



SAFE SKIES.
SUSTAINABLE FUTURE.

ICAO

State Safety Assurance

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Component III - State Safety Assurance

1

State Safety Assurance

2

Safety Performance
Measurement

3

Service Provider's Safety
Risk Profiles

4

Change Management

1 State Safety Assurance

Objective of the Module

1. To develop the State's safety assurance process.
2. Measure safety performance.
3. Manage change through decision making and system improvements.

Document References

- Doc. 10004 Global Aviation Safety Plan.
- Annex 19 Safety Management.
- Doc. 9859 Safety Management Manual.





OACI

Normas y métodos
recomendados internacionales

Anexo 19 al Convenio sobre Aviación Civil Internacional

Gestión de la seguridad operacional

Segunda edición, julio de 2016



Esta edición reemplaza, desde el 7 de noviembre de 2019, todas las ediciones anteriores del Anexo 19.

Véase en el Preámbulo y en el Capítulo 2 la información relativa a la aplicación de las normas y métodos recomendados.

ORGANIZACIÓN DE AVIACIÓN CIVIL INTERNACIONAL

3.4 Aseguramiento estatal de la seguridad operacional

3.4.1 Obligaciones de vigilancia

3.4.1.1 Los Estados cumplirán las obligaciones de vigilancia de conformidad con la Sección 7 del Apéndice 1.

Nota.— En la vigilancia del SMS del proveedor de servicios se tiene en cuenta el rendimiento en materia de seguridad operacional, así como la dimensión y complejidad de sus productos o servicios de aviación.

3.4.1.2 **Recomendación.**— *Los Estados deberían establecer procedimientos para priorizar las inspecciones, auditorías y encuestas relacionadas con los elementos que plantean más preocupación o que requieren mayor atención.*

Nota.— Los perfiles organizativos de riesgos, los resultados de la identificación de peligros y de la evaluación de riesgos, al igual que los resultados en materia de vigilancia, pueden proporcionar información para priorizar las inspecciones, auditorías y encuestas.

3.4.1.3 **Recomendación.**— *Los Estados deberían examinar periódicamente el rendimiento en materia de seguridad operacional de cada proveedor de servicios.*

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ORGANIZACIÓN DE AVIACIÓN CIVIL INTERNACIONAL

Capítulo 3

Anexo 19 — Gestión de la seguridad operacional

Nota 2.— En el Manual de gestión de la seguridad operacional (SMM) (Doc 9859) figura orientación para establecer indicadores y metas de rendimiento en materia de seguridad operacional, así como un nivel aceptable de rendimiento en materia de seguridad operacional.

3.4.2.2 Recomendación.— *Los Estados deberían elaborar y mantener un proceso para evaluar la eficacia de las medidas emprendidas para manejar los riesgos de seguridad operacional y resolver los problemas de seguridad operacional.*

Nota.— Los resultados de la evaluación de la seguridad operacional pueden utilizarse para establecer las prioridades de las medidas para manejar los riesgos de seguridad operacional.

3.4.2.3 Recomendación.— *Los Estados deberían evaluar la eficacia de sus respectivos SSP para mantener o mejorar continuamente su nivel global de rendimiento en materia de seguridad operacional.*

State Safety Assurance

Componente 3 del SSP
Aseguramiento estatal
de la seguridad operacional

CE-7 Obligaciones de vigilancia

Rendimiento estatal en materia
de seguridad operacional

State Safety Assurance

State Assurance Objective

Ensure that government functions and service providers achieve their safety objectives and goals.



State Safety Assurance

Importance of State Safety Assurance



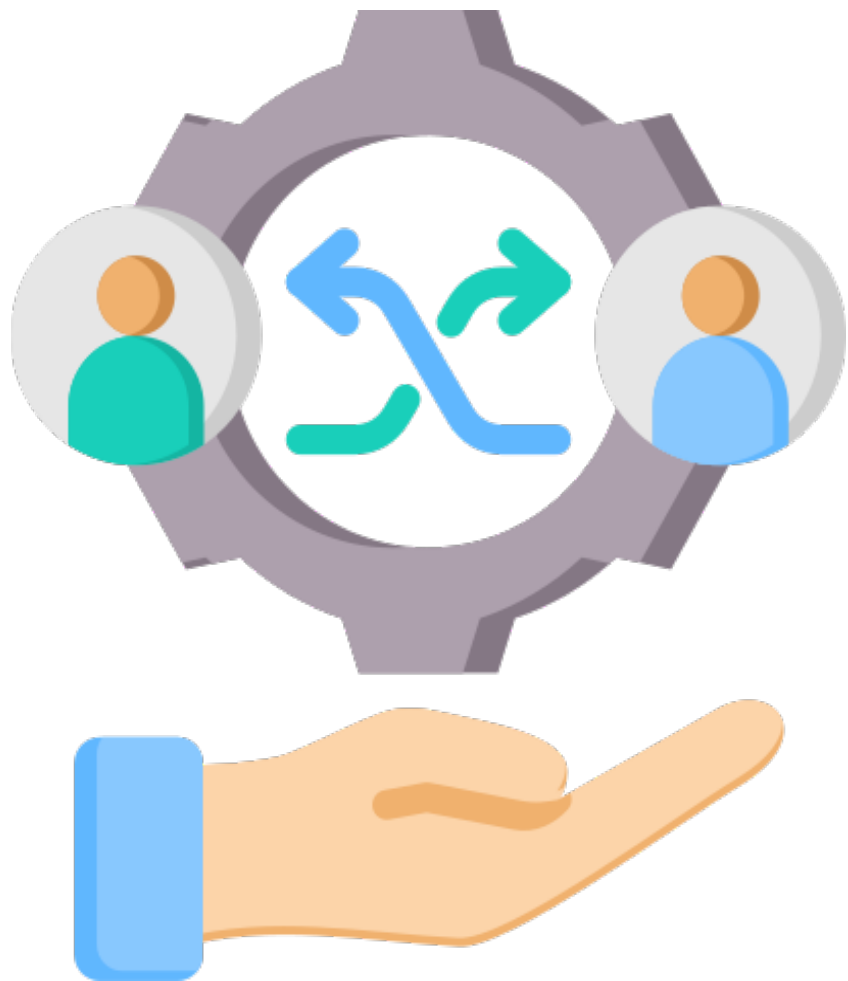
Adequate direction towards safety objectives



Promotion of confidence in the aviation system.



Guarantee of efficiency in the state's safety processes.



State Safety Assurance

Key State Assurance Activities

1. Implementation of a State Assurance Process

To ensure the effective functioning of the State's safety processes.



State Safety Assurance

Key State Assurance Activities

2. Surveillance and Data Collection

To ensure the integration of regulatory controls of SMS safety risks of service providers and the SSP.

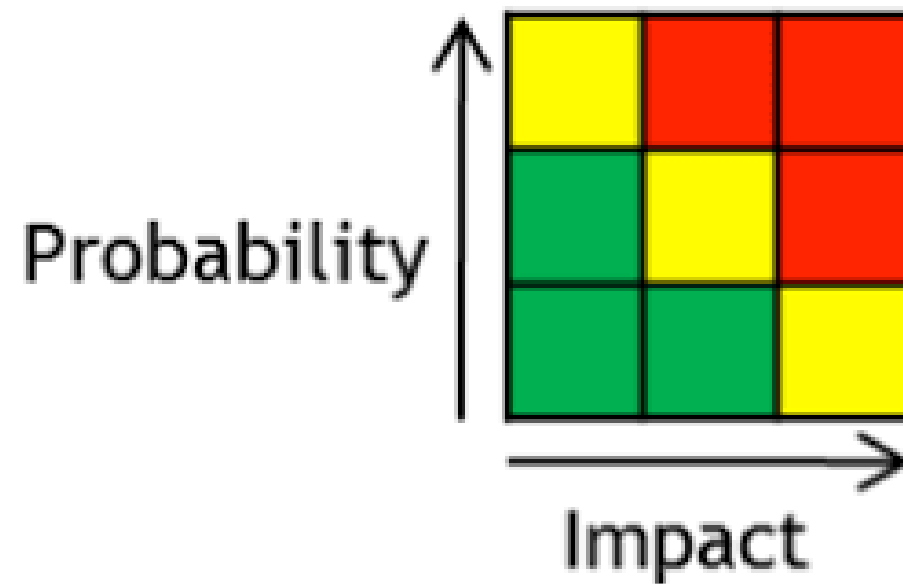
To provide information for data-driven decision making.

