ICAO State Safety Programme (SSP) and Safety Management Systems (SMS) Implementation

RASG-PA Aviation Safety Seminar

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3. SSP implementation
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1. Introduction
Concept of safety

ICAO Doc 9859:

Safety is the state in which the possibility of harm to persons or property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management.
Prescription and Performance

- Safety Management principles
- Realistic implementation
- ICAO SARPS
- Prescription

Performance
Prescriptive & Performance based environment

**Prescriptive based environment**

Regulations as **administrative controls**

- Rigid regulatory framework
  - Inspections
  - Audits

  ✓ **Regulatory compliance**

**Performance based environment**

Regulations as **safety risk controls**

- Dynamic regulatory framework
  - Data based identification
  - Prioritization of safety risks

  ✓ **Effective safety performance**
Two phased process:

- Reorganization of existing SARPs and supporting guidance material
- In-depth review of SARPs to assess whether they need to be amended or expanded
Safety Management Guidance Material

- Safety Management Manual - Doc 9859
- Third Edition – 2012 (Unedited advance version)
- Detailed guidance for SMS / SSP implementation
- ICAO Safety Management website
  - [http://www2.icao.int/en/ism/Pages/GuidanceMaterials.aspx](http://www2.icao.int/en/ism/Pages/GuidanceMaterials.aspx)
Two audience groups

- States
- Service providers

Three distinct Standards

- State safety programme (SSP)
  - Acceptable level of safety performance (ALoSP)
- Safety management system (SMS)
  - Safety performance of the SMS
- Management accountability
2. SSP and SMS
State Safety Programme definition

SSP is an integrated set of regulations and activities aimed at improving safety
SSP provides the means to combine prescriptive and performance-based approaches to:

1. Safety rulemaking
2. Safety policy development
3. Safety oversight
States shall establish the SSP in order to achieve an acceptable level of safety performance (ALoSP)

ALoSP will be set by the State

SSP is a management system for the management of safety by the State
The implementation of an SSP must be commensurate with the size and complexity of the State’s aviation system.
Core operational activities of an SSP

- State safety risk management (SRM)
- State safety assurance (SA)
The SMS is a systematic approach to managing safety, including the organizational structures, accountabilities, policies and procedures.
SMS State requirement

That a service provider implement the SMS acceptable to the State that:

- Identifies safety hazards
- Ensures the implementation of remedial action necessary to maintain agreed safety performance
- Provides for continuous monitoring and regular assessment of the safety performance
- Aims at a continuous improvement of the overall performance of the safety management system
A system to assure the safe operation of aircraft through effective management of safety risk

Designed to continuously improve safety by identifying hazards, collecting and analyzing data and continuously assessing safety risks

Seeks to proactively contain or mitigate risks before they result in aviation accidents and incidents

Commensurate with the organization’s regulatory obligations and safety goals
SMS cont.

✈️ Service providers are responsible for establishing the SMS

✈️ States are responsible for the acceptance and oversight of service providers’ SMS
Service providers and SMS

Organizations that are required to implement the SMS:

- Approved training organizations that are exposed to safety risks during the provision of their services
- Aircraft operators
- Approved maintenance organizations
- Organizations responsible for design and/or manufacture of aircraft
- Air traffic services providers
- Certified aerodromes
SSP and SMS components

SSP components

1. State safety policy and objectives
2. State safety risk management
3. State safety assurance
4. State safety promotion

SMS components

1. Safety policy and objectives
2. Safety risk management
3. Safety assurance
4. Safety promotion
Basic safety management SARPs
SSP – SMS relationship

**Objective:** Support safety objectives

- Acceptance
- Prescriptive surveillance

**Objective:** Support production objectives

- Performance-based surveillance

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State Safety Programme (SSP)

Organization’s Safety Management system (SMS)

Service delivery

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States:

- States shall establish a State safety programme (SSP), in order to achieve an acceptable level of safety (ALoSP) in civil aviation.
- ALoSP to be achieved shall be established by the State.

Service providers:

- States shall require, as part of their SSP, that a service provider implement an SMS acceptable to the State that:
  - Identifies safety hazards
  - Ensures the implementation of remedial action necessary to maintain agreed safety performance
  - Provides for continuous monitoring and regular assessment of the safety performance
  - Aims at a continuous improvement of the overall performance of the safety management system.
3. SSP implementation
### ICAO SSP Framework

1. **State safety policy and objectives**
   - 1.1 State safety legislative framework
   - 1.2 State safety responsibilities and accountabilities
   - 1.3 Accident and incident investigation
   - 1.4 Enforcement policy

2. **State safety risk management**
   - 2.1 Safety requirements for service providers SMS
   - 2.2 Agreement on service providers safety performance

3. **State safety assurance**
   - 3.1 Safety oversight
   - 3.2 Safety data collection, analysis and exchange
   - 3.3 Safety data driven targeting of oversight on areas of greater concern or need

