Runway Incursion

Safety Risk Assessment

Version 1.0 July 2024

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Fact Sheet

Safety Issue			
Runway Incursion			
Regional Exposure	**All Regions**	**Sector Exposure**	**Industry Wide**
Key Risk Area	**Runway Safety**	**Proximity**	**Current**

Issue Description

The incorrect presence of an aircraft, vehicle, person or animal within the runway protected area, with the potential to lead to a collision on the ground.

Safety Risk Assessment Purpose and Scope:

The purpose and scope of this risk assessment is to assess the runway incursion safety issue using a generic bow tie risk model to identify threats, consequences and risk controls. The generic model should be tailored to an individual operators' scope of operation. At the 32nd Safety Issue Review Meeting, IATA committed to continue to develop safety models relating to Runway Safety and share with the industry.

Links are identified between the risk controls (mitigations) and IOSA Standards and Recommended Practices (ISARPs).

Further supplementing the risk controls are links to the Global Action Plan for the Prevention of Runway Incursions (GAPPRI) recommendations. This provides key information on how the implementation of recommendations can strengthen the effectiveness of the risk controls. The GAPPRI recommendations are not only addressed to operators but industry more widely, with the content validated by IATA.

The Safety Risk Assessment presents a number of recommendations to operators.

The full bow tie model is contained in Annex A and is made available in both MS Visio and BowTieXP files in the Safety Issue Hub. The risk control register is also provided as a complementary MS Excel file.

Recommendations Summary

To address runway incursions, IATA invites operators to:

- Complete a risk assessment for runway incursion, tailoring this generic risk assessment to your own operation, and regularly review it.
- Supported by IATA's GAPPRI Gap Analysis Tool, conduct a gap analysis of your organization's Runway incursion safety program to understand the organization's current position regarding the Global Action Plan for the Prevention of Runway Incursions (GAPPRI).
- Develop and implement a plan to align your runway incursion safety program with GAPPRI recommendations based on your needs, organizational capability and risk appetite.
- Re-enforce the importance to crews to report runway safety events.
- Establish leading and lagging safety performance indicators to monitor the effectiveness of risk controls and precursors (near misses) to runway incursion and actual incursion events.
- Consider and implement approaches to assess the risk controls of third parties that mitigate the risk of runway incursion where your aircraft operate, prioritising your hubs/major destinations.
- Participate in runway safety teams at strategic aerodromes based on factors such as the number of operations (e.g. home base) and incursion trends.
- Operators are also encouraged to review the ICAO Runway Safety Programme - Global Runway Safety Action Plan.

Bowtie as a Risk Assessment Methodology

One effective way to manage risk is using the bowtie model. This model is useful in identifying and mapping potential threats and unsafe operational states that could lead to undesirable consequences. In addition, the bowtie model also considers the safety controls that can help organizations mitigate the risk of undesirable outcomes.

Leveraging the different components of the bowtie model, organizations can attain a comprehensive overview of potential safety risks, allowing them to take proactive measures to prevent occurrences.

The runway incursion safety issue has been split into three individual bow tie models, covering an incursion by: i) an aircraft, ii) a vehicle and iii) people/animals. These models have been produced by multi-disciplinary teams and validated by IATA members.

