



Boeing Safety Management System Overview

Doug Kihm
Technical Fellow, Systems Engineering
Boeing Commercial Airplanes
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Aviation Safety Responsibilities Are Shared



Government

- Airworthiness requirements
- Safe operating environment

Manufacturers

- Safe airplane design
- Manufactured in conformity to the approved design
- Initial operating & maintenance manuals
- In-service safety

Airlines

- Operated safely
- Maintained properly

Safety Management System (SMS)

ICAO model

Safety management system — a systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures

ICAO SMS Framework “4 Components” “12 Elements”

Safety Policy and Objectives

- 1.1 Management commitment and responsibility
- 1.2 Safety accountabilities
- 1.3 Appointment of key safety personnel
- 1.4 Coordination of emergency response plan
- 1.5 SMS documentation

Safety Risk Management

- 2.1 Hazard identification
- 2.2 Safety risk assessment and mitigation

Safety Assurance

- 3.1 Safety performance monitoring and measurement
- 3.2 The management of change
- 3.3 Continuous improvement of the SMS

Safety Promotion

- 4.1 Training and education
- 4.2 Safety communication

Boeing safety leadership

Working together for a safe, efficient global system



DESIGN | BUILD | OPERATION | MAINTENANCE | INFRASTRUCTURE | REGULATION

Safety Integration Across the Value Stream

Boeing's Commitment to Safety

“ensuring safe travel for all passengers and crew is the primary focus of the Boeing men and women who design, build, test, deliver and support its airplanes.”

Safety Policy

Boeing's Commitment to Safety

Boeing promotes aviation safety in a number of ways:

- **By using robust processes to produce safe products**
- **By continuously monitoring the performance of the worldwide fleet**
- **By leveraging new technology to enhance safety**
- **By participating in accident investigations**
- **By working together with others to make sure flying is as safe as possible**

Safety Management System

Boeing's Commitment to Safety

Robust processes produce safe products:

Design

Safety is the primary consideration when Boeing engineers design an airplane.

Testing

Boeing ensures its airplanes meet rigorous design standards and certification requirements through equally rigorous validation testing.

Safety Risk Management:
Initial
Hazard Identification
Risk Mitigation

Boeing's Commitment to Safety

Continuous monitoring of worldwide fleet performance:

Boeing continually monitors in-service aircraft performance to proactively identify areas where the design of current and future models can be enhanced.

**Safety Risk Management:
In Service
Hazard Identification
Risk Mitigation
Safety Assurance:
Performance Monitoring**

Boeing's Commitment to Safety

Leveraging new technology to enhance safety:

Boeing develops and incorporates new technologies to enhance safety. Through research, development and collaboration, Boeing has developed sophisticated technologies that provide distinct safety advantages, such as:

- Vertical Situation Display
- Predictive windshear equipment along with improved windshear-training programs for pilots
- Enhanced Ground Proximity Warning System

**Safety Risk Management:
Predictive
Hazard Identification
Risk Mitigation**

Boeing's Commitment to Safety

Participating in accident investigations:

Boeing's safety efforts primarily focus on preventing accidents from occurring in the first place, however, a great deal of effort goes into supporting accident investigations to ensure that the same kind of accident does not recur.

- Industry and government safety experts study accidents to identify “intervention strategies” for preventing the same kinds of accidents in the future.
- The strategies include new training aids for flight crews and mechanics, new operating procedures, infrastructure improvements, aircraft design modifications, and incorporation of new technologies into the aviation system.

**Safety Policy and Objectives.
Emergency Response Plan**

Boeing's Commitment to Safety

Working together with others to make flying even safer:

Aviation safety is the combined result of

- **Regulatory oversight**
- **How airplanes are designed and produced**
- **How crews operate and maintain them**
- **How air traffic and airport infrastructure support them**

An example of this collaboration is the Commercial Aviation Safety Team (CAST), which comprises hundreds of representatives from airlines, manufacturers, labor and government.

