



Your safety is our mission.

LET'S START EASY

Rode Island

**Rode Island explanation** 



Safety Programmes in Reg 139

Committees

Runway Safety Concepts

**Ground safety Concepts** 

Foreign Object Debrise (FOD)

How to Define & Stablish Programmes



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LOCAL (Aerodrome Operators)



National (Aerodrome Authority)

## **Runway Safety**





## **FOD**





## **Apron Safety**









,	
AMC1 ADR.OR.D.027 Safety programmes	140
GM1 ADR.OR.D.027 Safety programmes	
GM2 ADR.OR.D.027 Safety programmes	
AMC2 ADR.OR.D.027 Safety programmes	
GM3 ADR.OR.D.027 Safety programmes	

Minimum of 3 Programmes (Runway, Apron, FOD)

ADR.OR.D.027 Safety programmes.....

Aerodrome Operator to Establish, Coordinate and Lead Safety Committees (Runway, Apron)

Safety Committees, DEFINE (Tasks, Composition, Regularity, Procedures, Minutes, etc.)

**HOT SPOT Management** 



## For further consultation Please Check these IRs + AMCs + GMs



ADR.OR.D.027 Safety programmes	139
AMC1 ADR.OR.D.027 Safety programmes	
GM1 ADR.OR.D.027 Safety programmes	
GM2 ADR.OR.D.027 Safety programmes	
AMC2 ADR.OR.D.027 Safety programmes	<b>14</b> 3
GM3 ADR.OR.D.027 Safety programmes	143

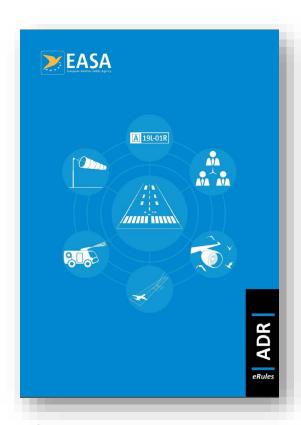
## ADR.OR.D.027 Safety programmes

Regulation (EU) No 139/2014

The aerodrome operator shall:

- (a) establish, lead and implement programmes to promote safety and the exchange of safetyrelevant information; and
- encourage organisations operating or providing services at the aerodrome to be involved in such programmes.





## AMC1 ADR.OR.D.027 Safety programmes

ED Decision 2014/012/8

### SAFETY PROGRAMMES — AERODROME SAFETY COMMITTEES

- (a) The aerodrome operator should:
  - (1) organise, coordinate and implement programmes to promote safety at the aerodrome. Such programmes should include, but are not limited to:
    - runway safety, including runway incursion and excursion prevention;
    - (ii) apron safety; and
    - (iii) FOD prevention;
  - coordinate and promote the exchange of information, and the joint investigation of occurrences, serious incidents, and accidents.
- (b) The aerodrome operator should establish, coordinate, and lead local aerodrome safety committees, and a Local Runway Safety Team, dealing with runway safety, apron safety, and the safety of the operations at the aerodrome in general. All relevant organisations operating or providing services at the aerodrome should participate to such aerodrome safety committees and the Local Runway Safety Team.

The local aerodrome safety committees and the Local Runway Safety Team should convene regularly, identify and review local safety issues, and examine possible solutions, and need for action. Minutes of such meetings should be kept. Procedures relevant to the functioning of local aerodrome safety committees and the Local Runway Safety Team should be included in the aerodrome manual.



### GM1 ADR.OR.D.027 Safety programmes

ED Decision 2014/012/R

### AERODROME SAFETY COMMITTEES

- (a) Manoeuvring area/Apron Safety Committee
  - The aerodrome operator should establish (a) Manoeuvring area/Apron Safety Committee(s);
  - The Manoeuvring area/Apron Safety Committee(s) should have an advisory role to the aerodrome operator;
- (b) Management of Manoeuvring area /Apron Safety Committee(s)
  - The Manoeuvring area /Apron Safety Committee(s) should be chaired by an aerodrome operator's official, responsible for aerodrome operations; and
  - (2) The aerodrome operator's safety manager should act as the secretary of the Committee(s).
- (c) Composition of Manoeuvring area /Apron Safety Committee(s)

Participation should include, but not limited to representatives of:

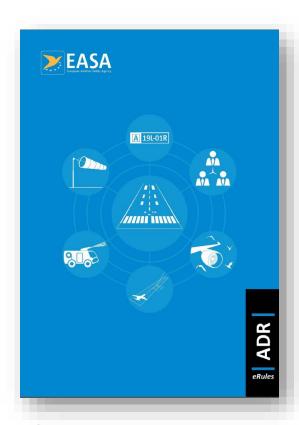
- aerodrome users active in flight operations;
- aircraft ground handling services providers;
- aerodrome rescue and firefighting services;

- (4) aerodrome operations;
- aerodrome wildlife management;
- (6) aerodrome maintenance; and
- air navigation service provider(s).
- d) Tasks

The tasks of the Manoeuvring area /Apron Safety Committee(s) should be:

- to receive and evaluate reports on operational safety issues;
- to receive reports and statistical information on accidents and incidents, and propose solutions;
- (3) to advise on manoeuvring area/apron safety issues such as:
  - promotion of apron safety discipline;
  - (ii) FOD prevention;
  - iii) developing measures for safe operations;
  - (iv) considering actions to resolve manoeuvring area/apron safety problems;
  - (v) apron equipment issues;
  - (vi) adherence to vehicle traffic issues;
  - (vii) new and/or updated safety instructions;
  - (viii) personal protective clothing/equipment issues;
  - (ix) methods to develop and promote apron safety awareness initiatives,
  - (x) snow and ice clearance issues;
  - (xi) proposed aerodrome works;
  - (xii) proposed changes/developments to the movement area;
  - (xiii) standard operating procedures, etc.





## GM2 ADR.OR.D.027 Safety programmes

ED Decision 2014/012/R

#### LOCAL RUNWAY SAFETY TEAM

### (a) Context

As part of its runway safety programme, the aerodrome operator should establish and lead a Local Runway Safety Team and act on local runway safety issues, including runway incursion (including runway confusion) and excursion prevention.

A runway incursion is defined as 'Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and take-off of aircraft<sup>1</sup>.'

A runway excursion occurs when 'An aircraft veers off or overruns the runway surface during either take-off or landing'.

### (b) Local Runway Safety Team composition

Participation should include representatives from all interested parties with direct involvement in runway operations at the aerodrome, including, but is not limited, to:

- aerodrome operations;
- aerodrome engineering and maintenance;
- (3) air navigation service providers;
- (4) aircraft operators that operate of the aerodrome;
- (5) aerodrome rescue and firefighting services;
- (6) drivers having access on the manoeuvring area.

### (c) Role

The role of the Local Runway Safety Team should be to advise the appropriate management on potential runway safety issues, and to recommend mitigating measures.



### GM2 ADR.OR.D.027 Safety programmes

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- drivers having access on the manoeuvring area.

### (c) Role

The role of the Local Runway Safety Team should be to advise the appropriate management on potential runway safety issues, and to recommend mitigating measures.

### (d) Tasks

The Local Runway Safety Team may have the following tasks:

- identification of potential runway safety issues, including the need for establishment of hot spots or other problem areas at the aerodrome and the review of the relevant entries of the AIP for accuracy;
- (2) developing and running local awareness campaigns, at suitable periods, including at the start of a busy season or before an unusual event, that focus on local issues, for example, producing and distributing local hot spot maps, or other guidance material considered as necessary; local awareness campaigns should be periodically refreshed to maintain interest and operational awareness of the relevant personnel;
- (3) monitoring the number, type and, the severity of runway incursions; disseminating safety recommendations delivered from accident and incident investigation findings as well as other relevant lessons learned e.g. from operational experience and best risk mitigation practices; sharing good practices to prevent runway incursions or excursions;
- (4) assisting in verifying that communications between air traffic controllers, or other Air Traffic Services personnel, pilots, and vehicle drivers are satisfactory, or if any improvements could be suggested;
- (5) making observations on a regular basis in different weather and light conditions to assess whether all runway entrances and visual aids are adequate, correctly located and understandable by all parties concerned, with no possible ambiguity of their meaning, or identify potential aerodrome design issues;
- 6) understanding the operating difficulties of personnel working in other areas, and recommending areas for improvement; when reviewing operating procedures it is necessary to ensure that the procedures employed by different companies at the aerodrome are integrated and effective, so as to minimise the risk of runway incursions. Care should be taken when examining existing or proposed runway capacity enhancing procedures or noise abatement schemes involving runway preferential systems;



## AMC2 ADR.OR.D.027 Safety programmes

ED Decision 2014/012/R

### HOT SPOTS

Once hot spots have been identified at an aerodrome, suitable strategies should be implemented to remove the hazard and, when this is not immediately possible, to manage and mitigate the risk, including the publication of HOT SPOT charts in the Aeronautical Information Publication.

## GM3 ADR.OR.D.027 Safety programmes

ED Decision 2014/012/R

### HOT SPOTS

A hot spot is defined as 'a location on an aerodrome movement area with a history, or potential risk of collision, or runway incursion, and where heightened attention by pilots/drivers is necessary.'

