Bird Control Solutions
Concepts and Techniques

Presentation Airport XXX
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Overview

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3. Risk Analysis and Ornithological Consulting
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1. Bird Strikes – Introduction

- What is a “Bird strike”? Collision between an airborne animal and a man-made vehicle
- Bird strikes have been a problem for aviation from the beginning
- More than 80% of bird strikes occur below 300m
- USA/EU: calculate 2-4 Bird strikes for every 10,000 take-offs and landings
- Damages estimated at: US$ 400m per year only in the US, $1.2bn globally
  est. 30 killed / injured annually
1. Bird Strikes – What does ICAO say?

- ICAO (Int‘l Civil Aviation Organization) Ann. 14:
  "take the necessary measures to reduce the number of birds which constitute a hazard to aircraft operations by adopting measures aimed at discouraging their presence on or near the airport."
  "It is impossible to drive all birds from an airport at all times."
  "The primary objective of bird control and reduction is to effectively prevent the presence of bird populations"

have a Wildlife Strike Reduction Programme in place with some key features:

a) Implement an Inter-institutional Bird Control Committee
b) Establish routine of Bird Strike reporting
c) Evaluate and analyze wildlife hazard
d) Implement control and preventive measures
e) Establish a strategy for communication, training and raising awareness of the risk posed by wildlife.
2. TONI – Independent Bird Control Specialist

- Since 2001, TONI Bird Control Solutions deter birds from Real Estate, Industrial parks, municipalities and agriculture
- Our Team Consist of:
  Bird control specialists, Installers, pest controllers, Ornithologists, Falconers and Radar specialists.
- Since 2009 TONI has teamed-up with other key leaders in the field of bird control for bird strike-prevention measures. We get worldwide expertise as a Representative of:
  - Detect Inc., USA
  - Lord Engenierie, France
  - Scarecrow, UK
  - Bird Raptor International S.L., Spain
- We offer Airports in Germany and Europe Bird strike prevention services
2. TONI – Integrated Approach: BASH-Management

BASH Management
(ICAO Ann 14)
3. Risk Analysis and Ornithological Consulting

- Ornithological Consulting / Analysis of the bird population around your airport.
- Score: Assessment and preliminary selection of appropriate Bird control methods including habituation risks.
- Monitoring and adapting introduced bird control methods
- Establish a continuous process of measuring success and adapting the proper bird control method
4. Documentation

Documentation of bird strikes or bird strike near events is mandatory (beware litigation)

- Scarecrow Ultima is a bird dispersal system with highly effective predator and distress calls installed
- Ready to work in bird control team cars
- With the data fed in, it automatically keeps seemless track on all bird activities around the airport and the control actions taken
- Full Reporting & GPS Accuracy
- Log all activities for future perusal and analysis
5. Bird Control Solutions (1) – Habitat Mgt, Raptors

- **Habitat Management**
  - Specific measures to remove the attractiveness of airport grounds to birds: cutting grass, netting or coverage of water reservoirs, plant endophytic grass
  - + Relatively easy to comprehend
  - – Personnel and cost intensive
  - – The job is sometimes too vast and costly

- **Natural enemies**
  - Falcons and dogs increase natural hostilities to unwanted birds. We offer falcon/dog programs
  - + Natural defense method, effects immediately noticed
  - – Limited control of birds, who themselves might become a danger
  - – Limited to day use and birds/dogs’ constitution
5. Bird Control Solutions (2) – Bird Robots

Bird Robots

- Ground controlled model aircraft in the form of birds of prey.
  - Successful model: Bird Raptor, Drone
  + Simulates a natural bird
  + Can be targeted at swarms (chasing)
  + Controllable at all times (beware wind)
  + No habituation with long range capabilities
  - Limited range of operation (battery life)
  - Training operators necessary
  - Wind sensitive

Effectiveness of Bird robots: Time how fast bird species flee after bird raptor appears

- **Larus Fuscus**: 6-12 seconds
- **Sturnus vulgaris**: 8 seconds
- **Columba livia**: 2-10 seconds
- **Syrigma sibilatrix**: 1-3 seconds
5. Bird Control Solutions (3) – Acoustic Methods

- Acoustic methods – predator calls
  - Predator calls combined with distress calls
    + Natural defense method partially automated or remotely controlled
    - Habituation possible
    - Specific distress calls for each bird species necessary

