



# Boeing Safety Management System Overview

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# Aviation Safety Responsibilities Are Shared

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## 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

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**“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

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**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

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## 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

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## 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

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## 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

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## 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

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**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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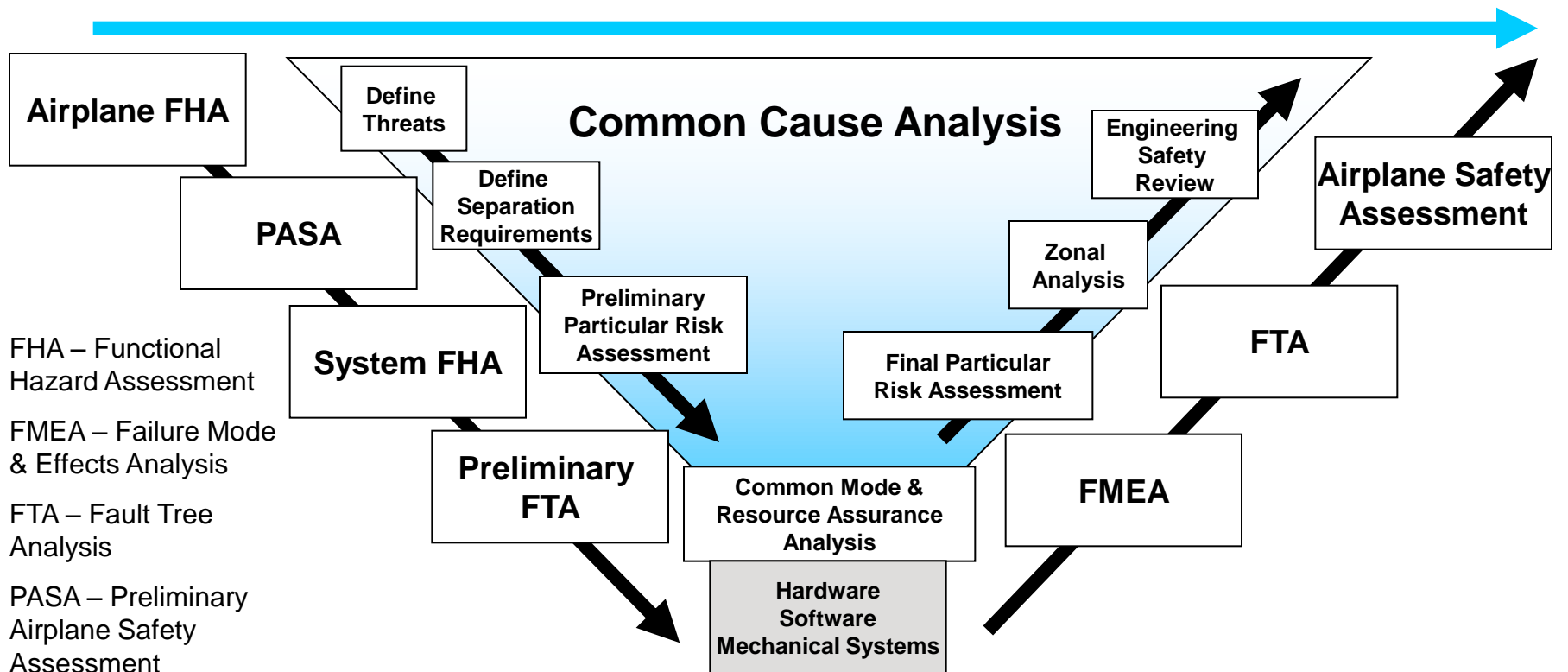
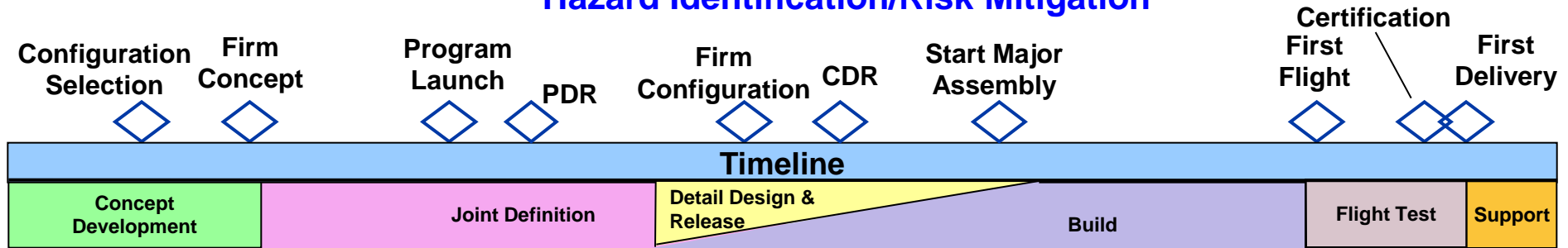
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# Boeing Uses Robust Processes to Produce Safe Products

