Athens International Airport S.A.

"Performance-based Wildlife Hazard Management under ICAO regulations"

Anastasios Anagnostopoulos
Head Wildlife and Biodiversity Management
Environmental Services Department

Purpose of the presentation

Provide guidelines for developing Performance-based Wildlife Hazard Management according to the ICAO Standards and Recommended Practices

ATHENS INTERNATIONAL AIRPORT
ELEFTHERIOS VENIZELOS

Presentation contents

- Background
- Setting up metrics
- Implementation
- Summing up
- Acknowledgements/References

ATHENS
INTERNATIONAL AIRPORT
ELEFTHERIOS VENIZELOS

Background

The Wildlife Hazard Management (WHM)

is an integral part of

the Aviation Safety Management System (ASMS)

Therefore, the WHM should follow

the Performance Based Approach

dictated by the ASMS

ATHENS INTERNATIONAL AIRPORT
ELEFTHERIOS VENIZELOS

Setting up metrics

The SMS structure

- 1. Safety policy and objectives
  - 1.1 Management commitment
  - 1.2 Safety accountabilities and responsibilities
  - 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 Safety 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

Management Commitment

- **WHM Policy**
- **WHM Objectives**
- **WHM Targets**

Performance Monitoring and Measurement

Safety Performance Indicators (SPIs) provide the means to determine the safety performance

Safety Performance Targets (SPTs) define short-term and medium-term safety performance management desired achievements.

Safety Performance Indicators

- ✓ **Reactive (lagging) indicators**
- ✓ **Proactive (leading) indicators**
- ✓ **Predictive indicators (precursor events)**

✓ Reactive (lagging) indicators:

Metrics that measure wildlife strikes that have already occurred and their impact on safety performance.

- **Analysis of past outcomes or events.**
- **Incidents and accidents are clear indicators of system deficiencies.**

✓ Proactive (leading) indicators:

Metrics that measure inputs to the wildlife management (either within an organisation, a sector, or across the total aviation system) to manage and improve performance.

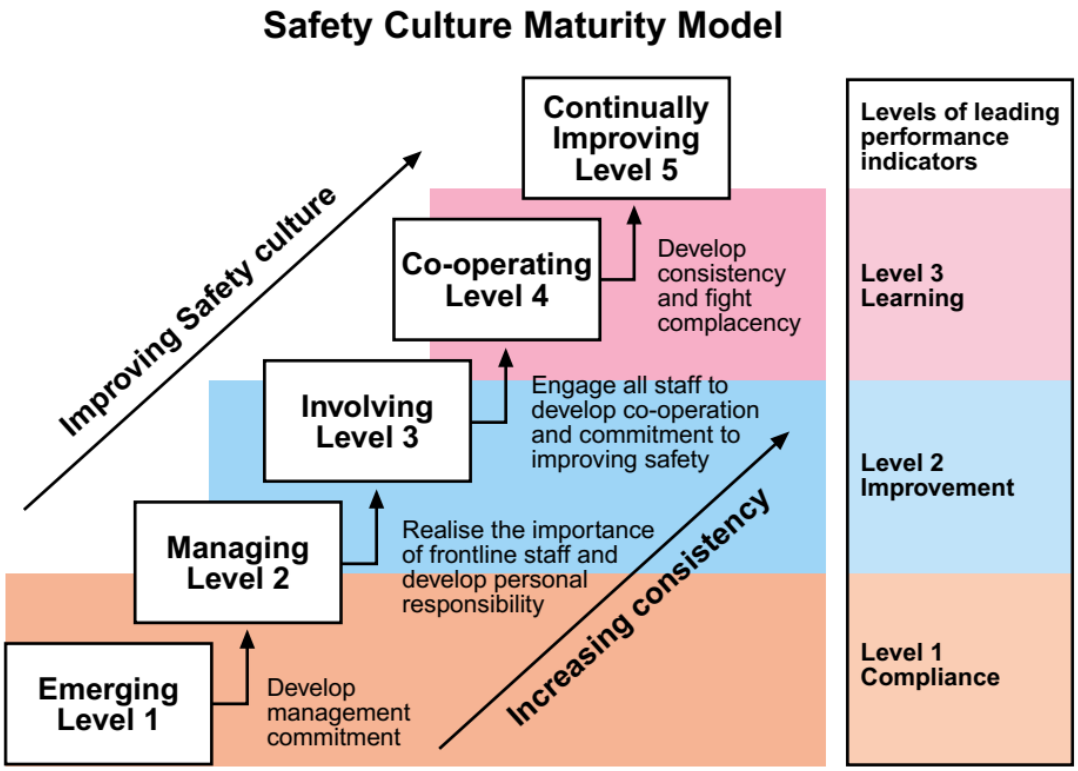
Leading indicators can be used to monitor the effectiveness of wildlife management actions and give advance warning of any developing weaknesses before problems occur.

