

Proactive safety management: Runway incursions as a case study

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Outline

- Safety management in a perfect world
- NAV CANADA's management of runway incursions
- Discussion

Safety Management in a Perfect World

- Proactive
- Purposeful and comprehensive
- Collaborative
- Appropriate
- Effective
- Explainable/Measurable

Evolution of proactivity

From:

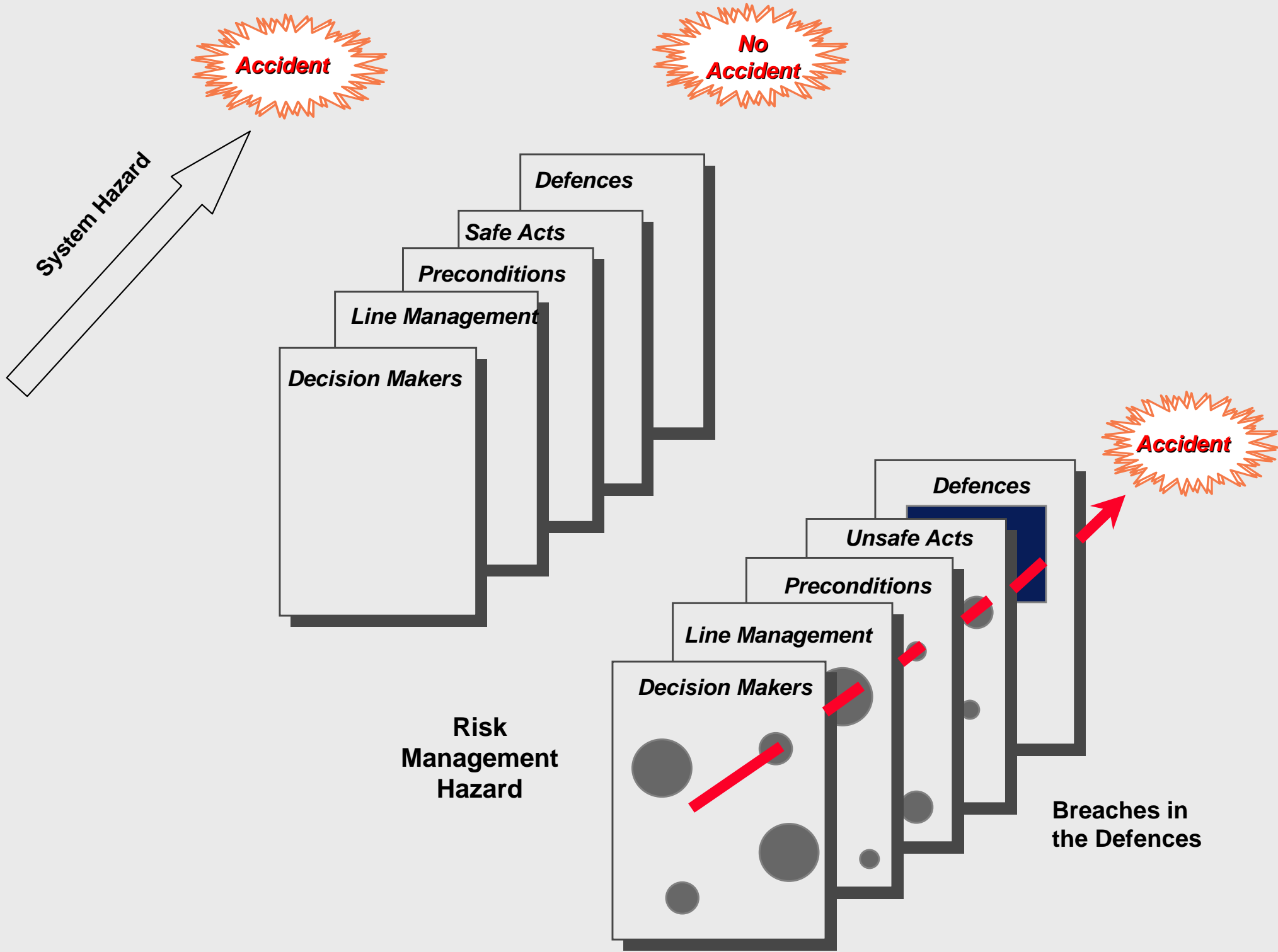
- reliability to performance
- 'technical' systems to 'complete' systems

Features of proactivity

- Modeling - anticipate
- Design – mitigate
- Prioritize – allocate resources
- Operate – manage
- Evaluate – measure
- Refine - understand
- Re-design

Case study of the design of a performance standard

YVR vs. BDA



... leading to ...