4. **State safety promotion**
   - 4.1 Internal training, communication and dissemination of safety information
   - 4.2 External training, communication and dissemination of safety information
SSP – Two considerations

- The implementation of the SSP is commensurate with the size and complexity of the State’s aviation system

- It may require coordination among multiple authorities responsible for individual element functions in the State
State as Service Provider

When the State is responsible for the provision of specific services (e.g. aerodromes, air navigation services, etc.) the organization providing the service should implement its SMS.
SSP gap analysis

-Allow to assess the existence and maturity within the State of the elements of an SSP
  - Guidance in the SMS Manual

-The components/elements identified as missing or deficient will form, together with those already existing or effective, the basis of the SSP implementation plan
SSP implementation plan

✈ A “flight plan” that guides the development of the SSP

✈ Allows States to:
  – Identify those tasks underlying the strategy leading to the implementation of the SSP
  – Coordinate the activities by the various State aviation organizations under the SSP in support of the implementation plan
Why a phased approach to SSP?

To manage the workload associated with the implementation of the SSP

To prevent the “compliance by ticking boxes”

Implementation phases are proposed based on:

- The results of the gap analysis
- The sequential application of the different components and elements of the SSP framework
4. The role of the SSP supporting the SMS implementation
SMS Framework

1. **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 planning
   1.5 – SMS documentation

2. **Safety risk management**
   2.1 – Hazard identification
   2.2 – Risk assessment and mitigation

3. **Safety assurance**
   3.1 – Safety performance monitoring and measurement
   3.2 – The management of change
   3.3 – Continuous improvement of the SMS

4. **Safety promotion**
   4.1 – Training and education
   4.2 – Safety communication
The role of the SSP in supporting SMS implementation

- Generate a context that supports the implementation of an SMS by service providers

- SMS cannot perform effectively either in a regulatory vacuum or in an exclusively compliance-oriented environment
A regulation on SMS should address the provision of SMS guidance or advisory materials by the State.

Such guidance materials should also include any provision for a phased SMS implementation.

CAA’s process for acceptance of SMS and agreement of their proposed safety performance should also be made known in such requirements or guidance materials as appropriate.
State activity supporting SMS

**STEP 1**
- Conduct a gap analysis of the SSP, in order to ascertain the existence and status of maturity, within the State, of the elements of an SSP.

**STEP 2**
- Develop an SMS training programme for staff of the State’s safety oversight authority.

**STEP 3**
- Develop SMS regulations for service providers.
- Prepare guidance material for the implementation of SMS.

**STEP 4**
- Revise the State’s enforcement policy.
Reasons for a phase approach to SMS implementation

- Provision of a manageable series of steps
- Allow implementation of SMS framework elements in sequence
- Initial availability of data and analytic processes to support reactive, proactive and predictive safety management practices
- Need for a methodical process to ensure effective and sustainable SMS implementation
# Four phases of SMS implementation