Strategies to manage and mitigate the risk from hot spots, depending on the case, may include, but are not limited to:

- (a) awareness campaigns;
- (b) additional visual aids (signs, markings, and lighting);
- (c) establishment of alternative routings;
- (d) introducing changes to the design of parts of the aerodrome; and
- (e) the mitigation of blind spots in the aerodrome control tower.

Aerodrome charts showing hot spots should be produced locally, checked regularly for accuracy, revised as needed, distributed locally, and published in the AIP. The criteria used to establish and chart a hot spot are contained in the PANS-ATM (Chapter 7) and Annex 4 — Aeronautical Charts (Chapters 13, 14 and 15).

Examples of how hot spots are shown on charts are provided in Figures 1, 2, and 3 below.







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**SAFETY COMMITTEES** 





## **SAFETY COMMITTEES**







## **ToRs** must include at least:

- Objectives: scope, and attributions. (REG 139)
- Meetings: annual Plan, ordinary, extraordinary, invitations, etc.
- Roles: Chairperson, Secretary, Members. (Raporteur)
- Data Management: data sharing between LRSTs, inputs, data base, reports, recommendations.
- Disclosure: Formal agreements for the no disclosure and inappropriate use of the shared LRSTs information.
- Measures: Definition, Implementation, Follow-up, Effectiveness.
- Recording: ACTs, Reports, Presentations, Recommendations, etc.
- Evaluation: Internal Audits, External Audits, Continuous Improvement.



## **LOCAL RUNWAY SAFETY TEAM**

- (1) Identification of the potential safety **RUNWAY PROBLEMS**,
  - a. Including the need to establish Hot Spots or the problematic spots in the airport, and
  - b. the review of the main AIP entrances in order to verify their precision;
- (2) Develop and execute **LOCAL AWARENESS CAMPAIGNS**, during the appropriate time periods.
  - a. Including at the beginning of a high activity season or before an unusual events occurs, that are focused on local problems, for example, producing and distributing critical local Hot Spots, or other guidance material considered as necessary;
  - b. The local awareness campaigns should be updated periodically for maintaining the interest and the operational awareness of the relevant team.



## **LOCAL RUNWAY SAFETY TEAM**

- (3) Controlling the number, type, and importance of the **RUNWAY INCURSIONS AND EXCURSIONS**;
  - a. Distributing the safety recommendations delivered after the accident or incident investigations results, as well as other important lessons learned, for example, the operational experience and the best risk mitigation practices;
  - b. Sharing good practices in order to prevent runway incursions and excursions;
- (4) <u>HELPING</u> to verify the <u>COMMUNICATION</u> between the air traffic controllers, or the personal of the air traffic services, pilots, and vehicle drivers are acceptable, or if improvements could be implemented;
- (5) Doing <u>REGULAR REVISIONS</u> in different meteorological and lighting conditions for evaluate if all the runway entrances & visual aids are adequate, are properly based and are comprehensible for all the actors, without any possible ambiguity about their meaning, or identify airport design potential problems.

- (6) <u>UNDERSTAND THE OPERATIONAL DIFFICULTIES</u> of the staff who work in other areas, and recommend areas for improvement; When operational procedures are reviewed, it is necessary to ensure that the procedures used by the different companies at the airport are integrated and are effective, in order to minimize the risk of runway incursions. Pay special attention when examining improvement capacity runway procedures existing or proposed or the reduction noise plans involving preferential systems of the runway;
- (7) <u>LEAD INITIAL AND PERIODIC TRAINING</u> and familiarization programs sets for the runway incursions and excursion prevention, for all relevant staff (drivers and other people who operate in the manoeuvring area, pilots and air traffic services staff). These programs may include visits to the manoeuvring area to increase the knowledge of the airport layout, signs, position of the anemometers, etc., where deemed necessary.
- (8) Provide RECOMMENDATIONS BEFORE THE IMPLEMENTATION OF CHANGES in the airport, practices and procedures to identify the probability of runway incursions or excursions;
- (9) Evaluate Periodically The Effectiveness of the implemented operational solutions.



## **LOCAL RUNWAY SAFETY TEAM**



Among the LRSTs tasks should include the following, derived from the EAPPRI:

- (10) Ensure that the recommendations contained in **EAPPRI** are implemented;
- (11) Review the airport to ensure that is consistent and in accordance with the

standards and recommendations of ICAO



BARCELONA

50M

350.000 OPS

IBIZA

8M

75.000 OPS

NORTH TENERIFE

6M

70.000 OPS

GIRONA

2M

20.000 OPS

JEREZ

1M

50.000 OPS

REUS

0,5M

20.000 OPS

LOGROÑO

0,02

1.500 OPS



HOW CAN IT BE THE SAME?



**AUTHORITY ROLE IN LRSTS** 

**REGULATION 139** 

Although the aeronautical authority participation is not essential, this role is to **provide indications on aspects of Aeronautics Legislation**, participate in the **information sharing** and **understand the airport problematic** and the local dangers of airport, and to **serve as a partner with other organizations and Government entities** for the LRST benefit when necessary.





**DIFFICULTES / RISKS** 

BAD USE OF THE PRESENCE OF THE CAA

WORDS/STATEMENTS FROM THE REPRESENTATIVE







ANNUAL ATTENDING PLAN

**PREVIOUS LRST** 

**INCURSIONS** 

**INSPECTIONS** 

	COMITÉS LOCALES DE SEGURIDAD EN PISTA												
AEROPUERTO	2017           ENE         FEB         MAR         ABR         MAY         JUN         JUL         AGO         SEP         OCT         NOV										DIC		
A Coruña	ENE	FEB	WAK	ABR	25/05/2017	JUN	JUL	AGO	SEP	OCI	NOV	DIC	
Algeciras Helip.													
Alicante				26/04/2017					127/39/1497	7394749774977			
Almería						Jun-2017						Dic-2017	
Asturias						08/06/2017					Nov-2017		
Badajoz													
Barcelona - El Prat			02/03/2017			01/06/2017			28/99/2007		30/11/2017		
Bilbao			Mar-2017								99/31/2017		
Burgos			23/03/2017							26/10/2017			
Castellón			Mar-2017								07/1434/2003///		
Ceuta Helip.				26/04/2017									
Córdoba			Mar-2017		09/05/2017		Jul-2017				26/33/2037		
El Hierro												95/12/2017	
Fuerteventura		Feb-2017								19/10/2017			
Girona - Costa Brava			Mar-2017						Sep-2017				
Gran Canaria			28/03/2017			20/06/2017					//28/XX/2935///		
Granada - Jaén						Jun-2017					Nov-2017		
Huesca - Pirineos					05/05/2017	21/06/2017				24/10/2017			
Ibiza					24/05/2017					2512012017			
Jerez					10/05/2017						/X9/XX/X8XX//		
La Gomera				07/04/2017									
Lanzarote											08/33/2937		
La Palma											36/33/2933		
La Seu D'Urgell			Mar-2017						Sep-2017				
León													
l órida				15/04/2017						15/10/2017			







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How to Define & Stablish Programmes



## 1.1 DEFINITION OF A RUNWAY INCURSION

The *Procedures for Air Navigation Services* — *Air Traffic Management* (PANS-ATM, Doc 4444) defines a runway incursion as:

"Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft."

What does "incorrect presence" mean?

What does "protected area" mean?



• This is an extract coming from a presentation given by **IAN WITTER** During the EUROCONTROL Safety Forum.



Ian Witter (ACI, Heathrow)(ICAO, AOWG)(EUROCONTROL, SISG)



**2017 Safety Forum Runway Incursion scenarios** 

6<sup>th</sup> June 2017



1. Despite numerous attempts by the ATC controller, to issue a landing clearance to Flight 123 on short final, the aircraft did not receive it as it was still on the previous frequency.

Flight 123 landed with no further incident.

Is this landing a runway incursion?





2. Flight 123 landed without landing clearance being issued.

The controller had not issued it due to distraction with an imminent runway direction change.

Is this landing a runway incursion?





3. The Tower controller cleared Flight 123 to land, after visually confirming that an Airport Ops vehicle undertaking a runway inspection had vacated the runway.

ATC had not received the verbal 'runway vacated' RT message from the Ops vehicle.

There was therefore the potential for the Airport Ops vehicle, who had been conducting a Runway Inspection at the time, to re-enter the runway without seeking ATC permission.





4. Whilst waiting for departure at the holding point from runway XY at Hold AB, Flight 123 reported an engine fire. The Fire Service attended and declared that the aircraft was fit to taxi back to stand.

In order to do so, Flight 123 was cleared to enter the runway (in order to vacate at the next holding point) followed by a Fire Service vehicle, and 2 Airport Ops vehicles.

Whilst doing so, one of the Ops vehicles asked the ATC controller if the Police vehicle which was now on the runway with them, had been issued with a clearance to do so.

The controller confirmed that no Police vehicles had been cleared to enter the runway.

As Flight 123 and the accompanying vehicles vacated the runway, the Airport Ops vehicle confirmed that the runway was clear of all vehicles and available for use.

Making every journey better

Was the Police vehicle a runway incursion?





5. At night, flight 123 at runway holding position Alpha One, was given a conditional line up clearance, which was read back correctly.

