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SIMS

Safety Information Monitoring System

**Connect, Monitor, and Share:
From safety data to safety intelligence**

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What is safety data

- ✈ A defined set of facts or set of safety values collected from various aviation-related sources, which is used to maintain or improve safety.

Note. — *Such safety data is collected from proactive or reactive safety-related activities, including but not limited to:*

- a) accident or incident investigations;
- b) safety reporting;
- c) continuing airworthiness reporting;
- d) operational performance monitoring;
- e) inspections, audits, surveys; or
- f) safety studies and reviews.



Store safety data

- ✈ According to Annex 19, amendment 1.
 - 5.1.1 States shall establish safety data collection and processing systems (SDCPS) to capture, store, aggregate and enable the analysis of safety data and safety information.
- ✈ SDCPS is a generic term which refers to:
 - processing and reporting systems;
 - databases;
 - schemes for exchange of safety information; and
 - recorded information.



Main components data processing

$$\begin{Bmatrix} 1010 \\ 0001 \\ 1100 \end{Bmatrix}$$

data



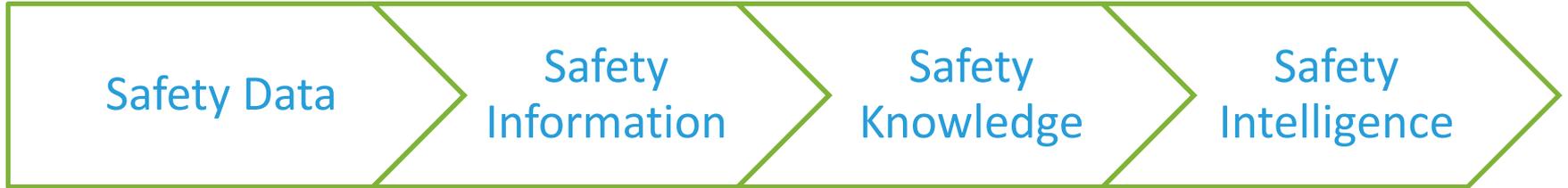
Indicator



system



From safety data to safety intelligence



Data-Driven Decision Making



Intelligence Level

Solution: linking “status” to “action” from combined information.
Actionable information for decision makers to define aviation safety strategies

Knowledge level

Reports based on metrics/algorithms

Information Level

Human-friendly, Processed meaningful ideas. Identification of relevant metrics

Data

Raw data is obtained from various sources



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SIMS

Safety Information Monitoring System

An icon representing connectivity, showing a network of nodes and lines, with a small airplane icon in a circle.

Connect
(data, States, service providers)

An icon representing monitoring, showing four circular gauges with red, yellow, and green segments.

Monitor
(performance, indicator, improvement)

An icon representing identification, showing a target symbol with an arrow hitting the bullseye.

Identify
(hazards, risks)

An icon representing sharing, showing a green silhouette of a world map.

Share
(safety information)