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<thead>
<tr>
<th>Phase I</th>
<th>Phase II</th>
<th>Phase III</th>
<th>Phase IV</th>
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<tbody>
<tr>
<td><strong>1. SMS element 1.1(i):</strong></td>
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<tr>
<td>b. Establish SMS Implementation Team</td>
<td>b. Define safety management responsibilities &amp; accountabilities across relevant departments of the organization</td>
<td>b. Establish safety risk management procedure</td>
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<td>c. Define scope of the SMS</td>
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<td>b. Establish occurrence reporting &amp; investigation procedure</td>
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<td>d. Perform SMS Gap Analysis</td>
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<td>b. Establish safety data collection &amp; processing system for high consequence outcomes</td>
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<td><strong>2. SMS element 1.5(i):</strong></td>
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<td>a. Develop SMS Implementation Plan</td>
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<td><strong>3. SMS element 1.3:</strong></td>
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<tr>
<td>a. Establish a key person/ office responsible for the administration and maintenance of the SMS.</td>
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<td><strong>4. SMS element 4.1(i):</strong></td>
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<td>a. Establish SMS Training program for personnel, with priority for SMS implementation team.</td>
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<td><strong>5. SMS element 4.2(i):</strong></td>
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<td>a. Enhance existing disciplinary procedure/ policy with due consideration of unintentional errors/ mistakes from deliberate/ gross violations</td>
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<td><strong>1. SMS element 1.1(ii):</strong></td>
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<td>a. Establish Safety Policy &amp; Objectives</td>
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<td><strong>2. SMS element 1.2:</strong></td>
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<tr>
<td>a. Define safety management responsibilities &amp; accountabilities across relevant departments of the organization</td>
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<td>b. Establish SMS/ Safety coordination mechanism/ committee</td>
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<td>c. Establish departmental/ divisional SAGs</td>
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<td>where applicable</td>
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<td><strong>3. SMS element 1.4:</strong></td>
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<td>a. Establish Emergency Response Plan</td>
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<td><strong>4. SMS element 1.5(ii):</strong></td>
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<td>a. Initiate progressive development of an SMS Document/ Manual &amp; other supporting documentation</td>
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<td><strong>1. SMS element 2.1(i):</strong></td>
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<td>a. Establish voluntary hazards reporting procedure</td>
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<td><strong>2. SMS element 2.2:</strong></td>
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<tr>
<td>a. Establish safety risk management procedure</td>
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<td><strong>3. SMS element 3.1(i):</strong></td>
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<tr>
<td>a. Establish occurrence reporting &amp; investigation procedure</td>
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<td>b. Establish safety data collection &amp; processing system for high consequence outcomes</td>
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<td>c. Develop high consequence SPIs &amp; associated targets &amp; alert settings</td>
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<td><strong>4. SMS element 3.2:</strong></td>
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<td>a. Establish Management of Change procedure that includes safety risk assessment</td>
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<td><strong>5. SMS element 3.3(i):</strong></td>
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<td>a. Establish internal quality audit programme</td>
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<td>b. Establish external quality audit programme</td>
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<td><strong>1. SMS element 1.1(iii):</strong></td>
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<td>a. Establish voluntary hazards reporting procedure</td>
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<td><strong>2. SMS element 2.1(ii):</strong></td>
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<td>a. Establish voluntary hazards reporting procedure</td>
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<td><strong>3. SMS element 3.1(ii):</strong></td>
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<td>b. Establish safety data collection &amp; processing system for high consequence outcomes</td>
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<td>c. Develop lower consequence SPIs &amp; associated targets/ alert settings</td>
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<td><strong>4. SMS element 3.2(ii):</strong></td>
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<tr>
<td>a. Establish Management of Change procedure that includes safety risk assessment</td>
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<td><strong>5. SMS element 3.3(ii):</strong></td>
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<td>a. Establish or integrate SMS audit into existing internal &amp; external audit programs</td>
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<td>b. Establish other operational SMS review/ survey programs where appropriate</td>
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<td><strong>6. SMS element 4.1(ii):</strong></td>
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<tr>
<td>a. Promote safety information sharing &amp; exchange internally and externally</td>
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**SMS element 1.5: SMS Documentation (Phase I to IV)**

**SMS element 4.1, 4.2: SMS Training, education & communication (Phase I & thereafter)**
Relationship SSP and SMS

State

ALoSP

SSP

SMS

Service providers
5. Summary
System today

Service providers

SMS

Airport N° 1

Airport N° 2

Airport N° 3

State Civil Aviation Authority

Safety measurement

- Capture
- Storage
Initial ALoSP

Service providers
- Airport N° 1
- Airport N° 2
- Airport N° 3

State Civil Aviation Authority

Safety measurement
- Capture
- Storage

Initial ALoSP
Initial ALoSP

Service providers

Airport N° 1

Airport N° 2

Airport N° 3

Exchange of protected safety data

State Civil Aviation Authority

State Civil Aviation Authority

Safety data collection & processing system

Protected safety data

- Capture
- Storage
- Process
- Analysis

Initial ALoSP
Mature ALoSP

Service providers

Airport N° 1

Airport N° 2

Airport N° 3

Exchange of protected safety data

State Civil Aviation Authority

State Civil Aviation Authority

Safety data collection & processing system

Protected safety data

- Capture
- Storage
- Process
- Analysis

Initial ALoSP
State accepts and oversees individual service providers’ SMS

State agrees and supervises individual service provider’s SMS safety performance

State accepts and oversees individual service providers’ SMS

Set of activities

ATS Service provider
Aerodrome operator
Aircraft operator N° 1
AMO
Training organization

SMS
SMS
SMS
SMS
SMS

Safety performance
Safety performance
Safety performance
Safety performance
Safety performance

Set of activities

Aircraft operator N° 2
Aerodrome operator
Training organization
ATS Service provider
AMO

SMS
SMS
SMS
SMS
SMS

Safety performance
Safety performance
Safety performance
Safety performance
Safety performance

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Summary

- Aviation is the safest mode of transportation
- There is no perfect safety system
- Successful safety management requires participation of all levels of management and supervision
- A clear understanding of the relationship between the SSP and SMS is key
States and service providers have safety responsibilities

ICAO standards require States to establish a SSP

SSP is an integrated set of regulations and activities aimed at improving safety

States are required to establish ALoSP

Services providers are required to establish SMS
The objective of a State (SSP) is to ensure public safety during service delivery by service providers. Achieved by defining the ALoSP and the control of safety risks within the State by Safety Risk Management (SRM) and Safety Assurance (SA). ICAO is supporting the implementation of SSP and SMS.
Questions?
For additional información:

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Visit: www.mexico.icao.int

Thank You!