## Airplane-Level Safety Assessment

### Hazard Identification/Risk Mitigation



FHA – Functional Hazard Assessment

FMEA – Failure Mode & Effects Analysis

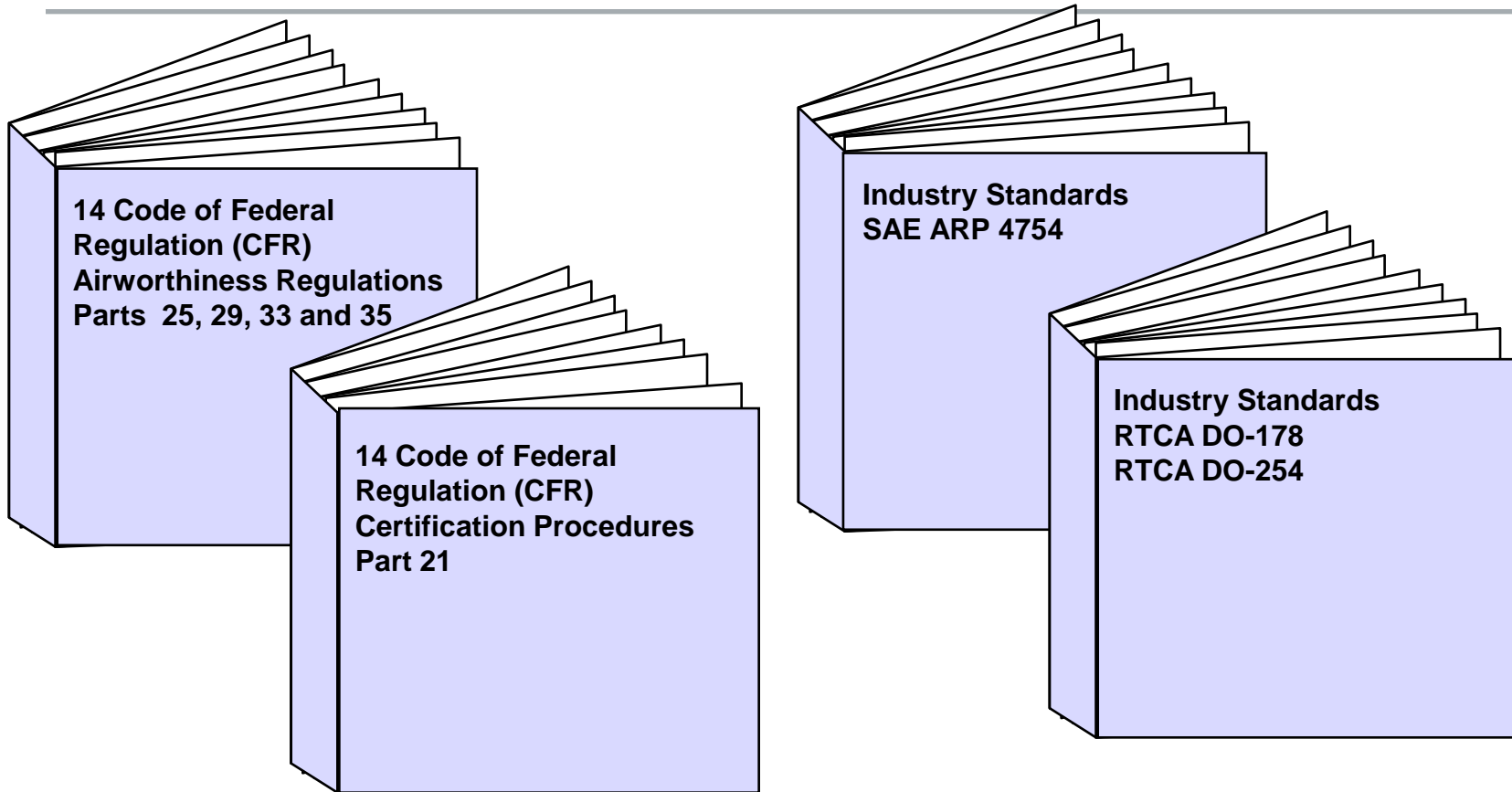
FTA – Fault Tree Analysis

PASA – Preliminary Airplane Safety Assessment

# Assure Healthy Safety Foundation

## Type Design Certification

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**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

