

Safety Management Systems in Maintenance Organizations

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Little Rock Repair Station Human Factors Seminar
Little Rock, AK
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Why SMS? – The First Ultra-safe Industrial System

Fragile system (1920's -1970's)

- Fly-Fix-Fly
- Individual risk management & intensive training
- Accident investigation

Safe system (1970's – mid 1990's)

- System Safety
- Technology & regulations
- Incident investigation

Ultra-safe system (mid 1990's onwards)

- Business management approach (SMS)
- Routine data collection and analysis

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2007 HF Symposium



19th FAA/ATA International Symposium

Human Factors
in Maintenance and Airport Service Safety

September 5-6, 2007
Evening "Kick-off" Reception on September 4, 2007
Hyatt Regency Orlando International Airport Hotel
Orlando, Florida, USA

ICAO Annex 6 Requirements

“...a safety management system acceptable to the State of the Operator that, as a minimum:

1. **identifies safety hazards;**
2. ensures that **remedial action** necessary to maintain an acceptable level of safety is implemented; and
3. provides for **continuous monitoring** and **regular assessment** of the safety level achieved.”
4. *...and, aims to make **continuous improvement** to the overall level of safety (proposed amendment)*

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FAA Support of the SMS Concept

- U.S. Response to the Annex 6 proposal endorsed the SMS concept
- Prior U.S. implementation of system safety-based oversight systems
 - ATOS
 - SASO
- FAA (AVS) will apply safety management concepts to oversight activities

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FAA Activity

- ICAO has proposed that the National Aviation Authorities adopt SMS regulation.
 - SMS to be a Standard by January 1, 2009
- FAA has written AC 120-92 Introduction to Safety Management Systems for Air Operators
 - Safety policy and objectives
 - Safety risk management
 - Safety assurance
 - Safety promotion.

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The Components of an SMS FAA—The Four Pillars

- ① Safety policy and objectives
- ② Safety risk management
- ③ Safety assurance
- ④ Safety promotion

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Risk Probability—ICAO and FAA		
Probability of occurrence		
Qualitative definition	Meaning	Value
Frequent	Likely to occur many times (has occurred frequently)	5
Occasional	Likely to occur some times (has occurred infrequently)	4
Remote	Unlikely, but possible to occur (has occurred rarely)	3
Improbable	Very unlikely to occur (not known to have occurred)	2
Extremely improbable	Almost inconceivable that the event will occur	1

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Risk Severity—ICAO and FAA		
Severity of occurrences		
Aviation definition	Meaning	Value
Catastrophic	<ul style="list-style-type: none"> Equipment destroyed Multiple deaths 	5
Hazardous	<ul style="list-style-type: none"> A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely. Serious injury or death to a number of people. Major equipment damage 	4
Major	<ul style="list-style-type: none"> A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of increase in workload, or as a result of conditions impairing their efficiency. Serious incident. Injury to persons. 	3
Minor	<ul style="list-style-type: none"> Nuisance. Operating limitations. Use of emergency procedures. Minor incident. 	2
Negligible	<ul style="list-style-type: none"> Little consequences 	1

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Safety Risk Matrix

Severity \ Likelihood	1 Negligible	2 Minor	3 Major	4 Hazardous	5 Catastrophic
5 Frequent	6	7	8	9	10
4 Occasional	5	6	7	8	9
3 Remote	4	5	6	7	8
2 Improbable	3	4	5	6	7
1 Extremely Improbable	2	3	4	5	6

	Unacceptable
	Acceptable with Mitigation
	Acceptable

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The SMS Standard - Summary

- **First FAA SMS standard was delivered on June 22, 2006 in Advisory Circular AC 120-92.**
- **SMSs are currently voluntary in the United States**
- **The standard is organized around the four pillars**
- **The standard is based on an extensive review of existing SMSs around the world**
- **The format of the SMS standard is similar to that of the ISO standards**

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Rulemaking Effort

- Rulemaking Project Record (RPR) opened Nov. 2006
- Rulemaking Project Team assigned Dec 2006
- Proposed strategy:
 - Align regulations with ICAO
 - Draft acceptance criteria (similar to present voluntary standard) in policy documents
 - Set implementation milestones in regulatory language

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Pilot Project

- A set of proof of concept trials will commence in 2007
- These trials will consist of voluntary SMS development and interface with oversight systems
- The purpose is to gather data to be used in further development of guidance material, risk management and audit tools, and implementation strategies

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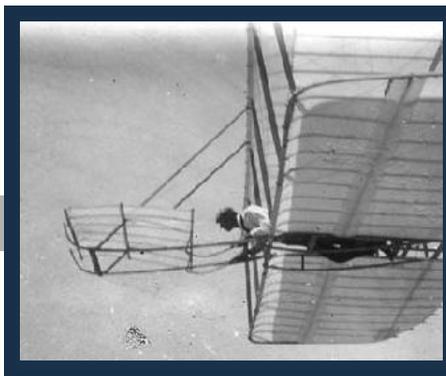


➤ *“Carelessness and overconfidence are more dangerous than deliberately accepted risk”*

Wilbur Wright, 1901



Wilbur Wright gliding, 1901
Photographs: Library of Congress



Find slides at www.hfskyway.com

Thank you

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