**Beyond
Safety Management System**

Boeing's Commitment to Safety

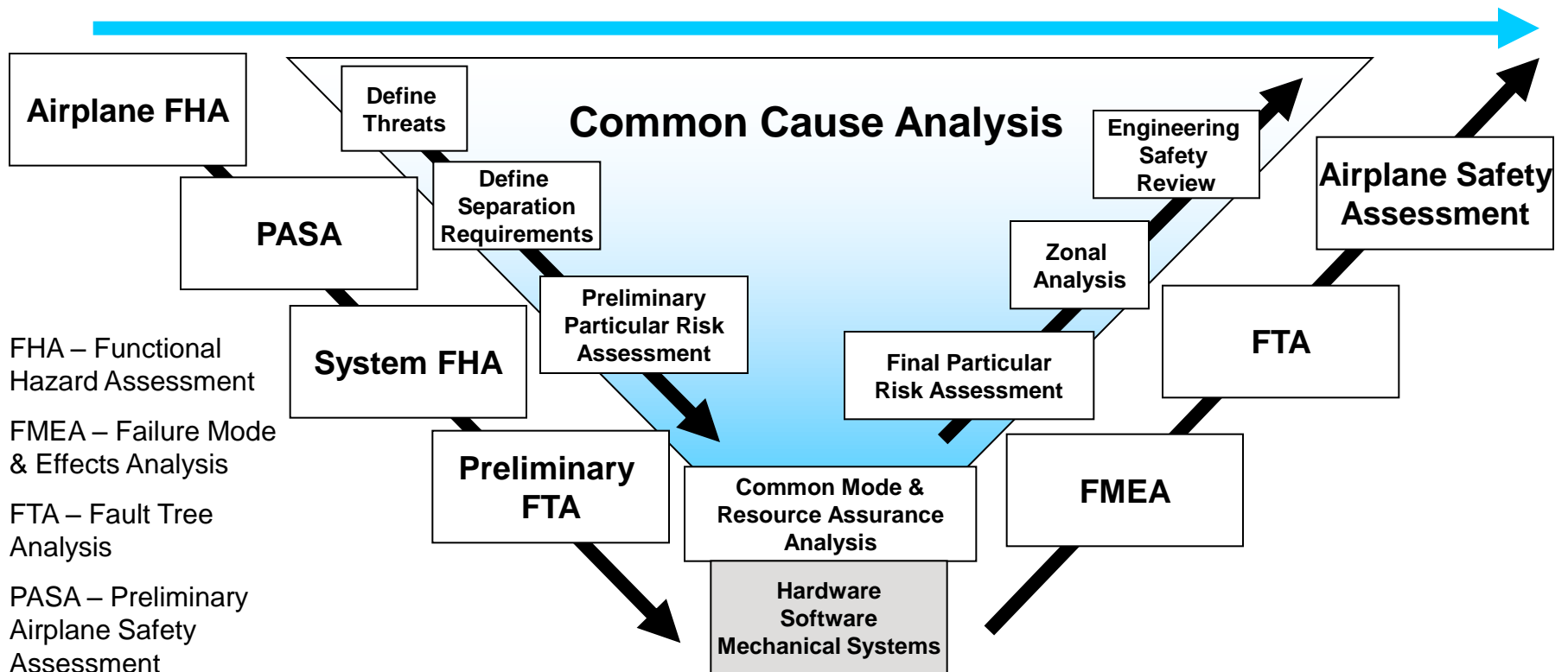
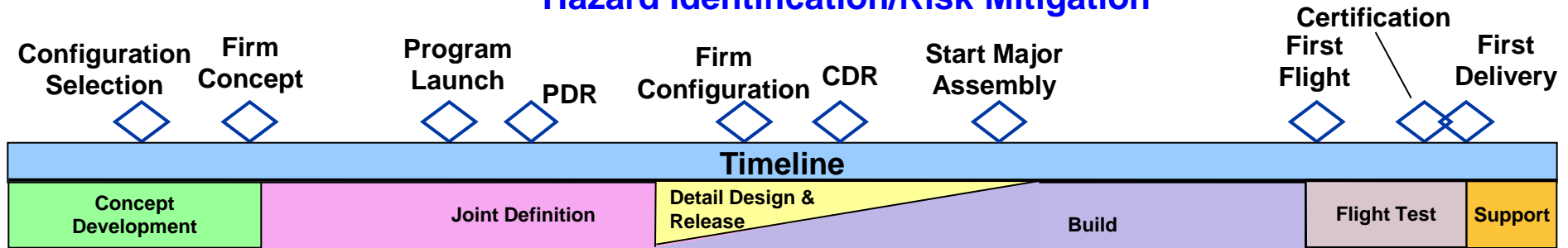
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Boeing Uses Robust Processes to Produce Safe Products

