

**Current Uses of Safety Management Systems
and the Effects on Risk and Insurance**

AIA 2018 Convention
Austin, Texas



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Panel Speakers

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Research Test Pilot
USC – Instructor for Aviation Safety Program
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USC Viterbi
School of Engineering

Aviation Safety Management Systems (ASMS)



Aviation Safety + Security Program

<https://aviationsafety.usc.edu/certificate-programs/aviation-safety-security/>

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BBA Aviation

- Worldwide organization of FBO, OEM, MRO, and GSP companies
- Has employed a dedicated risk manager for more than 25 years
- Implementing SMS on a voluntary basis
- Goal of Zero Preventable Accidents



ZIPP ZERO PREVENTABLE INCIDENTS

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What is SMS?

- A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures. (ICAO).
- A top down, organization-wide effort to avoid accidents.
- A giant step beyond merely complying with minimum requirements.
- A proactive, not reactive, manner to assess and mitigate risk.
- A continually evolving program with dedicated personnel who assess performance and recommend improvements.



ZIPP ZERO PREVENTABLE INCIDENTS

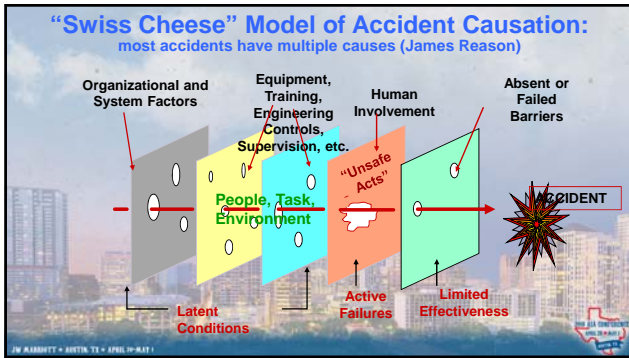
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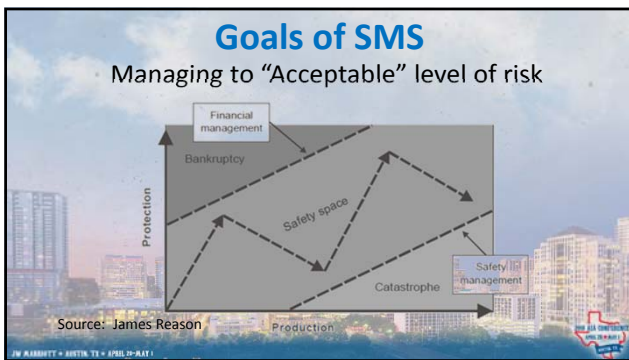
Evolution of Safety Programs

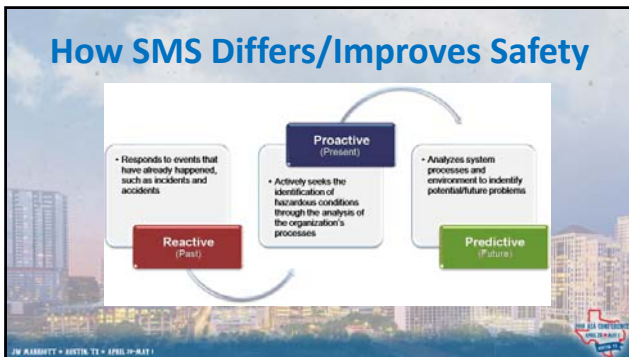


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Practical Applications of SMS

- Airlines
- Unmanned Flight
- Airports
- FBOs/GSPs
- Military
- FAA/Government
- Product OEMs, MROs



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Manned v. Unmanned: Aviation Evolution

Cessna 182 Boeing 737



Standards in Displays & Controls...Human Factors Engineering
Minimizes Error
Eases Progressive Training



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Unmanned, but NOT Unpiloted: Human Factors in UAS



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Challenges of UAS Integration


- Non Aviation Standard
 - Displays & Controls,
 - Procedures, Capabilities
- Definition of a "Pilot" –
 - Knowledge, Skills, Abilities...and Experience
- Regulatory Environment and FAA Expectations
- Hazard Identification, Risk Measurement, Mitigation



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UAS Display and Control Issues

Digital vs. Analog
Switches Are Identical (Keyboard)
Limited "Out-the-Window" View
Terminology / Logical Hierarchy



Fuel Heat Inhibit
Disable / Enable
F12

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What is a "Pilot"?

