



## INNOVATION IN ANS/AGA SAFETY OVERSIGHT IN THE DOMINICAN REPUBLIC

“Towards a more Agile and modern Surveillance”

By: Gerson Mena  
ANS/AGA Safety Oversight director  
Dominican Republic  
Aug 14<sup>th</sup> 2005



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## Objective

Present the implementation strategy for innovative solutions that optimize operational, technical, and regulatory compliance surveillance of Air Navigation and Aerodrome Services, ensuring safety, efficiency, and sustainability.



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## Improvement Initiatives

- Digitize and automate monitoring and auditing processes
- Improve the traceability and analysis of operational and technical data
- Implement predictive tools to identify risks before they materialize
- Promote a culture of innovation and operational safety among staff
- Align surveillance with international standards and emerging technologies.



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## Scope Of Work

- 01 Data-Driven Oversight
- 02 Digitalization of Audits
- 03 Remote and Predictive Monitoring
- 04 Tools for Safety Analysis
- 05 Training and Culture of Innovation



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## Data-Driven Oversight



- Implementation of Business Intelligence platforms to centralize and analyze operations, maintenance, and safety data.
- Integration of ATS surveillance, meteorology, NOTAM, and air traffic flow management data.
- Use of dynamic KPIs with real-time dashboards for performance monitoring.

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### Digitalization of Audits

- Use of mobile applications for aerodrome inspections and ATS services, with photo capture, georeferencing, and real-time registration
- Digital signature system and automatic upload to the central database
- Smart checklists adapted to ICAO regulations, which are automatically updated.



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### Remote and Predictive Monitoring



- 01 Integration of IoT sensors into critical systems (runway lights, radars, VOR/DME, ILS, weather stations).
- 02 Implementation of AI-based predictive maintenance to anticipate failures in CNS/ATM equipment.
- 03 Use of **drones** for airport infrastructure inspection and visual aids.

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### Tools for Safety Analysis



- Implementation of Safety Performance Indicators (SPIs) and Early Warnings
- Application of predictive models to identify incident and non-conformity trends
- Integration with Voluntary and Confidential Reporting systems (just culture).



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### DESIGN THINKING FOR AN AIRPORT



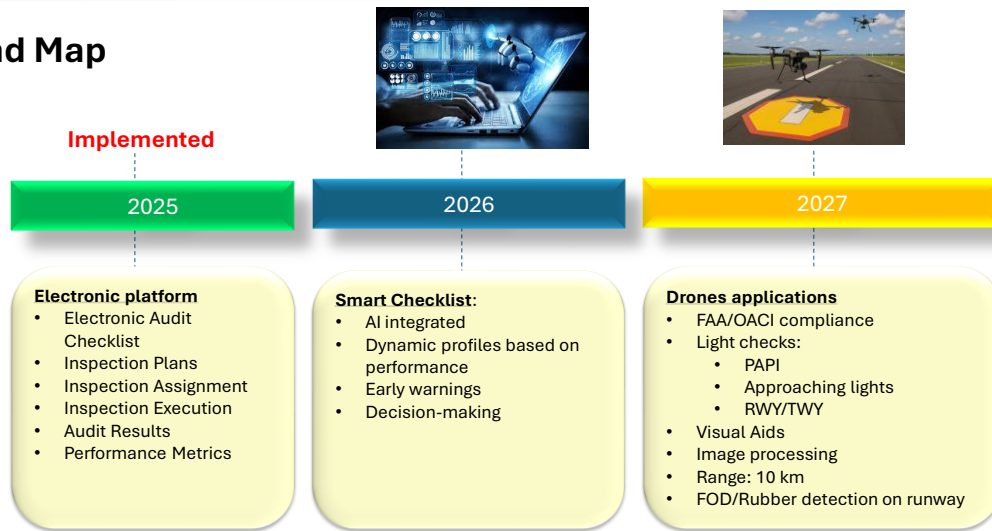
### Training and Culture of Innovation

- 01 Continuous training in emerging technologies (AI, Big Data, Cybersecurity).
- 02 Innovation laboratory for pilot testing of new solutions.
- 03 Design thinking workshops to engage staff in improving surveillance.