- Development of performance standards
- Setting risk-based priorities
- Integrating programs under the umbrella of the SMS
- Promotion of true collaboration
- Enhancement of (systems) understanding
- Proactive measures of system performance

Case Study of a Collaborative system

BDCA

Then & Now

Case Study

NAV CANADA & Runway Incursions



Safety Management System




- NAV CANADA defines SMS as the systematic and comprehensive process for the proactive management of safety risks that integrates the management of operations and technical systems with financial and human resource management.

A Safety Management System



- Why is a Human Factors framework the foundation of the SMS?

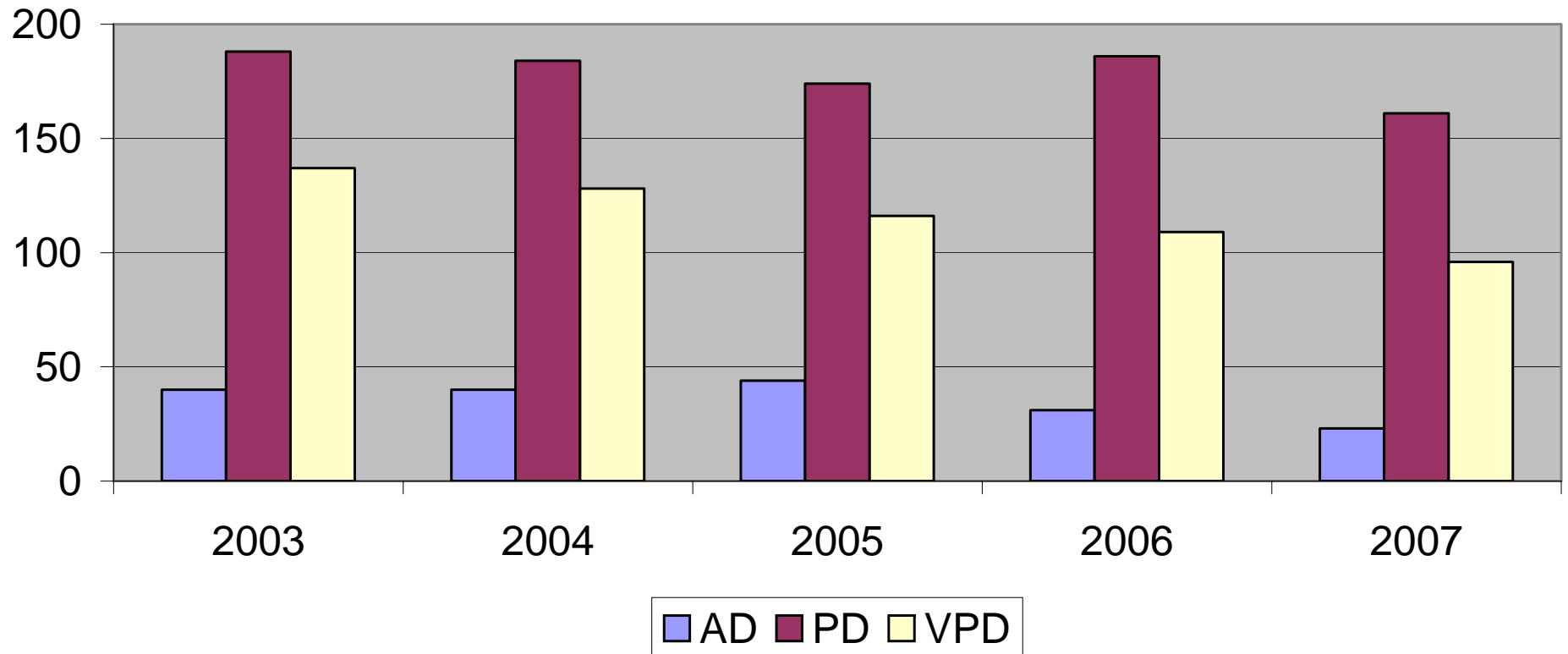
