Agencia Estatal
de Seguridad Aérea

# Methodology of Safety Assessment for Aerodromes

*Courtesy Translation*

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# Index

# 1. INTRODUCTION

The Annual Oversight Plan of the Spanish Aviation Safety and Security Agency (hereinafter referred to as AESA) establishes the regulatory control and oversight activities on civil aviation matters in order to ensure compliance with the regulations in air transport. This Plan shall take into account the priorities established by the Safety Committees of Commercial Air Transport, Aerial Works and General Aviation, Airports and Air Navigation.

The Safety Committees are high-level meetings chaired by the Director of the Agency, in which senior management and experts from AESA oversight units involved in operational and economic oversight are represented. The Committees, based on the information available from the safety assessment carried out through these methodologies, analyse and decide on the adoption of measures related to prevention and oversight in their field. They will meet on a scheduled basis at least three times a year.

This document describes the Methodology of Safety Assessment for Airports, as a result of the application of the preventive approach[1] in the field of Airports, throughout three different categories of safety: strategic, operational and alert.

The methodology shall be used to prioritize oversight actions, adding actions to the Oversight Plan whether is necessary, and reallocate resources. Additionally, it shall ease the identification of areas subjected to monitor, providing useful information to the inspectors.

The results from this methodology will be analysed and assessed within the Airports Safety Committee (CSA).

[1] The preventive approach complements the traditional approach, based primarily on compliance and oversight. This new approach is based on performance, risk management and safety assurance, and is process-oriented rather than just outcome-oriented.

## 2. OBJETIVES AND SCOPE

The objectives of this methodology are as follows:

- Establishing numerical indicators to determine and measure safety-related parameters, values and evolutions, based on the oversight results of Airports as well as on events and occurrences that occurred during their activities.
- Obtaining a periodic image of the operational safety level of each aerodrome operator.
- Monitoring the evolution of safety-related parameters.
- Determining the sector's safety trend.
- Identifying the domains and the aerodrome operators where, an appropriate approach of the oversight activity, could promote an improvement in safety.
- Adjusting and focussing the Annual Oversight Plan of AESA to the results of this analysis.
- Presenting the results of the analysis in a graphical, simple and intuitive way.

This methodology shall apply to Airports that comply with:

- Commission Regulation (EU) No 139/2014 of 12 February 2014 laying down requirements and administrative procedures related to Airports.
- Royal Decree 862/2009 of 14 May 2009 laying down requirements for aerodrome design and operations (Spanish regulation).

# 3. AIRPORTS GROUPS

Airports shall be grouped attending to different parameters that define in any way their complexity (volume of operations and passengers, oversight frequency), so as they are comparable among them.

To reach the maximum homogeneity in each group and the greatest difference between groups, a Cluster Analysis and a qualitative analysis have been used.

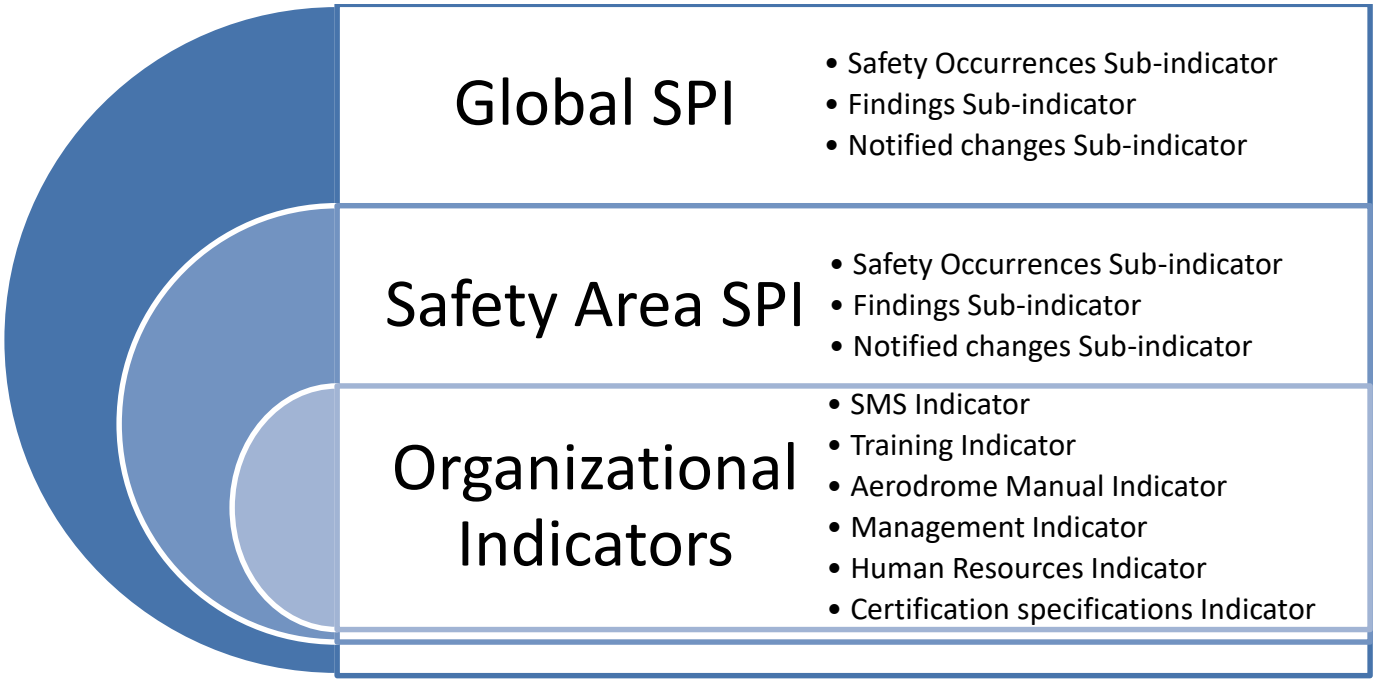
## 4. INDICATORS CATEGORIES

Three Safety Performance Indicators (SPI) categories have been defined to establish priority level of an aerodrome:

**Category 1: Global SPI** shall establish the global level of priority of an aerodrome.

**Category 2: Safety Area SPI** shall establish the level of priority for an aerodrome and a specific Safety Area.

**Category 3: Organizational indicators** provide information of an aerodrome operator management and operational features.