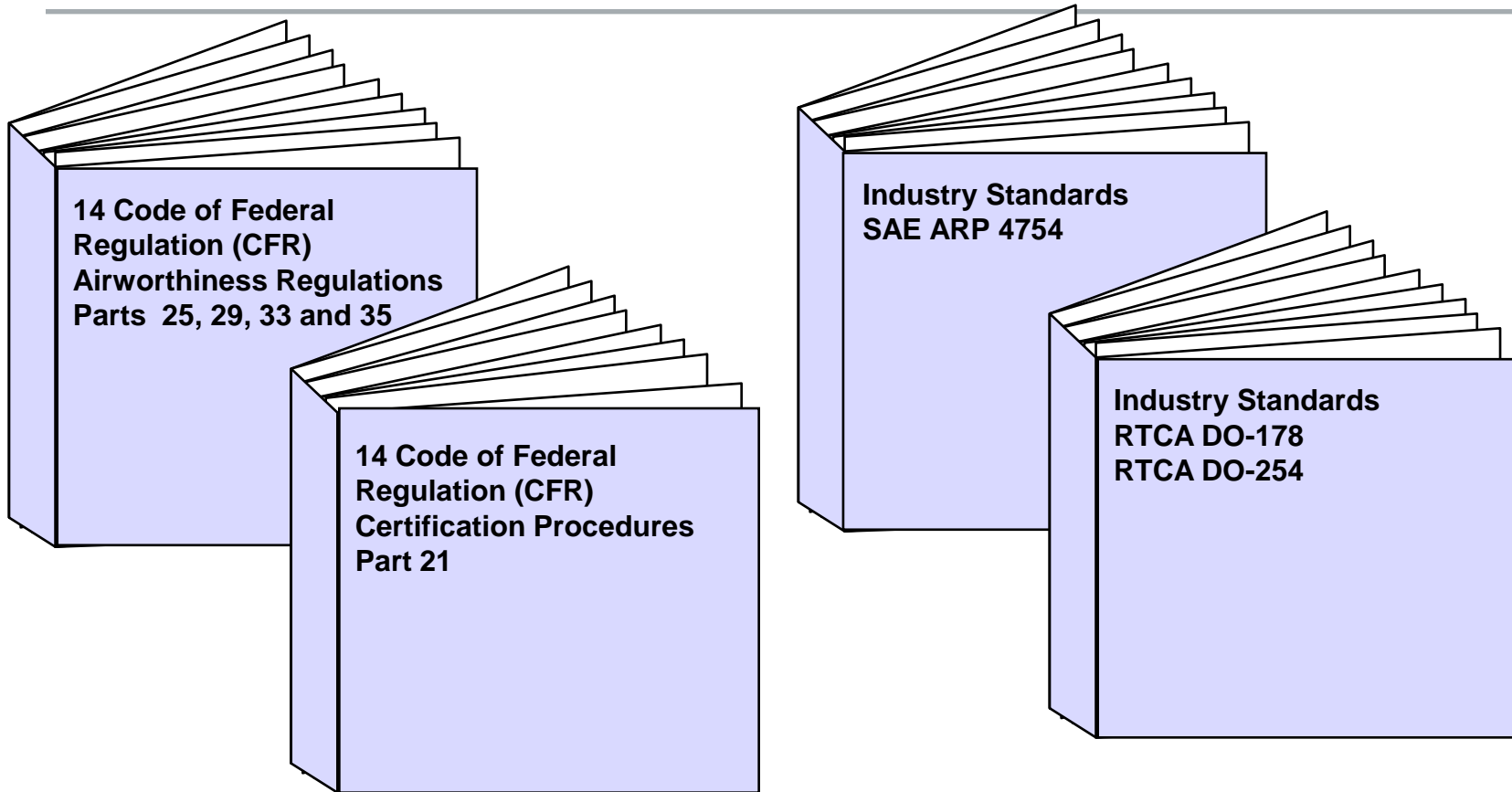
Airplane-Level Safety Assessment

Hazard Identification/Risk Mitigation



Assure Healthy Safety Foundation

Type Design Certification



Type Design Certification Airworthiness Regulations, Procedures and Industry Standards Meet the Intent of SMS by Identifying Hazards and Risk Mitigations for the Initial Design

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Promote Proactive Risk Management Approach