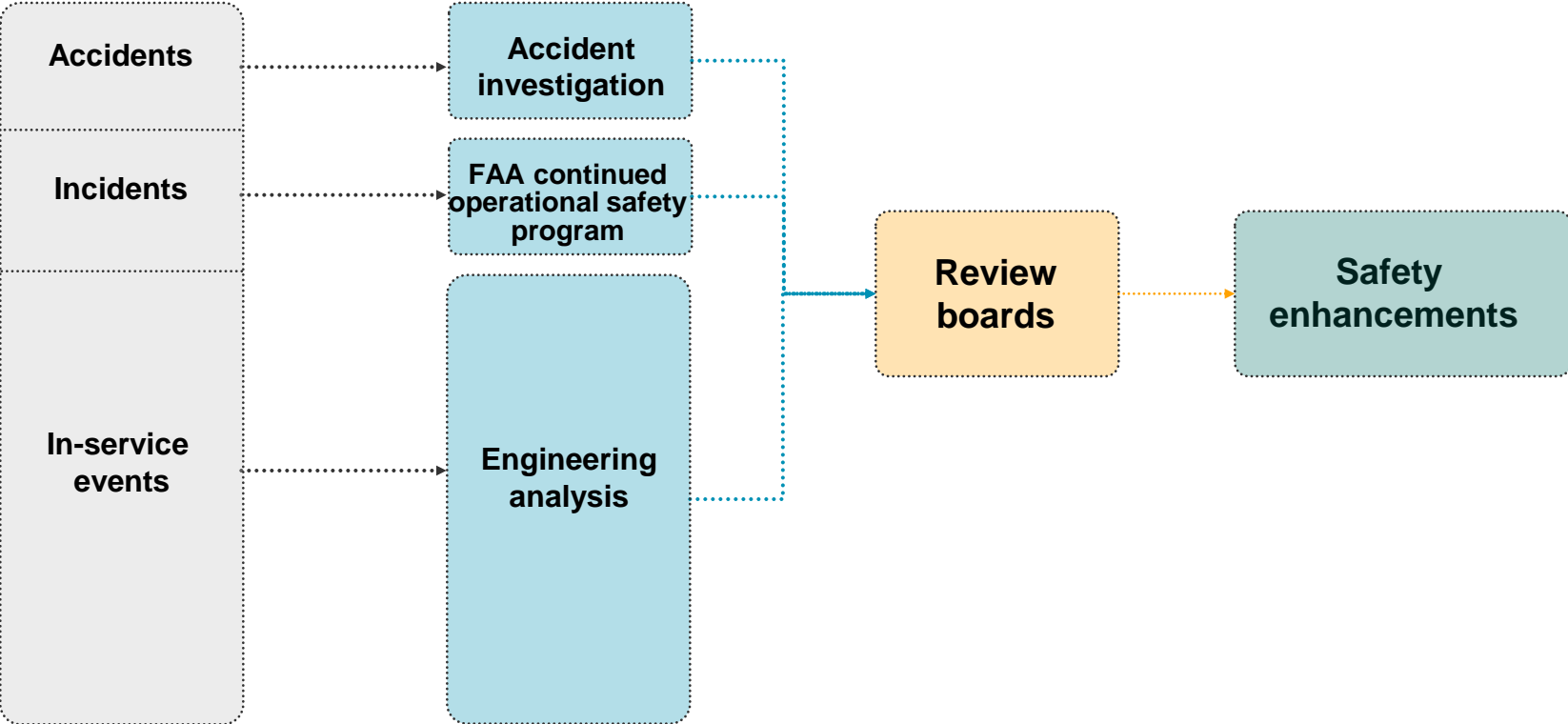
Data

Potential issue analysis

Hazard Identification

Issue classification

Risk Mitigation  
Corrective action management



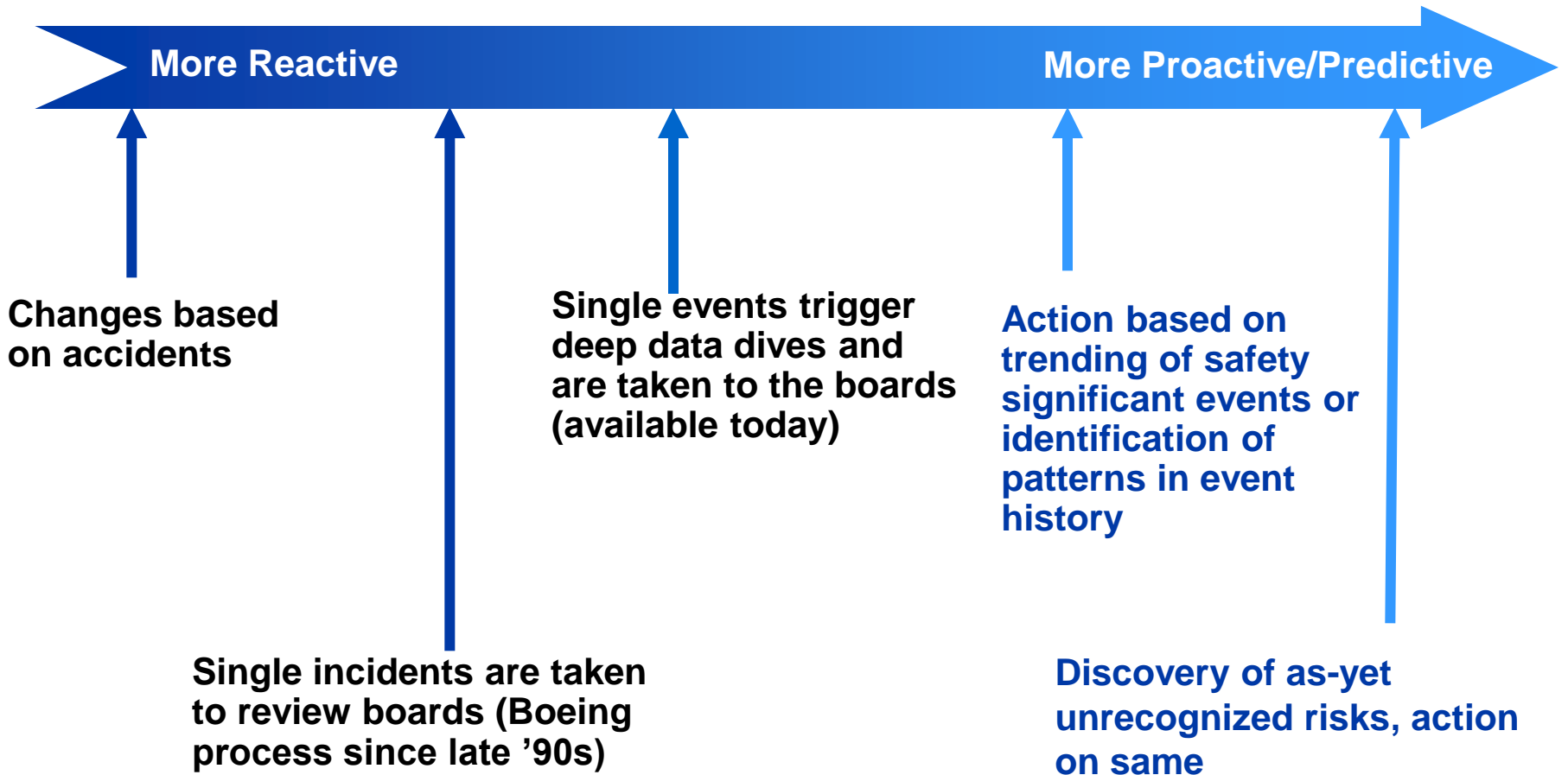
>12 million Boeing flights



# Promote Proactive Risk Management Approach

## Boeing Data Capability

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# Boeing's Commitment to Safety