Runway Incursion

The logo for NAV CANADA, featuring the text "NAV CANADA" in white capital letters inside a blue oval with a white border.

Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft.

(ICAO Definition)

Statistics



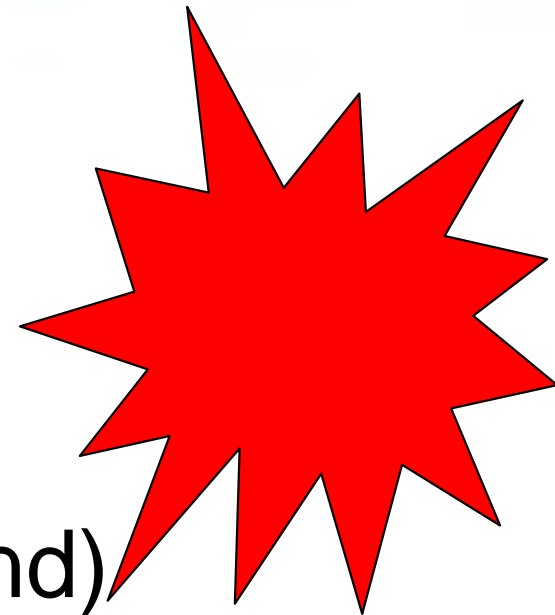
Classification	2003	2004	2005	2006	2007
AD	40	40	44	31	23
PD	188	184	174	186	161
VPD	137	128	116	109	96
Total	365	352	334	326	280
	AD -ATS Deviation	PD-Pilot Deviation	VPD-Pedestrian or Vehicle Deviation		

What are Safety Risks?

NAV CANADA

Loss of life or aircraft due to collision between:

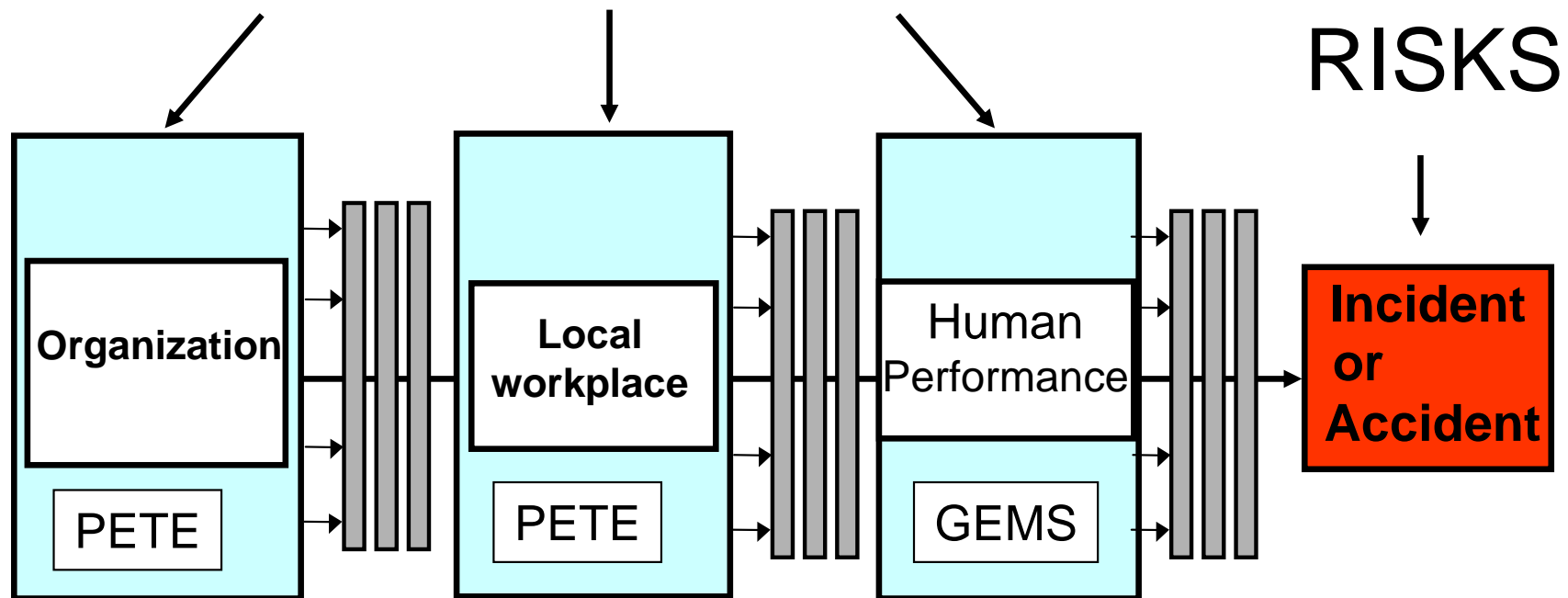
- Aircraft (air)-aircraft (ground)
- Aircraft (ground)-aircraft (ground)
- Aircraft-vehicle/craft (land or water)/person



