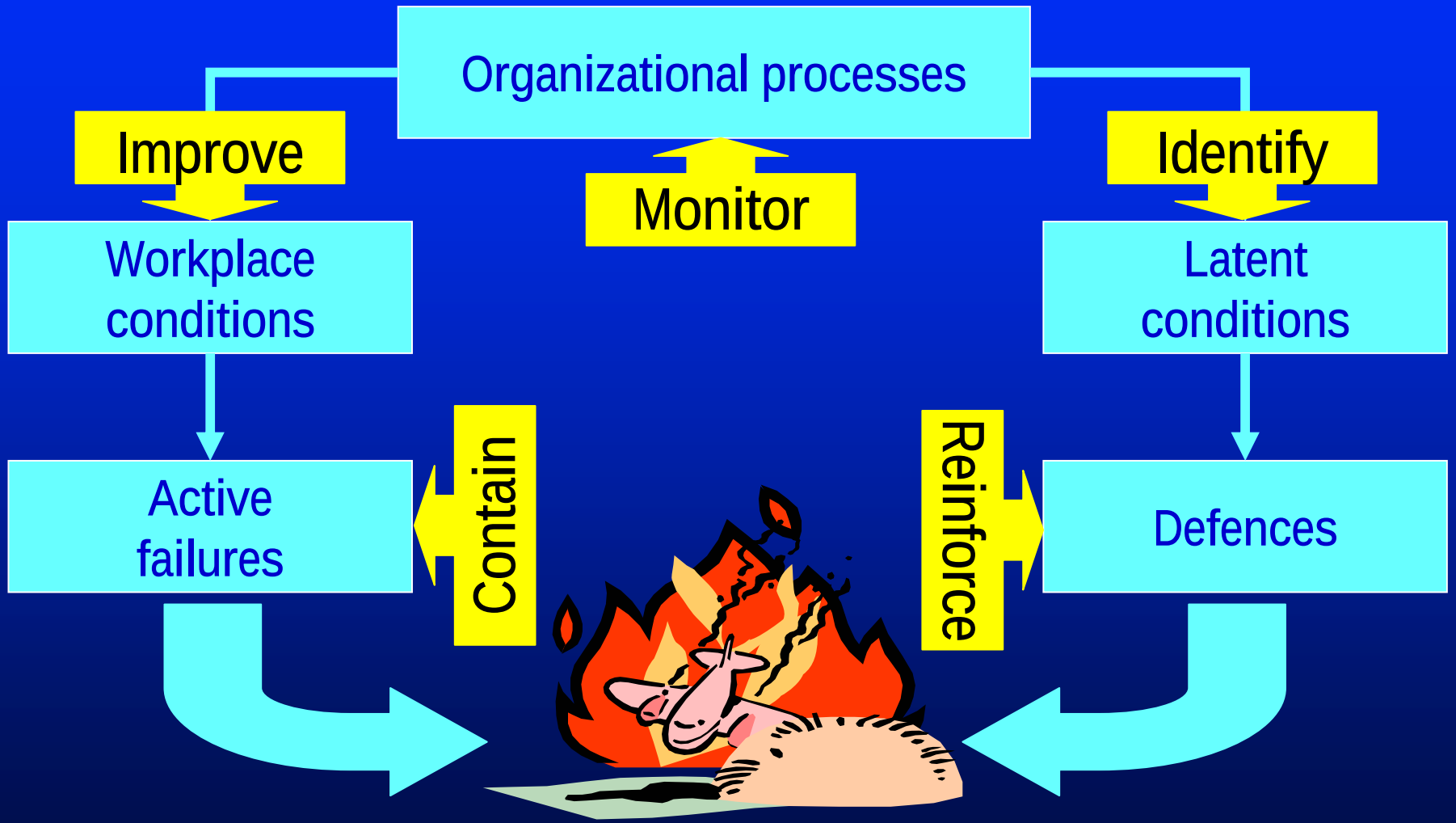
Factors that directly influence the efficiency of people in aviation workplaces

Performance-based Safety



Actions or inactions by people (pilots, controllers, maintenance engineers, aerodrome staff, etc.) that have an immediate adverse effect

Performance-based Safety



Performance-Based Safety: The *ABC*

A. Senior management's commitment to the management of safety
B. Initial analysis of system design and risk controls (safety risk management)
C. Continuous safety monitoring and analysis of safety data from normal operations (safety assurance)

A balanced perspective

…The pilot-in-command must bear responsibility for the decision to land and take-off in Dryden… However, it is equally clear that the air transportation system failed him by allowing him to be placed in a situation where he did not have all the necessary tools that should have supported him in making the proper decision …