

Safety Demonstrator Series for Operational In-Time Aviation Safety Management System (IASMS): Disaster Oriented Operations

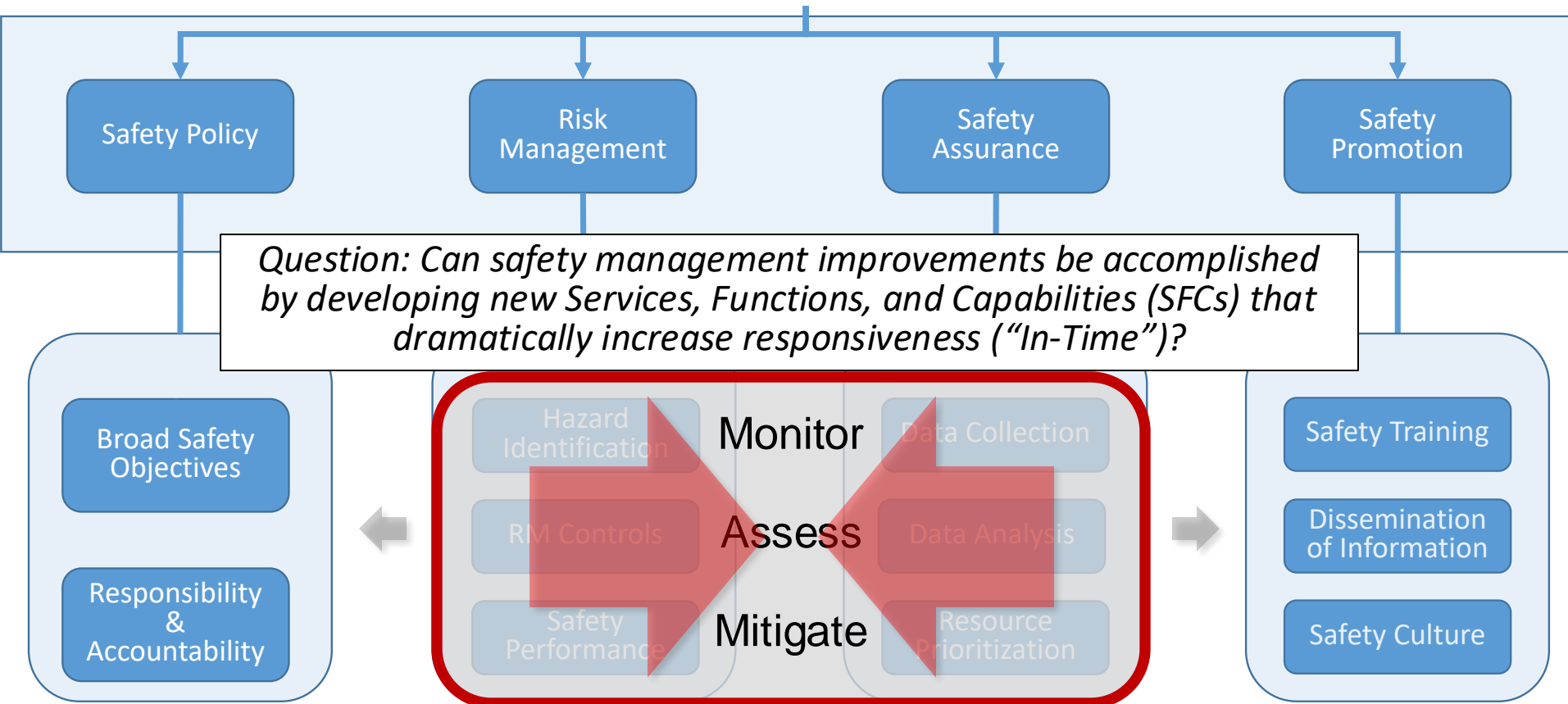
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September 28, 2023