- Acoustic methods – gas cannons
  - Utilizes multiple propane cannon blasts to frighten birds and other animals.
    + Cost effective
    + No habituation so far recognized
    + Minimal effective range of 200 meters.
    + Several gas cannons linkable into one remotely controlled system
    - High loudness
    - Refill necessary
5. Bird Control Solutions (3) – Acoustic Methods

- Acoustic methods - LRAD Directional Sound

The LRAD system is a superior sound system, which utilizes directional high frequency sounds to disperse birds. It is used by the US government (US Navy, US Army and US Border Control) and 30 nations (Japan, China, South Korea, Israel).

+ Predator and distress calls of up to 153 dB
+ Up to 3,000 meters in a directed beam
  +/−15° @ 1.0 kHz/−3dB
+ Partially automated or remotely controlled
+ Almost no habituation
- Operator training needed
- Requires continuous BCU monitoring
- Dangerous to humans: „Non-lethal weapon“
5. Bird Control Solutions (4) – TOM500-Laser

- Visual Methods - Laser
  - Birds are visual animals
  - All birds are mostly sensitive to green laser light (532nm)
  - Silent and effective defense: references show min 40% reduction in bird strikes,
  - First system without habituation
  - Range up to 1,500 m into both directions,
  - completely safe 2M-category Laser
  - unattended and permanently ON
  - very attractive cost of ownership
  – Above 15,000 lux the system will shut down, but still works with cloudy skies
5. Bird Control Solutions (5) – TONI-Laser, Fogg

- **Hand-held Laser**
  - Made for Bird control teams on the field to target roosting birds
  - works up to 300 meters
  - Safe (Laser-class II)
  - Limited efficiency at strong daylight
  - Limited effect with pigeons

- **Fogging**
  - Methylanthranilate (MA) is a natural substance from grape extract. Birds flee when exposed
  - works for large areas (mounted on car)
  - Non-poisonous
  - Effective, also for migratory birds
  - No habituation
  - Wind and temperature sensitive
  - Doses for large areas hard to determine
5. Bird Control Solutions (6) - Facilities

- Preventing Bird Strikes does not stop at Airport runways alone.
- Removing birds from airport facilities reduces the attractiveness of the airport for birds and is an integral part of Bird strike prevention.
- Our aim to remove birds from facilities are:
  - NO SHELTER
  - NO FOOD
  - NO ROOSTING
  - NO BREEDING
- We target: Hangars, airport buildings, signs, tower, other facilities
- Some bird control methods for the airfield can also be used for facilities: Bird cages, Lasers, Nettings, Fogging, acoustical systems
5. Bird Control Solutions (7) – Facilities: Nettings

Netting

Birds often breed or roost inside Hangars. These attractive points must be protected. TONI has developed a new method to glue large nettings on structures:

+ Very effective
+ Affordable
+ No damage to Hangar structure
+ Anti-dirt coating available
5. BCS (8) – Facilities: Spikes, Electrical, Wires

- **Spikes for Hangar attics**
  stainless or PC-plastic spikes in every RAL-colour prevent birds from roosting
  + Easy installation
  + Protects hangars
  - visible

- **Electrical and wire systems**
  Wire systems protect hangar attics with thin stainless steel wire. Electrical systems work with 5,000 voltage to scare-off birds
  + Very effective
  + Birds memorize and don’t return (Memory-effect)
  - Can become expensive
5. Bird Control Solutions (9) – Facilities: Laser / Cages

- **Lasers**
  - Birds take flight when scared by a green laser. Laser V02.1 scans the hangar ceiling automatically and permanently
  - Covers large areas
  - Can become a nuisance

- **Bird Cages / Bird Houses**
  - Luring of unwanted birds / bird population management according to the Augsburg model
  - Bird population management
  - Limited bird capacity
  - Regular service needed
5. Bird Control Solutions (10) - Budget Concerns

Bird control must not be expensive

- Train your staff
- Introduce excellent documentation
- Low cost bird control measures (<€10K)
  - Eagle Eye
  - Bird kites/Balloons
  - Birdraptor or other drones
  - Guns to scare or hit birds (non-lethal)
  - Protect bird attractive spots with nettings, spikes, electrical systems
5. Bird Control Solutions - Conclusion

- Since birds adapt, most measures require:
  - Combined use of different solutions
  - Constant monitoring of methods’ effectiveness
  - Objective efficiency control with ornithological consulting and documentation

- TONI helps to select, monitor and adapt the most suitable bird control method for your airfield

We help to establish Bird control as a **PROCESS**
6. Bird Detection and ORM

ICAO: „It is impossible to drive all birds from an airport at all times.“

Bird detection technology enables you to proactively manage Bird strike risk instead of merely reacting.