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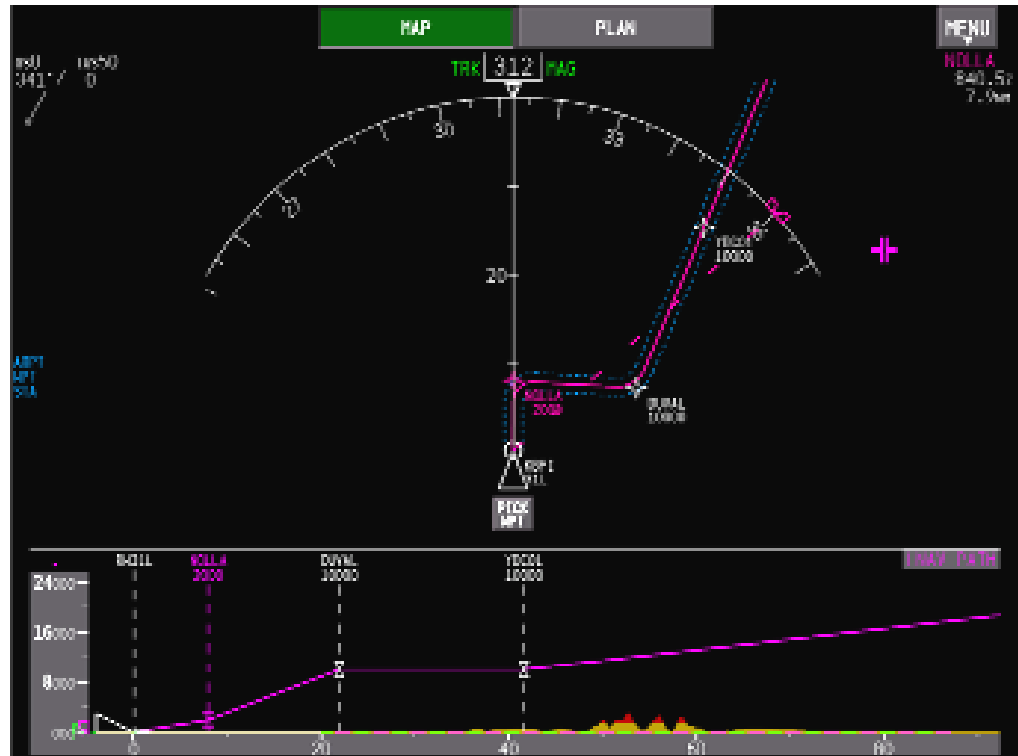
# Assure Healthy Safety Foundation

## 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**



# Boeing's Commitment to Safety

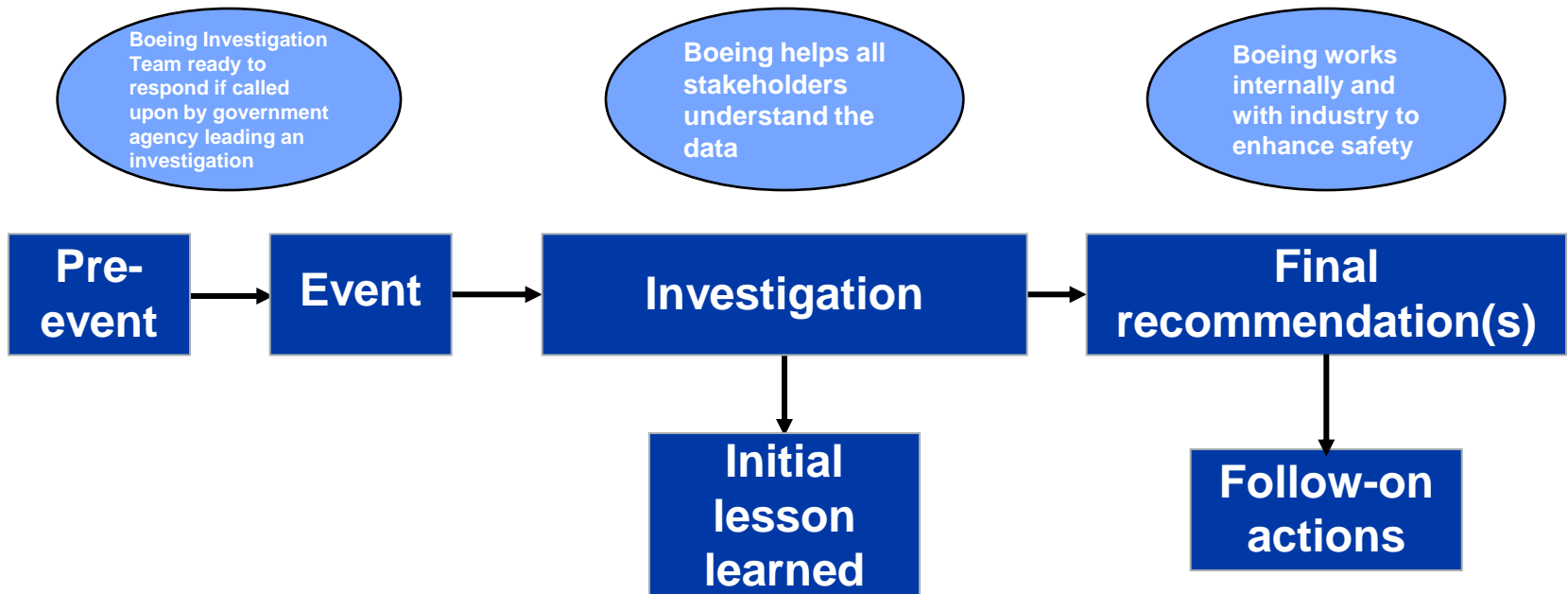
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# Participating in Accident Investigations