State Safety Assurance

Key State Assurance Activities

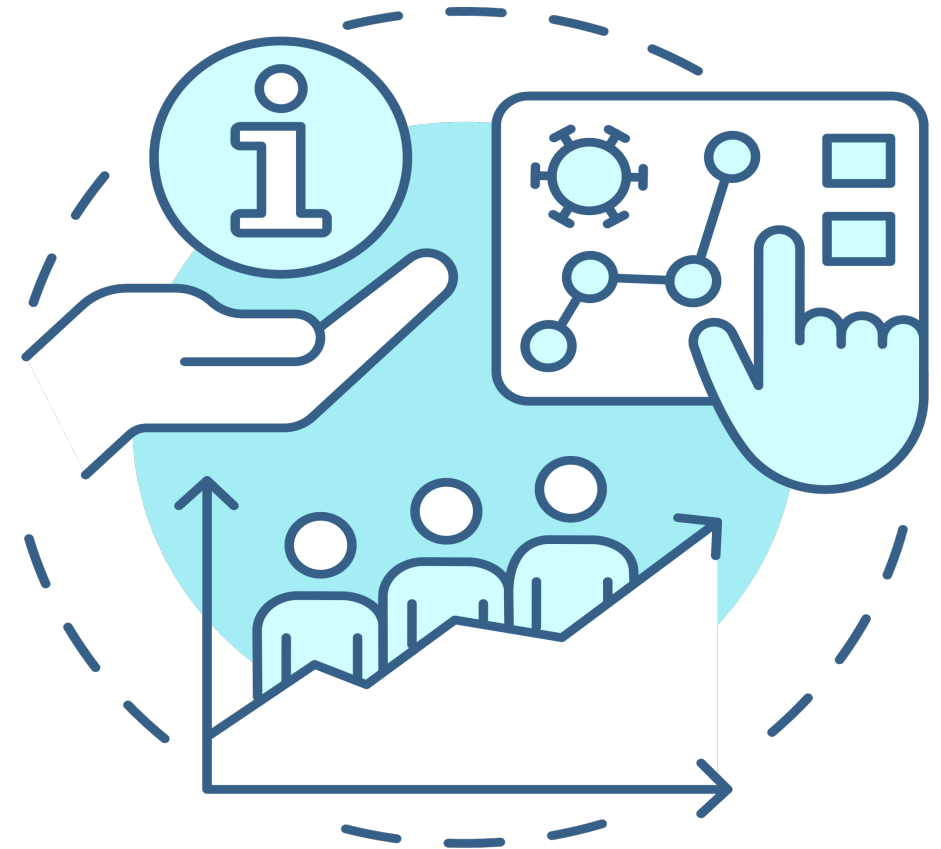
3. Surveillance Obligations

With a risk-based approach to prioritize and allocate resources effectively. To ensure the interaction between the regulator and the suppliers



Surveillance Obligations

- Surveillance prioritization activities
- Service provider's institutional safety risk profiles.
- State Safety Performance.
- Change management from the State's perspective



State Safety Assurance

Benefits of a Risk-Based Approach

1. Prioritization and effective allocation of resources
2. Improve the quality of surveillance.
3. Promotes greater confidence in the system





State Safety Assurance

For the State, an effectively implemented SSP is used as a decision-making tool for safety performance management, which should include:

- Safety performance of its service providers.
- The surveillance capacity of the State
- Establishment of guidelines

State Safety Assurance

States should consider measuring their capabilities to:

- Maintain its safety surveillance system.
- Implement specific safety measures and introduce safety initiatives.
- Adapt existing safety risk controls to ensure that they remain effective.



State Safety Assurance

State Safety Assurance Process

- Establish a process objective;
- Establish a process scope;
- Identify inputs, suppliers, products and customers;
- Establish documentation control;
- Establish indicators for process compliance;



State Safety Assurance

Objective of the process

Manage the measurement of the State's safety performance to assess compliance with the actions determined through the NASP and the performance of service providers.



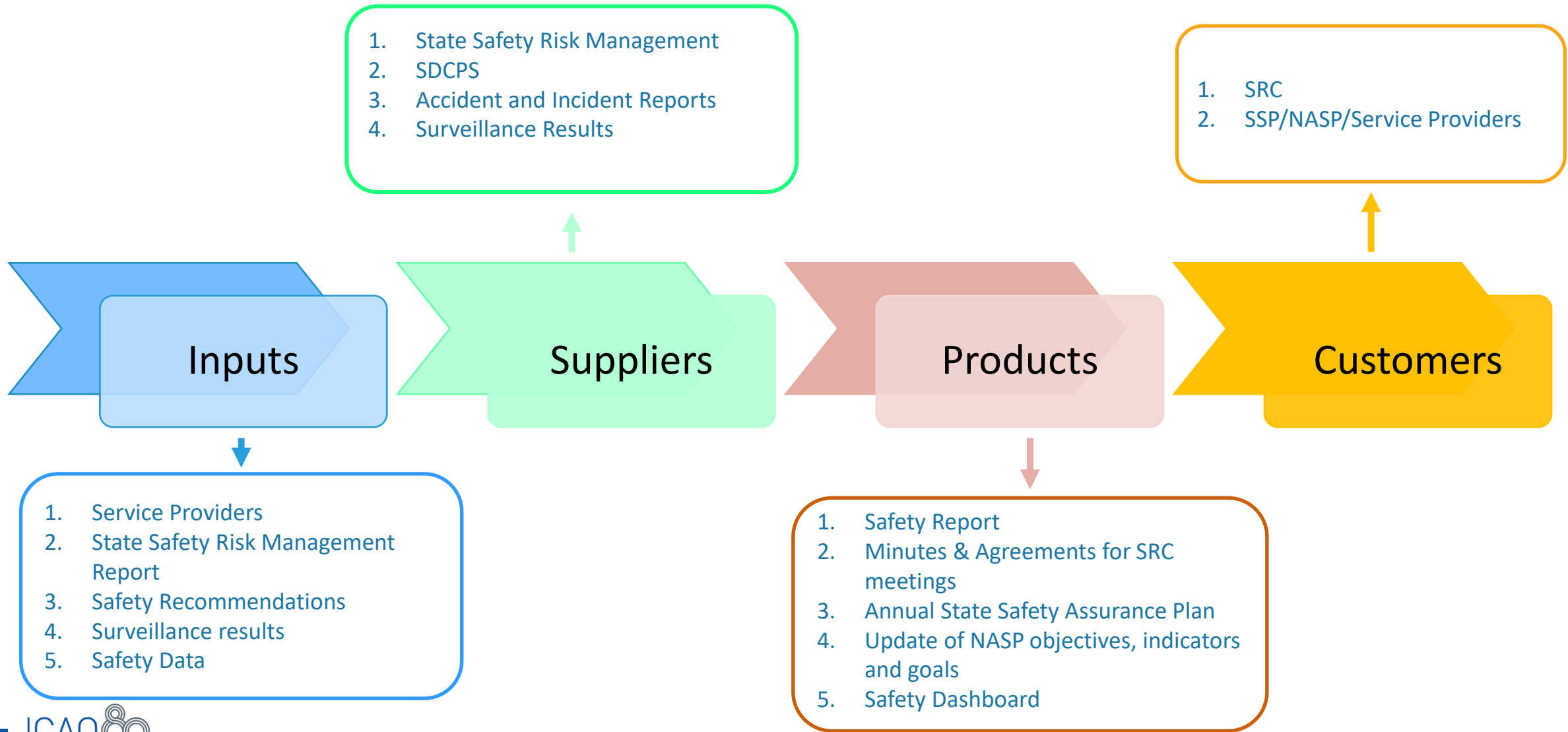
State Safety Assurance Process

Scope of the process

Applies to all SSP and NASP activities.



State Safety Assurance Process



State Safety Assurance Plan

The State Assurance Plan should take into account the following:



Evaluation and update of regulations



Establishment of standards and procedures



Assignment of responsibilities and deadlines for implementing safety measures.



Establishment of a regular follow-up plan to monitor the effectiveness of actions.

The State Assurance Plan should take into account the following:



Periodic review and updating.



Establishment of a program to periodically review and update the safety risk profile.



Adjust the mitigation plan as necessary.