✓ Proactive (leading) indicators:

Leading performance indicators at a A340-300 flight panel

✓ Proactive (leading) indicators:

Relation to the Safety Culture Maturity*



*According to Step Change in Safety: Leading Performance Indicators (2015)

Safety Performance Targets

- ✓ Define **short-term and medium-term** WHM performance management desired **achievements**
- ✓ Act as "**milestones**" that provide confidence that the organization is **on track** to achieving its safety objectives and provide **a measurable way of verifying the effectiveness** of safety performance management activities.
- ✓ The setting of SPTs should be determined after considering what is **realistically achievable** for the associated aviation sector and recent performance of the **particular SPI**, where historical trend data is available
- ✓ If the combination of safety objectives, **SPIs and SPTs** working together are **SMART**, it allows the organization to more effectively demonstrate its safety performance

Implementation

WHM Lagging Indicators and related Targets

SPI	SPT*
Number of Strikes with Engine Damage	Reduce by X%
Number of Strikes with Airframe Damage	Reduce by X%
Number of Engine Ingestions (without damage)	Reduce by X%
Number of Aborted Take-Offs	Reduce by X%
Number of strikes per species	5 year rolling mean should fall the subsequent years** ALoSP***
Wildlife Strike Rate per species (strikes per 10,000 movements)	5 year rolling mean should fall the subsequent years** ALoSP***
Wildlife mass involved in strikes (total or per Severity or Bird Size Category)	Reduce by X% (in total or per Category)

*** Targets can be set in a Wildlife Hazard Management Action Plan (WHMAP)**

**** Following "Allan, J. 2007: A Heuristic Risk Assessment Technique for Birdstrike Management at Airport" or any revision based on the 2016 paper related to this.**

***** Acceptable Level of Safety Performance (ALoSP) can also be established even on airport level**

ATHENS INTERNATIONAL AIRPORT ELEFTHERIOS VENIZELOS

Implementation

WHM Leading Indicators and related Targets

SPI	SPT
Number of training courses	2 initial courses, 5 recurrent courses
Percentage of personnel having completed training courses	Above 95%
Number of Meetings of the Airport Wildlife Strike Committee	4 meetings
Number of Aviation Safety Meetings where WHM actively contributes annually	11 Airside Safety Committees, 4 Safety Action Groups, 3 Runway Safety Teams, 2 Wildlife Management Committees
Number of awareness meetings with Aviation Safety Stakeholders annually	5 awareness meeting with Aviation Safety Stakeholders
Vegetation performance monitoring surveys	52 monitoring surveys
Airside vegetation maintenance routines	10 annual routines
Pro-active RWY checks	2 per shift
ATC deviations regarding clearance for movement while runway not completely clear from wildlife	Reduce by X%

ATHENS INTERNATIONAL AIRPORT

Implementation

WHM Leading Indicators and related Targets

SPI	SPT
Number of Active Measures applied / shift (in Total or per type)	Reduce by …
Mean time lapse before wildlife dispersed returns	Increase by …
Number of surveys at the vicinity of the Airport	>= 10 for the 3 km zone >= 5 for the zone between 3-8 km >= 3 for the zone between 8-13 km
Completion of WHM Hazard Identification and Risk Assessment (HIRA) cases studied	>= 80% of the WHM HIRA submitted
Number of raptors trapped and relocated	As per the Annual Action Plan
Warnings to aircraft operators	4 NOTAMs annually