Boeing In-Service Safety Process

Safety Assurance

Safety Risk Management

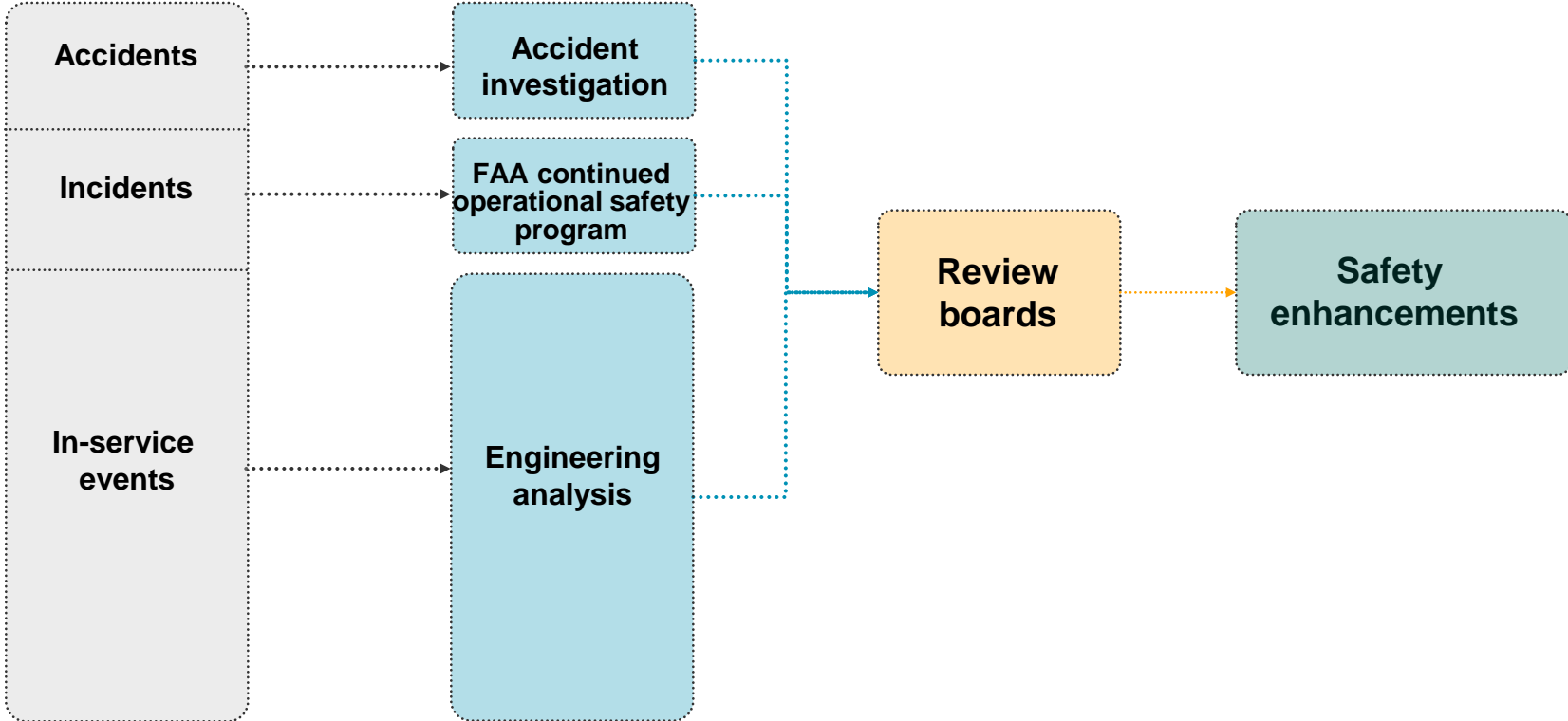
Data

Potential issue analysis