## Coordination of Emergency Response Plan



### Possible safety enhancements:

- Training
- Procedures
- Infrastructure
- Design
- New technologies

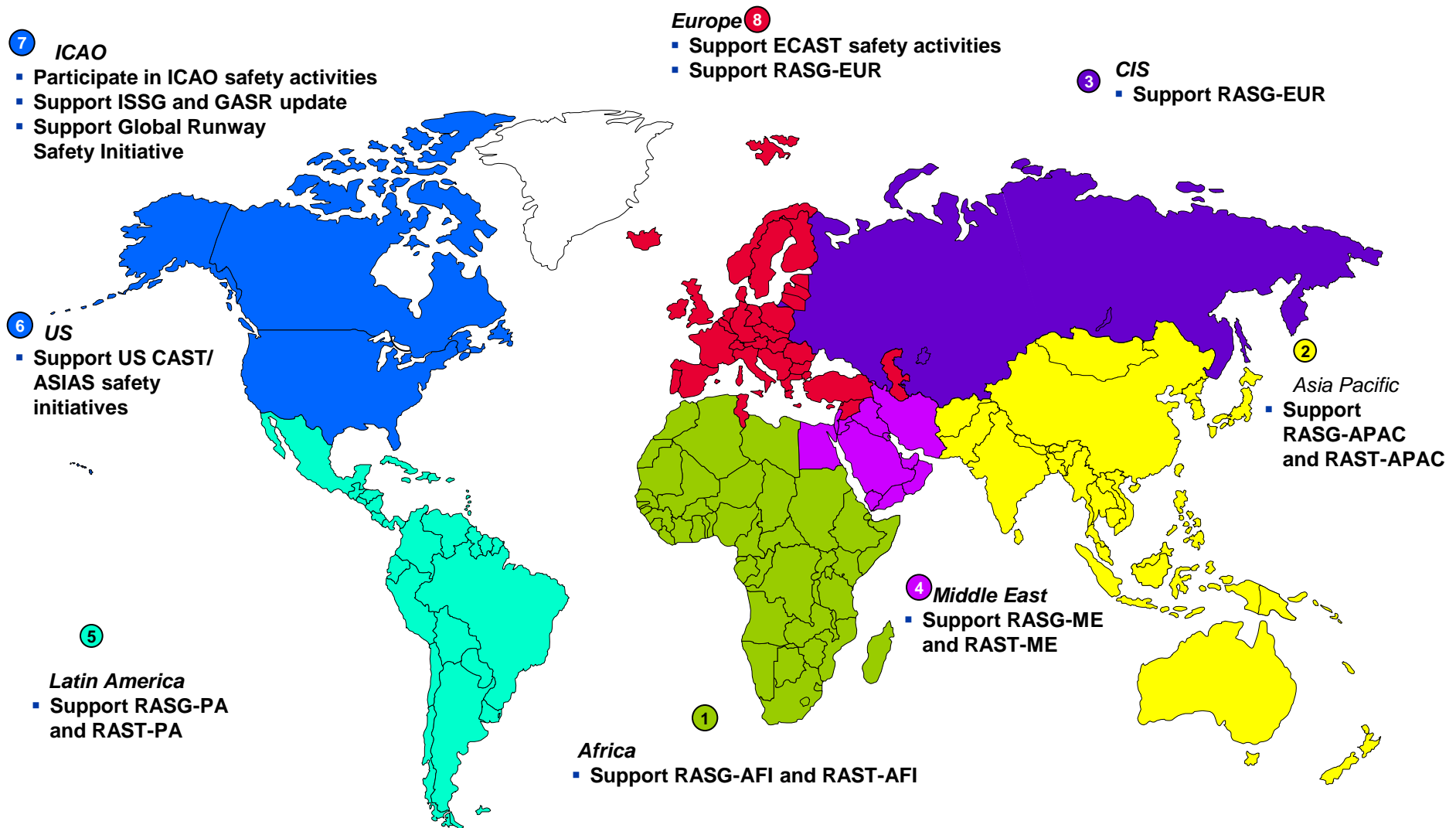
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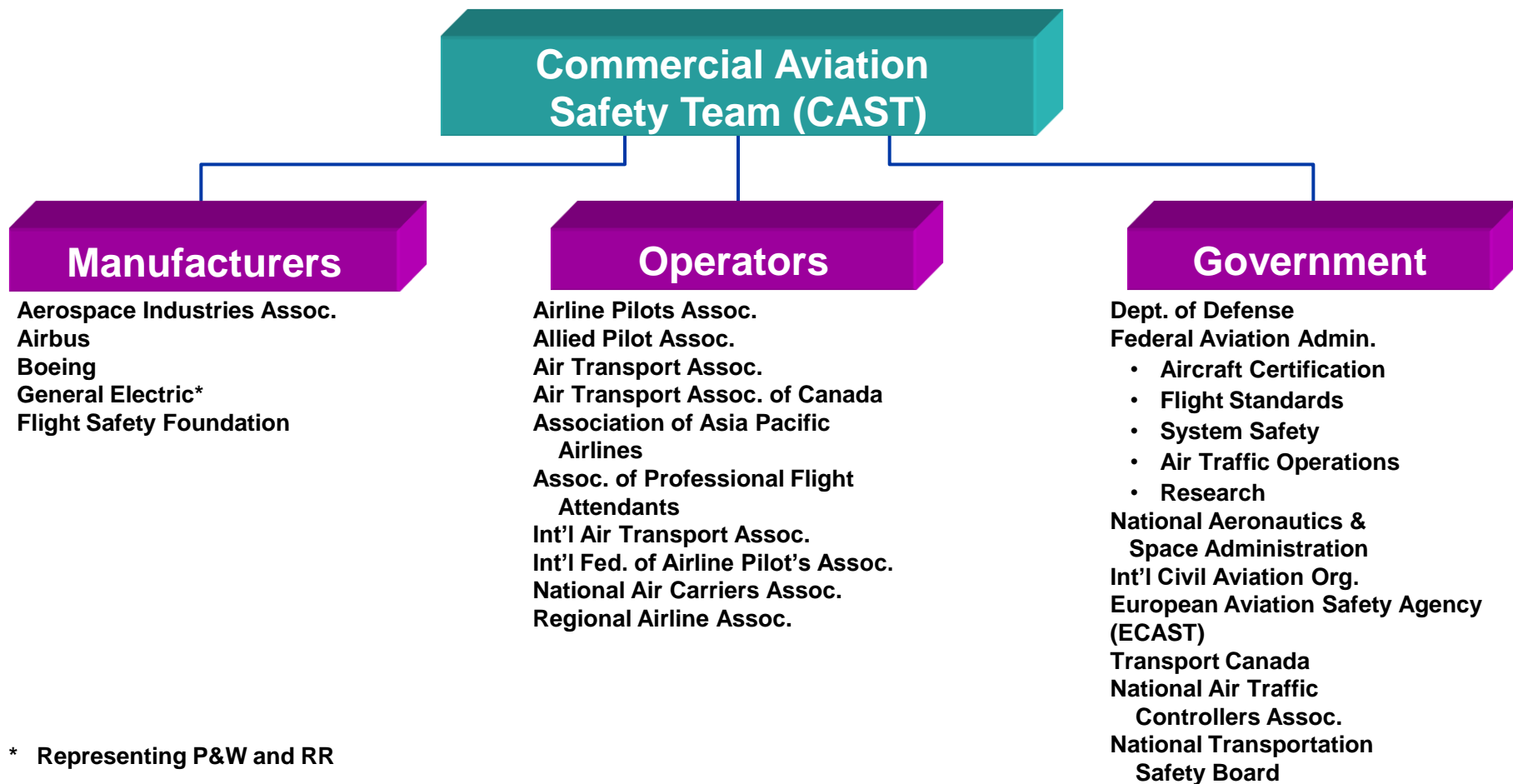
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# Boeing Regional Aviation Safety Initiatives



# 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

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- **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?