Disaster Oriented Operations: Selected Safety Relevant Challenges

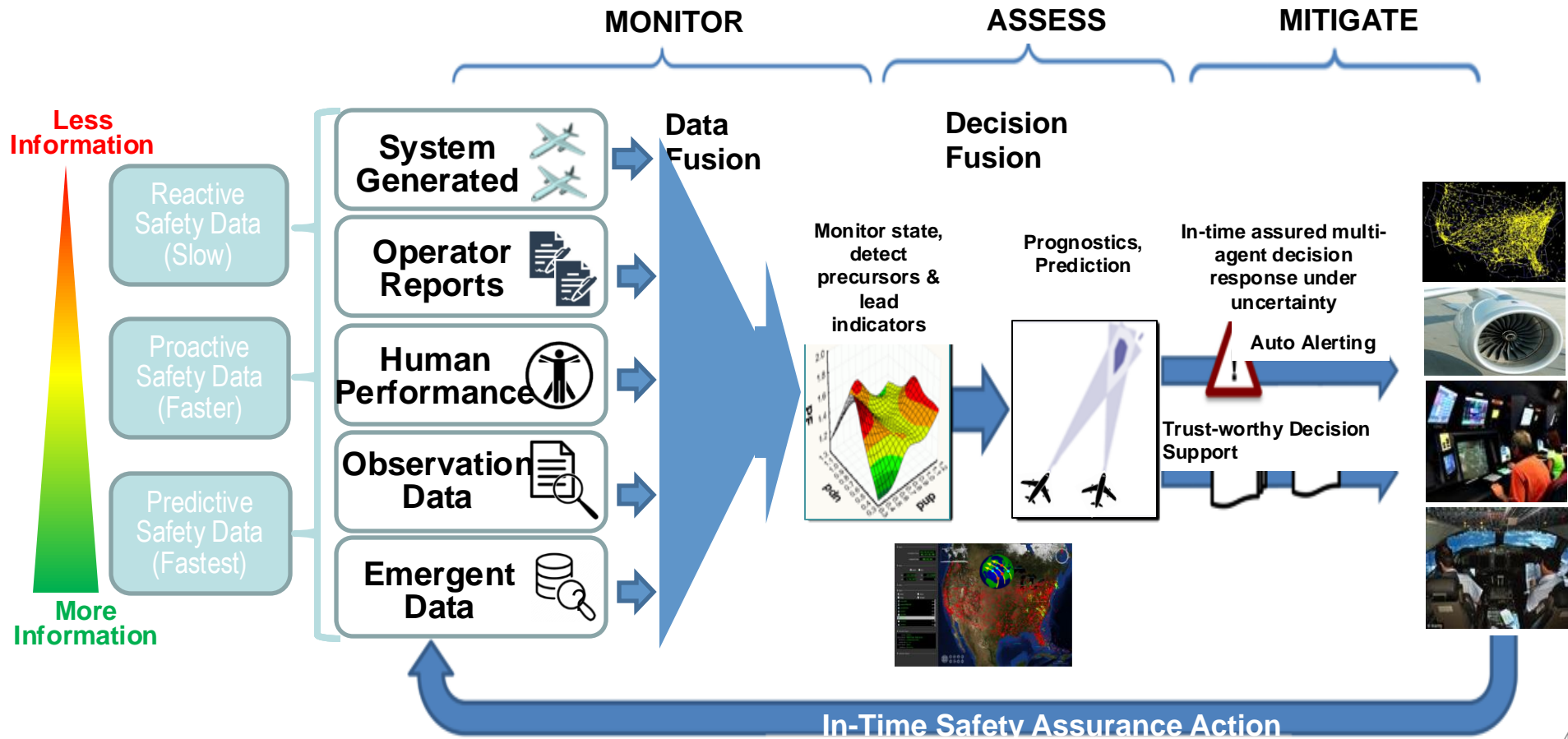


- Lack of persistent surveillance for detection and tracking at appropriate resolution
- Lack of persistent aerial operations, particularly under poor visibility
- Higher accident/incidence occurrence rate than generally seen in civil aviation (vehicle airworthiness and operations)
- Lack of standards and coordinated situational awareness across agents, organizations, and agencies
- Lack of timely access to data for safety critical decision-making
- Lack of safety services, functions, and capabilities to enable multiple types of aircraft (manned and unmanned) operating simultaneously

In-Time Aviation Safety Management (IASMS)



In-Time Aviation Safety Management (IASMS)



System Wide Safety Project: Safety Demonstrator Scheduled Progression



FY 24



FY 27



FY 29



FY 32

Wildfire Fighting

Hurricane Relief and Recovery

Emergency Medical

Urban Disaster Relief

! HIGH
Rural and partially evacuated area

⚙️ LOW-MODERATE
Intensive HMI and lack of commercial flights

? LOW-MODERATE
Unknown location of fire; poor visibility

Environment:
Low Visibility, Smoke...

! MED
Partially evacuated area

⚙️ MODERATE
Numerous agencies coordinating multiple relief efforts

? MODERATE-HIGH
Unknown state of terrain; poor infrastructure

Environment:
Low Visibility, RF/EMF Hazards, Poor Weather...

! LOW
Urban area

⚙️ MODERATE
Regularly scheduled commercial flights

? MODERATE
All weather operations

Environment:
Urban Airspace, RF/EMF Hazards...

! LOW
Urban area

⚙️ HIGH

? HIGH

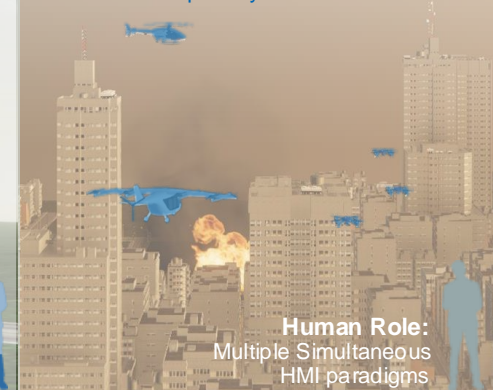
Environment:
Degraded Infrastructure, RF/EMF Hazards...