State Safety Assurance Plan

Information and documents to be taken into account for the preparation of the Annual State Safety Assurance Plan:

- Safety statistics
- Results of audits and evaluations
- Safety data analysis
- Information on regulatory changes and improvements
- Stakeholder feedback
- Results of accident and incident investigations
- Performance evaluation of the Safety Management System



State Safety Assurance Plan				
REVIEW	RELATED DOCUMENTS	PERIODICITY OF REVIEW	ESTIMATED DATE OF REVIEW	DATE OF REVIEW
State safety policy and objectives				
SSP Performance				
Service Providers Performance				
Safety Event Reports / Accident and Serious Incident Investigation of the Period				
Changes that may affect the SSP				
Results of State Safety Risk Management				
Compliance with the Annual State Safety Plan				
Follow-up actions to previous reviews				
Recommendations for improvement				

Exercise 3.1

1. Design a Safety process;
2. Establish an Annual State Safety Assurance Plan.

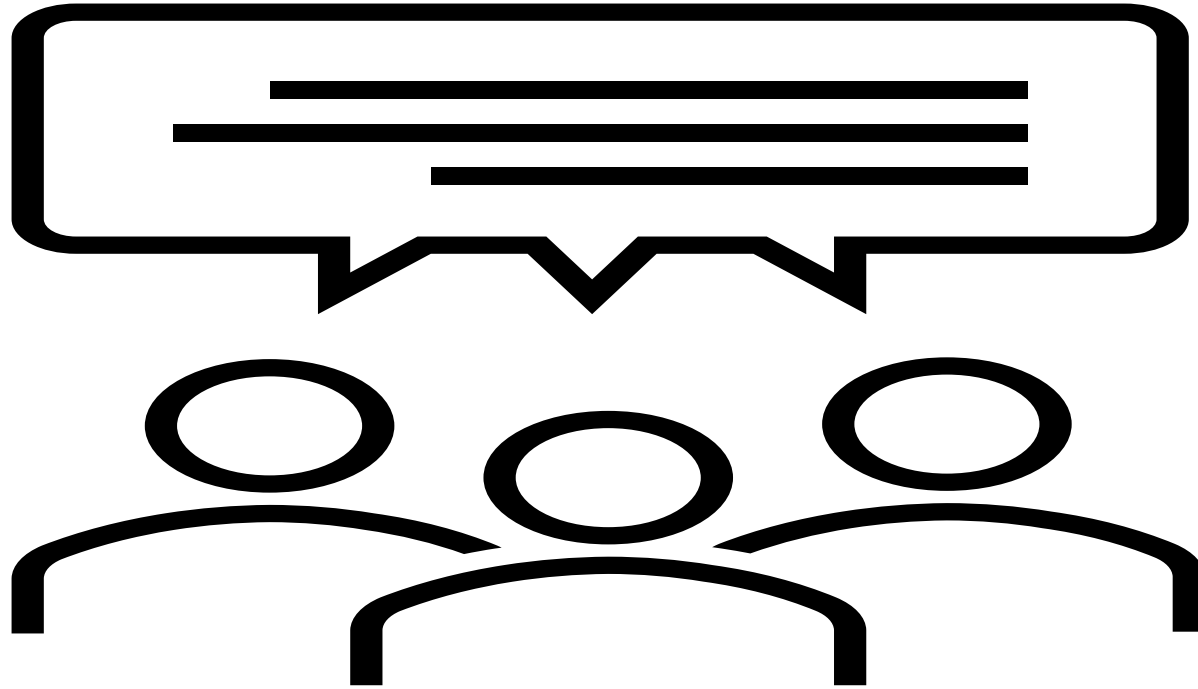
Exercise 3.1

Instructions:

1. The objective of this exercise is to provide an opportunity to practice in the development of a State Safety Assurance Process and Plan.
2. Work teams will be created.
3. Upon completion of the exercise, one member of the group will be appointed to present the answers and conclusions.
4. Each team will have 30 minutes to answer the exercise and 5 minutes for the presentation to the class.

Exercise 3.1

Answers to the Exercise



2

Safety Performance Measurement

General Aspects

States should consider measuring their capabilities to:

- Maintain its safety surveillance system.
- Implement specific safety measures and introduce safety initiatives.
- Adapt existing safety risk controls to ensure that they remain effective.

Safety Performance Measurement

Safety performance management is critical to the operation of SSPs and SMSs. If well implemented, it will provide the organization with the means to determine whether its activities and processes are working effectively to achieve its safety objectives.



Safety Performance Measurement

Safety performance management helps the organization to ask and answer the four most important questions regarding safety management:

- What are the main safety risks of the organization?
- What does the organization want to achieve in terms of safety and what are the main safety risks to be addressed?



Safety Performance Measurement

- How will the organization know that it is making progress toward its safety objectives?
- What safety data and information are needed to make informed safety decisions, including the allocation of organizational resources?



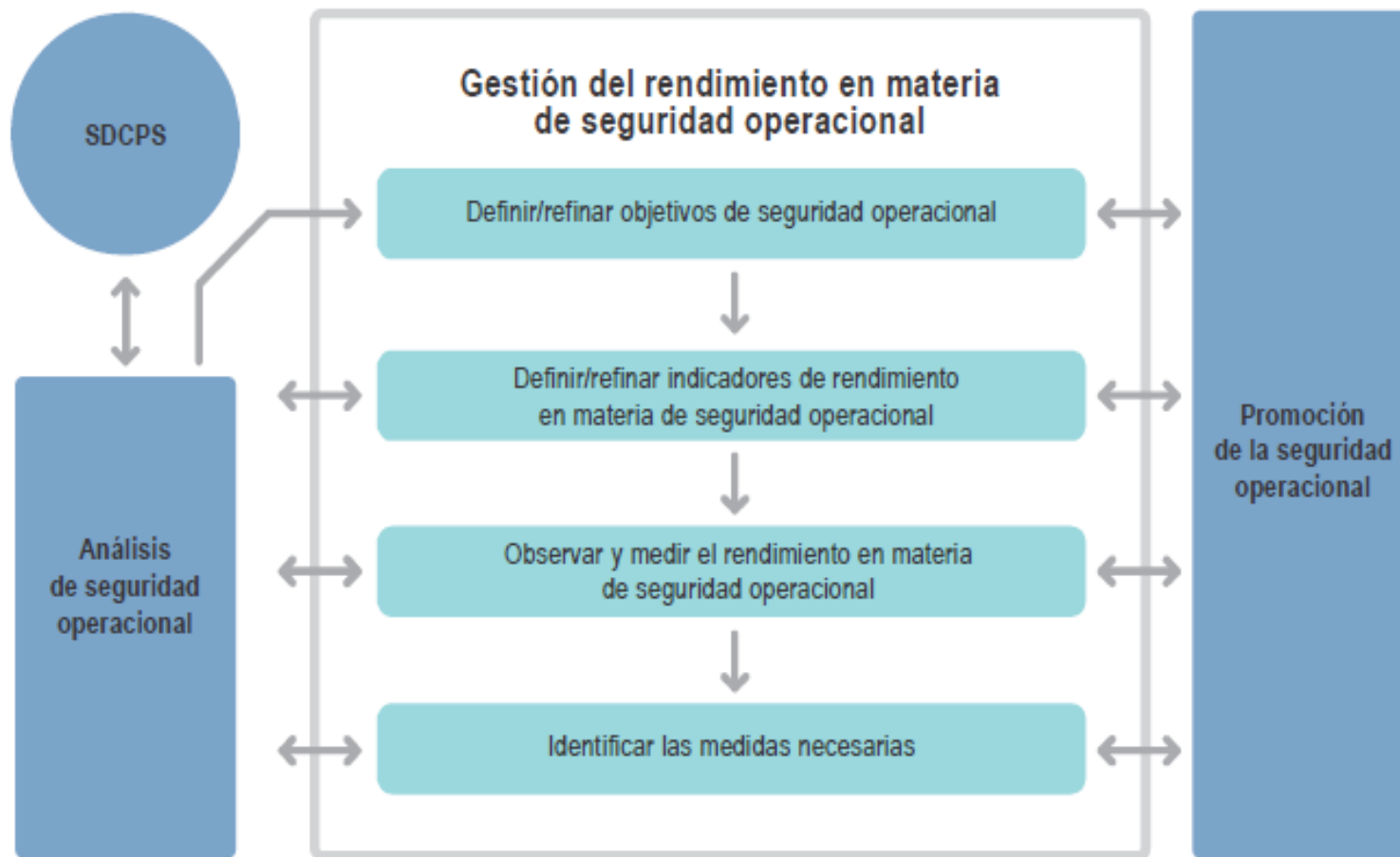
Safety Performance Measurement

Safety Performance Management Process

The safety performance management process can also be applied to the establishment of an acceptable level of safety performance (ALoSP).