Hazard Identification

Issue classification

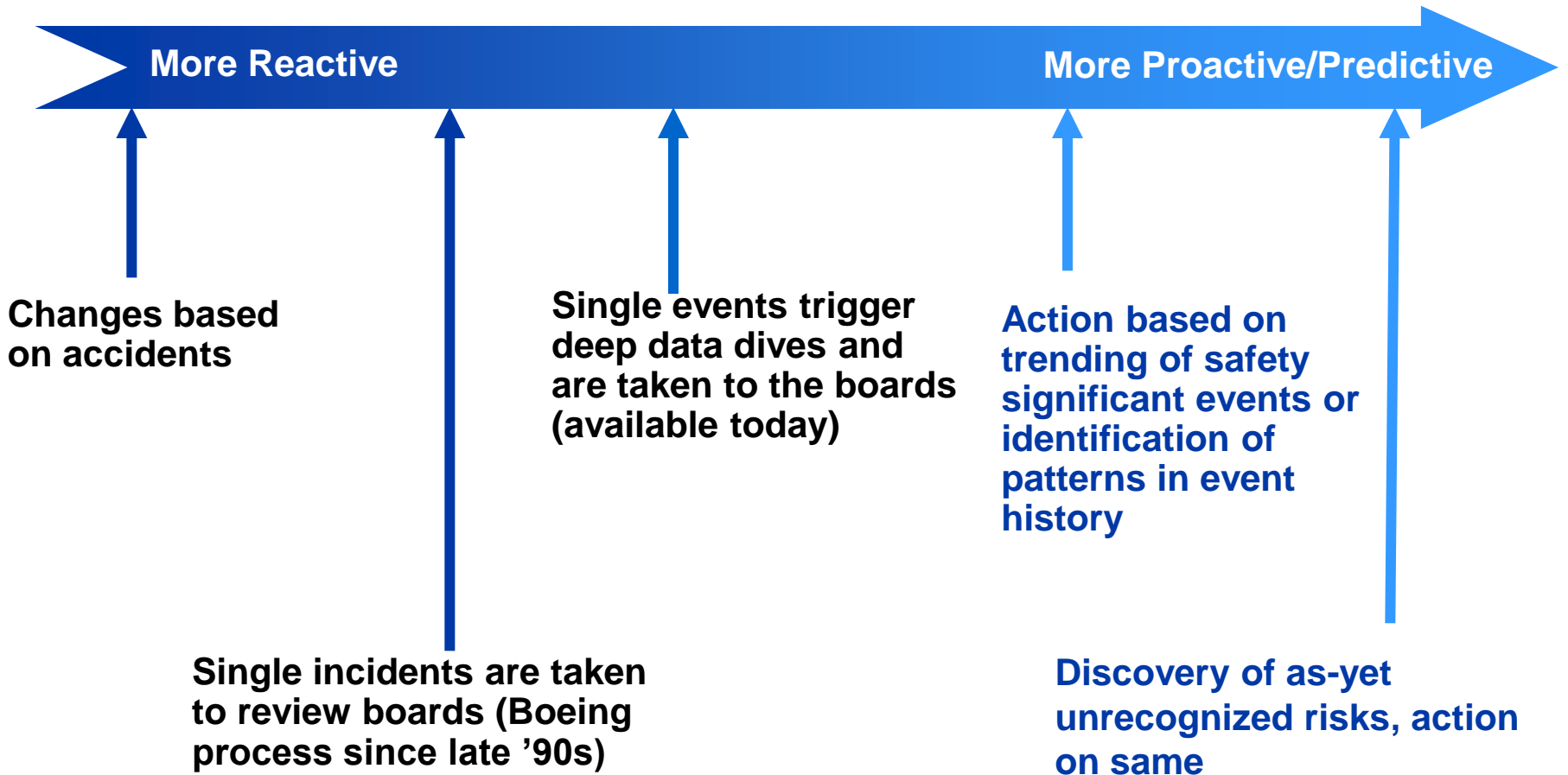
Risk Mitigation
Corrective action management