Runway Incursion – Incorrect presence of an aircraft

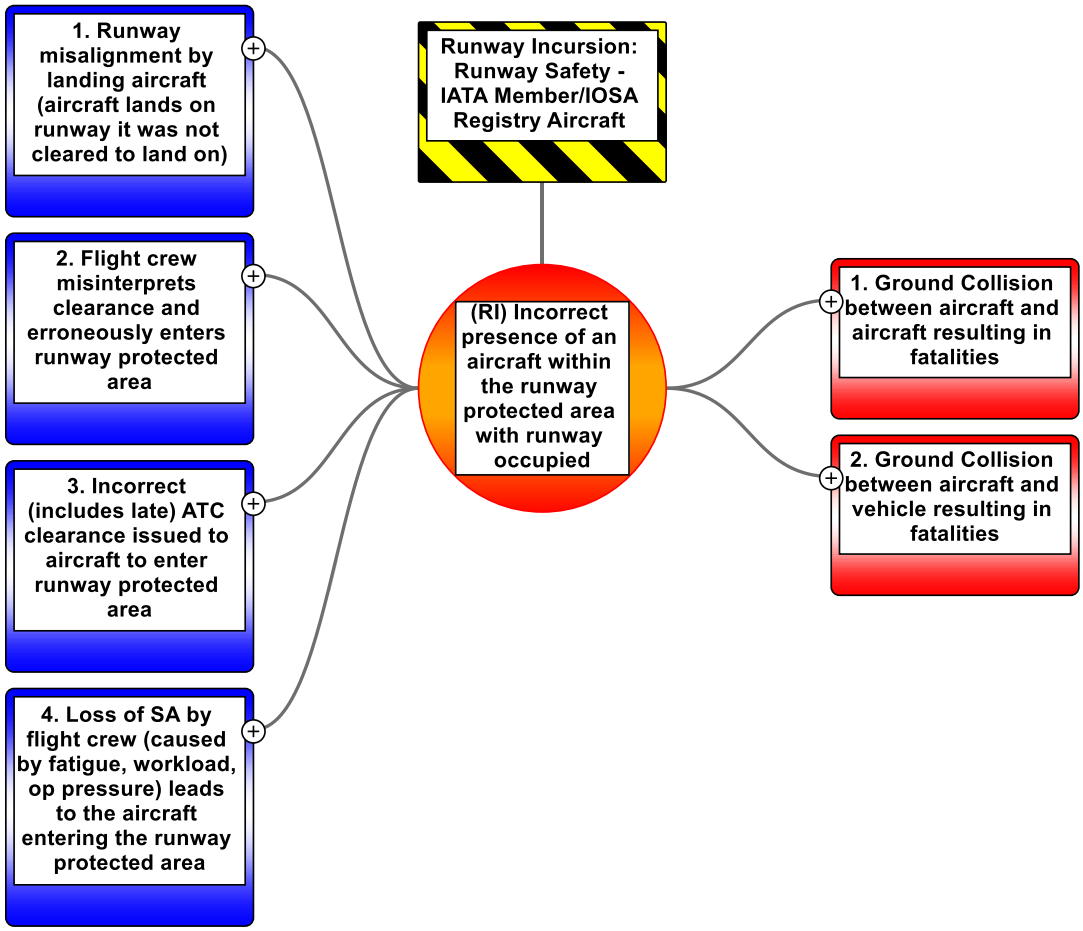


Figure 1 Runway Incursion Bow Tie Risk model – incorrect presence of an aircraft

Runway Incursion – Incorrect presence of a vehicle

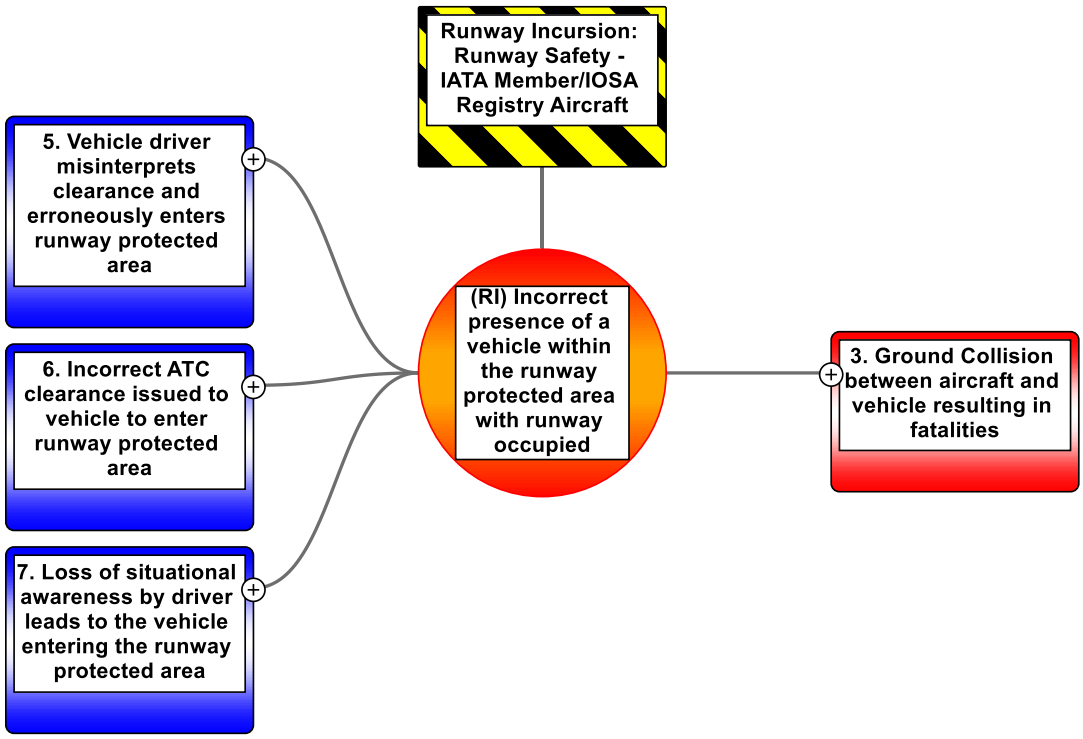


Figure 2 Runway Incursion Bow Tie Risk model – incorrect presence of a vehicle

Runway Incursion – Incorrect presence of a person/animal

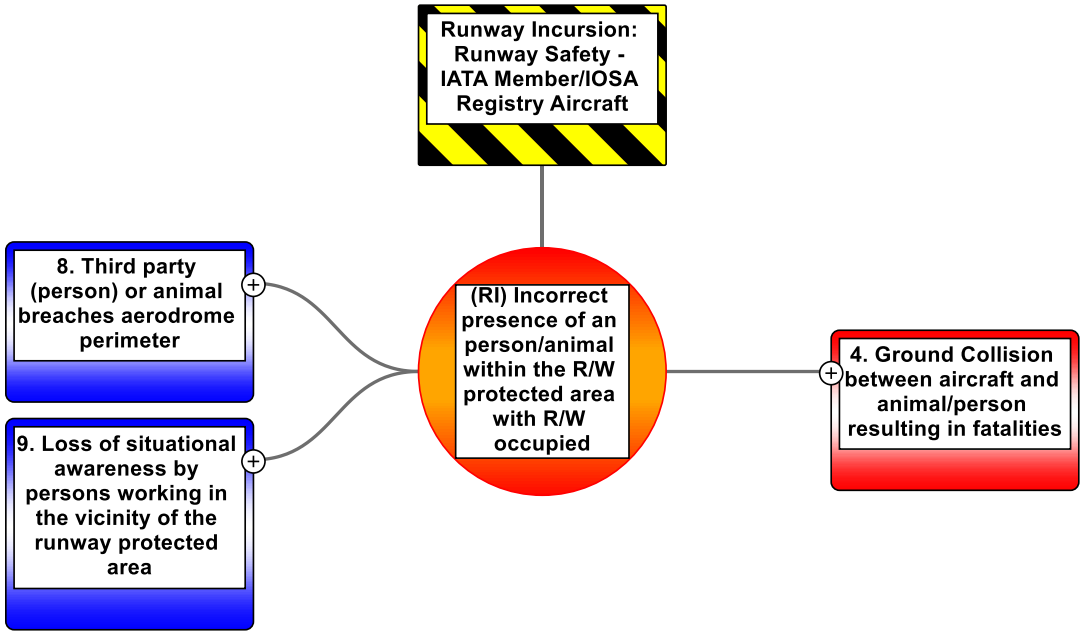


Figure 3 Runway Incursion Bow Tie Risk model – incorrect presence of a person/animal

Managing Risk - How to use bow ties as an effective tool.

A bowtie is a tool used in risk management that helps safety practitioners describe, depict, and comprehend the safety risk landscape of specific operational scenarios. When a bowtie is completed, it gives a tailored overview of the risk and provides a framework for targeting data collection to improve the risk management strategy.