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Who can connect to SIMS

ICAO Member State

Service Providers

Air traffic
services
(ATS)
providers

Air
operators

Operators of
certified
aerodromes

Type design or
manufacture of
aircraft, engines
or propellers

Approved
Training
Organizations

Approved
maintenance
organizations



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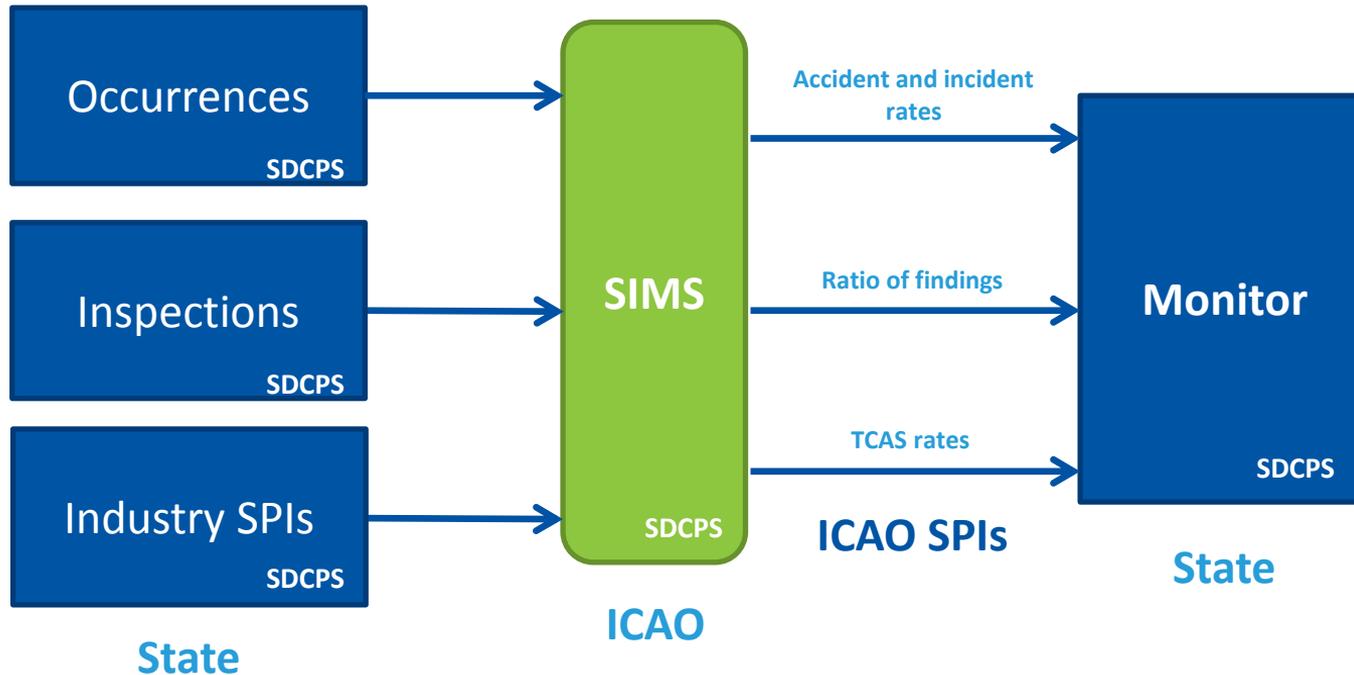


How to connect to SIMS

- ✈ Letter of interest via ICAO Regional Offices
- ✈ Collaborate with service providers to join SIMS
- ✈ Subscribe to group SIMS on ICAO Secure Portal
- ✈ International organizations:
 - Become member of the Research and Development group
 - Sign MoU for third parties as contributor



SIMS as a SDCPS Integrator







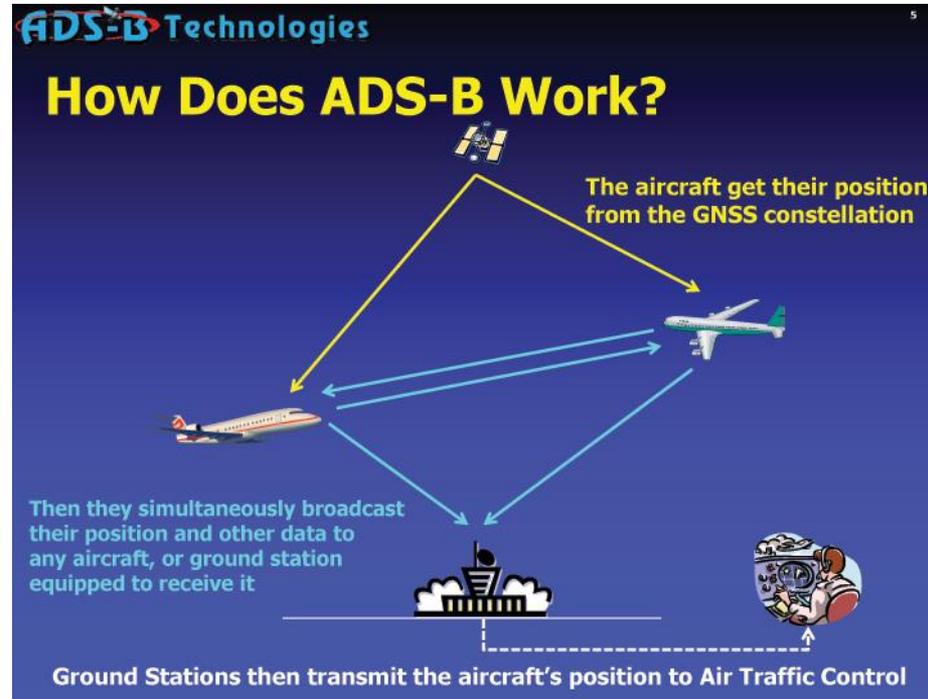
Automatic Dependent Surveillance Broadcast (ADS-B)

Automatic - It's always ON and requires no operator intervention

Dependent - It depends on an accurate Global Navigation Satellite System (GNSS) signal for position data