>12 million Boeing flights

Promote Proactive Risk Management Approach

Boeing Data Capability



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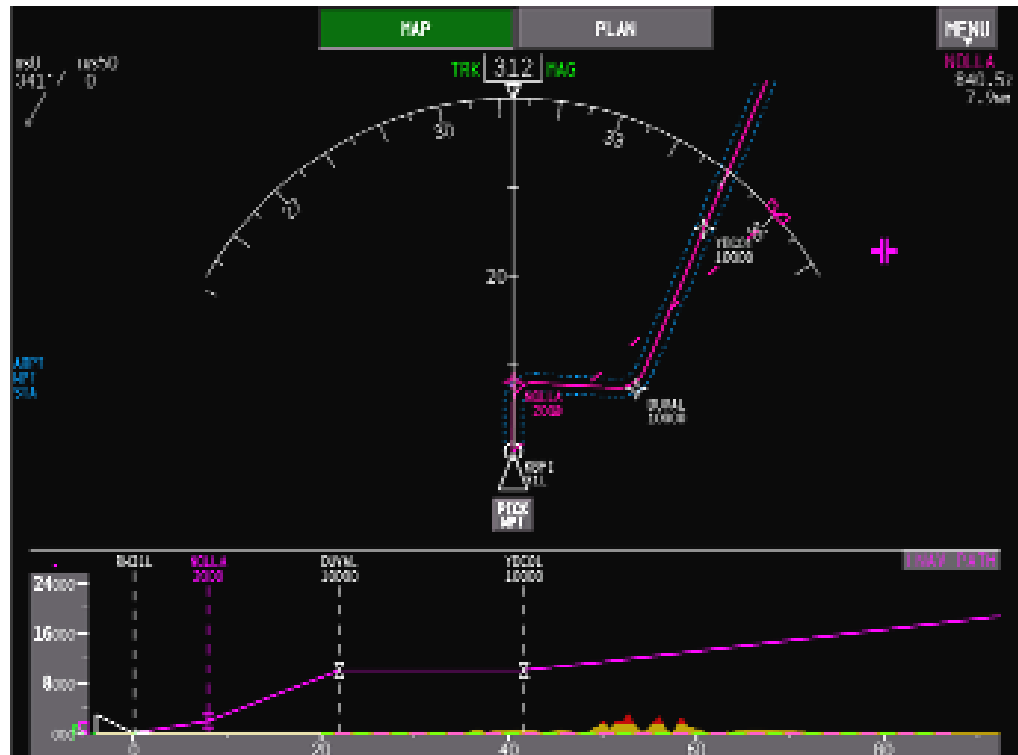
Assure Healthy Safety Foundation

Improved Situational Awareness Features

Vertical Situation Display

- Provides vertical view of flight plan route
- Displays terrain under lateral flight path

**Safety Risk Management:
Predictive
Hazard Identification
Risk Mitigation**



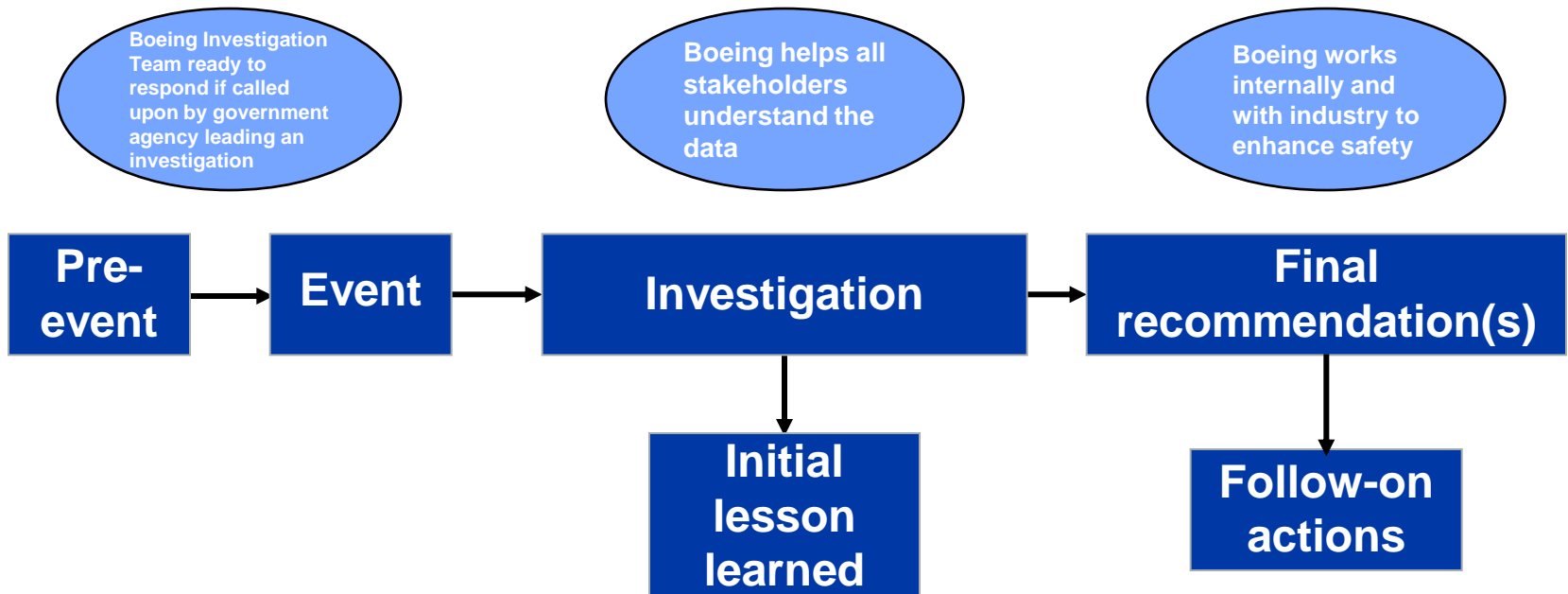
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Participating in Accident Investigations