The aircraft was then observed to cross the Alpha One lit stop bar, but at the correct time with respect to the conditional traffic clearance.





6. An aircraft is cleared to line up for departure on the runway.

The aircraft lines up as instructed.

To the controllers surprise the aircraft is next seen accelerating through 100kt and completes its departure.





7. An aircraft waiting at a holding point is cleared to enter the runway for departure after a landing clearance has been issued to another aircraft which is on finals.

The departing aircraft does not move as the pilot realises the situation.





8. An aircraft taxying for departure on the parallel taxiway to the runway exceeds his given clearance on the taxiway and enters the ILS Glidepath critical area.

Is this a runway incursion?





9. An aircraft is cleared to land after a departing aircraft has taken off.

The landing aircraft is overflying the threshold when the departing aircraft just gets airborne from the same runway.

Is this a runway incursion?





10. Flight 123 was waiting at the runway holding point to enter the runway for departure.

An aircraft was on finals to land.

ATC gave a clearance to Flight 123 "After the landing, line up runway XY"

The aircraft on finals carried out a go-around due to cabin insecure.

Seeing the go-around, Flight 123 entered the runway and lined up.

Is this a runway incursion?



era

Answers received during the 2017 Safety Forum



2017 Safety Forum Runway Incursion scenarios

6<sup>th</sup> June 2017

Heathrow Making every journey better

1	YES 70%	NO 30%
2	<b>YES 95%</b>	NO 05%
3	YES 30%	NO 70%
4	<b>YES 85%</b>	NO 15%
5	<b>YES 60%</b>	NO 40%
6	YES 25%	NO 75%
7	YES 05%	NO 95%
8	<b>YES 50%</b>	NO 50%
9	YES 20%	NO 80%
X	<b>YES 50%</b>	NO 50%



### What does "incorrect presence" mean?





FORMERLY,
A TABLE IN EAPPRI
2.0 EDITION

Aircraft, vehicle or pedestrian is cleared, correctly, to enter or cross a runway and proceeds as cleared, but does not read-back the clearance.		Х
Aircraft is cleared, correctly, to land or take off and proceeds as cleared, but does not read-back the clearance.		X
Aircraft lands without clearance.	Х	
Aircraft lands without clearance and evidence shows that the pilot was acting appropriately in accordance with Loss of Communication procedures due to R/T failure.		x
Aircraft takes off without clearance.	Χ	
Aircraft, vehicle or pedestrian enters runway without clearance.	Х	
Aircraft, vehicle or pedestrian is cleared to enter the runway and does so, as instructed and intended, but before the red stop bar has been "dropped". (this also applies to traffic lights where so positioned).	x	
Aircraft, vehicle or pedestrian enters the runway at the incorrect holding point.	Х	
Aircraft, vehicle or pedestrian vacates at the incorrect holding point.		Х
Controller incorrectly clears an aircraft, vehicle or pedestrian to enter or cross runway.	Х	
Controller incorrectly clears an aircraft to land or take-off.	Х	
Aircraft lines-up out of instructed sequence.	Х	

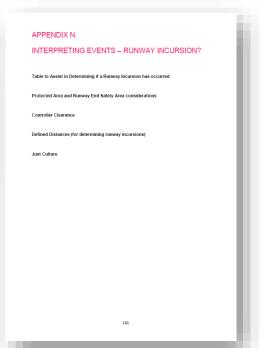


What does "incorrect presence" mean?



NOW, A NEW WHOLE
APPENDIX IN THE SOON
COMING EAPPRI 3.0
EDITON











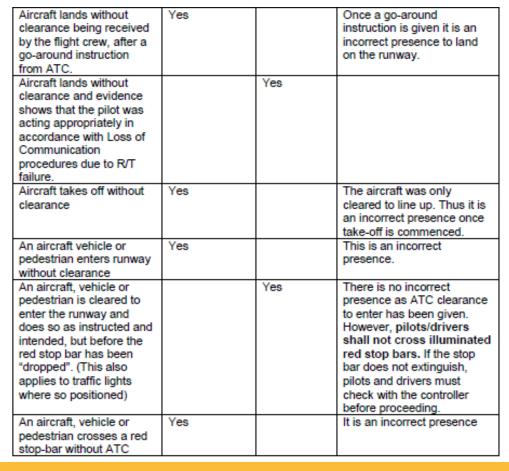


# Table to Assist in Determining if a Runway Incursion has occurred

Example	Runway Safety; Runway Incursion	Runway Safety Event; Not Incursion	Rationale
An aircraft vehicle or pedestrian is cleared correctly to enter or cross a runway and proceeds as cleared but does not read back the clearance.		Yes	There is no incorrect presence. Failing to read back does not create an incursion.
An aircraft is cleared correctly to land or take off and proceeds as cleared, but does not read back the clearance.		Yes	There is no incorrect presence. Failing to read back does not create an incursion.
Aircraft lands without clearance being issued by the controller.	Yes		This is an incorrect presence.
Aircraft lands without clearance being received by the flight crew, having been issued by ATC.		Yes	If ATC have given the clearance, there is no incorrect presence.

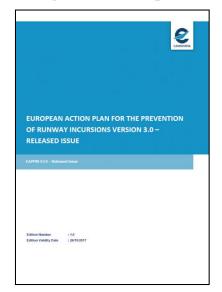








An aircraft vahicle or





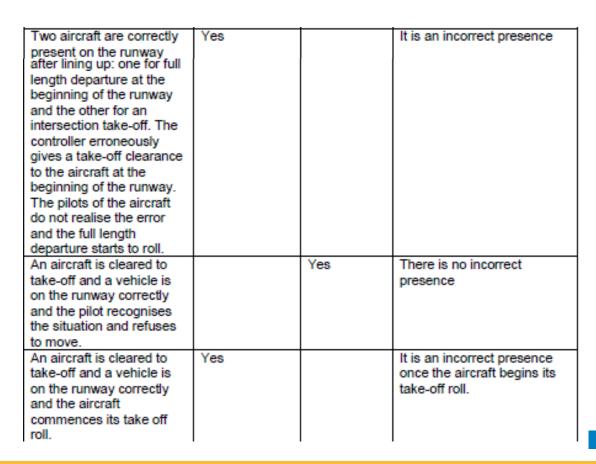
pedestrian enters runway at the inc holding point.	the		runway it is an incorrect presence.
An aircraft vehicle pedestrian vacate runway at the inc holding point.	es the orrect	Yes	There is no incorrect presence on the runway
Controller incorrectears an aircraft, or pedestrian to ecross a runway a runway is entered controller issues clearance he wou have issued if he conscious of the situation.	vehicle enter or nd the d. l.e. the a uldn't was		It is the movement onto the runway or protected area that creates the incorrect presence – not the incorrect RT transmission. The RT transmission does not mean an RI occurs at that moment.
Controller incorrectears an aircraft or take-off. I.e. the controller issues clearance he wou have issued if he conscious of the situation.	to land e a ıldn't was		It is an incorrect presence. It is the movement onto the runway or protected area that creates the incorrect presence – not the incorrect RT transmission. The RT transmission does not mean an RI occurs at that moment.
Aircraft lines up o sequence	out of Yes		It is an incorrect presence

At this location on the















Aircraft, vehicle or pedestrian crosses a red stop bar but stays outside of the protected surface of the runway (e.g. stop bar at Cat III position but Low Visibility conditions not present)		Yes	No incorrect presence on the runway or protected area. However, pilots/drivers shall not cross lit red stop bars and shall check with the controller.
An aircraft taxies up to a runway holding point and stops, with all undercarriage short of the holding point but the nose/radome is beyond the holding point.	Yes		It is an incorrect presence
During Cat III operations a vehicle enters the Cat III runway strip without ATC clearance.	Yes		It is an incorrect presence
During Cat I operations a vehicle enters the Cat I runway strip without ATC clearance.	Yes		It is an incorrect presence
A vehicle convoy is cleared by ATC to enter the runway, but the stop- bar comes back on before the last vehicle has crossed the holding point.		Yes	As the convoy was cleared to enter, there is no incorrect presence. However, pilots/drivers shall not cross lit red stop bars and shall check the status of the stop bar with the controller before proceeding.

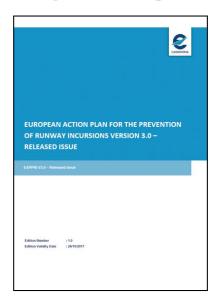






A pilot lands an aircraft on a runway NOTAM'd as closed.		Yes	If the runway is NOTAM'd as closed, it is not a runway.
Two airfield ops vehicles and 2 fire service vehicles call ATC and obtain permission to enter the runway correctly which is done. Another vehicle joins the back of the convoy without communication and 5 vehicles cross the runway.	Yes		In this example the 5 <sup>th</sup> vehicle is an incorrect presence.
At night a departing aircraft is given a conditional line up clearance at the correct holding point which is read back correctly. The aircraft enters the runway at the correct time in terms of the conditional clearance, but in doing so crosses a lit stop-bar.		Yes	There was no incorrect presence. However, pilots/drivers shall not cross lit red stop bars and shall check the status of the stop bar with the controller before proceeding.