Vehicle & Mission:
sUAS, mid-size UAS/
Short Range

Vehicle & Mission:
sUAS, mid-size UAS, large UAS/
Multiple Days

Vehicle & Mission:
sUAS, mid-size UAS, large UAS/
Short to Long Range

Vehicle & Mission:
sUAS, mid-size UAS, large UAS/
Multiple Days



Human Role:
High

Human Role:
Medium

Human Role:
Low

Human Role:
Multiple Simultaneous
HMI paradigms



Backup



Operational Safety (Thrust 5)

TC-1:
*Predictive
Terminal Area
Risk
Assessment*

TC-2: *IASMS
SFCs for
Emerging
Operations*

Safety Demonstrator Series
Operational demonstration of and recommendations for requirements and standards necessary to monitor, assess, and mitigate risks to assure safety in disaster-oriented operations.

**TC-5: Safety
Demonstrator
Series for
Operational
IASMS**

Current Day

Near Future

Transforme

TC-3: *V&V for
Commercial
Operations*

TC-4:
*Complex
Autonomous
Systems
Assurance*

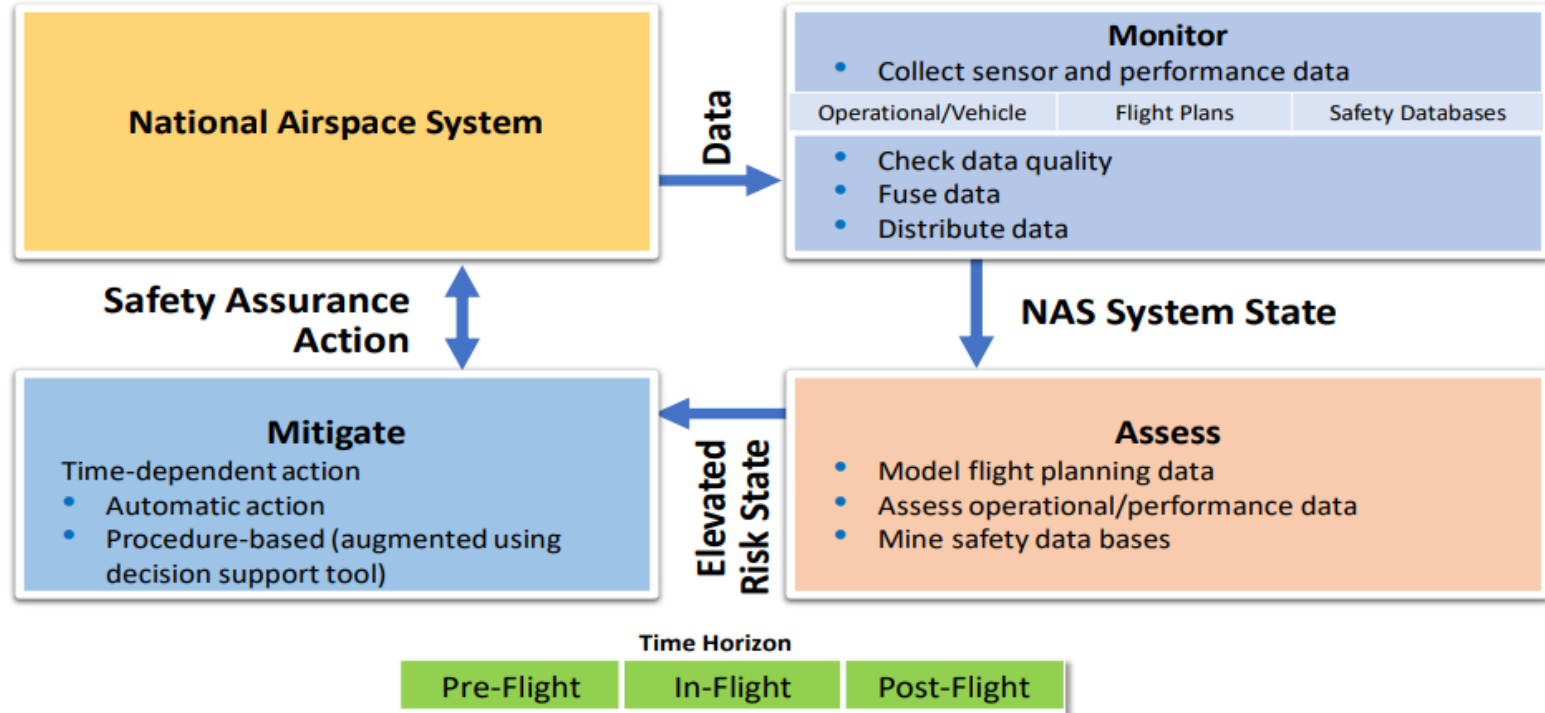
Design Safety (Thrust 6)

IASMS – In Time Aviation Safety Management System
SFC – Services, Functions, and Capabilities



ConOps and Information Flow

Services and Functions enabling new Capabilities



Engagement

- Work with disaster-oriented stakeholder community to tackle technical, operational, or regulatory safety-oriented challenges.
- Potential collaboration touchpoints
 - Testing and evaluating safety-oriented capabilities to generate evidence supporting safe operational integration
 - Developing guidance on requirements for the safe integration of increasingly autonomous operations into disaster-oriented operations
 - Enhancing situational awareness and safety through common operating pictures.