Bird Radar

Camera-based Systems

Latest technology allows professional management of Bird strike risk
6. Automated Bird Detection – Bird Radar MERLIN

- Automatic bird detection radar technology
  - ABAR Aircraft Bird strike Avoidance Radars
  - Maintain 24 hour situational awareness of bird strike hazard, even during rain and fog
  - Automatically identify hazardous conditions
  - Alert Tower personnel of danger, with audible and visual notifiers
  - Frequency: 2,920-3,080 MHz, 10cm Wavelength (S-Band)
  - Range 6-8 nm, 360°
  - Weather-resistant, 24 hours a day / 7 days a week

- Use Worldwide
  - Military, civil aviation, wind turbines, field studies.
  - Worldwide 65 radars in use in U.S., Europe, Canada, India, Kuwait, Africa.

- FAA (Federal Aviation Administration) recommends to use avian radar systems for use in airport bird management and control operations
6. Automated Bird Detection – MERLIN in Use

Dual range option on HSR allows for simultaneous close-in display for bird control (1-2 nm) & long range for ATC (6-8 nm).

- **Horizontal (HSR) radar - 360° area bird detect to 6-8 miles & up to 15,000+ feet AGL (24 degree beam volume with tilt)**

- **Vertical (VSR) radar provides horizon-to-horizon bird detection in runway approach & departure corridors to 3-4 nm (22 degree beam width)**
6. Automated Bird Detection – MERLIN in Use (2)

- Knowing the location and likely flying path of the birds enables continuous determination & alerting of bird strike risk for runway approach & departure corridors.

- PAR-type display format with current color-coded bird strike risk:
  - Color-coded text (Green = LOW; Yellow = MODERATE; Red = SEVERE)
  - Delineated & labeled runway corridors
  - Toggle button "flips" display for wind changes
  - Highlights bird activity areas
  - Audible & visual alerts when risk changes

- This information needs to be integrated into daily airside routines (ATC and Bird control)

- Upon Radar information, ATC must decide on the detailed action to be taken.
6. Automated Bird Detection – MERLIN in Use (3)

- Practical experience (Example)
  - USAF: savings of U.S. $3m per year since 2003
  - No Class-A Bird Strikes (damage > $1m)
  - No Class B Bird Strikes (Non U.S. $1m <> 500k)

- Commercial users:
  - Louisville Int’l Airport
  - Calgary Int’l Airport (2007)
  - Durban Int’l Airport (2008)
  - Riga, Latvia (2010)
6. Automated Bird Detection – Camera-Based

- **Automatic visual bird detection system (VBDS)**
  - Detects birds in real-time and takes programmed actions (warning to ATC)
  - Detected birds: >650mm wingspan
  - Continuous monitoring during daylight >200 Lux
  - Infrared-system under development
  - Surveillance area: runway length (2,000m) and up to 200m height for larger birds
  - Also detects birds sitting on the runway

- **Automatic system Mivotherm®**
  - Works day/night (includes Infrared)
  - Detects bird size, bird number, flying height, flight direction and flock dimension
  - Issues warning to ATC
  - Used at Fraport
7. Bird Strike Academy

We offer seminars in various modules, which can be booked individually and are held at client’s location:

- Ornithological principles
- Bird strike risk analysis and reporting
- Bird Detection and ORM
- Theory and practice of bird control methods
- MERLIN / ABAR bird radar system incl. data processing and reporting
- Documentation

Training airport personnel increases awareness and reduces bird strike risk.
8. Further Steps

Bird control measures in place at your Airport:

- Habitat Management?
- Staff Training?
- Runway inspection?
- Bird control measures?
- Risk assessment audit?
- Bird Identification?
- Documentation?
- Other wildlife measures?

What can we do for you?
Thank You!

More Information:

www.birdcontrol.aero (Aviation industry)
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