An aircraft enters the runway correctly but faces in the wrong direction (e.g. cleared to enter runway 23 but lines-up facing 05 direction) and starts its roll.	Yes	W	It is an incorrect presence once it starts take-off roll.
The TWR controller erroneously clears an incorrect aircraft for take- off. He immediately realises his error and corrects the clearance. The aircraft does not move and remains at the holding point.		Yes	There is no incorrect presence
A helicopter flies or ground taxies along part of the runway length without clearance to do so.	Yes		It is an incorrect presence
An aircraft is cleared to enter the runway after a landing clearance has been given to another aircraft.		Yes	The RT clearance does not mean an incursion has immediately happened.
An aircraft is cleared to enter the runway and does so, after a landing clearance has been given to another aircraft.	Yes		It is an incorrect presence



















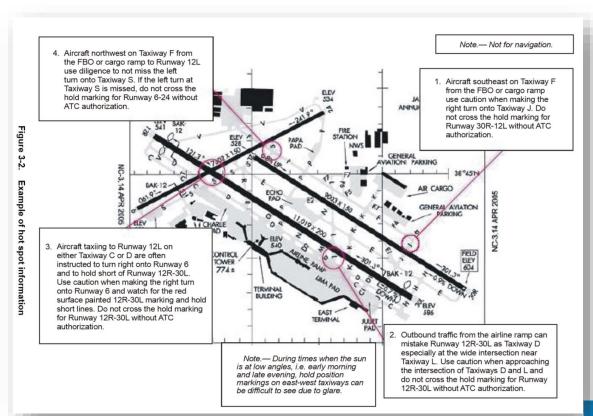






### **HOT SPOTS**

What are the main differences between a good & a bad HOT SPOT MAP?







Published hot spot information shall be clear and effective and should consider the following charting guidance:

- Each hot spot is depicted by a clear bright red circle and joined to a red label box, providing the assigned designator of the hot spot if applicable (e.g. HS1, here meaning "Hot Spot 1").
- Large tabulated textual information elaborating the action required of pilots in and around the hot spot. This may be inserted on the main aerodrome diagram or on the verso of the chart.
- Additional graphical boxes depicting the hot spots in greater detail. These additional boxes should if possible be linked to the relevant hot spot on the main aerodrome diagram, by lines or arrows.
- Publish specific hot spot pages in cases where the aerodrome diagram otherwise would be too cluttered, to present the hot spots effectively.
- Usage of a colour-coded format assisting the depiction of runways, hot spot areas and normal taxiways.



### CIRCLE + HSX

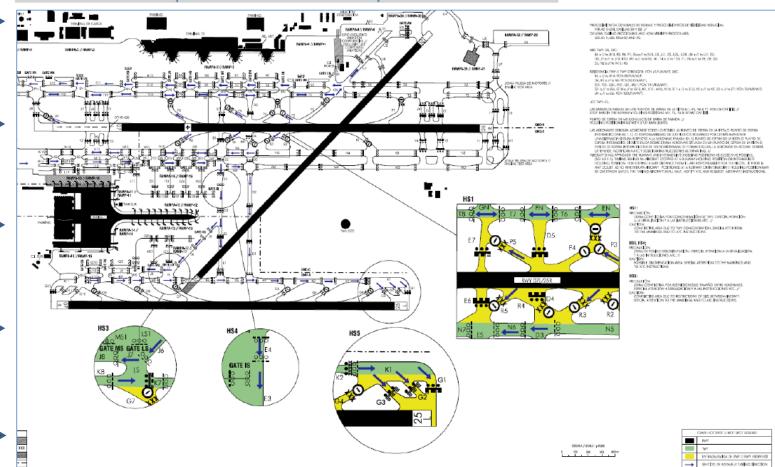
ZOOM

**TEXT** 

**COLORS** 



### Extract from Hot Spot Aerodrome Chart - published in the AIP.







Safety Case 1
Providence 2013
Multiple Runway Incursions

Safety Case 2
Charlotte Douglas 2013
Runway Incursion

Safety Case 3
Chicago O'Hare 2016
Runway Incursion

Safety Case 4 NY JFK 2017 Wingtip Clearance







Safety Programmes in Reg 139

Committees

Runway Safety Concepts

**Ground safety Concepts** 

Foreign Object Debrise (FOD)

How to Define & Stablish Programmes













VIDEO A380 VS CRJ NEW YORK WINGTIP CLEARANCE



Giant\_A380\_Colliding\_CRJ700\_\_JFK\_New\_York-1.mp4

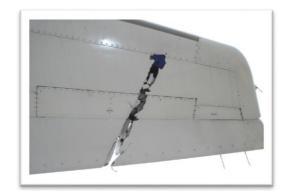
















#### Presentación

En los últimos años se han venido produciendo diversas colisiones o cuasi colisiones entre aeronaves en rodaje estando una de ellas detenida en un punto de espera y la otra rodando por las calles de rodaje adyacentes.

La División de Inspección de Aeropuertos y la Unidad de SMS de AESA constituyeron un grupo de trabajo con el sector aeroportuario español compuesto por :

- Responsables safety y operaciones de AENA
   Responsables safety y operaciones de ENAIRE
- Los principales gestores aeroportuarios
- Los principales gestores aeroportus
   Principales proveedores de TWR
- Pilotos
- Controladores de TWR,
- APROCTA

El objetivo del grupo ha sido identificar las causas y factores contribuyentes para finalmente emitir una serie de recomendaciones orientadas a la prevención de este tipo de colisiones.





#### Datos de contacto

Agencia Estatal de Seguridad Aérea

<u>Divisiones de inspecciones Aeroportuarias</u> Avenida General Perón nº 40, Puerta B, 4ª planta 28020, Madrid

ATENCIÓN TELEFÓNICA (Lunes a Viernes de 09 h a 15 h) +34 91 396 81 81 / +34 91 396 84 86

INFORMACIÓN TELEMÁTICA aeropuertos.aesa@seguridadaerea.es

PÁGINA WEB www.seguridadaerea.gob.es



Agencia Estatal de Seguridad Aérea

Buenas Prácticas Prevención de golpes entre aeronaves "Wingtip Clearance"











#### GLOBALES

# 01 Factores contribuyentes

Dificultad de percepción de distancias (tripulación y TWR)

 Exceso confianza (situación controlada). Todos los sucesos ocurren con buenas condiciones meteorológicas.



#### AC1 – aeronave parada en el punto de espera (PE)

- Distancia extra de la tripulación al PE para prevención incursión.
- No conocimiento del piloto de la posible afección a la calle de rodaje por detrás.
- Confusión entre la configuración de puntos de espera CAT I/II-III (Configuración A/B).
- Desviaciones de la AC1 respecto del eje rodaje resultantes del giro para posicionarse en PE.
- Visibilidad desde cabina de pilotaje del PE y de la Barra de Parada (AAVV y luces).



#### AC2 – aeronave en calle de rodaje adyacente

- La AC2 no tiene una referencia de calle rodaje libre que indique que los márgenes se respetan.
- 2. Desvío eje rodaje (para evitar el traqueteo).
- Actuación del piloto ante duda de distancias seguras.
- 4. Dificultad implementar restricciones operativas.

#### 1-IDENTIFICACIÓN DE PE PROBLEMÁTICOS.

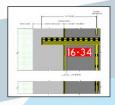
#### Identificación, por parte del Gestor Aeroportuario, de aquellos puntos del aeropuerto donde exista peligro de que puedan producirse golpes asociados a la temática Wingtip Clearance.

### 2-AUMENTAR INFORMACIÓN PROPORCIONADA EN TIEMPO REAL A LOS PILOTOS.

En los PE identificados como problemáticos se recomienda proveer información adicional mediante: Añadir a las instrucciones de ATC:

#### Instalar letreros adicionales:

- En el PE, para el AC1: "MAKE A GOOD POSITION"
- En la TWY de detrás, para el AC2: "CAUTION WINGTIP CLEARANCE"





#### 3-MEJORAR LA SEÑALIZACIÓN DE LOS PE.

La finalidad de esta medida es mejorar la visibilidad de los PE, para que los pilotos del AC1 se aproximen lo máximo posible al punto de espera sin perder la referencia visual:

- Ampliar la señal del PE (CS ADR-DSN,L.575/580) incluyendo los márgenes de la TWY.
- Ampliar las luces de la BP (CS ADR-DSN.M.730) incluyendo los márgenes de la TWY.
- Instalar luces elevadas de BP (GM1 ADR-DSN.M.730).

#### 4-ANÁLISIS DE USO OPERACIONAL.

O

N

Se debe analizar las operaciones posibles teniendo en cuenta la configuración de rodaje, la flota de aeronaves y los márgenes de seguridad, implantando un uso operacional acorde con el análisis realizado.