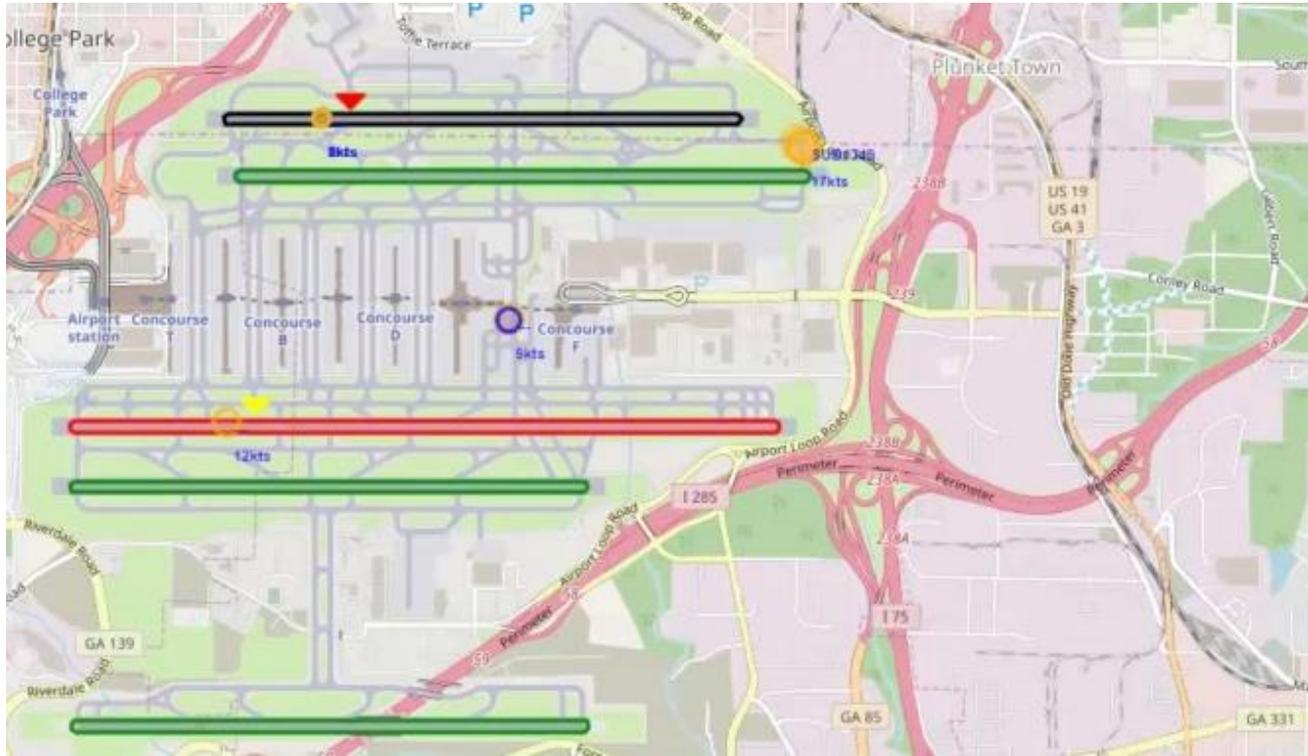
Surveillance - It provides "Radar-like" surveillance services, much like RADAR

Broadcast - It continuously broadcasts aircraft position and other data to any aircraft, or ground station equipped to receive ADS-B





Real-time Runway safety monitoring





Safety information sharing

Challenges

- Reporting culture
- Trust
- Fear of misuse of shared data
- Obstacles to release data
- Lack of standardization

Benefits

- Minimize safety risks at national, regional, and global level
- Use of risk-based approach for surveillance