The Safety Map



Weaknesses or Gaps



Weak or Missing Defences

NAV CANADA's Safety Management System



Safety Philosophy

Safety Policy Level

Safety Goal

Safety Priority

Safety
Responsibility

Safety
Management

Safety Management System

Safety
Planning

Operational
Risk
Management

Exchange of
Safety
Information

Safety
Performance
Measurement

Safety
Management
Assurance

NAV CANADA's Safety Management System



Safety Philosophy

accidents are organizationally based and as such SMS must integrate technical and operational systems with financial and human resource management

Safety Policy Level

Safety Goal

to reduce safety risks resulting from the provision by NAV CANADA of air navigation services and products to a level as low as reasonably achievable

Safety Priority

safety is afforded the highest priority over commercial, operational, environmental or social pressures

Safety Responsibility

everyone has a responsibility to contribute to the achievement of the safety goal

Safety Management

proactive, systematic, explicit and coordinated management of safety risks

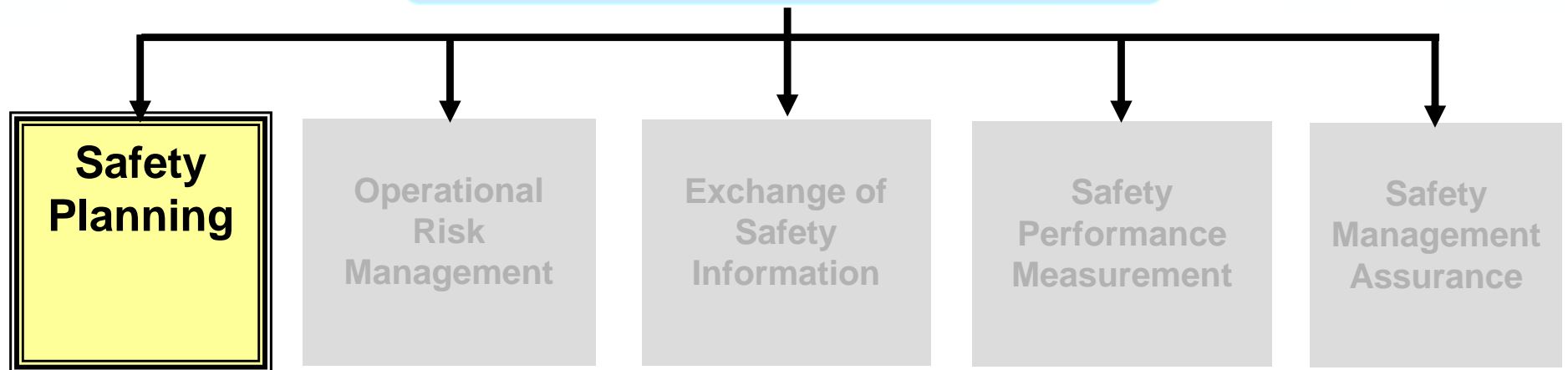
Safety Management System

The systematic and comprehensive processes and procedures for the proactive management of safety risk to ensure that safety management at NAV CANADA is proactive, robust, effective, efficient and integrated across groups and functions in order to achieve the safety goal