### 5-CAMPAÑAS DE CONCIENCIACIÓN A LOS PILOTOS

La realización de campañas de concienciación enfocadas a:

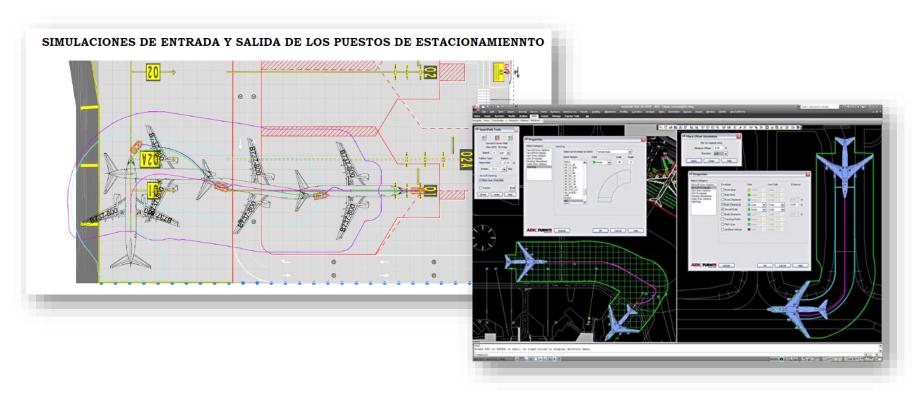
- Ubicar la aeronave muy lejos del PE puede suponer una afección a la calle de rodaje por detrás.
- En caso de duda sobre las distancias, se debe detener la aeronave.

#### 6-DISEÑO DE CALLES DE RODAJE.

Evitar, en el diseño de futuras infraestructuras, o modificación de las existentes, calles de rodaje con punto de espera de entrada a pista en ángulos distintos de 90 grados.













Safety Programmes in Reg 139

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Runway Safety Concepts

**Ground safety Concepts** 

Foreign Object Debrise (FOD)

How to Define & Stablish Programmes





U.S. Department of Transportation Federal Aviation Administration

### Advisory Circular

Subject: Airport Foreign Object Debris Date: 9/30/2010 AC No: 150/5210-24 (FOD) Management Initiated by: AAS-100 Change:

- PURPOSE. This advisory circular (AC) provides guidance for developing and managing an airport foreign object debris (FOD) program. In addition, this AC provides specifications for the equipment used in FOD removal operations.
- SCOPE. The program described herein is composed of four main areas: prevention: detection; removal, and evaluation. Each of the four areas (corresponding to a dedicated chapter in this AC) contains strategies and practices that can help reduce FOD at airports.

The guidance in this AC is particularly applicable to airport owners and operators, air carrier station managers, and general aviation operators. Individuals in these positions may then be able to communicate to apron crews, maintenance technicians, and aircraft servicing personnel the safety hazards posed by FOD.

The FOD management guidelines presented in this AC are advisory and can be implemented at the discretion of the airport operator in accordance with the airport operator's approved Airport Certification Manual

- CANCELLATION. AC 150/5380-5B, Debris Hazards at Civil Airports, dated 7/5/96, is canceled.
- 4. APPLICATION. The Federal Aviation Administration (FAA) recommends the guidance and specifications in this Advisory Circular for developing and managing an airport FOD management program. In general, use of this AC is not mandatory. However, use of this AC is mandatory for the acquisition of FOD removal equipment through the Airport Improvement Program (AP) or the Passenger Facility Charge (PFC) Program. See Grant Assurance No. 34, Policies, Standards, and Specifications, and PFC Assurance No. 9. Standards and Specifications.





U.S. Department of Transportation Advisory Circular

Federal Aviation Administration

Subject: Airport Foreign Object Debris (FOD)
Date: 09/30/2009
AC No: 150/5220-24
Initiated by: AAS-100
Change:

- PURPOSE. This advisory circular (AC) provides information that airports can use to procure foreign object debris (FOD) detection equipment.
- SCOPE. This AC contains minimum performance specifications for systems and equipment that
  detect foreign objects on sixport. Four types of detection systems are discussed, including: stationary
  radar; stationary electro-optical; stationary hybrid radar and electro-optical; and mobile radar.

This AC is based on research conducted by the Federal Aviation Administration's (FAA's) Airport Technology Research and Development Program and Center of Excellence in Airport Technology (CEAT) to examine the performance of several new FOD detection technologies.

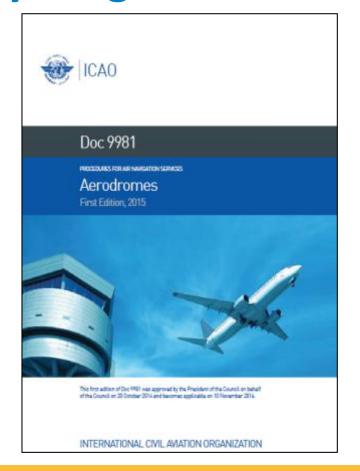
- APPLICATION. The FAA recommends the guidance and specifications in this Advisory Circular for procuring airport FOD detection equipment. In guarant, use of this AC is not mandatory. However, it is mandatory for all FOD detection equipment equired through the Airport Improvement Program (AIP) or the Passuager Facility Charge (PFC) Program. See Grant Assurance No. 34, Policies, Sandards and Secretifications, and Assurance No. 3, Sandards and Secretifications.
- 4. COMMENTS OR SUGGESTIONS for improvements to this AC should be sent to:

Manager, Airport Engineering Division (AAS-100) ATTN: FOD ENGINEER Federal Aviation Administration 800 Independence Avenue SW Washington DC 20591

Michael J. O'Don

Director of Airport Safety and Standards





**EASA** 

#### CHAPTER 5

#### FOREIGN OBJECT DEBRIS (FOD) CONTROL

#### 5.1 GENERAL

- 5.1.1 The presence of FOD on the movement areamaypose a significant threat to the safety of aircraft operations. FOD has the potential to damage aircraft during critical phases of light, which can lead to catstrophic loss of life and airframe, and increased maintenance and operating costs. FOD hazards can be reduced through the implementation of a FOD control programme, which would normally include FOD prevention, detection, removal and evaluation.
- 5.1.2 It is important that all personnel with access to the movement area understand their role in the prevention of FOD. FOD control is normally a module of the initial training given to personnel with access to the movement area.
- 5.1.3 It is necessary to have a process to regularly clear the movement area of FOD. Removing FOD is the responsibility of everyone.
- 5.1.4 FOD may be controlled by ensuring that all personnel with movement area access, in particular inspection and maintenance personnel and ground handlers are aware of situations which may potentially cause FOD.

#### 5.2 OBJECTIVES

- 5.2.1 Aerodrome operators shall establish a FOD control programme commensurate with the identified risks and appropriate to the local operating conditions. The programme shall consist of prevention, detection, removal and evaluation.
- 5.2.2 FOD prevention shall include awareness, training and education as well as measures for FOD prevention.
- 5.2.3 The detection of FOD shall include methods for the monitoring and inspection of the movement area.
- 5.2.4 Operational procedures and, where applicable, equipment shall be provided for the removal, containment and disposal of FOD from the movement area.
- 5.2.5 Data and information about FOD shall be collected and analysed regularly to identify sources and assess trends.

#### 5.3 OPERATIONAL PRACTICES



Awareness & Safety Culture (WHAT it is & What do I do?, Training)



Detection and Prevention (WHERE they are or can come from?, Inspection)



Incident Analysis (WHY did it happened?, Specific Report)



Safety Actions
(HOW and WHO is going to fix it, Action Plan)



Continuous Awareness (WHEN You see it, Campaigns)





	FAA		EASA
FOD Program specifications	Detailed in a specific AC. Including its elements, requirements		Brief mention in the legislation. Included in the SMS
	and main characteristics		
FOD Manager	Defined roles in the legislation (AC)		Figure not included in the legislation
FOD removal operations	Detailed in a specific AC. Including its elements and requirements		No specific requirements in legislation. International practices
Equipment specifications	Detailed technical specifications in legislation. A specific AC	i	No specific requirements in legislation or additional material
			Chandand training for an auring safety
Training	Particularized requirements in legislation		Standard training for ensuring safety and specific programs in the airports.



# NATIONAL TEHCNICAL INSTRUCTION FOD CONTROL PROGRAMME

**FOD CONTROL POLICY** 

**FOD CONTROL MANAGER** 

**FOD CONTROL COMITEE** 



Safety Culture (WHAT it is & What do I do?, Training)

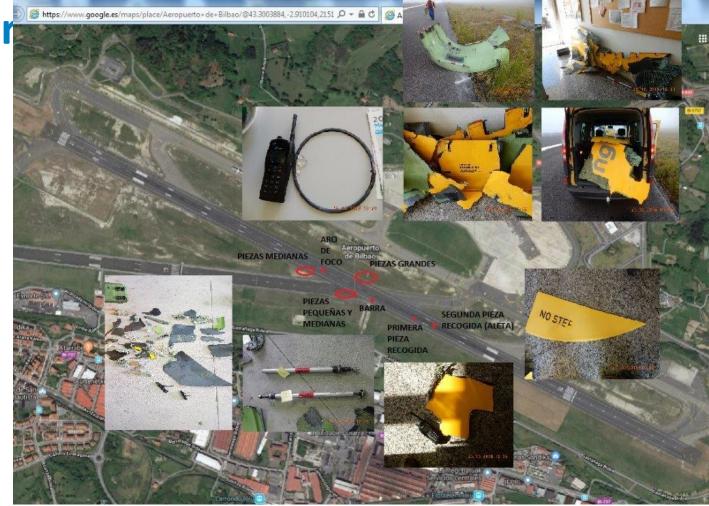
FOD can be composed of any material. It is important to use the correct description so that source areas can be identified and mitigation measures taken. FOD may include the following:

- a) aircraft and engine fasteners (nuts, bolts, washers, safety wire, etc.);
- b) aircraft parts (fuel caps, landing gear fragments, oil sticks, metal sheets, trapdoors, and tyre fragments);
- c) mechanics' tools;
- d) catering supplies;
- e) personal items (personnel badges, pens, pencils, luggage tags, drink cans, etc.);
- f) apron items (paper and plastic debris from catering and freight pallets, luggage parts, and debris from ramp equipment);
- g) runway and taxiway materials (concrete and asphalt chunks, rubber joint materials, and paint chips);
- h) construction debris (pieces of wood, stones, fasteners and miscellaneous metal objects);
- i) plastic and/or polyethylene materials;
- j) natural materials (plant fragments, inanimate wildlife and volcanic ash); and
- contaminants from winter conditions (snow, ice).