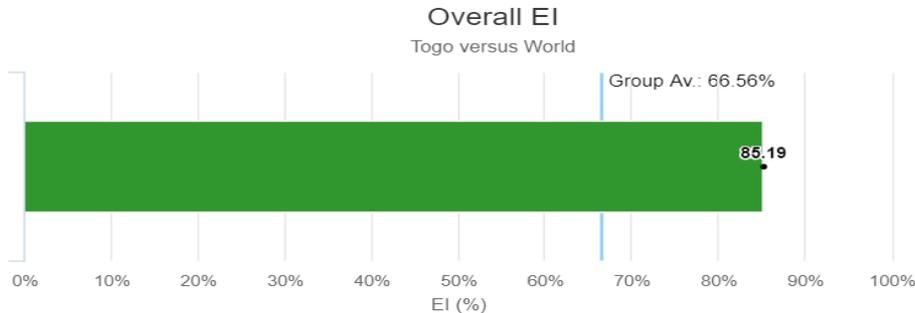
Togo



23 international destinations

Gnassingbe Eyadema has an average of 31 daily movements

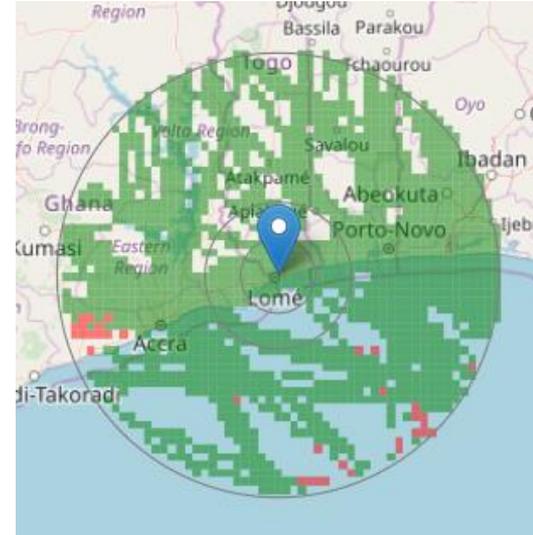
The airport's compound annual growth rate (CAGR) is +3.03%.





SIMS facts in Togo

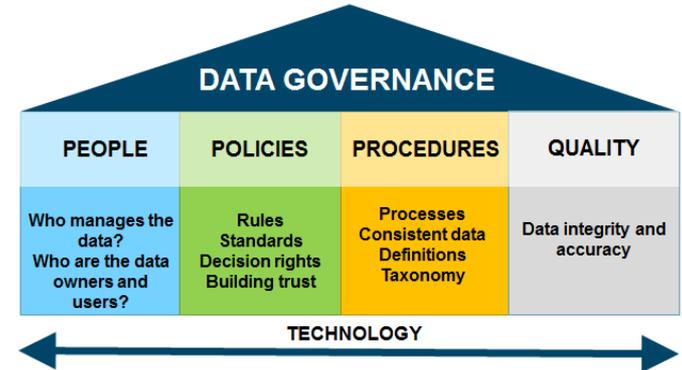
- ✈ ADS-B ground receiver installed in 2017 by ICAO
 - ✈ GnassinGnassingbe Eyadema (DXXX)
 - ✈ Niamtougou Intl (DXNG)
- ✈ 1st ICAO Member State to join the SIMS in 2017
- ✈ Participating Service Providers: Air Operator (ASKY Airlines), Air Navigation Service Provider (ASECNA), Civil Aviation Authority (ANAC), Airport Operator (SALT)





Safety data collection in Togo

- ✈ Togo established procedures for the collection of data from its Service Providers
- ✈ Appointed/Nominated Point of Contact (PoC) for each Service Provider
- ✈ Use of standard template for Ramp Inspections and Occurrence/event data





Example of data provided by Togo

- ✈ TCAS alerts
- ✈ Bird Strikes
- ✈ Loss of separation
- ✈ Ramp inspections





Safety Performance monitoring

- **What do you know?**
 - Indicator : Vertical Flight Efficiency During Descent. (*Actual distances flown in CDO versus total descent distance*)
 - Avg. 97 % weekly in last 4 months
 - Sudden drop for 2 weeks





SIMS Challenges in Togo

- ✈ Challenge: Internet connectivity issue
 - ADS-B receiver needs to be connected to the internet for signal
 - Currently Niamtougou Intl (DXNG) ADS-B ground receiver is not active

- ✈ Challenge: Data from Service Providers
 - Delays in reporting, submitting their data
 - Not using the proper form (template)
 - Data reported might not be correct, crosscheck need for data quality



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What Togo CAA says

“SIMS is helpful tool for safety performance monitoring, evaluation and analysis. It provides safety indicators based on aircraft real performance data thanks to ADS-B communication devices. Due to the fact that some data are sent automatically through ADS-B system, SIMS helps also to solves the problem of data quantity (not enough data/lack of reporting). SIMS provides us with different applications which give information, trends and visualizations good sources for safety data-driven decision making. With SIMS, even if we are in our office, at airport or not, we can check and visualize aircraft real movement and monitor associated safety performance. We believe in SIMS and we support it.” Atchou AMAH