Safety Planning



Safety Management System



Safety Planning

The planning and management of corporate, group and project safety management activities to ensure that safety management activities are integrated, purposeful, appropriate and measurable.

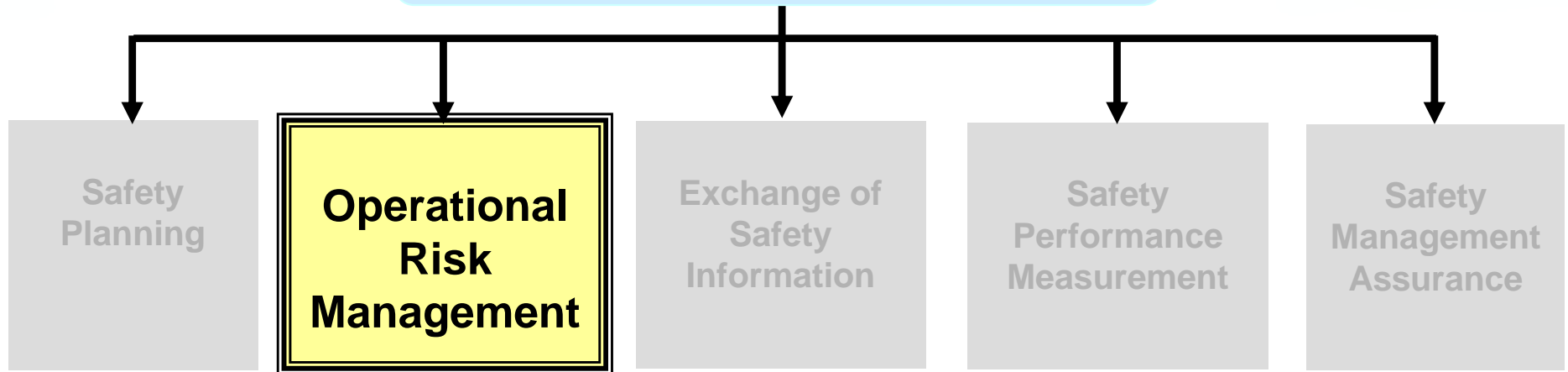
Examples

Annual Corporate Safety Plan, Group Safety Plans, Project Safety Management Plans

Operational Risk Management



Safety Management System



Operational Risk Management

The systematic and effective application of suitable risk-management techniques, employing system safety and human factors concepts to reduce the safety risks resulting from the provision, by NAV CANADA, of air navigation services and products to a level as low as reasonable achievable (ALARA).