Coordination of Emergency Response Plan



Possible safety enhancements:

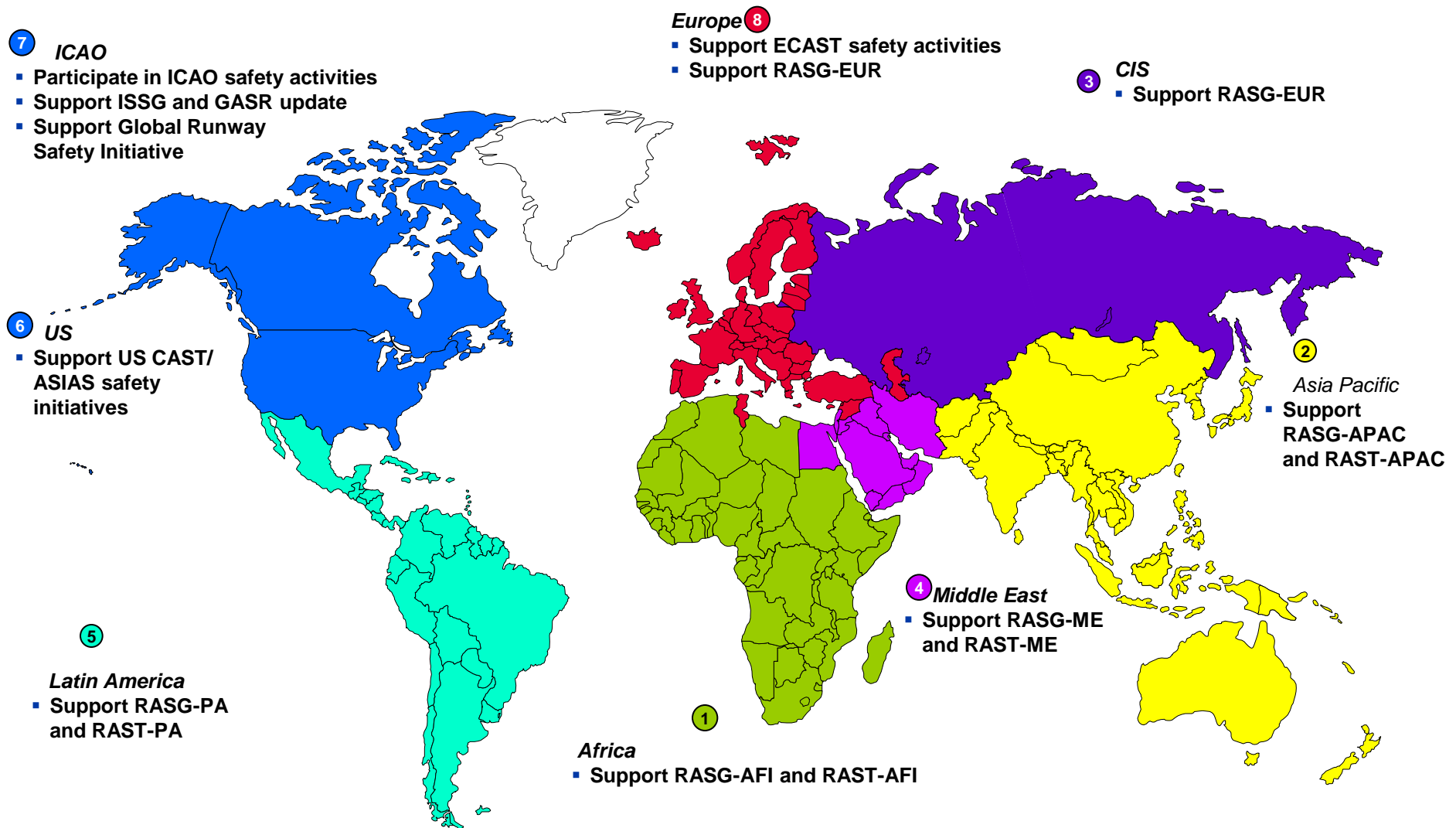
- Training
- Procedures
- Infrastructure
- Design
- New technologies