ATHENS INTERNATIONAL AIRPORT

Implementation

WHM Predictive Indicators and related Targets

SPI	SPT
Bird sighting near aircraft (including near misses)	Reduce by …
Bird crossings of the runway	Reduce by …
Bird RADAR detections	Reduce by …

Implementation

Wildlife Hazard Management Action Plan (WHMAP)

Airport name and Code

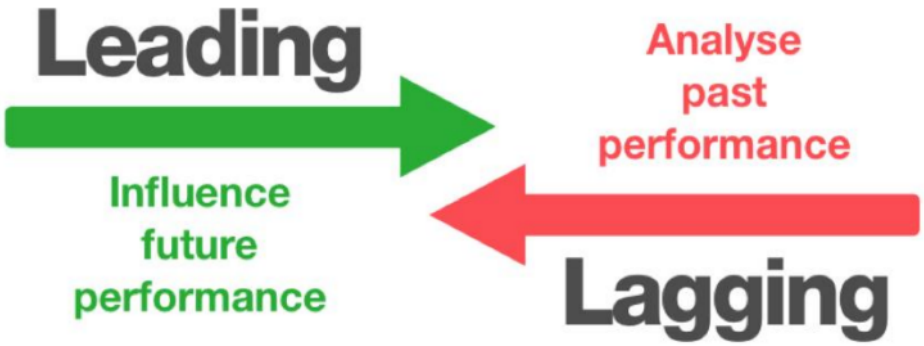
Wildlife Management Action Plan

Date Created/Revised:		Date validated	
Created/Revised By:		Validated By:	CNO
VERSION		*RELEASE*	

NO.		ACTIONS/EVENTS/AREAS/INDICATORS	RESPONSIBLE	COST (EST)	START DATE	END/GOAL DATE	STATUS/ PROGRESS UPDATE	TARGETS	ACHIEVEMENTS vs. TARGETS	Comments
I. HAZARD IDENTIFICATION/RISK ASSESSMENT										
A	Hazard Identification									
	1									
	2									
	3									
B	Risk Assessment									
	1									
	2									
	3									
	4									
C	Preparation and Submission of HIRA related to Wildlife									
	1									
	2									
	3									
II. RISK MITIGATION										
A	Habitat Management									
	1									
	2									
B	Active measures									
	1									
	2									
III. SAFETY ASSURANCE										
A	Safety Performance Monitoring (including SPIs)									
	1									
	2									
	3									
	4									
IV. SAFETY PROMOTION										
A	Safety Communication									
	1									
	2									
B	Reporting									
	1									
	2									
C	Awareness Programme									
	1									
	2									
D	Training									
	1									
	2									