It is important to acknowledge that the methodology is in continuous review and evolution. Therefore, indicators or their contribution to the SPI may be modified.

# 5. SAFETY AREAS AND ORGANIZATIONAL ISSUES

Safety issues closely related to events reported during operations and domains that may cause potential danger in Airports are grouped in Safety Areas and Organizational Issues.

## 5.1 SAFETY AREAS

Safety Areas[2] (ASO) identify the main areas of focus in Spanish Airports according to safety Issues. These Safety Areas are:

- Runway Safety
- Powerplant and Visual Aids
- Adverse Meteorological Conditions
- Wildlife
- Apron Management
- Aerodrome obstacles and RPAs

## 5.2 ORGANIZATIONAL ISSUES

Organizational Issues provide determined operational, organizational, management and commitment of the current Airports Regulation providing an overview of the aerodrome:

- Safety Management System
- Training and competence
- Aerodrome Manual
- Management
- Human Resources
- Certification specifications

[2] ASO identified in this document do not necessarily correspond to the Key Risk Areas described in the current Spanish Safety Action Plan.

# 6. INDICATORS DEFINITION

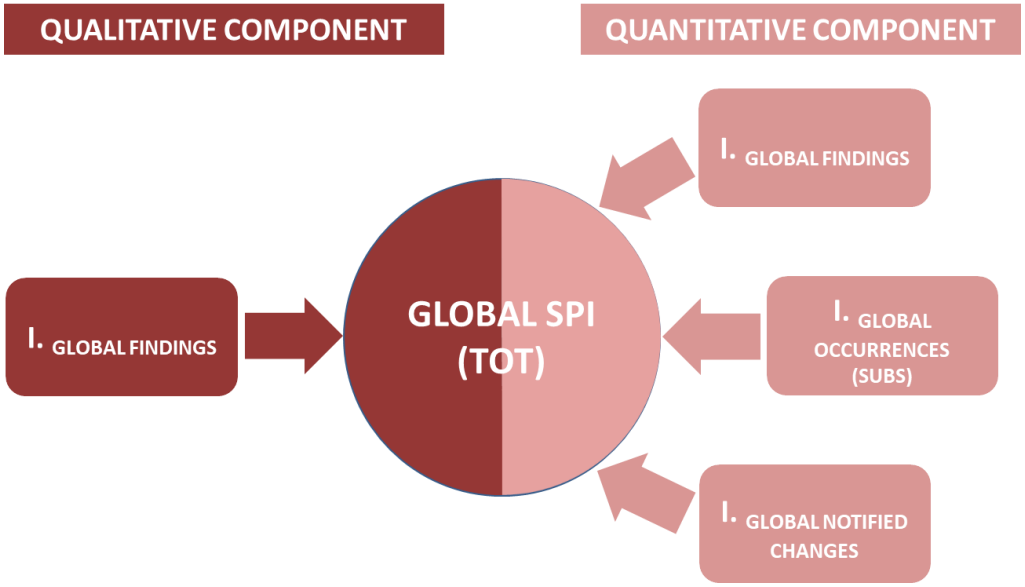
## 6.1 GLOBAL SPI

Safety Performance Indicators are described in this section. They have been established to, among other objectives, perform planning activities of regulatory control to aerodrome operators.

### GLOBAL SPI (TOT)

**Objective**

The Global SPI shall allow assessing the global safety level for each aerodrome. It combines qualitative and quantitative sub-indicators, weighing them according to the weigh assigned to any of them.




**Components**

| Qualitative $i_{iQL}\|_{ap}^{TOTAL}$ | Quantitative $i_{iQN}\|_{ap}^{TOTAL}$ |
|---|---|
| - Global Findings Sub-Indicator , $i_{inspQL}\|_{ap}^{TOT}$ | - Global Findings Sub-Indicator; $i_{inspQN}\|_{ap}^{TOT}$<br>- Global Occurrences Sub-Indicator; $i_{sucQN}\|_{ap}^{TOT}$<br>- Global Notified Changes Sub-Indicator ; $i_{gcQN}\|_{ap}^{TOT}$ |

| Value Range | Temporality | Domain |
|---|---|---|
| 0-5 | **Frequency of calculation:** 3 times per year (according to CSA).<br>**Data selection timeframe:** 4 years. | Airports |

**Formula**

$$i_{s.o}|_{ap}^{TOT} = \sum_{iQN} P_{iQN} \cdot i_{iQN}|_{ap}^{TOT} + \sum_{iQL} P_{iQL} \cdot i_{iQL}|_{ap}^{TOT}$$

- Where $P_i$ is the weighed coefficient applied to each indicator $i_i$.

| $i_i$ | $i_{inspQN}\|_{ap}^{TOT}$ | $i_{sucQN}\|_{ap}^{TOT}$ | $i_{inspQL}\|_{ap}^{TOT}$ | $i_{GCQN}\|_{ap}^{TOT}$ |
|---|---|---|---|---|
| $P_i$ | 40% | 40% | 20% | 0% |

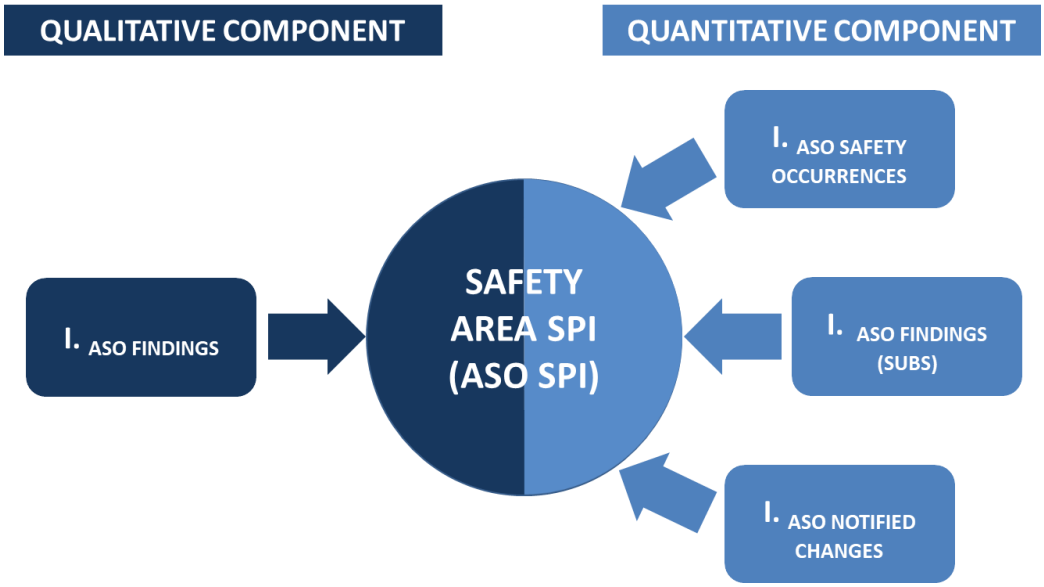
## 6.2 SAFETY AREA SPI (ASO SPI)