**Safety Progr** 

BIO – Incidente FOD VLG 25/10/18

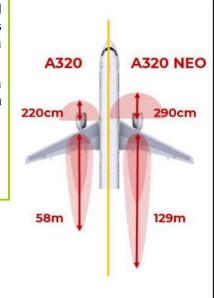




Se ha detectado que las aeronaves con motores **CFM International LEAP-1A** necesitan unas áreas de seguridad de los motores significativamente superiores a las necesarias con otro tipo de motor y a las consideradas en la Normativa de Seguridad en Plataforma (NSP).

Así, la comparativa de las distancias de seguridad respecto a la motorización con CFM56 en régimen IDLE THRUST y a la NSP es la siguiente:

Motorización	CFM56	LEAP-1A	NSP
Distancia de seguridad posterior al motor	58 m	129 m	50 m





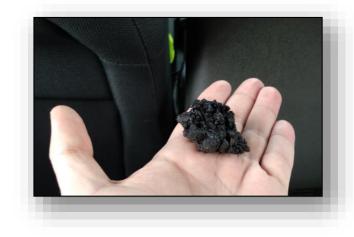


APPENDIX A

#### FOD TRAINING



- a) Safety of personnel and passengers as related to FOD;
- b) Overview of the FOD control programme in place at the aerodrome;
- c) Causes and principal contributing factors of FOD;
- d) The consequences of ignoring FOD, and/or, the incentives of preventing FOD;
- e) Practicing clean-as-you-go work habits, and the general cleanliness and inspection standards of work areas;
- f) FOD Detection procedures, including the proper use of detection technologies (if applicable);
- g) Requirements and procedures for regular inspection and cleaning of movement areas;
- h) FOD Removal procedures;
- Proper care, use, and stowage of material and component or equipment items used around aeroplane while in maintenance or on aerodrome surfaces;
- j) Control of debris in the performance of work assignments (e.g. loose items associated with luggage, ramp equipment and construction materials);
- k) Control over personal items and equipment;
- 1) Proper control/accountability and care of tools and hardware;
- m) How to report FOD incidents or potential incidents; and
- n) Continual vigilance for potential sources of hazardous FOD.





Detection (WHERE they are or can come from?, Inspection)

### F@D CRITICAL AREA

#### FOD DETECTION

#### 1. FOD Detection Operations

Operational areas are inspected as described in Part 2 Chapter 3, with additional inspections being made in construction areas and immediately after any aircraft or ground vehicle accident or incident or any spill of material to ensure all FOD has been detected and removed.

In addition to the above it is good practice for personnel on the movement area to employ a clean-as-you-go technique of looking for FOD in the course of their regular duties. When inspections occur at night, after the runway is closed or before the runway is opened, additional lights/lighting systems on vehicles are beneficial to better detect FOD.

It is normal for vehicles to be driven on clean, paved surfaces when possible. If a vehicle must be driven on unpaved surfaces, the driver has a responsibility to ensure the vehicle's tyres do not transport FOD (e.g. mud or loose stones) back on to the pavement.



Detection (WHERE they are or can come from?, Inspection)

#### FOD DETECTION

#### 2. Methods and Techniques of FOD detection



#### Detection Technologies

Recent technological developments have expanded the capabilities of FOD detection through automation. Advanced technologies are now available for automated FOD detection, including capabilities for continuous monitoring on runways and other aircraft movement areas to supplement the capabilities of aerodrome personnel.

If an aerodrome chooses to implement these new FOD detection technologies, procedures should be established with the Air Traffic Control (ATC) services to ensure that appropriate and timely action is taken if FOD is detected.

The aerodrome operator should have considerable flexibility in terms of how to implement continuous detection systems at the aerodrome. The user interface may be located in the aerodrome's operation or maintenance centre, and/or it may be located in the ATC tower.



Detection (WHERE they are or can come from?, Inspection)



Regardless of the configuration, an aerodrome operator will determine the most efficient way to notify aerodrome personnel to remove the detected FOD, as well as the ATC staff to take appropriate action if a significant risk is presented.

When using continuously operating FOD detection technologies on a runway a decision on the appropriate action to be taken has to be made once an object is detected. If the location or characteristics of the FOD present no immediate safety hazard the object should be removed as soon as the operational schedule permits. If the location or characteristics of the FOD present an immediate safety hazard, provisions in the FOD management program should clearly indicate that a hazard exists and allow for an action to be taken that may lead to the temporary cessation of the runway operations.

Although not all types of FOD will necessitate an immediate runway closure, a prompt decision is needed in all cases, to assess the hazard posed by FOD. Aerodromes should establish procedures for handling such matters in cooperation with their ATC services.



Detection (WHERE they are or can come from?, Inspection)

## FOD Detection Technologies Performance Evaluation - Locations

- Stationary Radar @ PVD
- Stationary Hybrid @ BOS
- Stationary Electro-Optical @ ORD
- Mobile Radar @ ORD, HNL













#### Detection (WHERE they are or can come from?, Inspection)

- (1) How the FOD object was detected
- (2) Date and time of FOD detection and retrieval
- (3) Description of FOD retrieved (category, size, color), and/or image (if available)
- (4) Location of FOD object (coordinates and reference to the AOA location)
- (5) Possible source
- (6) Name of personnel detecting / investigating FOD item
- (7) Airport operations and weather data during the FOD detection event







Safety Actions (HOW and WHO is going to fix it, Action Plan)

#### 1. FOD removal equipment



#### Mechanical systems

Types of mechanical removal systems may include:

a) Power Sweepers. The sweeper removes debris from cracks and pavement joints, and is typically used in all of the movement area.

Note: For all brush systems, operators are cautioned that bristles can detach from brooms and produce a FOD source. Brushes made with metal bristles or spines are not recommended to be used for FOD removal purposes. Plastic or combination plastic/metal bristles may be appropriate, but the user should consult the equipment manufacturer for specific recommendations.

- b) Vacuum Systems. These systems perform FOD removal functions similar to the power sweepers described above. The systems may also perform in conjunction with mechanical brooms or other recirculation air units.
- c) Jet Air Blowers. These systems move FOD and other debris by directing a stream of high velocity air towards the pavement surface. When used in the aerodrome environment, it is recommended that these systems incorporate a debris collection mechanism so that FOD will not simply be relocated to another area.



#### 1. FOD removal equipment



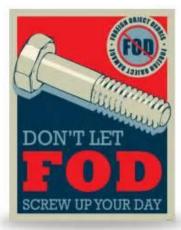
#### Non mechanical systems

- a) Friction Mat Sweepers. A rectangular assembly towed behind a vehicle that employs a series of bristle brushes and friction to sweep FOD into sets of capture scoops, which are covered by a retaining mesh to hold collected debris.
- b) Magnetic Bars (attached to vehicles). These bars can be suspended beneath tugs and trucks to pick up metallic material. However, the bars should be cleaned regularly to prevent them from dropping the collected debris. Magnetic bars are not able to pick up the following types of common FOD materials: titanium, aluminium alloys and some stainless steels.
- c) Rumble strips (also known as "FOD Shakers"). While these devices may have been used in the past, they are no longer a widely accepted FOD removal system. Their effectiveness at removing debris from tires or vehicle undercarriages is negligible, and the equipment can generate its own FOD if not cleaned out regularly.



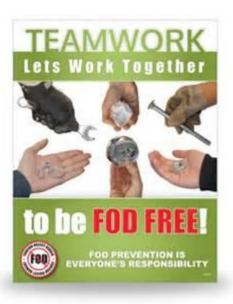


Continuous Awareness (WHEN You see it, Campaigns)











#### Follow Up (WHEN and HOW MUCH?, Safety Indicators)

Comité Local de Seguridad en Pista

#### 4. Indicadores de Seguridad Operacional en pista

#### INDICADOR DE FOD EN PISTA.



Respecto a los FODs en pista durante los cinco primeros meses del año 2017, solo se ha producido incumplimiento en el mes de MARZO, llegándose exclusivamente al nivel de referencia.