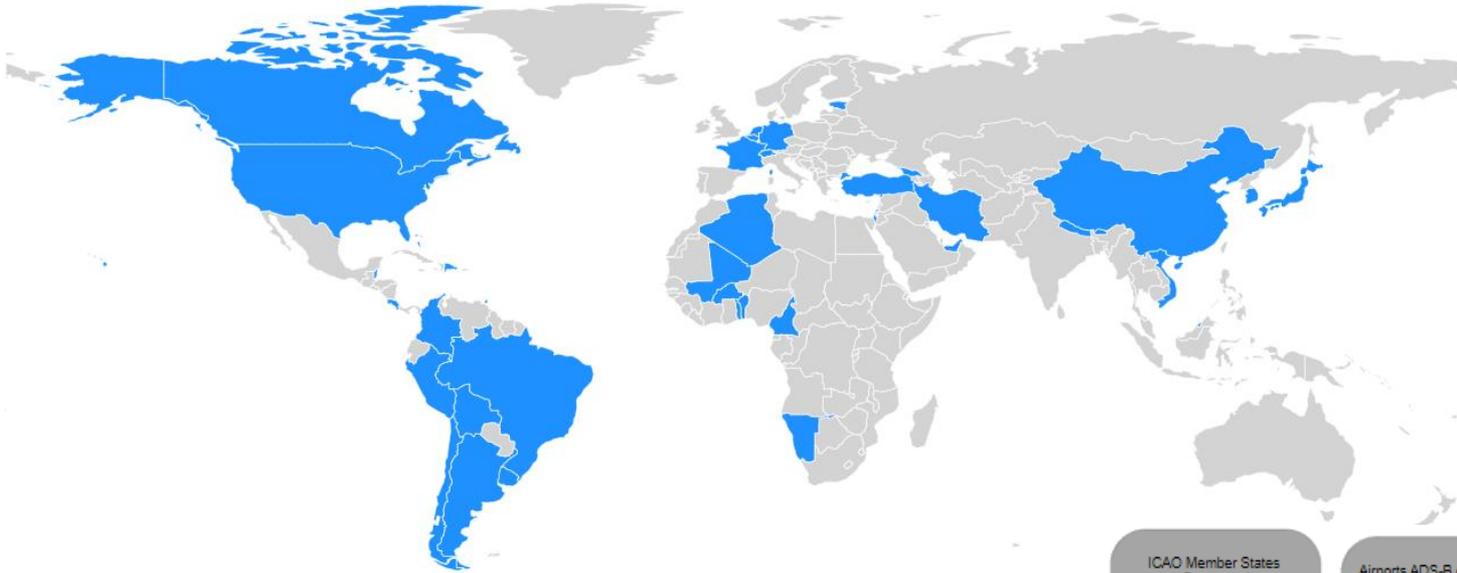
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SIMS users



ICAO Member States
Connected

41



Airports ADS-B data in SIMS

80



Users

200





AN-Conf/13 Recommendation to States

- ✈ The Thirteenth Air Navigation Conference 2018, recommended Committee B, as per agenda item 7.1/1 Data-driven decision-making;
- ✈ consider using ICAO's air navigation analysis solutions, especially during the initial development of their State safety programmes (SSPs), and joining the ICAO Safety Information Monitoring System (SIMS) project to better utilize their stored data;
- ✈ exchange safety and air navigation information with other Member States through data analysis tools such as SIMS in support of safety risk management;



Conclusion



Supports
the identification of
hazards and risks



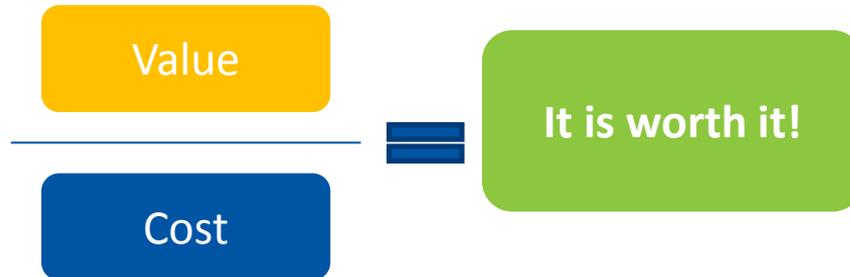
Allows
monitoring of safety
performance



Resolves
need for in-house
analytics technology



Facilitates
data-driven
decision making





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SIMS

Safety Information
Monitoring
System

Thank you!

Contact sims@icao.int