### SAFETY AREA SPI (ASO SPI)

#### Objective

ASO SPI shall allow assessing the safety level according to a particular aerodrome in a specific Safety Area.

It combines qualitative and quantitative sub-indicators, weighing them based on the weigh assigned to any of them.




#### Components

| Qualitative $i_{iQL}\|_{ap}^{ASO}$ | Quantitative $i_{iQN}\|_{ap}^{ASO}$ |
|---|---|
| - ASO Findings Sub-Indicator , $i_{inspQL}\|_{ap}^{ASO}$ | - ASO Findings Sub-Indicator; $i_{inspQN}\|_{ap}^{ASO}$<br>- ASO Safety Occurrences Sub-Indicator; $i_{sucQN}\|_{ap}^{ASO}$<br>- ASO Notified Changes Sub-Indicator ; $i_{gcQN}\|_{ap}^{ASO}$ |

| Value Range | Temporality | Domain |
|---|---|---|
| 0-5 | **Frequency of calculation:** 3 times per year (according to CSA).<br>**Data selection timeframe:** 4 years. | Airports |

#### Formula

$$i\ |_{ap}^{ASO} = \sum_{iQN} P_{iQN} \cdot i_{iQN}|_{ap}^{ASO} + \sum_{iQL} P_{iQL} \cdot i_{iQL}|_{ap}^{ASO}$$

*Where* $P_i$ is the weighed coefficient applied to each indicator $i_i$.

| $i_i$ | $i_{inspQN}\|_{ap}^{ASO}$ | $i_{sucQN}\|_{ap}^{ASO}$ | $i_{inspQL}\|_{ap}^{ASO}$ | $i_{GCQN}\|_{ap}^{ASO}$ |
|---|---|---|---|---|
| $P_i$ | 40% | 40% | 20% | 0% |

## 6.3 ORGANIZATIONAL INDICATORS (ORGANIZATIONAL MAP)

### ORGANIZATIONAL INDICATORS (ORGANIZATIONAL MAP)

#### Objetive

Organizational Issues indicators provide information of management and organization of the aerodrome operator.
Indicators obtained for each Organizational Issue shall allow to assess compliance level assigned to the Organizational Area.

| Requirement | Sub-indicator |
|---|---|
| **Manual (MA)** | $i_{MA}$ |
| **Technical Specifications (CS)** | $i_{CS}$ |
| **SMS** | $i_{SMS}$ |
| **Training and Competence (FOR)** | $i_{FOR}$ |
| **Management (ORG)** | $i_{ORG}$ |
| **Resources (REC)** | $i_{REC} = i_{RRHH} + i_{FIN}$ |

#### Data Information sources

- Oversight Activities performed by AESA

#### Components

| Qualitative | Quantitative |
|---|---|
| **Management (ORG)** | |
| - ASO Findings Sub-Indicator, according to the assessment questionnaire associated to ORG $\boldsymbol{i_{inspQL}\vert_{ap}^{ORG}}$<br>- ASO –Findings Correction Sub-Indicator, $\boldsymbol{i_{subQL}\vert_{ap}^{ORG}}$<br>- ASO Notified Changes Sub-Indicator ; $\boldsymbol{i_{gcQL}\vert_{ap}^{ORG}}$ | - ASO Findings Sub-Indicator; according to the ORG inspection actions: $\boldsymbol{i_{inspQN}\vert_{ap}^{ORG}}$ |
| **Resources (REC)** | |
| - ASO Findings Sub-Indicator (HR): $\boldsymbol{i_{inspQL}\vert_{ap}^{HR}}$<br>- ASO Findings Sub-Indicator (FIN): $\boldsymbol{i_{inspQL}\vert_{ap}^{FIN}}$ | - ASO Findings Sub-Indicator (HR): $\boldsymbol{i_{inspQN}\vert_{ap}^{HR}}$<br>- ASO Findings Sub-Indicator (FIN): $\boldsymbol{i_{inspQN}\vert_{ap}^{FIN}}$ |
| Rest of Organizational Indicators | |
| - ASO Findings Sub-Indicator, according to the assessment questionnaire:<br>o Associated to MA $\boldsymbol{i_{inspQL}\vert_{ap}^{MA}}$<br>o Associated to CS $\boldsymbol{i_{inspQL}\vert_{ap}^{CS}}$<br>o Associated to SMS $\boldsymbol{i_{inspQL}\vert_{ap}^{SMS}}$ | - ASO Findings Sub-Indicator; according to the inspection actions:<br>o Associated to MA $\boldsymbol{i_{inspQN}\vert_{ap}^{MA}}$<br>o Associated to CS $\boldsymbol{i_{inspQN}\vert_{ap}^{CS}}$<br>o Associated to SMS $\boldsymbol{i_{inspQN}\vert_{ap}^{SMS}}$ |

#### Calculation

**Considered Hypothesis:**

- Each oversight task (AI) shall be assigned to one or several Organizational Areas.
- Each Finding shall be assigned to an Organizational Area and also it is assigned to an oversight task.
- Findings shall be take into account for each aerodrome and oversight task.

| Value Range | Temporality | Domain |
|---|---|---|
| 0-5 | **Frequency of calculation:** 3 times per year (according to CSA).<br>**Data selection timeframe:** 4 years | Airports |