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## Road Map



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Innovation in safety oversight contributes to aviation **crisis management** by transforming the way a State:

- |               |   |                                           |
|---------------|---|-------------------------------------------|
| 01 detect     | } | About serious incidents<br>or emergencies |
| 02 evaluate   |   |                                           |
| 03 Response & |   |                                           |
| 04 Learn      |   |                                           |

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## ANS/AGA Innovation contribution to Crisis Management

- Prevention and early stage detection
- Faster and more coordinated response
- Comprehensive management during the crisis
- Recovery and restoration
- Continuous improvement and Org learning



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## Innovation contributions to crisis management

- Prevention and early stage detection
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- Real-time monitoring using sensors, drones, smart cameras, and IoT on runways, taxiways, and aprons
- Predictive analytics with AI that identifies risk patterns before they become critical events (e.g., unstable approaches, runway incursions)
- Integration of data from different sources (air navigation, aerodromes, meteorology, maintenance, safety) to provide a comprehensive view of risk.

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## Innovation contributions to crisis management

Prevention and early stage detection

Faster and more coordinated response

Comprehensive management during the crisis

Recovery and restoration

Continuous improvement and Org learning

- Surveillance platforms with centralized dashboards displaying live information to all key stakeholders (tower, control center, aviation firefighters, authorities)
- Multi-channel automatic alert systems simultaneously notify operational and crisis managers
- Redundant and secure communications (satellite, LTE/5G links, digital radio) to avoid interruptions during an emergency.

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## Innovation contributions to crisis management

Prevention and early stage detection

Faster and more coordinated response

Comprehensive management during the crisis

Recovery and restoration

Continuous improvement and Org learning

- Integration with aircraft tracking systems (ADS-B, radar, multilateration) to maintain air traffic control in critical scenarios
- Digital airport maps and models that help redirect operations, allocate resources, and plan evacuations
- Cloud-based collaborative tools that allow multiple agencies to work with the same information in real time.

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## Innovation contributions to crisis management

Prevention and early stage detection

Faster and more coordinated response

Comprehensive management during the crisis

Recovery and restoration

Continuous improvement and Org learning

- Post-event evaluation with advanced analytics to identify causes, protocol failures, and opportunities for improvement
- Simulation models to quickly reconfigure operations after a crisis.
- Use of airport “virtual replica” to plan repairs and optimize residual capacity.

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## Innovation contributions to crisis management

Prevention and early stage detection

Faster and more coordinated response

Comprehensive management during the crisis

Recovery and restoration

Continuous improvement and Org learning

- Recording and analysis of historical surveillance data to generate lessons learned and realistic training
- Simulations based on real incidents detected by the surveillance system
- Safety performance indicators that measure the effectiveness of crisis response and guide adjustments to plans.



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## In short,

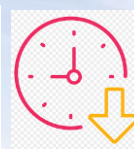
- 1 strengthens the state's crisis management plans.
- 2 allows for anticipating, responding to, and recovering more effectively from serious events, emergencies, or disasters in a timely manner
- 3 enables contingency protocols to be activated before the threat compromises Safety
- 4 allows for the continuity of surveillance obligations.

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## Outcomes

- Reduction in pre-audit preparation time
- Reduction in audit execution time
- Reduction in audit report preparation time
- Reduction in drafting errors
- Better traceability of findings
- Adaptation of predictive models
- Improve Redundancy of Safety Oversight
- More accurate Crisis Plans
- Improved auditee experience and satisfaction
- Innovation culture



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## Conclusion

With the implementation of this innovation strategy for the oversight of ANS/AGA services, the Civil Aviation Authority of the Dominican Republic has achieved improved levels of safety and ICAO regulatory compliance, faster, more accurate, and traceable oversight processes, and a reduction in inspection-related costs. It has strategic information for evidence-based decision-making and, of course, a more innovative and proactive organizational culture.

The state has implemented more robust plans and crisis management to ensure the continuity of safety Oversight Obligations.



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# THANKS

## Q&A



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