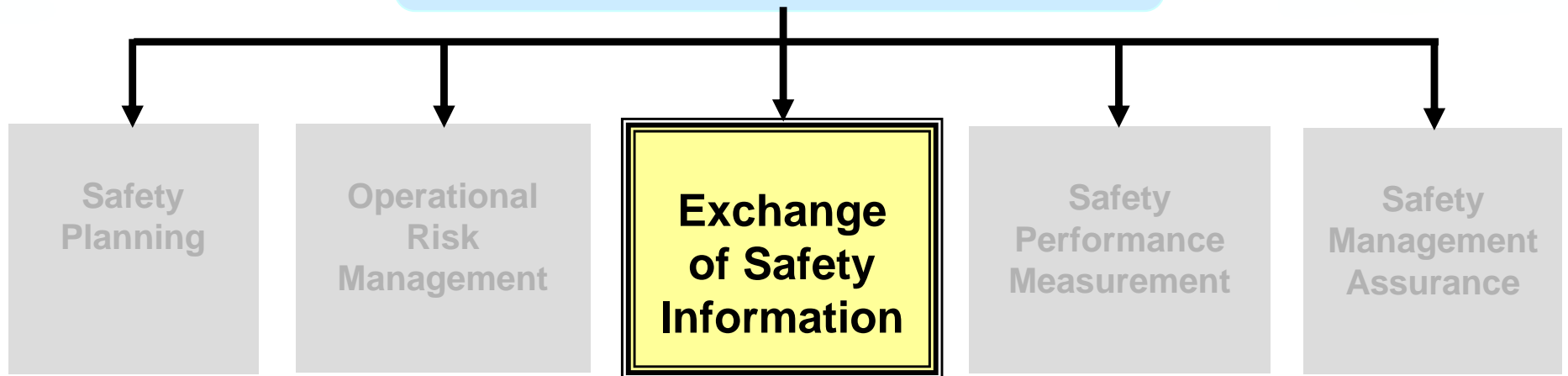
Examples

Training, staffing, procedures, operational validation process, Investigations, Evaluations, HIRA, Aeronautical Studies

Exchange of Safety Information



Safety Management System



Exchange of Safety Information

The processes used to openly exchange safety-related data and knowledge both externally and internally to the company to share data regarding hazards and system safety deficiencies thereby ensuring risks are ALARA and to promote a strong safety improvement culture within the company.

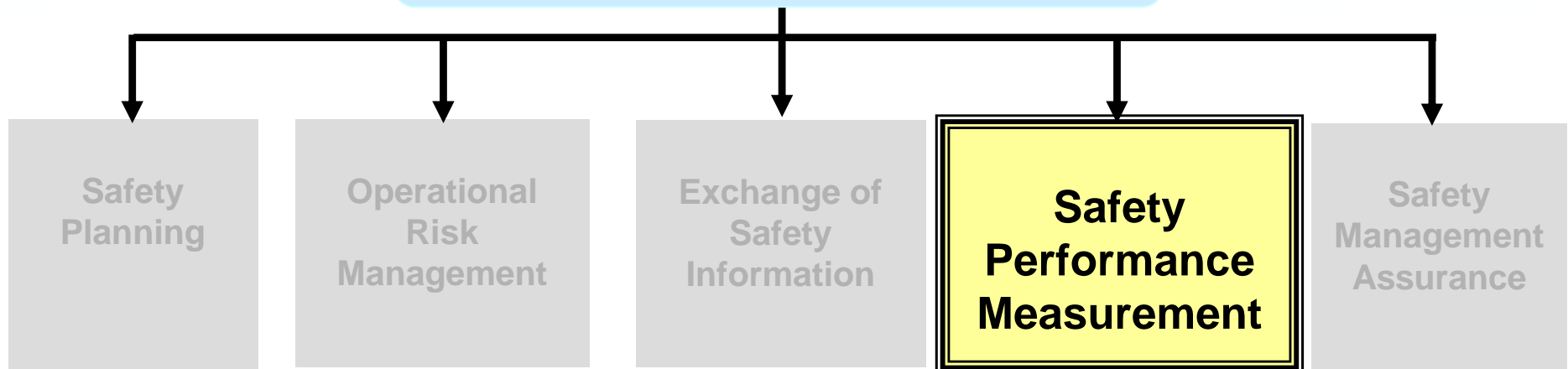
Examples

Confidential Safety Reporting System, Safety Committees, National Safety Hazard Tracking System, Safety Management Training, Recurrent Training, Newsletters, Monthly OI statistics, Trend Analysis, Safety Bulletin Boards, External committees

Safety Performance Measurement



Safety Management System



Safety Performance Measurement

The development, review and analysis of safety performance measures at all levels of the company to provide the executive and management with meaningful feedback that can be used to enhance safety performance throughout the company.