Analizando la tendencia de 2017 no es posible determinar un patrón o justificación relativa a ningún tipo concreto de FOD en una misma pista, por lo que se consideran hechos puntuales y con un origen diverso. Estos incidentes son tratados individualmente en caso de ser graves a través del MAD-PGS-04.

Durante el 2015 y el 2016 se implantaron las medidas en prevención de FOD contempladas en el Programa de Prevención de FOD probándose eficaces durante los primeros 3 meses de 2017.

Dicho programa debe ser revisado en 2017 para fijar nuevas medidas y/o objetivos.







TORREJON DE ARDOZ MADRID

17 OCT 2017

F-18

1 CASUALTY









Safety Programmes in Reg 139

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Foreign Object Debrise (FOD)

How to Define & Stablish Programmes





LOCAL (Aerodrome Operators)



National (Aerodrome Authority)

#### **Runway Safety**





#### **FOD**





#### **Apron Safety**

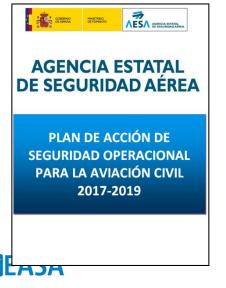






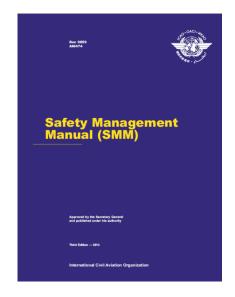
National (Aerodrome Authority)



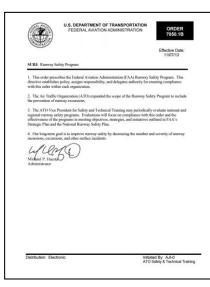












LOCAL
(Aerodrome Operators)

National (Aerodrome Authority)

APPROACH 1 (DOC.9870)

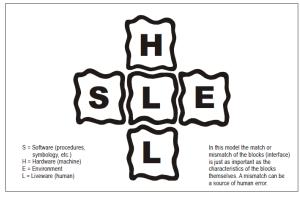


Figure 2-1. The SHEL Model

**BASED IN INTERFACES** 

APPROACH 2 (ANNEX 19)

safety policy and objectives;

safety risk management;

safety assurance; and

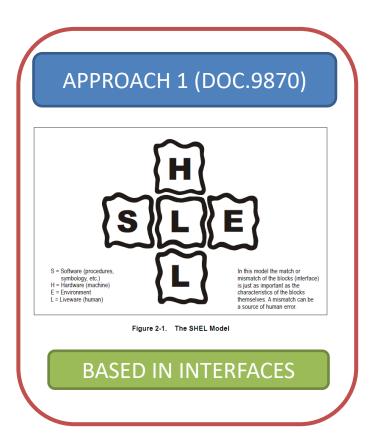
safety promotion.

**BASED IN STEPS** 



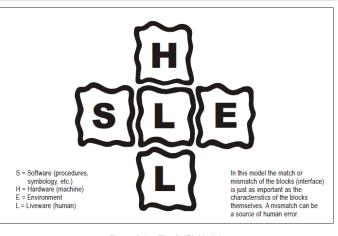
LOCAL
(Aerodrome Operators)

National (Aerodrome Authority)





#### What we have NOW



### NEEDS



#### What we WANT

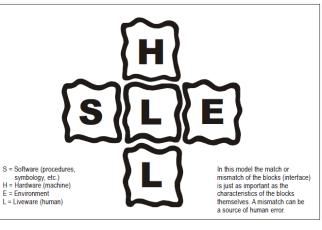


Figure 2-1. The SHEL Model

Figure 2-1. The SHEL Model

LOCAL (Aerodrome Operators)

National (Aerodrome Authority)



#### **SOFTWARE**

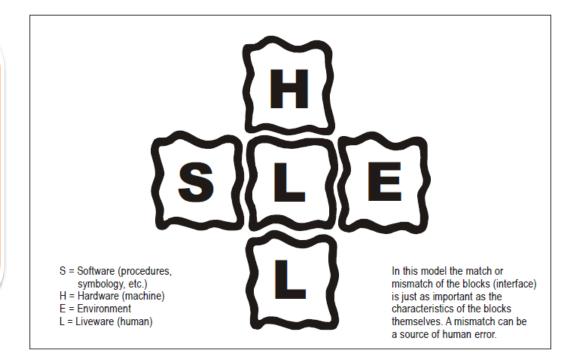


Figure 2-1. The SHEL Model



#### **SOFTWARE**





#### **SOFTWARE**





#### **SOFTWARE**

DATA BASE (NATIONAL/ADR)

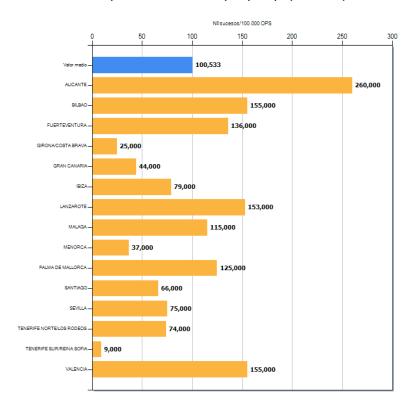
REPORTING SYSTEM (NAT/ADR)

AIS (NAT/AIS)

REGULATION (NAT/ADR)

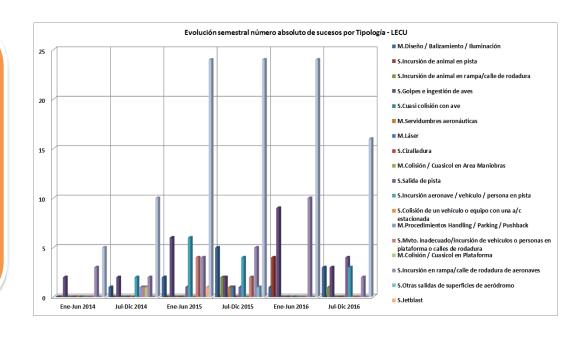
GUIDANCE MATERIAL (NAT/ADR)

Tasa sucesos reportados Presencia de obstáculos FOD por aeropuerto España (Enero'16-Enero'17)





#### **SOFTWARE**





#### **SOFTWARE**

DATA BASE (NATIONAL/ADR)
REPORTING SYSTEM (NAT/ADR)
AIS (NAT/AIS)
REGULATION (NAT/ADR)
GUIDANCE MATERIAL (NAT/ADR)



NOTAM Summary (Series A) for July 2019

NOTAM Summary (Series B) for July 2019

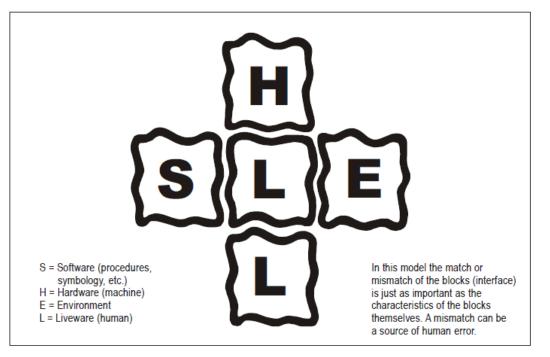
IS IT FREE?

Yangon 11021, Myanma

ACCURACY?

LANGUAGES?



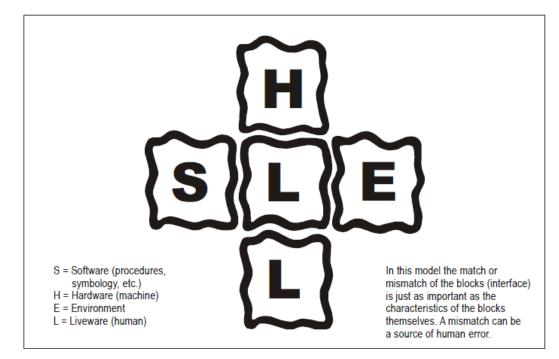


#### **HARDWARE**

SURVEILLANCE (NAT/ADR)
GUIDANCE (NAT/ADR)
COMMUNICATION (NAT/ADR)
METEOROLOGY (NAT/ADR)
TECHNOLOGY (NAT/ADR)

Figure 2-1. The SHEL Model



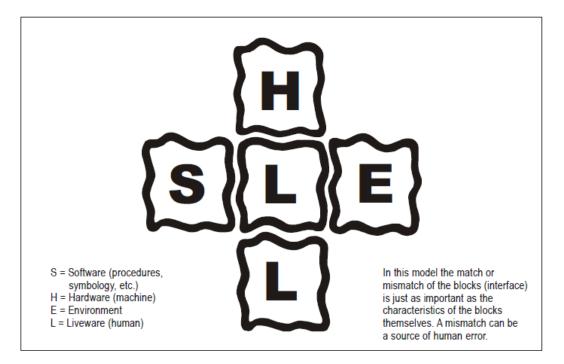


#### **ENVIROMENT**

SURROUNDINGS (NAT/ADR)
METEOROLOGY (NAT/ADR)
WILDLIFE (NAT/ADR)

Figure 2-1. The SHEL Model





#### **LIVEWARE**

WILDLIFE (NAT/ADR)

STAFF (NAT/ADR)

OTHER HUMANS (Pilots, ATCOs,

ADR Staff, etc)

Figure 2-1. The SHEL Model



#### APPROACH 1 (DOC.9870)

LOCAL (Aerodrome Operators) **National** S = Software (procedures, In this model the match or

symbology, etc.)