#### Formula

$$\mathrm{i}_{FUN}\vert_{ap} = \sum_{iQN} P_{iQN} \cdot i_{iQN}\vert_{ap}^{FUN} + \sum_{iQL} P_{iQL} \cdot i_{iQL}\vert_{ap}^{FUN}$$

- FUN: Organizational area.
- ap: aerodrome
- Qualitative indicator $i_{QL}$ ; Qualitative coefficient; $P_{QL}$
- Quantitative indicator $i_{QN}$ Quantitative coefficient; $P_{QN}$

| $\mathbf{i}_{FUN}$ | $i_{MA}$ | $i_{CS}$ | $i_{SMS}$ | $i_{FOR}$ | $i_{ORG}$ | $i_{REC}$ | $i_{MA}$ |
|---|---|---|---|---|---|---|---|
| $\boldsymbol{P_{QN}}$ | 80% | 80% | 80% | 80% | 100% | 80% | 80% |
| $\boldsymbol{P_{QL}}$ | 20% | 20% | 20% | 20% | 0% | 20% | 20% |

# 7. SUB-INDICATORS DEFINITION

In this section, the following sub-indicators, which complement the precedent SPI, are described:

- Safety Occurrence Sub-indicator.
- Findings Sub-indicator, including Coefficient of Finding Correction.
- Changes Notified Sub-indicator.

## 7.1 SAFETY OCCURRENCES SUB-INDICATOR

### SAFETY OCCURRENCES SUB-INDICATOR

#### Objective

The objective of this indicator is to identify the Airports on which a higher number of occurrences have happened, those of higher severity, those which that happened repeatedly or those that which have recently happened.

| CATEGORY | SAFETY AREA |
|---|---|
| **CE & AAVV - Power Systems**<br>**CE & AAVV - AD Lights**<br>**CE & AAVV - AD Signs**<br>**CE & AAVV - ATC Support Systems** | Powerplant & visual aids |
| **birdstrike -Bird Ingestion**<br>**Cuasi-collision**<br>**Wildlife presence** | Wildlife |
| **Obstacles**<br>**RPAs** | Obstacles & RPAs |

| CATEGORY | SAFETY AREA |
|---|---|
| **CMA & LVP** | Adverse Meteorological Conditions |
| **Runway Incursion**<br>**Runway Excursion** | Runway safety |
| **Ground Conflicts - Apron**<br>**Incursions - Apron**<br>**Excursions - Apron**<br>**Handling Procedures**<br>**Jetblast** | Apron Management |

#### Data information sources

- Occurrence Reporting System (ORS - ECCAIRS 5.0)
- Operations: ESTOP

#### Components

- Quantitative component.

#### Calculation

**Considered Hypothesis:**

- Each occurrence shall be assigned to a Safety Area.
- Global Ocurrences Indicator $i_{suc,ap}^{TOT}$, takes into account occurrence happened in the aerodrome.
- ASO Safety Occurrence Indicator $i_{suc,ap}^{ASO}$; takes into account occurrence happened within the Safety Area.
- Coefficient of time and coefficient of severity are established.

**Coefficient of time: $C_t$**

A coefficient of time (Ct) for each occurrence shall be established and calculated based on the date that it happened. The more recent the occurrence is, the higher the coefficient is It will be obtained from the following formula:

$$C_t = \frac{(Tt - 4)^2}{3{,}2}$$

- Most recent occurrences have more importance.
- Where $T_t$ is the "time passed from the detection of the deficiency, expressed in years".

**Coefficient of severity: $C_{sev}$**

A coefficient of severity will be assigned to each occurrence based on its severity according to the following chart:

- Highlight airports with a growing volume of incidents.
- Highlight airports with the most severe severities.
- The adjustment of the severity coefficients: avoid excessively destabilizing airports that have had events with high severities but their total volume of events is low.

| SEVERITY | | $C_{sev}$ |
|---|---|---|
| S1+ | Accident with fatalities | 10 |
| S1 | Accident | 5 |
| S2 | Serious incident | 4 |
| S3 | Major incident | 1 |
| S4 | Significant incident | 0,1 |
| S5 | Occurrence without safety effect | 0.05 |
| -- | Not determined | 0 |

| Value Range | Temporality | Domain |
|---|---|---|
| 0-5 | **Frequency of calculation:** 3 times per year (according to CSA).<br>**Data selection timeframe:** 4 years | Airports |

#### Formula

$$i_{suc,ap} = \frac{\sum C_{sev} \cdot C_t}{Operations\ volume}$$

Being:

- Operations volume: number of actual operations performed during the assessment period.

## 7.2 FINDINGS SUB-INDICATOR

### FINDINGS SUB-INDICATOR

#### Objective

- **Quantitative component** identifies those airports with a greater number of findings detected. It takes into account the time passed since the activity and the severity of the finding.
- **Qualitative component** measures the inspectors' perception of the aerodrome in relation to the oversight performed.

#### Data Information sources

- Oversight Activities performed by AESA

#### Components

- Quantitative component.
- Qualitative component.

#### Calculation

| Considered QUANTITATIVE Hypothesis | Considered QUALITATIVE Hypothesis |
|---|---|
| - It shall be a component of $\boldsymbol{i_{s.o}\vert_{ap}^{TOT}}$,if every oversight activity carried out in the aerodrome is taken into account.<br>- Oversight tasks (AI) shall be assigned to risks areas, ideally to only one.<br>- Oversight tasks belonged to one category shall be assigned to the same risk area (AR).<br>- GLOBAL SPI shall take into account every Finding happened in an aerodrome. | - It shall be a component of $\boldsymbol{i_{s.o}\vert_{ap}^{ASO}}$, if oversight activity assigned to a Safety Area is taken into account.<br>- Each inspector shall assess separately each Safety Area assigned to an oversight task actually performed in a specific oversight activity.<br>- There are 4 options to assess: good, fair, poor and very poor.<br>GLOBAL SPI shall take into account every finding. |

| Value Range | Temporality | Domain |
|---|---|---|
| 0-5 | **Frequency of calculation:** 3 times per year (according to CSA). | Airports |
| | **Data selection timeframe:** 4 years | |