Safety Performance Measurement



Safety Objectives

Brief, high-level statements of safety achievements or desired results to be achieved.

Safety objectives provide direction to the organization's activities, and should therefore be consistent with the safety policy that establishes the organization's high-level safety commitment.



Safety Objectives

They must be:

Process-oriented: stated in terms of safe behaviors expected from operational personnel or the performance of measures implemented by the organization to manage safety risks.

Results-oriented: encompasses measures and trends related to accident containment or operational losses.

No
Image



Safety Objectives

The set of safety objectives should enable the organization to demonstrate whether it is maintaining or improving its safety performance.

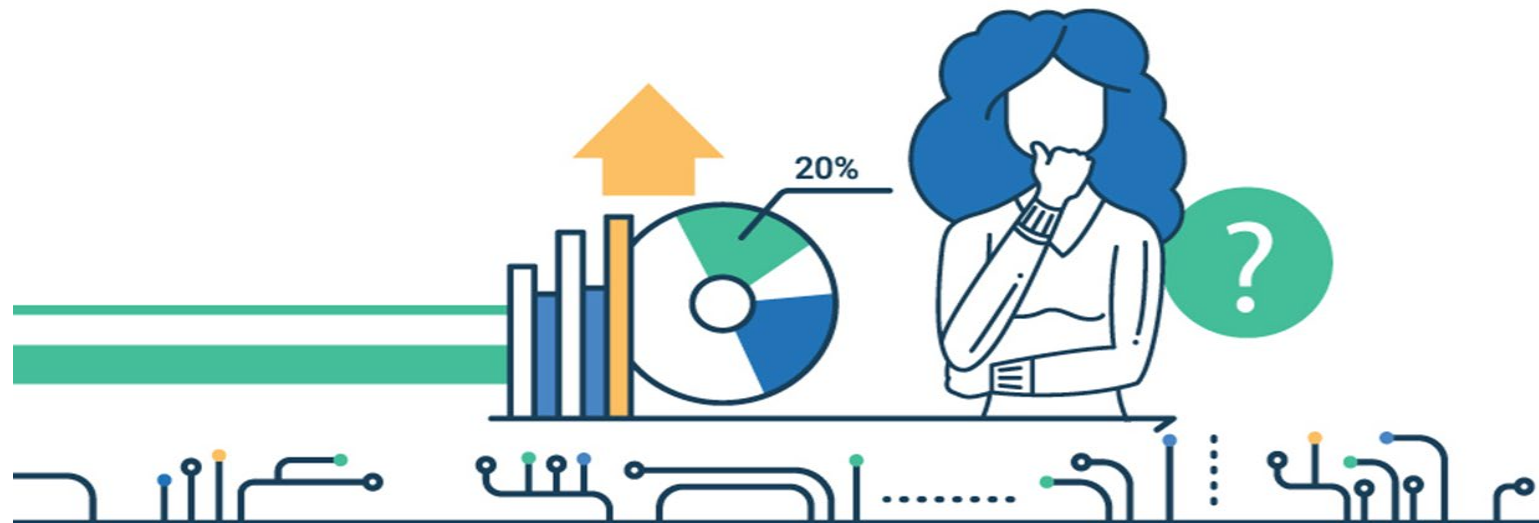


What is an indicator?

An indicator is a measure or metric that indicates/provides information about the state, level, condition or change of something.

Safety Indicators

- Qualitative and quantitative indicators.
- Indicators of past performance (lagging) and leading performance (leading).



Qualitative

Quantitative



VS



Safety Indicators

Qualitative and quantitative indicators

SPIs are used to help management know whether or not the organization is likely to achieve its safety objective; they can be qualitative or quantitative. *Quantitative* indicators refer to measurement by quantity, rather than quality, while *qualitative* indicators are descriptive and measure by quality.

Safety Indicators

- a) The SPI must be:
- b) Related to the safety objective they are intended to indicate;
- c) Selected or developed based on available data and reliable measurements;
- d) Appropriately specific and quantifiable; and
- e) Realistic, taking into account the possibilities and limitations of the organization.



Safety Indicators

		Consequence	
		Low	High
Likelihood	Low	LOW	HIGH
	High	MEDIUM	LIFE THREAT

Outcome SPIs are divided into two types:

a) **Low likelihood/high severity:** outcomes such as accidents or serious incidents. The low frequency of high severity results means that aggregation of data (at the industry segment or regional level) can result in a more meaningful analysis. An example of this type of outcome SPI would be aircraft and engine damage due to bird strikes.

b) **High likelihood/low severity:** results that did not necessarily result in an accident or serious incident. They are also sometimes referred to as indicators of precursor events.

Safety Indicators



- Example of Quantitative Indicators:

- "No. of runway incursions/ No. of operations".
- "Aircraft separation / # of operations".

- Example of Qualitative Indicators:

- "SMS Maturity level".

- Example of Performance and Advanced Indicators

- "Types of accidents by aircraft type" .
- "Specific incident types by region".
- "Number of ramp collisions between number of inter-vehicle movements after ramp markings redesign."
- "Percentage of personnel who have successfully completed safety training on time."
- "The frequency of activities to chase birds away."
- "Number of runway departures / 1000 landings".
- "Number of safety briefings conducted. "

Safety Goals

- Performance targets are specific and achievable objectives that are set to improve the level of safety and meet the requirements of the ALoSP.
- These goals may be related to the reduction of accidents/incidents, compliance with certain safety standards, implementation of improvements in safety management processes, among other aspects.
- Performance targets provide clear guidance on what is expected to be achieved in terms of safety and serve as a benchmark for evaluating the success of actions taken to improve performance.



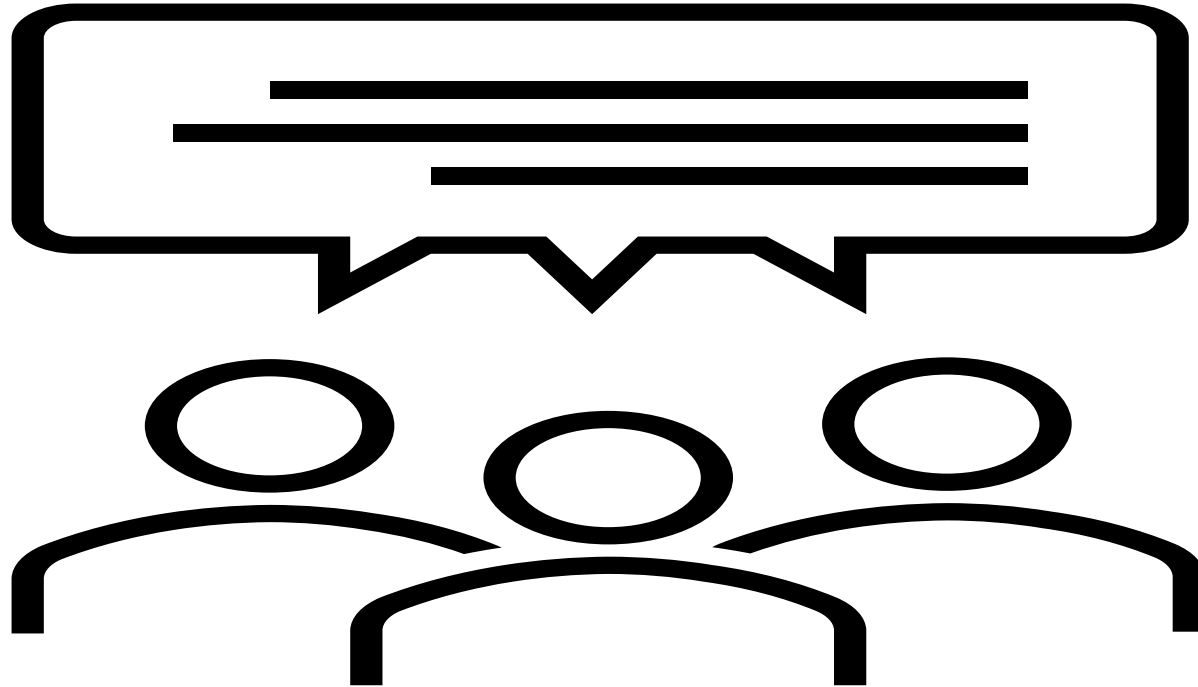
Exercise 3.2

The objective of this exercise is to give trainees the opportunity to practice designing safety objectives, targets and indicators.

