FOD Detection Systems

Supporting Runway Safety

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FOD - The Danger

- Major accidents
- Severe incidents
- Maintenance issues

FOD - The Treatment

- Routine visual inspections (proactive)
- Threat-based visual inspections
- Event-response visual inspections (reactive)

Regulatory mandated in UAE by GCAA CAR Part IX.
Visual Inspection Reliant Programs - Weaknesses

- Human element.
- Immediately obsoleted.
- Physical occupancy reduces runway capacity.

The OMDB Operating Environment

- Poised to become the world’s busiest aerodrome.
- Dual-runway operation.
- Circa 1000 movements per day (peak ~52 per hour).
- 5 routine runway inspections (min.) carried out per H24 by a dedicated team.
Dubai Airports’ Approach – Technology Support

Dubai Airports Engineering Projects (DAEP), on behalf of Dubai Airports, has procured a ‘Runway Debris Monitoring System’ (RDMS) according to the following core operational stipulations:

• Continuous:
  – 24x7 operational surveillance in all environmental conditions.
  – Performance must meet or exceed US FAA Advisory Circular AC150/5220-24 in all light conditions.

• Reliable and accurate:
  – System alerts must be proven to collect at least 90% of valid events, but false alarms must be minimised.

• Robust:
  – Equipment and system architecture must operate with high ‘Mean Time Between Failures’ (MTBF), low downtime for maintenance and reasonable investment/life-cycle costs.
  – 100% redundancy in terms of power, communications and data recording (with 2-year retrieval).

• Informative and Intelligent:
  – The system must be able to detect AND identify items – providing sufficient information to operators to appropriately evaluate the scenario and act.
  – The system must facilitate a ‘closed loop’ of event management – from identification to resolution and data management (including facilitation of SMS interrogation).
Dubai RDMS Solution - *iFerret*

Stratech of Singapore, supported by Bayanat, have been commissioned to provide a customised vision-based system:

- 28 hi-res cameras (12 per runway, 4 taxiway crossings).
- Located 130 (+/-) from runway centreline – facilitating access for installation and service without restriction to normal runway operations.
- 45 second scan rate in daytime, 90 seconds at night.
- Visual ranges overlap – in the event of failure adjacent units automatically compensate.
- Combined imagery provides a real-time panoramic view of the runway.
**iFerret – Concept of Operation and Workflow**

**GREEN**
Ops normal

**AMBER**
FOD detected, no immediate threat (remove as soon as practicable)

**RED**
FOD detected, close runway at earliest safe opportunity to address
iFerret - Operator Console
iFerret – Imagery Capability
iFerret – Imagery Capability

Airfield at Night under natural light conditions

Airfield at Night with iFerret™ Sensor
Thank you