Knowledge, Ability and Skill Sets

Airmanship/Air Sense:
Principles of Flight/Aerodynamics
Aircraft Systems, Performance
Procedures and Regulations
Navigation in NAS
Communications with ATC
Flight Planning
Fuel Planning
Alternate Planning
Emergency Procedures



Remotely Piloted Aircraft System

Radio Controlled Visual Line-of-sight

Pilot (manned) Aircraft

What should these people have in common?

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(Dis)Advantages of Being Human



- I **can't hear** the engine rpm fluctuating
- I **can't feel** vibrations, accelerations or motion
- I **can't smell** the fuel leak
- I **can't taste** the electrical fire smoke
- AND, I **lose vision** in one eye, 30° FOV!
- WELCOME to UAS flying!

MROs, FBOs and GSPs

- Challenge of integrating disparate business lines and cultures under one safety system
- Methods of training, supervision, hazard id, risk assessment and reporting differ
- How to continue running each business and location profitably while integrating a new safety system?

We are the Same -- but Different

- MRO includes closed environment facilities with highly regimented tasks, as well as field service opportunities
- Facilities vary dramatically in size and work scope
- Losses are typically external to the operation

.. Maybe more Different than Same

- FBOs are primarily customer-facing, in a dynamic outdoor environment
- Hazards involve persons external to the business as well as their property
- Risk assessments consider customer immediate needs and requirements
- Environmental concerns are a further variable

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In fact, mostly Different

- GSP's respond to the high pressure demands of airlines and scheduled service customers
- The AOA: extremely fast-paced with many unique hazards from competing entities, collaborators, and non-customer airlines
- Deadlines for turnaround can be in tension with need to minimize risks

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BUT – we share the goal of safety

- Objectives
- Manual
- Hazard identification
- Risk assessments
- Training
- Data collection
- Auditing




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SMS ↔ Insurance

- Communicates **risk avoidance** to underwriter
- Shows **proactive**, not reactive, approach
- Proven ability to **reduce losses**
- Establishes an ongoing **safety culture**

➔ Saves money, avoids injuries, boosts morale

ICAO and FAA Standards



International Standards
and Recommended Practices

APPENDIX 2. Framework for a safety management system (SMS).....	APP 2-1
1. Safety policy and objectives.....	APP 2-1
2. Safety risk management.....	APP 2-3
3. Safety assurance.....	APP 2-3
4. Safety promotion.....	APP 2-4

Safety Management

ICAO and FAA Standards



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
National Policy

ORDER
8000.369B

Effective Date:
03/18/16

SUBJ: Safety Management System

1. This order establishes the Safety Management System (SMS) policy for the Federal Aviation Administration (FAA) and requirements for FAA organizations incorporating SMS and/or International Civil Aviation Organization (ICAO) State Safety Program (SSP) frameworks to form the overall FAA SMS. Specifically, this order:

- a. Furthers safety management by evolving to a more process-oriented system safety approach with an emphasis on Safety Risk Management (SRM) and Safety Assurance.

FAA Requirements - Part 121 Carriers

§5.1 Applicability.
 (a) A certificate holder under part 119 of this chapter authorized to conduct operations in accordance with the requirements of part 121 of this chapter must have a Safety Management System that meets the requirements of this part and is acceptable to the Administrator by March 9, 2018.

U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Safety Management Systems for Aviation Business Operators **Date:** 10/15/15 **AC No:** 120-928
Initiated by: AFS-900 **Change:**

This advisory circular (AC) provides information for Title 14 of the Code of Federal Regulations (14 CFR) part 121 air carriers that are required to implement safety management systems (SMS) based on 14 CFR part 1. Specifically, this document provides a description of regulatory requirements, guidance, and methods of developing and implementing an SMS. This AC may also be used by other aviation service providers interested in voluntarily developing an SMS based on the requirements in part 1.