- Work teams will be created.
- Two objectives, two goals and four safety indicators will be designed.
- The indicators should be one (1) qualitative and one (1) quantitative.
one (1) lagging and one (1) leading.
- Upon completion of the exercise, one member of the group will be appointed to present the answers and conclusions.
- Each team will have 15 minutes to answer the exercise and 5 minutes for the presentation to the class.

Exercise 3.2

Answers to the Exercise





Surveillance Obligations



The application of a risk-based approach to safety oversight enables the prioritization and allocation of the State's safety management resources in accordance with the risk profile of each sector or service provider.

Surveillance Obligations

Target

- **Ensure compliance with safety regulations:** States must ensure that aviation service providers comply with nationally and internationally established safety regulations and standards.
- **Oversee the Safety Management System (SMS):** States have the responsibility to monitor and evaluate the effectiveness of the SMS implemented by aviation service providers to manage safety risks.
- **Prioritize inspections and audits:** States should establish procedures to prioritize safety-related inspections, audits and surveys, focusing on areas of greatest risk or concern.

Target

- **Evaluate safety performance:** States should periodically review the safety performance of each aviation service provider to identify areas for improvement and take corrective action when necessary.
- **Use information for decision making:** States should base their oversight actions on information obtained through safety performance assessment, organizational risk profiles, and other relevant data.



Service Provider Performance Monitoring

- Periodic review of suppliers' Safety Management Systems (SMS) and (SPT).
- Evaluation of the performance and effectiveness of SMS and SPT.
- Identification of areas for improvement to ensure safety continuous improvement.

Establishment of Acceptable Level of Safety Performance (ALoSP)

- Responsibility of state aeronautical authorities.
- Expressed through sets of Safety Performance Indicators (SPI) for the State, sectors and suppliers.
- ALoSP reflects the agreement between state aviation authorities on the expected level of performance and demonstrates the state's safety management.

Risk Profiles

It is a structured and systematic tool to identify, evaluate and prioritize risks related to operational safety and service providers of the State.

To provide a comprehensive view of risks in civil aviation, in order to improve decision making and effective safety management.



Risk Profiles



- The definition of these risk profiles will serve to develop and manage inspection and continuous surveillance plans for the civil aviation sector in a more efficient way, making better use of available resources.
- In other words, inspection actions may be prioritized on suppliers or areas identified as having a higher risk for safety.

Service Provider's Safety Risk Profiles

Creating safety risk profiles for service providers involves assessing and classifying the risks associated with the providers' activities and operations.

Next, we will see how a safety risk profile for service providers should be structured.

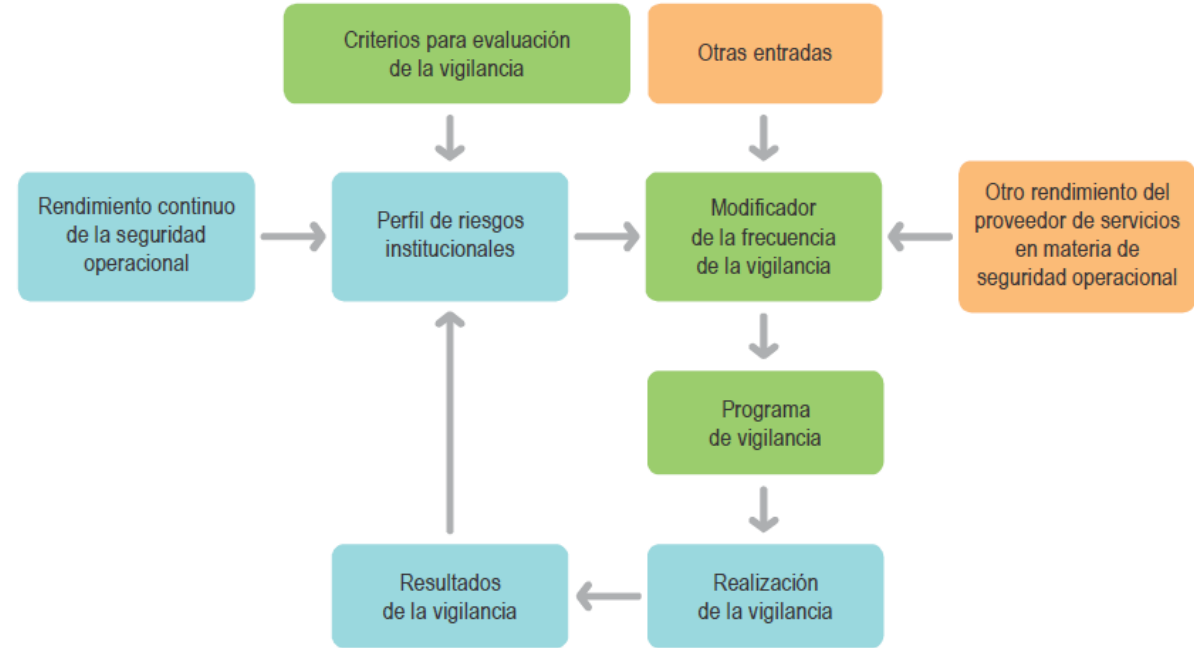


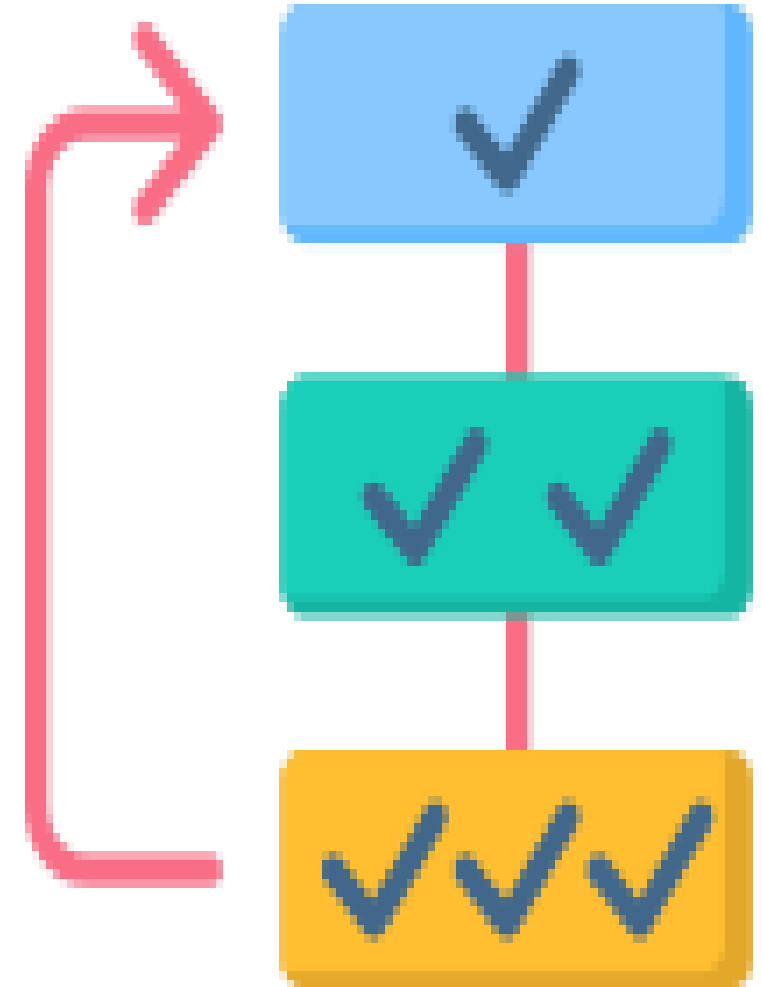
Figura 8-3. Concepto de vigilancia de la seguridad operacional basada en riesgos

Service Provider's Safety Risk Profiles

Its purpose is to support the modification of the scope and frequency of surveillance activities.