#### Formula

**QUANTITATIVE**

Findings indicator represents the relationship between the number of Findings (global or assigned to a Safety Area) that have been detected in any aerodrome during the assessment period, weighted according to the severity and the number of oversight activity

$$\mathrm{i}_{QN}\vert_{ap}^{ASO-TOT} = \frac{2}{3}\cdot \mathrm{C}_{\mathrm{Sub}}\vert_{ASO-TOT}\cdot \mathrm{i}_{Q}\vert_{ap}^{ASO-TOT}$$

- ASO-TOT: Safety Area- Global
- ap: aerodrome.
- $\mathrm{C}_{\mathrm{Sub}}\vert_{ASO-TOT}$: Coefficient of Finding Correction (Value range: 0,5-1,5)
- $\mathrm{i}_{Q}\vert_{ap}^{ASO-TOT}$: Quantitative Sub-indicator.

$$\mathrm{i}_{Q}\vert_{ap}^{ASO-TOT} = \sum_{0}^{n} 5\cdot\frac{C_n\cdot\bar{\delta}\vert_{n,ap}^{AR-TOT}}{\sum C_n}$$

  - $\delta\vert_{n,ap}^{ASO}$: Findings density, for a ASO, cycle n
  - $C_n = P^{-J\cdot n}$ Coefficient of time.

**QUALITATIVE**

$$\mathrm{i}_{QL}\vert_{ap}^{ASO-TOT} = \sum_{0}^{n}\frac{C_n\cdot\varepsilon\vert_{n,ap}^{ASO-TOT}}{\sum C_n}$$

- n: Cycle
- $C_n$: Coefficient of time.
- $\varepsilon\vert_{n,ap}^{ASO-TOT}$: weighed sum of every inspector assessment.

| Good | Fair | Poor | Very poor |
|---|---|---|---|
| 0/3=0 | 5/3=1.66 | 10/3=3.33 | 15/3=5 |

## 7.3 COEFFICIENT OF FINDING CORRECTION

### COEFFICIENT OF FINDING CORRECTION

#### Objective

- **Quantitative component** measures the level of compliance of the aerodrome to the proposed implementation time for the corrective actions of the detected Findings in each aerodrome.
- **Qualitative component** measures the inspectors' perception of the aerodrome in relation to management of the notifies change. Qualitative component shall only apply to Management Indicator ( $i_{ORG}$)

#### Data information Sources

- Oversight activities performed by AESA:
  - Number of corrective actions establishes for each Oversight activity
  - Corrective Action Plan issue date
  - Proposed implementation date for each corrective action
  - Delivery of the evidence of the implemented action issue date

#### Components

- Quantitative component.
- Qualitative component.

#### Calculation

| Considered QUANTITATIVE Hypothesis | Considered QUALITATIVE Hypothesis |
|---|---|
| - For each Finding, corrective actions shall be taken into account<br>- Corrective actions shall be assigned to oversight tasks though assigned Finding. Therefore, corrective action shall be assigned to Safety Areas.<br>- Quantitative component shall apply either to GLOBAL as to AREA SPIs | - Each auditor shall carry out the assessment before the Preliminary Report Evidences is released.<br>- Once the Final Diligence Report is release, a separate assessment shall be done.<br>- There are 4 options to assess: good, fair, poor and very poor.<br>- Qualitative component shall apply to GLOBAL SPI. |

| Value Range | Temporality | Domain |
|---|---|---|
| 0,5-1,5 | **Frequency of calculation:** 3 times per year (according to CSA).<br>**Data selection timeframe:** 4 years | Airports |

#### Formula

**QUANTITATIVE**

For each deficiency, the communication of corrective actions received during the applicable period will be registered and will be compared with the time passed from the existence of correction evidences compared to the proposed implementation time for the corrective actions of the detected Findings in each aerodrome:

$$C_{Sub}|_{\boldsymbol{ap}}^{\boldsymbol{ASO-TOT}} = \frac{1}{K_{AR}} \sum_{n=1}^{k} \frac{te_{kASO-TOT}}{tp_{kASO-TOT}}$$

- ASO-TOT: Safety Area; ap: aerodrome.
- $K_{ASO\text{-}TOT}$: number of correction actions assigned to AR
- nk correction action k assigned to AR
- $te_{KASO\text{-}TOT}$ time passed until evidence of implementation of k correction action.
- $tp_{KASO\text{-}TOT}$ time proposed until the implementation of k correction action.

**QUALITATIVE**

$$\frac{\sum_{n=1}^{k} V_{AP}}{K_{AP}}$$

- AP: aerodrome.
- $K_{AP}$: number of assessments carried out to AP
- $V_{AP}$: numeric value of the assessment.

| Good | Fair | Poor | Very poor |
|---|---|---|---|
| 0/3=0 | 5/3=1.66 | 10/3=3.33 | 15/3=5 |

## 7.4 NOTIFIED CHANGES SUB-INDICATOR

### NOTIFIED CHANGES SUB-INDICATOR

#### Definition

- **Quantitative component** identifies those aerodrome operators which greater number or more severe or more recent changes have been notified, to prioritize aerodrome in the next oversight activity plan.
- **Qualitative component** measures the auditors' perception of the aerodrome operator in relation to the management of the Change. .Qualitative component shall only apply to Management Indicator ( $i_{ORG}$)

#### Data Information sources

- Notified changes reported by aerodrome operators

#### Components

- Quantitative component.
- Qualitative component.

#### Calculation

**Considered Hypothesis**

- Notified changes are divided into 4 categories: 1, 1A, 2 & 3.
- Categories 1, 1A y 2 shall be notified in advance to their entry into force.
- A Notified Change shall be assigned to one or several Safety Area.

| Value Range | Temporality | Domain |
|---|---|---|
| 0-5 | **Frequency of calculation:** When there is a notified change | Airports |
| | **Data selection timeframe:** 4 years | |

#### Formula

**QUANTITATIVE**

$$I_{GC}^{QN}|_{ap}^{ASO-TOT} = \sum_{0}^{n} C_c|_{n,ap}^{ASO-TOT} = \sum_{0}^{n} C_{Sev} \cdot C_t|_{n,ap}^{ASO-TOT}$$

- ASO-TOT: Safety Area- Global
- ap: aerodrome
- $C_{Sev}$: Coefficient of severity (minor, moderate or mayor)
- n: nº Cycle
- $C_t$: Coefficient of time.
- $C_c|_{ap}^{ASO-TOT}$: Quantitative Coefficient of Notified Changes .