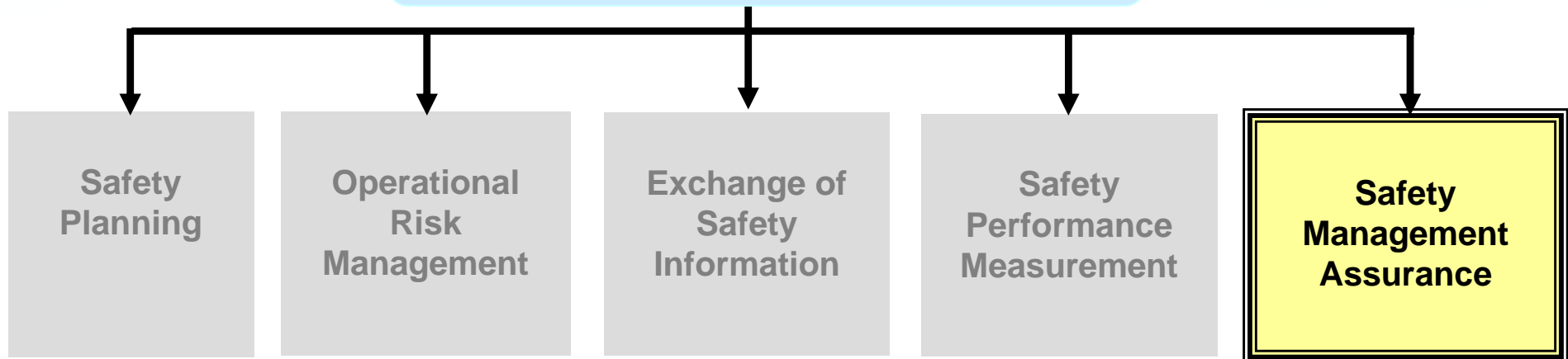
Examples

Corporate Performance Measures, Human Factors Trend Analysis, Annual Objectives, Safety management activities

Safety Management Assurance



Safety Management System



Safety Management Assurance

The means for providing assurance that risks are being properly managed to ensure that risk management and safety management decision-making is consistent, rigorous and subject to independent scrutiny and challenge.

Examples

Safety Reviews, follow-up for Operational Safety Investigations/Unit & Training Evaluations, SMS audits

NAV CANADA's SMS



NAV CANADA Safety Philosophy
 accidents are organizationally based and as such SMS must integrate technical and operational systems with financial and human resource management

NAV CANADA SAFETY POLICY			
<p>Safety Objective</p> <p>to reduce safety risks resulting from the provision by NAV CANADA of air navigation services and products to a level as low as reasonably achievable</p>	<p>Safety Priority</p> <p>safety is afforded the highest priority over commercial, operational, environmental or social pressures</p>	<p>Safety Responsibility</p> <p>everyone has a responsibility to contribute to the achievement of the safety objective</p>	<p>Safety Management</p> <p>proactive, systematic, explicit and coordinated management of safety risks</p>

NAV CANADA Safety Management System
 The systematic and comprehensive processes and procedures for managing safety risk to assure that safety management at NAV CANADA is proactive, robust, effective, efficient and integrated across groups and functions thereby

KEY ELEMENTS OF THE SAFETY MANAGEMENT SYSTEM				
<p>Safety Planning</p> <p><u>Definition:</u> the planning and management of corporate, group and project safety management activities</p> <p><u>Objective:</u> to assure that safety management activities are integrated,</p>	<p>Operational Risk Management</p> <p><u>Definition:</u> the systematic and effective application of suitable risk-management techniques, employing system safety and Human Factors concepts</p> <p><u>Objective:</u> to reduce the safety</p>	<p>Exchange of Safety Information</p> <p><u>Definition:</u> the processes used to openly exchange safety-related data and knowledge both externally and internally to the company</p> <p><u>Objective:</u> to share data regarding hazards and system safety deficiencies</p>	<p>Safety Performance Measurement</p> <p><u>Definition:</u> The development, review and analysis of safety performance measures at all levels of the company</p> <p><u>Objective:</u> to provide management with meaningful feedback</p>	<p>Safety Management Assurance</p> <p><u>Definition:</u> the means for providing assurance that risks are being properly managed</p> <p><u>Objective:</u> to assure that risk management and safety management</p>