Factors considered:

- Financial strength
- Operational experience
- Stability of key personnel
- Competence and performance of those responsible for operational safety
- Results of previous audits.
- Relative activity level.
- Maturity of the hazard identification and risk assessment process.
- Data-driven operational safety performance and performance monitoring.



Service Provider's Safety Risk Profiles

- Risk profiles and performance monitoring are key to effective safety management.
- They reflect the specific operational environment.
- They help to identify and control safety risks.
- They consider conditions that may lead to undesirable outcomes and the means to manage those risks.



Service Provider's Safety Risk Profiles

Elementos de criterios de evaluación	Criterios	Operador A		Operador B		Operador C	
Volumen de Operaciones	< 10,000 = 1						
	10,000 a 35,500 = 2						
	> 35,500 =3						
Número de Aeronaves	< 5 = 1						
	5 a 8= 2						
	> 8 = 3						
Operador internacional	Si = 2						
	No = 1						
Tamaño de flota	< 19 = 1						
	20 a 50 = 2						
	> 50 = 3						
Certificación SMS	Si = 2						
	No = 1						
Número de años en operación	> 10 años = 1						
	5 a 10 = 2						
	5 < = 3						
Salud financiera (últimos 3 años)	Estable= 2						
	No Estable = 1						
Accidentes últimos 5 años	3 = 1						
	3 a 5 = 2						
	> 5 =3						
Valor de puntaje de riesgo:							

Service Provider's Safety Risk Profiles

Table value C1	Exposure Indicator Description Exposure Indicator	Exposure Indicator
≤ 12	Low impact on the aeronautical system / Low exposure to hazards	A
$\geq 13 \leq 23$	Moderate impact on the aeronautical system / Moderate exposure to hazards.	B
≥ 24	High impact on the aeronautical system / High exposure to hazards	C

Examples of criteria for service providers

TRAINING CENTERS

- Number of students in flight training;
- Number of aircraft;
- Number of satellite bases, if applicable;
- Qualifications granted;
- Fleet variety



Puntuación total Tabla 3-6-2	Descripción	Letra
6	Muy bajo impacto en el sistema aeronáutico. Muy baja exposición a los peligros.	A
$\geq 7 \leq 9$	Bajo impacto en el sistema aeronáutico. Baja exposición a los peligros	B
$\geq 10 \leq 12$	Impacto moderado en el sistema aeronáutico. Moderada exposición a los peligros	C
$\geq 13 \leq 15$	Alto impacto en el sistema aeronáutico. Alta exposición a los peligros	D
$\geq 16 \leq 18$	Muy alto impacto en el sistema aeronáutico. Muy alta exposición a los peligros	E



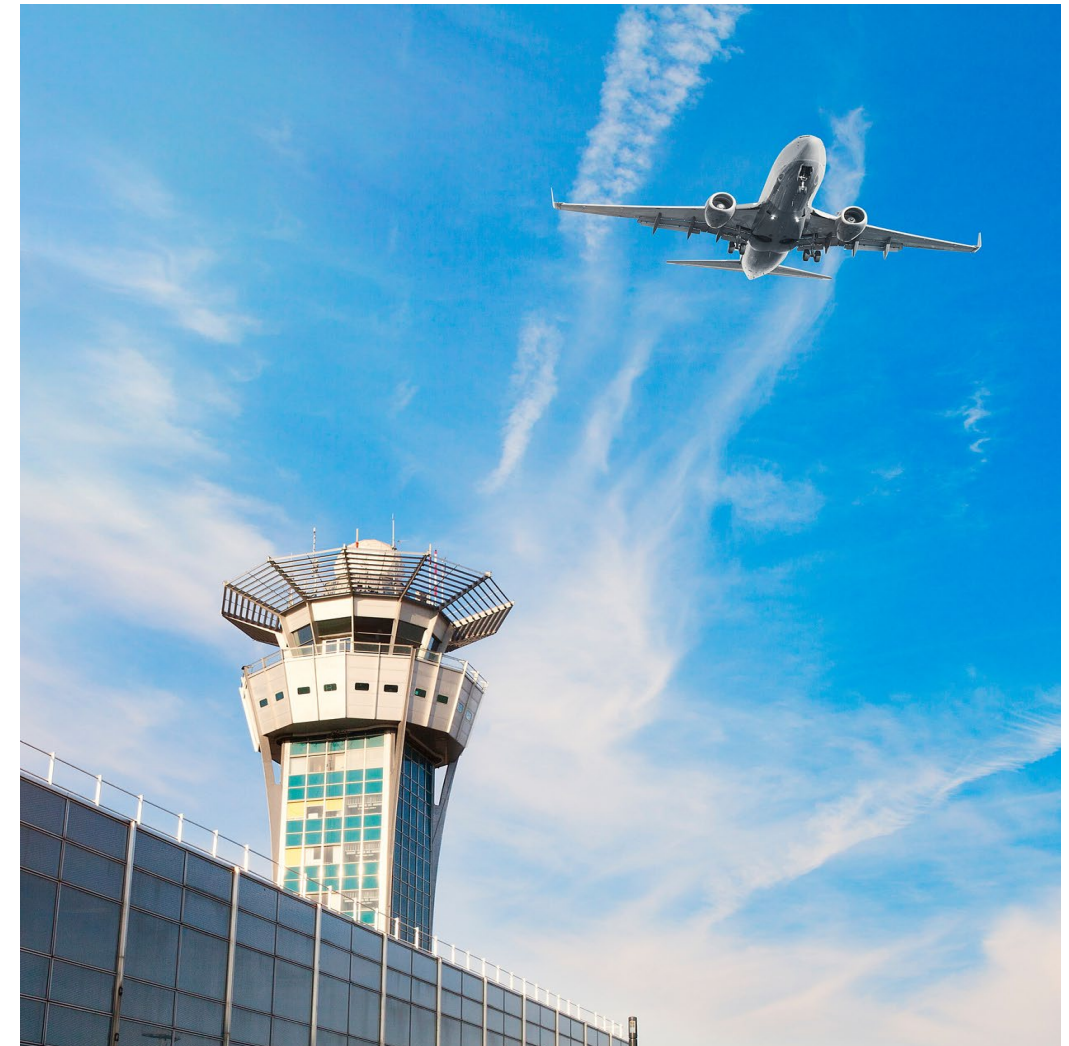
Examples of criteria for service providers **AERODROMES**

- Number of safety events;
- Accidents or serious incidents in the aerodrome;
- Conditions of facilities and equipment

Examples of criteria for service providers

AIR NAVIGATION

- Number of passengers/aircraft processed;
- Type of operation (VFR D, VFR D/N, NP, P);
- Type of aircraft (jet; turboprop; turbofan);
- Typical operating condition (VMC, IMC)



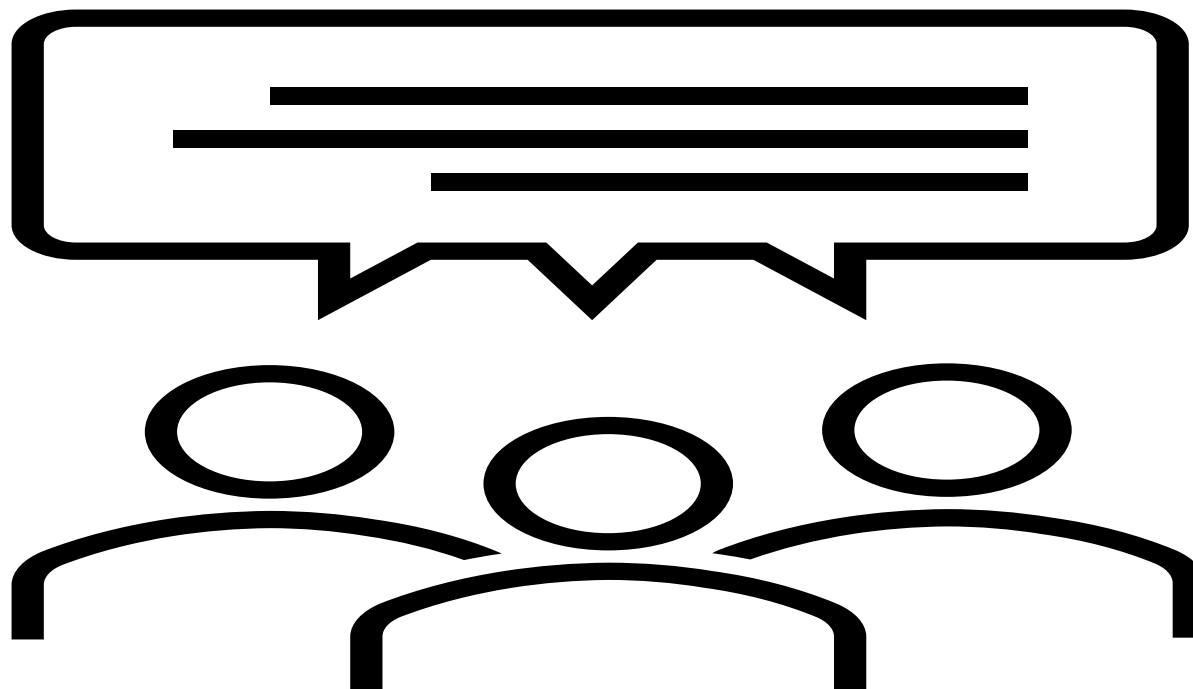
Exercise 3.3

Instructions:

- The objective of this exercise is to provide an opportunity to practice risk profiling.
- Work teams will be created.
- Upon completion of the exercise, one member of the group will be appointed to present the answers and conclusions.
- Each team will have 30 minutes to answer the exercise and 5 minutes for the presentation to the class.

Exercise 3.3

Answers to the Exercise



04

Change
Management

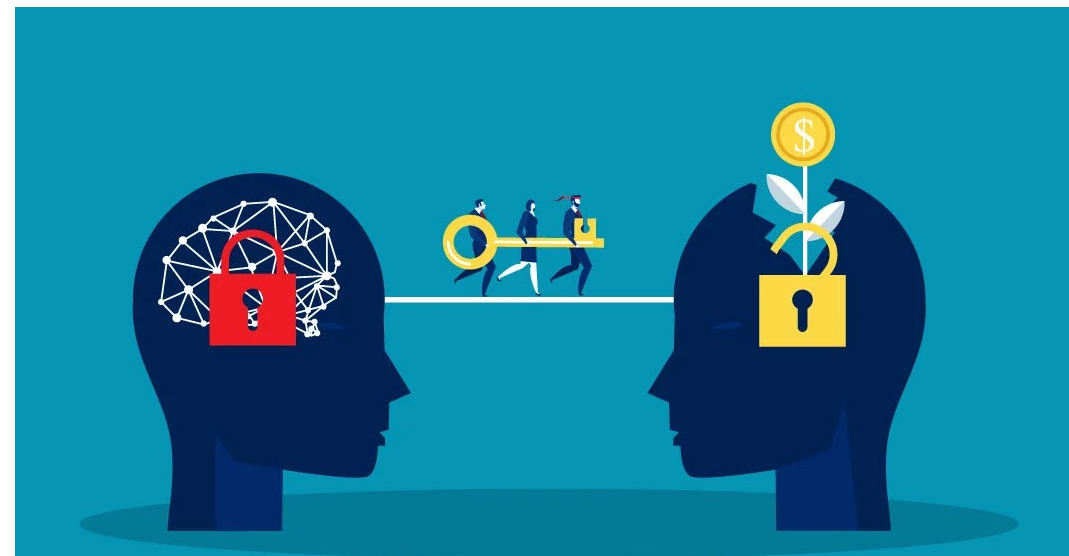
Change Management

Change management within the framework of the State Safety Management Systems (SSP).

- Design the procedure for state change management.
- Implement the change management procedure.

Change Management

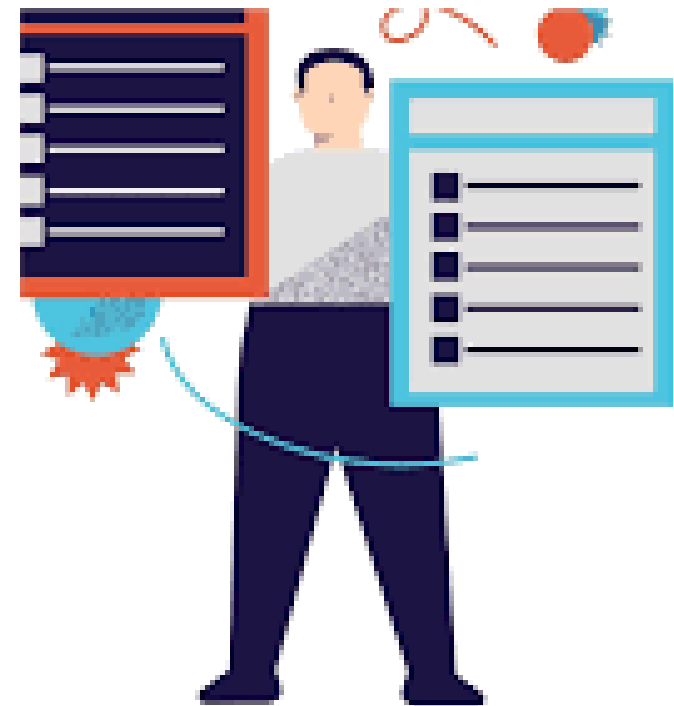
- Development of procedures in the SSP to evaluate the consequences of changes at the state level.
- Proactive identification of safety implications prior to implementation of changes.
- Structured planning and execution of the proposed changes.
- Unmanaged changes in the contemporary aeronautical system and may affect safety.



Change Management

Types of Changes and Significant Consequences

- Institutional Change: Reorganization of authorities, changes in SSP processes.
- Operational Change: Modifications in the use of airspace, introduction of new technologies.
- Significant Consequences: Impact on the State's ability to meet its obligations and on safety management capabilities.



Design of a procedure for state change management in aviation safety:

- ✓ Identification of the change
- ✓ Impact assessment
- ✓ Consultation and collaboration.
- ✓ Development of implementation plans
- ✓ Implementation
- ✓ Control and evaluation
- ✓ Continuous review



Change Management Process



Change Management

Risk Analysis and Evaluation



Before implementing changes, the State must analyze the consequences with respect to the existing system.

Use of Safety Risk Management (SRM) process to analyze, assess and mitigate risks associated with changes.

No operation should be carried out in a modified context until all operational safety risks have been assessed.

Change Management

Before implementing changes, the State must analyze the consequences with respect to the existing system.

Use of Safety Risk Management (SRM) process to analyze, assess and mitigate risks associated with changes.

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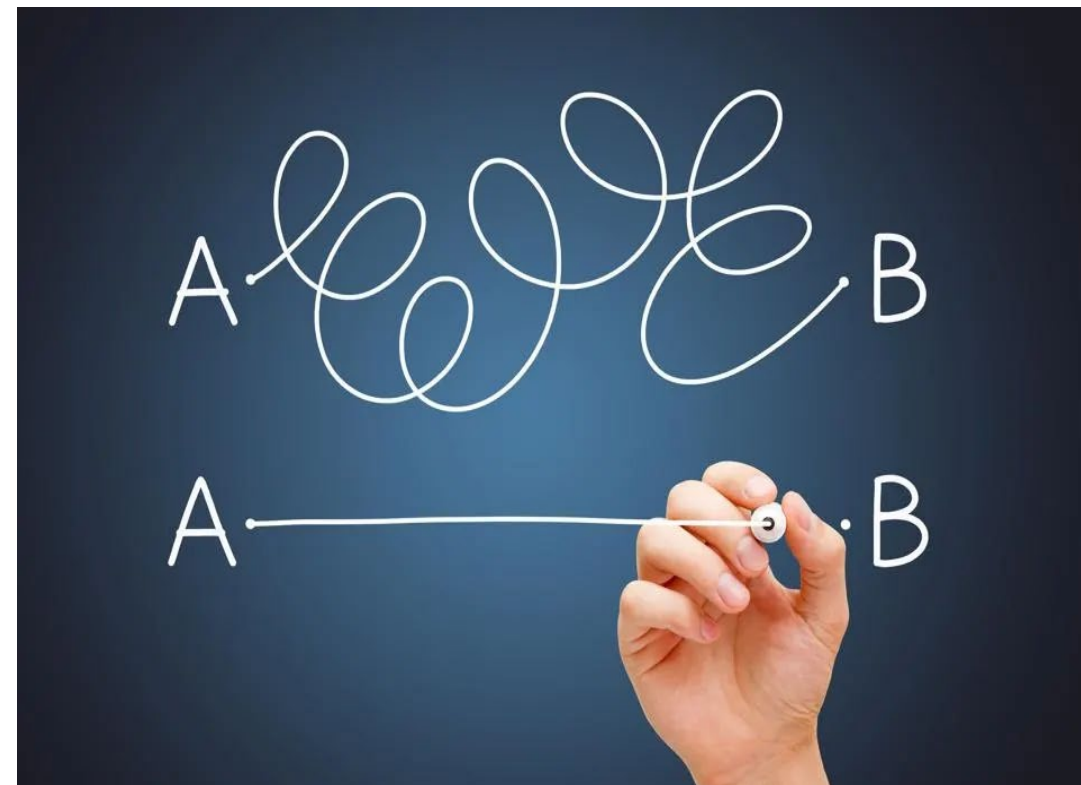
Change Management

- Change management is essential to maintain and improve safety in the aviation system.
- Proactive assessment of the consequences of change and effective communication are critical to successful change management.
- The implementation of structured changes and continuous evaluation are key to ensuring a safe and efficient aviation system.