**QUALITATIVE**

$$I_{GC}^{QL}|_{ap}^{TOT} = \sum_{0}^{n} \frac{C_n \cdot C_q|_{n,ap}^{TOT}}{\sum C_n}$$

- TOT: Global
- ap: aerodrome
- n: nº Cycle
- $C_q$: Qualitative Coefficient of Notified Changes
- $C_n$: Coefficient of time

| Good | Fair | Poor | Very poor |
|---|---|---|---|
| 0/3=0 | 5/3=1.66 | 10/3=3.33 | 15/3=5 |

# 8. STANDARIZATION OF OBTAINED VALUES

In order to better analyse the values obtained, the indicators have been typified and escalated so that its value is comprised between 0 and 5. The cases in which the final values are outside this interval must be analysed on a case by case basis.

With the objective of expressing the behaviour of any analysed aerodrome against one of its group, both the position within the group and the evolution along the time, a comparative factor is included to correct the deviation with respect to a reference period in which its average values are considered acceptable.

$$Z = \left( \left( \frac{x - \mu}{\sigma} + \left( \frac{\mu - \mu_{ref}}{\sigma} \right) \right) + 3 \right) * \frac{5}{6}$$

Where:
$x \equiv rate \rightarrow x = I_i$, being $I_i$ each one of the indicators described in precedent chapter

$\mu \equiv$ average of the group to be analysed

$\mu_{ref} \equiv$ average of the reference period

$\sigma \equiv$ standard deviation according to the simple of the group

## 8.1 CLASIFICATION AND KEY OF THE OBTAINED VALUES

As defined in the previous section, the obtained results will be comprised, in most of the cases, between 0 and 5 in such a way that it could be assess in an analytical way.

Three priority levels are defined, with its respective codification, similar to that of a risk analysis:

- Priority 3: Corresponds to the values comprised between 0 and 2,5. No further action is required.
- Priority 2: Corresponds to the values comprised between 2,5 and 3,5. A monitoring of this indicator should be performed in case it will pass to Priority 1, controlling its evolution.
- Priority 1: Corresponds to the values greater than 3,5. The cases in which this happens should be analysed case by case in the Committee in case another corrective measure could be necessary.

# 9. GRAPHIC REPRESENTATION OF INDICATORS

A number of graphs have been defined to present the results from the analysis and monitoring of the level of safety in the activity of Airports.

- Global Safety Indicator for all Airports
- Temporal Evolution of Global Safety Indicator for all Airports
- Safety Area map
- Organizational map

These graphs enable to show standby data (fixed image of the state of the Airports in order to identify negative situations) and in a temporal way (evolution of the values of Global Safety indicator along time in order to identify negative trends).

The indicators described in the previous points, enable to make the specified graphic representations.

## 9.1 GLOBAL SAFETY INDICATOR BAR DIAGRAM

A graphic representation example of the global technical indicator for all Airports is included.
Thanks to the chart, it can be seen at a glance which Airports a priori deserve more oversight activities, as well as their more deficient aspects.