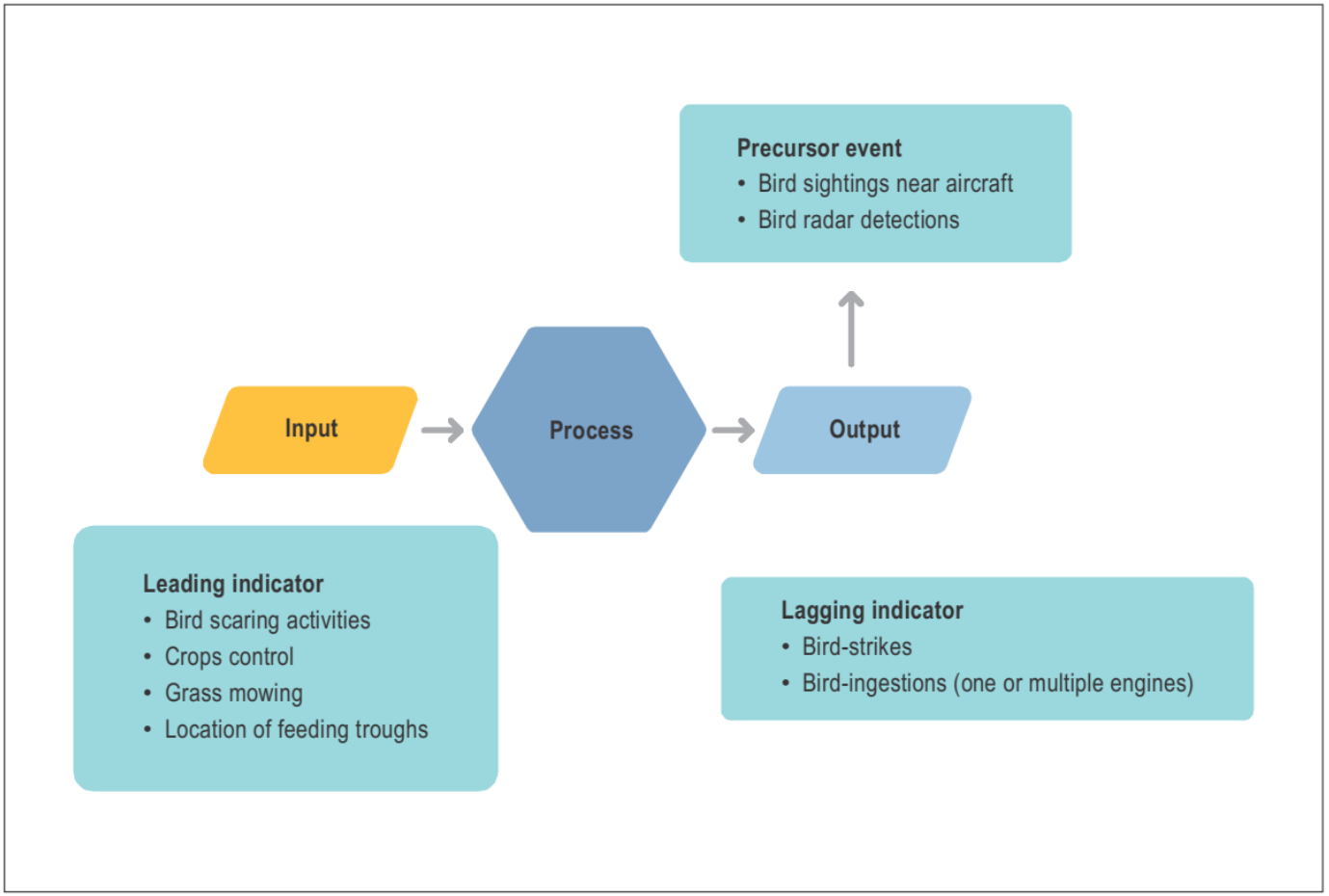
ATHENS INTERNATIONAL AIRPORT ELEFTHERIOS VENIZELOS

Summing up



According to Leveson 2018 STAMP Workshop: Leading Indicators Based on STAMP

Summing up



According to ICAO DOC 9859 Safety Management Manual 4th Edition 2018

Acknowledgements/References

✓ Acknowledgements:

Thanks to the ACI APEX in SAFETY Team, especially Juan Manuel Manriquez

✓ References:

- ICAO Doc 9859 - Safety Management Manual (SMM). Forth Edition – 2018.
- ICAO Doc 9137-AN/898 Part 3 - Airport Services Manual: Part 3 Wildlife Hazard Management. Fifth Edition - 2020.
- Airport Cooperative Research Program (ACRP) Report 145 - Applying an SMS Approach to Wildlife Hazard Management, WASHINGTON, D.C. 2015
- Step Change in Safety (2015): Leading Performance Indicators (https://www.stepchangeinsafety.net/resources/leading-performance-indicators)
- Leveson, N. (2018): STAMP Workshop - Leading Indicators Based on STAMP (Presentation)

ATHENS INTERNATIONAL AIRPORT

Thank you for your attention

ATHENS
INTERNATIONAL AIRPORT
ELEFTHERIOS VENIZELOS