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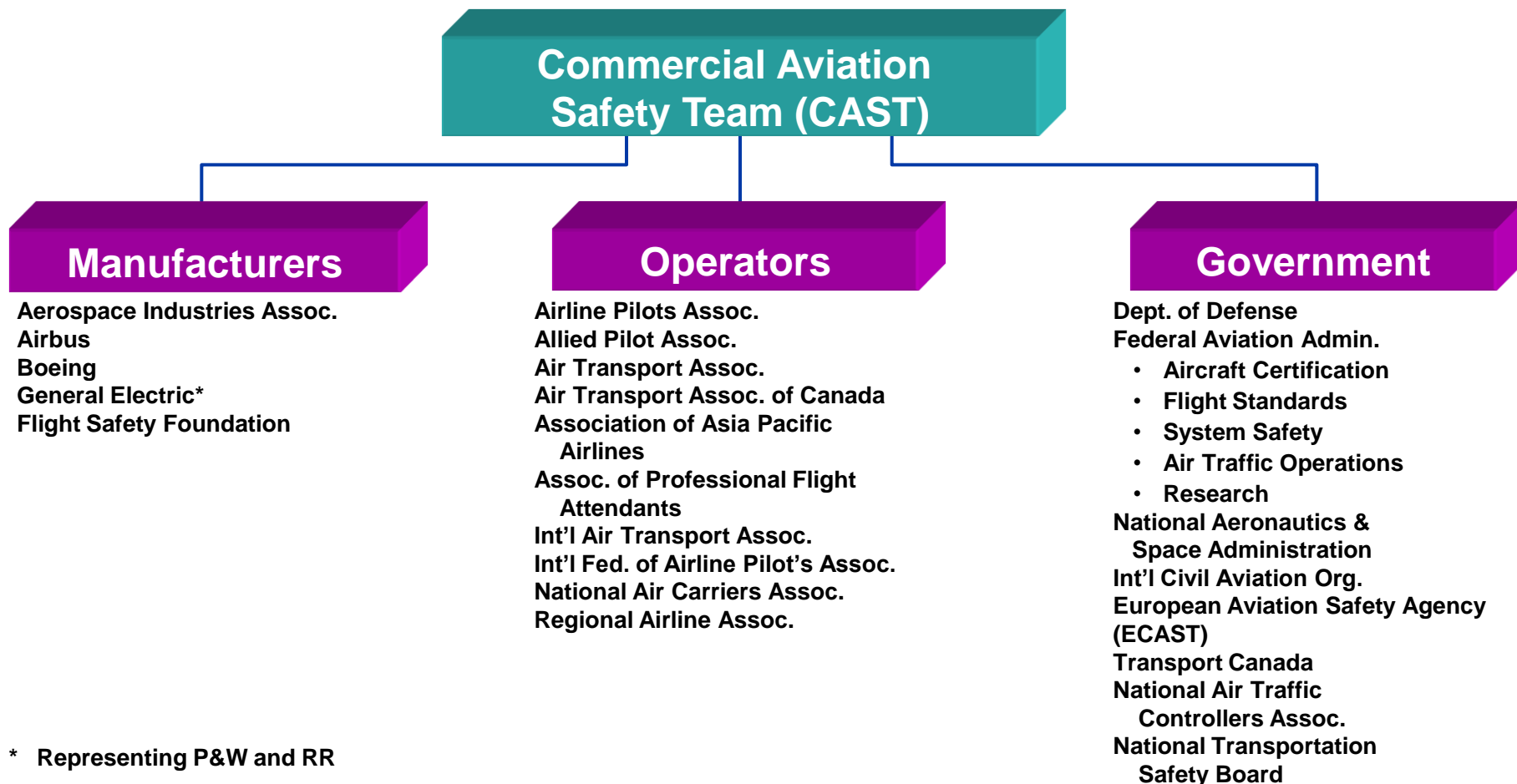
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Boeing Regional Aviation Safety Initiatives



U.S. Commercial Aviation Safety Team

Key stakeholders come together to cooperatively develop, implement a prioritized safety agenda



* Representing P&W and RR

Boeing Safety Management Summary

- **Boeing is committed to the safety of its products and the people who fly on them**
- **Boeing's safety management culture and processes have been used successfully for many years**
- **Boeing's safety management culture and processes exceed the objectives of SMS supporting regional safety initiatives**



Questions?