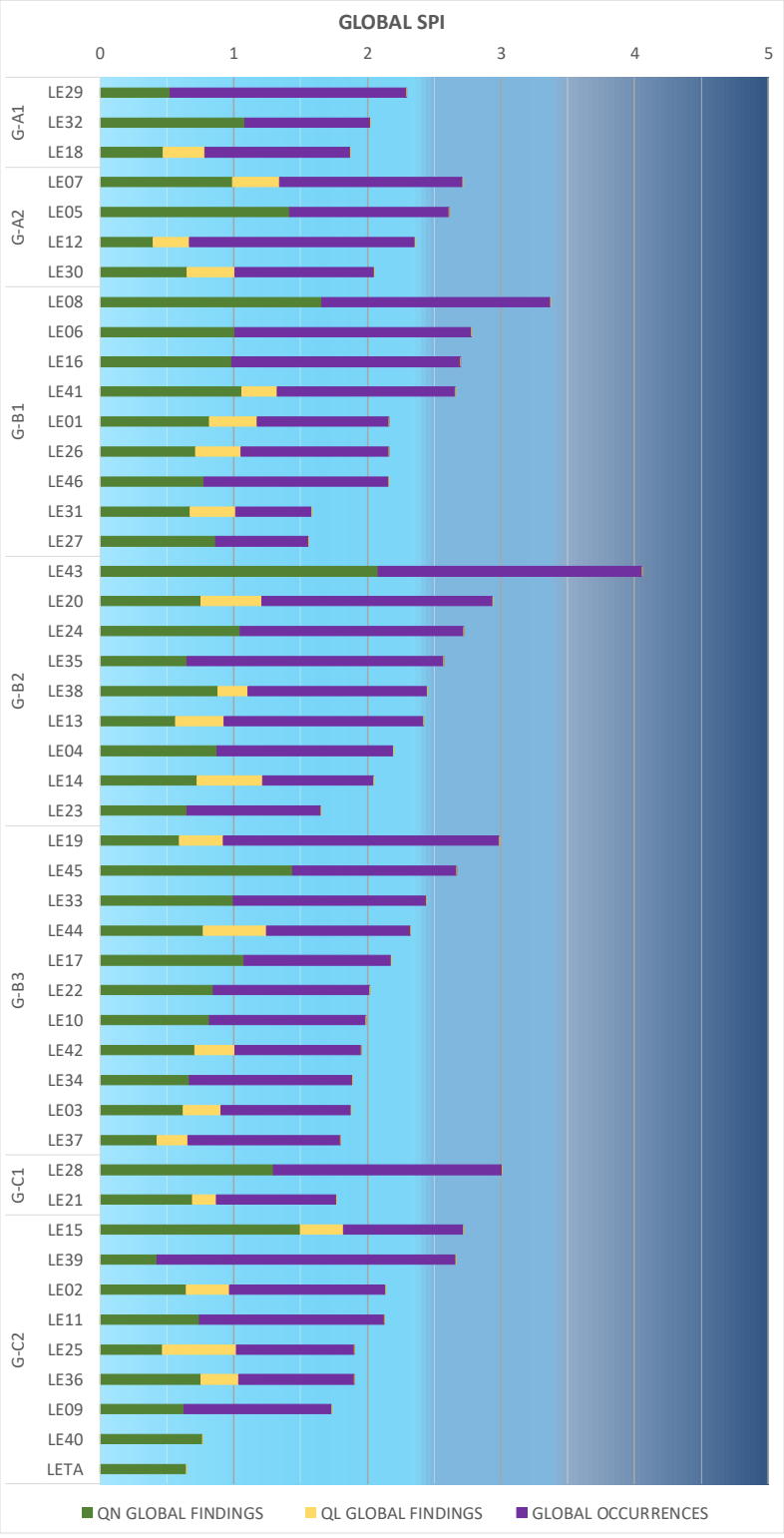



**Figure 9.1 Global Safety Indicator for all Airports**

## 9.2 TEMPORAL EVOLUTION GLOBAL SAFETY INDICATOR CHART

The following chart represents the tendency and evolution of the Global Safety Indicator versus the volume of operations.

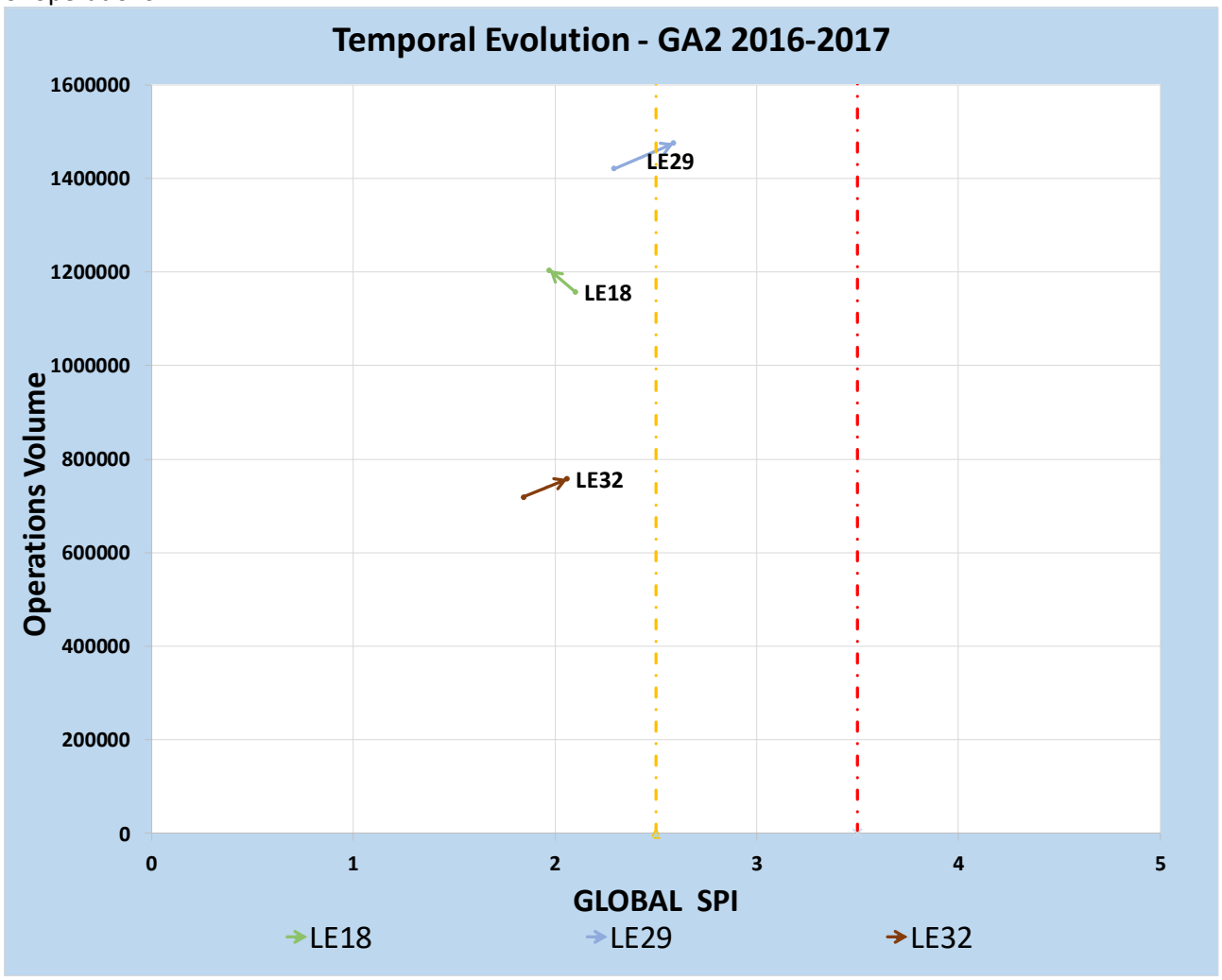



**Figure 9.2 Temporal Evolution Global Safety Indicator vs volume operations**

## 9.3 SAFETY AREA AND ORGANIZATIONAL GROUP MAPS

These maps show the values from each Safety Area or Organizational Issue for a determine group of Airports. Therefore, it shall be possible to compare among the Airports in the group.