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FAA Requirements – Others

U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: INTRODUCTION TO SAFETY MANAGEMENT SYSTEMS (SMS) FOR AIRPORT OPERATORS **Date:** February 28, 2007 **AC No.:** AC 150/7200-37
Initiated by: AAS-300 **Change:**

Docket Number: FAA-2010-0997

	Original	Newly Projected
To OST	12/08/2017	04/27/2018
To OMB	01/09/2018	06/13/2018
OMB Clearance	04/09/2018	09/13/2018
Publication Date	04/23/2018	09/27/2018

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SMS Objectives of the Organization

SMS development and implementation will follow the phased approach, advocated by ICAO, FAA, and other CAA's around the world.

- 4 Continuous Improvement
- 3 Proactive Processes
- 2 Reactive Processes
- 1 Planning & Organization
- 0 Orientation & Commitment


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Safety Culture

1/8/15AC 120-92B

CHAPTER 2. SAFETY MANAGEMENT SYSTEM (SMS) FOUNDATIONS

2-1. SAFETY CULTURE AND SAFETY MANAGEMENT. One key aspect that is essential to safety performance is the culture of the organization. "Safety culture" is the term that we apply to those aspects of the organization's culture that relate to safety performance. The concept of safety culture underlies safety management and is the basis for the SMS requirements of Title 14 of the Code of Federal Regulations (14 CFR) part 5.²



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E.g.--SMS ORIENTATION GOALS

- To launch and introduce SMS at a high level and preview what's to come
- To set the stage for the next 3-5 years of SMS implementation
- To diagnose requisite behavioral / cultural changes that all will be involved with
- To position leadership to embrace, own and lead the SMS change
- To develop leadership's capacity for leading significant change beyond SMS
- To do the above in a most effective and experiential way



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Next Steps....

- Company-wide commitment to adopt formal Aviation SMS process
- Re-orient current material, practices and efforts to conform with SMS program
- Evaluate current outside/internal support to and execute true aviation SMS program
- Engage interested regulatory authorities (FAA/CAA)
- Company-wide safety statement and SMS commitment
- Company wide SMS orientation/training by 2Q 2015 for all leadership

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Promotion

1

Planning & Organizing



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E.g.--2016 and 2017 SMS Plan and Goals:

- SMS Manual complete
- Existing systems and processes mapped to SMS
- SMS Management of Change process designed and implemented
- SMS training for managers including Operations GMs, HR and HSE complete

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SMS: What Makes it Great?

Safety Policy & Objectives	Safety Risk Management	Safety Assurance	Safety Promotion
Management Commitment	Hazard Identification	Safety Performance	Training & Education
Accountabilities	Risk Assessment	Management of Change	Safety Communication
Emergency Response	Risk Mitigation	Continuous Improvement	
Documentation			

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I. Safety Policy-SMS Manual

FOCUS

- Establish Corporate SMS policies and procedures, accountability, responsibility and flow-downs
- Define corporate risk acceptance levels
- Set guidance for Business Unit, Company and Site-specific authorities and unique system attributes

ADJUST

- Focus on just those elements that are unique to the Division including measurable Safety Objectives, Accountabilities and Responsibilities
- Establish Divisional Risk Acceptance criteria and authority

MAINTAIN

- Manual structure and alignment to ICAO Annex 19
- Current basic content (Section A)

ADD

- Identification, verification and performance monitoring of Division-specific Safety Risk Controls
- Hazard Register documenting top five Division SMS Hazards, associated Risk Controls and Risk Assessment
- Formal Division Safety Assurance audit process and requirements

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III. Safety Promotion

Initial Design/Draft

- Establish MOC policy/criteria (when required), process flow, participant requirements, system requirements, record keeping requirements and procedural documentation for incorporation in SMS Manual

Incorporate in database

- Create data collection (form), notification and workflows in database

Test

- Select and perform tests of MOC process using live test cases in each Division

Deploy

- Determine training and communication requirements and schedule release of process to coincide with release of Corporate SMS manual

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IV. Safety Assurance

Employee Reporting System

- Evaluate current reporting forms, investigation process/records and data analysis capabilities of database

Internal Evaluation (Audit) Program

- Assess current Corporate, Divisional and Site audit and inspection processes, tools and results including Corrective/Preventative Actions process

Investigations Process

- Evaluate investigations processes, consistency, records and continuous improvements resulting from reported hazards, incidents and accidents

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Future of SMS



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