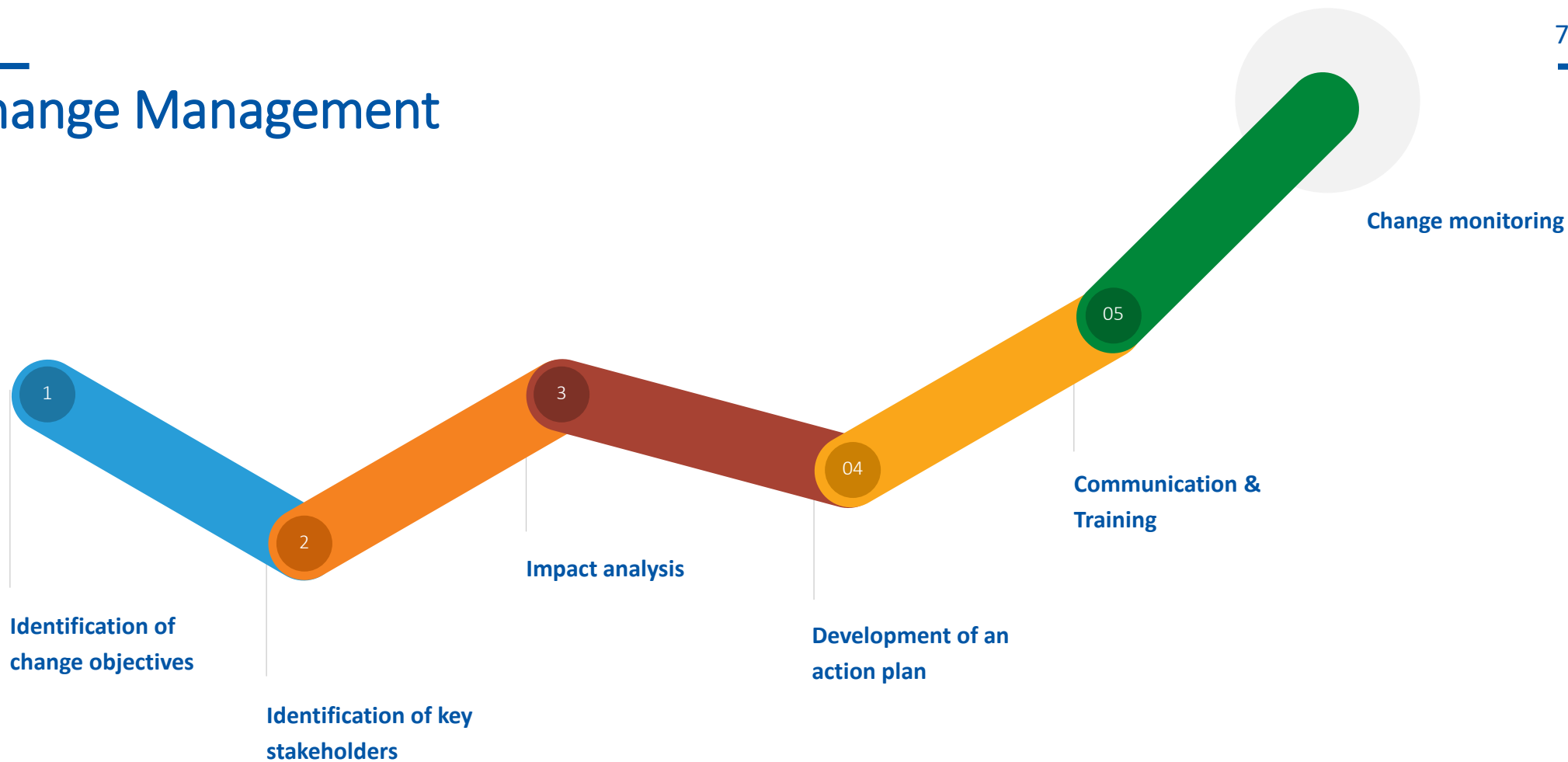
Change Management

Communication and Change Awareness

- Effective communication of change is fundamental to change management.
- Everyone involved, both within the State and the service providers, must be aware of the change, its timing and its consequences.
- This ensures a smooth transition and adequate response to changes in the aircraft system.



Change Management



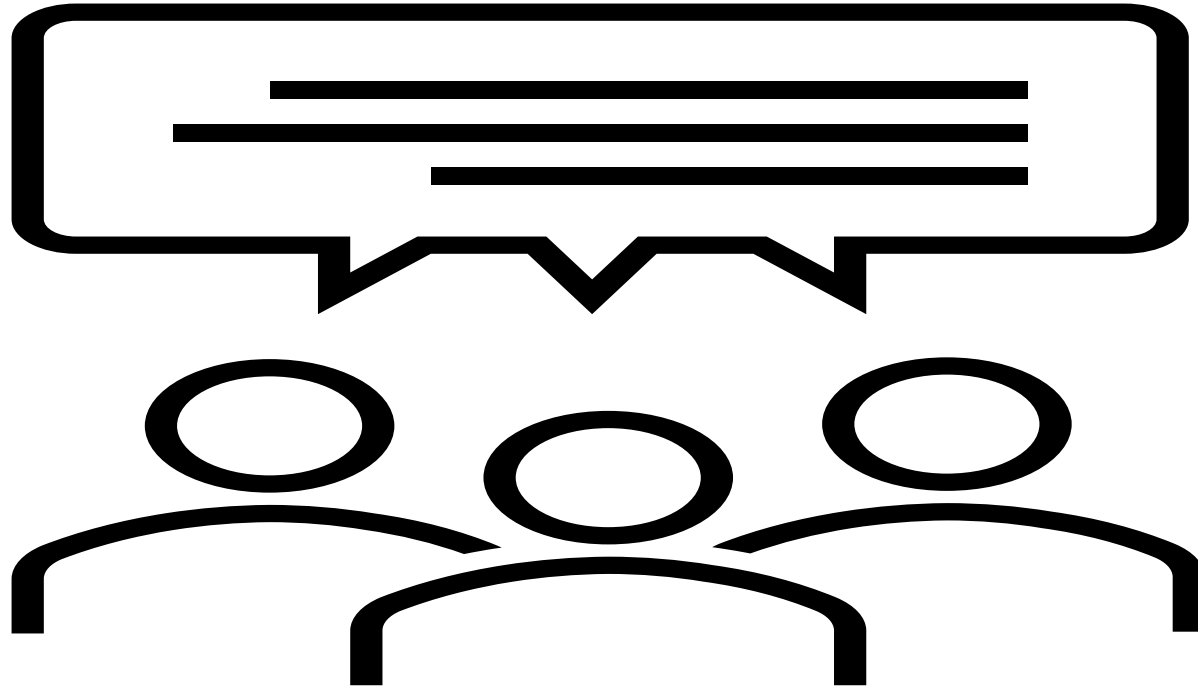
Exercise 3.4

Instructions:

- ❑ The objective of this exercise is to provide practice in change management for decision making and system improvement.
- ❑ Work teams will be created.
- ❑ Upon completion of the exercise, nominate a group member to present the group's responses and conclusions for discussion.
- ❑ Each team will have 30 minutes to answer the exercise and 5 minutes for the presentation to the group.

Exercise 3.4

Answers to the Exercise





Thank You!