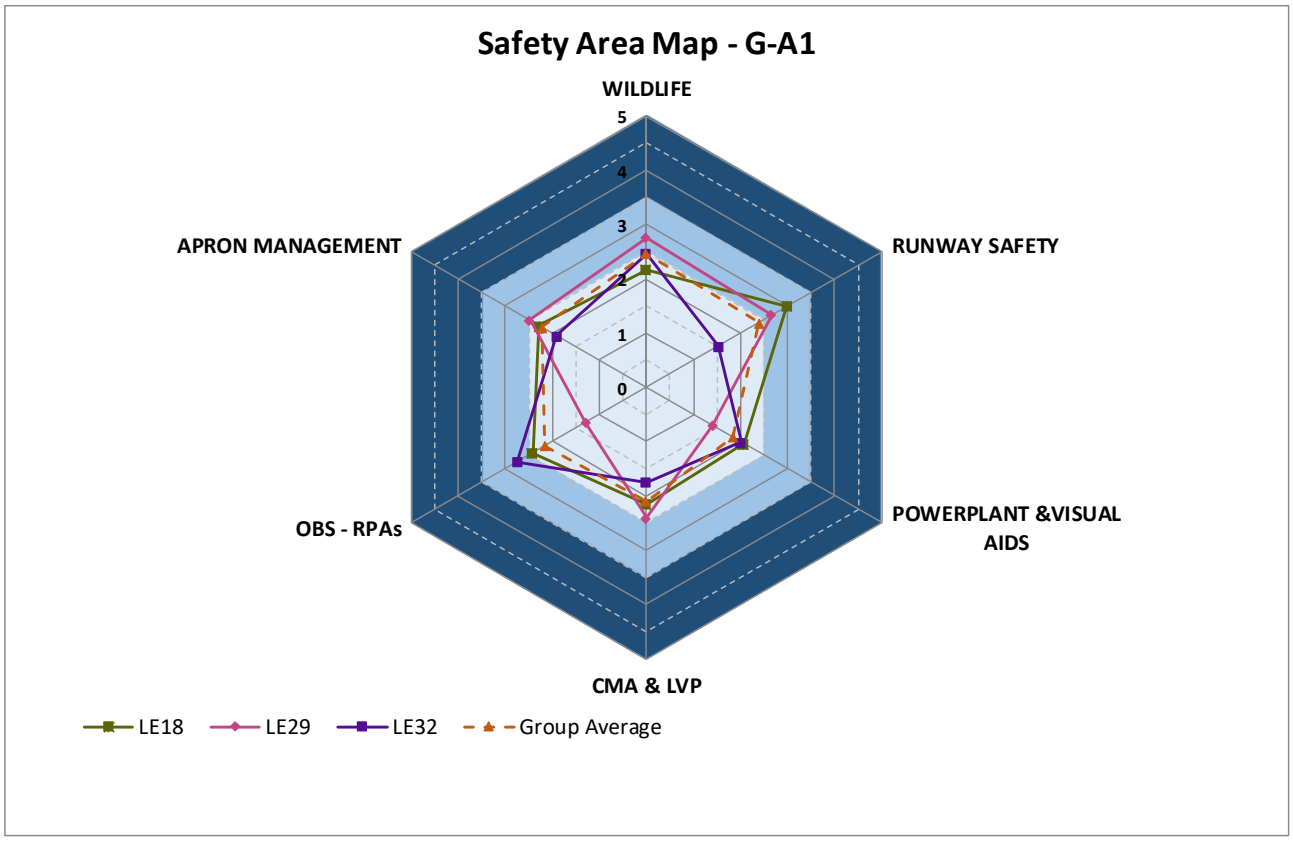



**Figure 9.3 Safety Area Map**

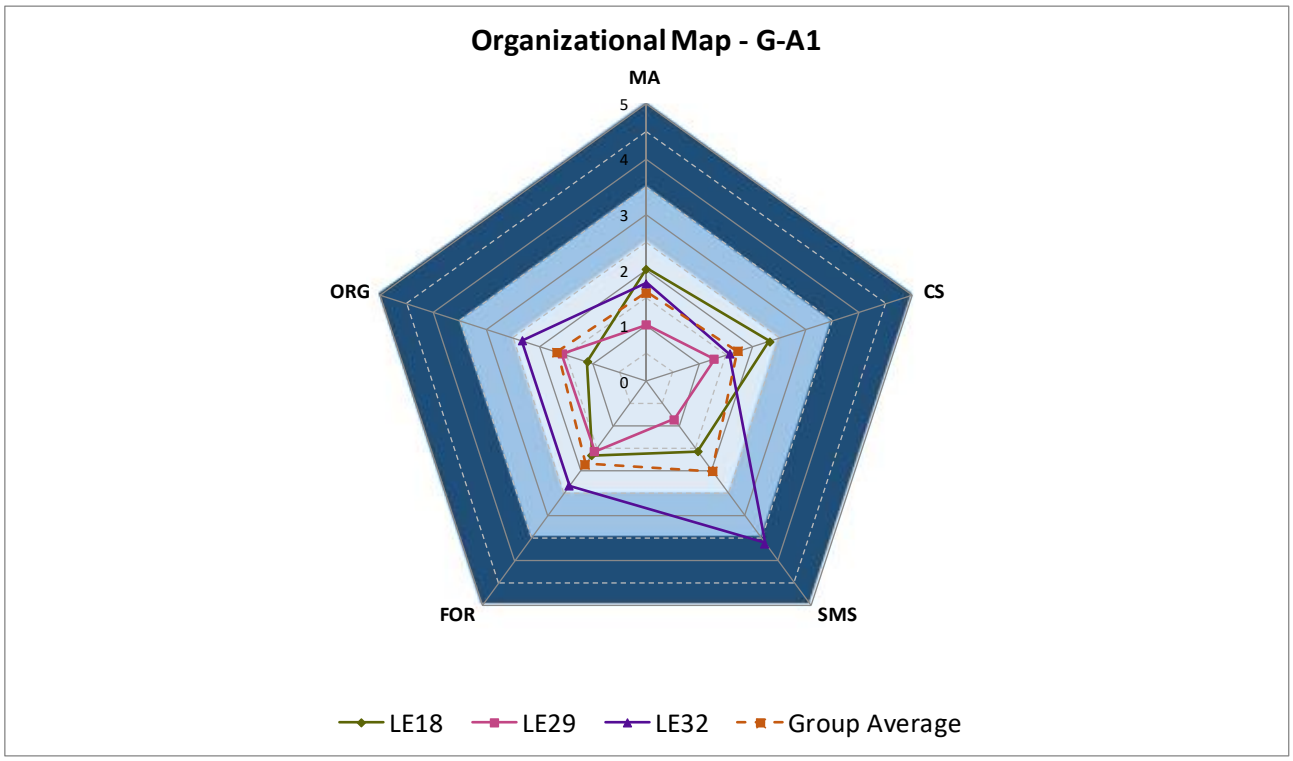



**Figure 9.4 Organizational Map**