H = Hardware (machine)

L = Liveware (human)

Figure 2-1. The SHEL Model

**BASED IN INTERFACES** 

mismatch of the blocks (interface)

themselves. A mismatch can be a source of human error.

is just as important as the

**EXAMPLE WITH RWY** 

#### **APPROACH 2 (ANNEX 19)**

safety policy and objectives; safety risk management; safety assurance; and safety promotion.

**BASED IN STEPS** 

**EXAMPLE WITH RWY** 



(Aerodrome Authority)

LOCAL (Aerodrome Operators)

National (Aerodrome Authority)

#### APPROACH 2 (ANNEX 19)

safety policy and objectives;

safety risk management;

safety assurance; and

safety promotion.

**BASED IN STEPS** 



safety policy and objectives;

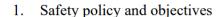
safety risk management;

safety assurance; and

safety promotion.

LOCAL (Aerodrome Operators)

National (Aerodrome Authority)



- 1.1 Management commitment and responsibility
- 1.2 Safety accountabilities
- 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

#### 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



safety policy and objectives;

safety risk management;

safety assurance; and

safety promotion.

LOCAL (Aerodrome Operators)

National (Aerodrome Authority)

(Aerodrome Operators)

- 1. State safety policy and objectives
  - 1.1 State safety legislative framework
  - 1.2 State safety responsibilities and accountabilities
  - 1.3 Accident and incident investigation
  - 1.4 Enforcement policy
- 2. State safety risk management
  - 2.1 Safety requirements for the service provider's SMS
  - 2.2 Agreement on the service provider's safety performance
- State safety assurance
  - 3.1 Safety oversight
  - 3.2 Safety data collection, analysis and exchange
  - 3.3 Safety-data-driven targeting of oversight of areas of greater concern or need
- 4. State safety promotion
  - 4.1 Internal training, communication and dissemination of safety information
  - 4.2 External training, communication and dissemination of safety information



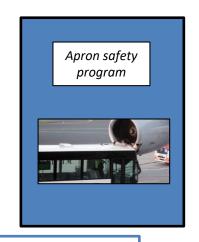


LOCAL (Aerodrome Operators)

National (Aerodrome Authority)



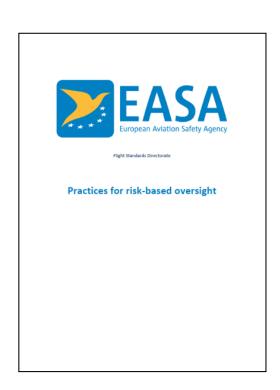


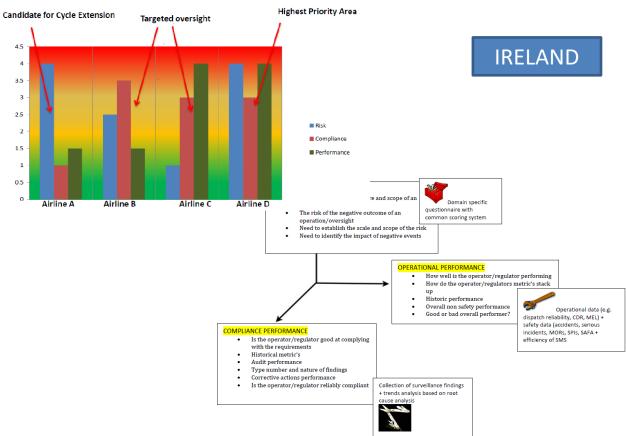


OK, VERY WELL DEFINED, BUT IS THIS BEING EFFECTIVE?

IN OTHER WORDS......
HOW CAN I PROVE TO MY BOSS THAT THIS IS WORKING?

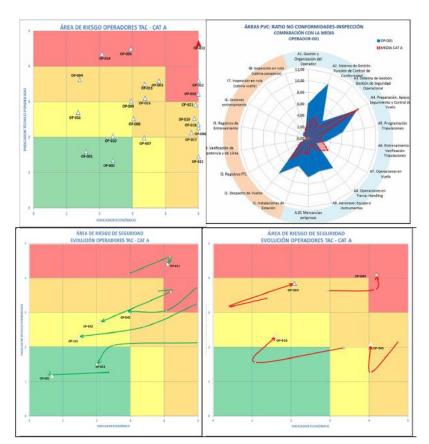








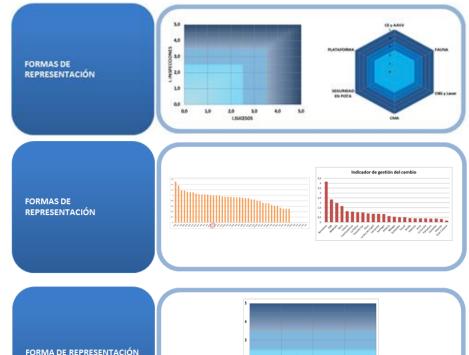




**SPAIN** 



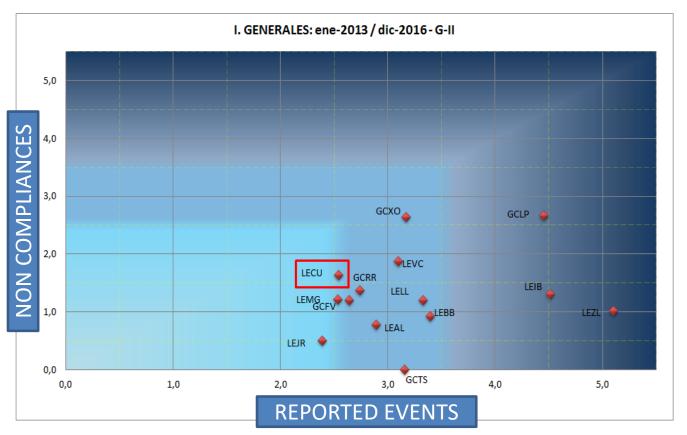






**SPAIN** 







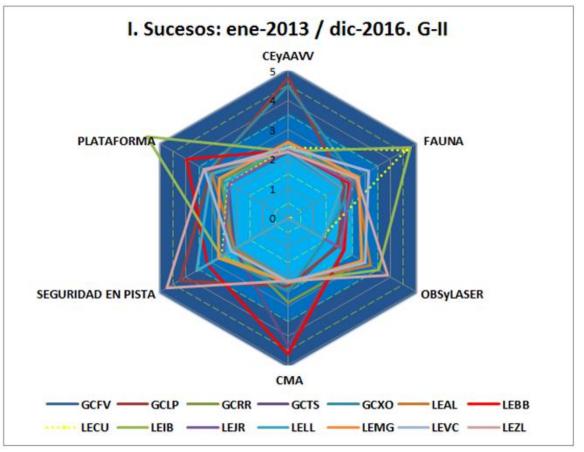


COMBINED INDICATORS

OPERATIONAL FOCUSED

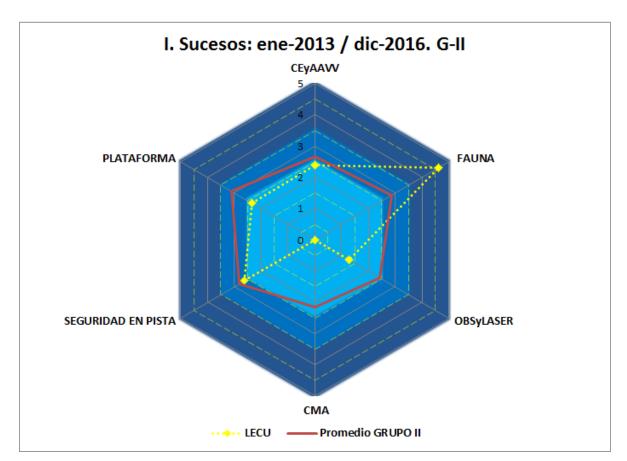
AIRPORTS COMPARED







1 AIRPORT
VS
DE AVERAGE OF ITS
AIRPORTS GROUP

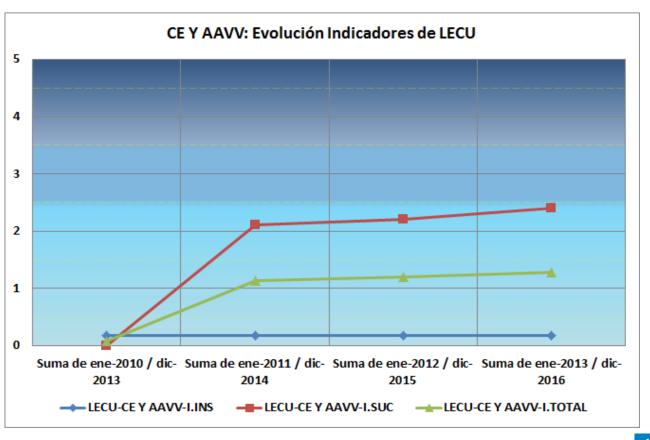






INDICATORS EVOLUTION

RISK AREAS FOCUSED













#### **END**

Thanks for your attention!!

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