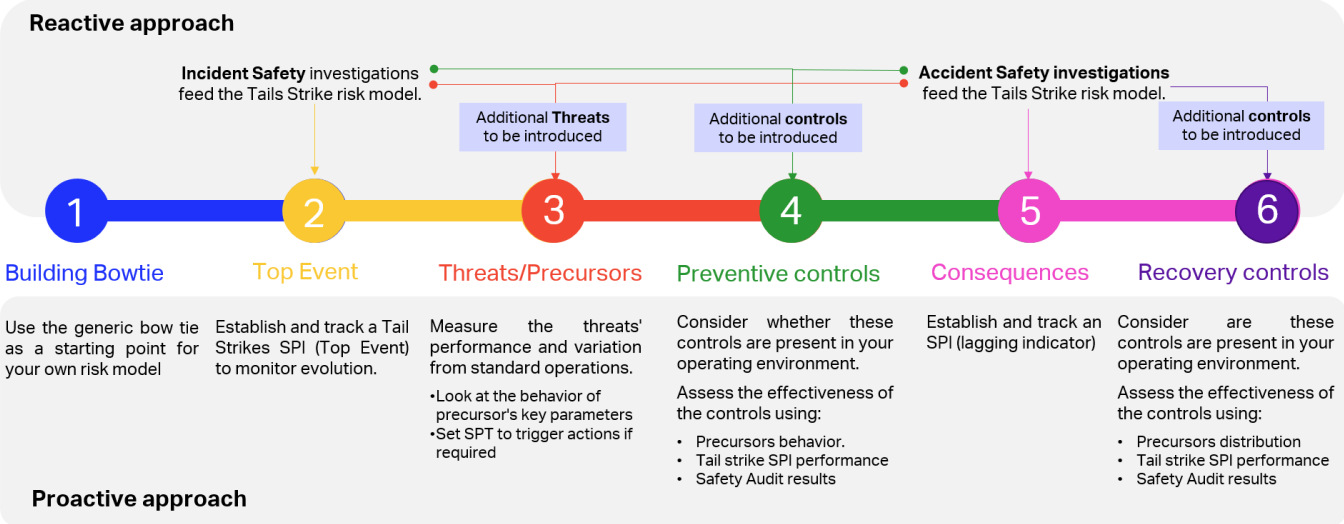


Figure 4 How to use a Bowtie.

Call to action. To ensure effective risk management, organizations are encouraged to build their risk model using Bowtie or other appropriate risk analysis methods. The risk model provided in this document should be used as a general reference only.

Consideration. Sometimes proactive safety management is thought of as only identifying *non-compliance* and *unreported hazards*. However, solely focusing on these activities still results in a reactive approach. Truly proactive safety management involves collecting data and analyzing operations to uncover trends and identify patterns and relationships to transform data into safety knowledge. It allows risk management to evolve from a reactive to a proactive data-driven approach, as outlined below.

Hazard

The Hazard is defined as having the potential to lead to unsafe operational state, loss, or damage. This risk assessment considers worldwide runway operations for IATA member aircraft/IOSA registered carriers.

Top Event

The Top Event is a point in time that describes the organization's loss of control over a hazard resulting in an unsafe operational state or undesired safety state. Therefore, this risk assessment outlines incorrect presence of an aircraft, vehicle, person or animal within the runway protected area as the top event, with the runway already occupied.

The bowtie risk model is considered a snapshot of the risk at a given time. However, when combined with the appropriated Safety Performance Indicators (SPI), it becomes a dynamic analysis tool that helps to make informed decisions, ensure appropriate management strategies, and address resource allocation.

Call to action Establish and track the Top Event - Incorrect presence of an aircraft within the runway protected area SPI to monitor its evolution. For your major hubs, to additionally track incursions by third party aircraft, vehicles, people, and animals.

Consideration. Monitoring runway incursions is a reactive approach since it only considers the unsafe operational state after it has occurred.

However, this SPI is still an essential parameter to identify runway incursion as an emergent safety issue. It will prompt further risk model analysis when frequency of occurrence deviates from the organization's objectives.

Furthermore, it provides a valuable data point that can be used to assess the preventive control's effectiveness against the threats or precursors.

Threats

Threats are the potential cause of a top event. Also described as a precursor to an undesired safety state. In the context of this risk assessment runway incursion may result from the following:

Threat	Aircraft	Vehicle	Person/Animal
Tht. 1. Runway misalignment by landing aircraft (aircraft lands on runway it was not cleared to land on)	X		
Tht. 2. Flight crew misinterpret clearance and erroneously enters runway protected area	X		
Tht. 3. Incorrect (includes late) ATC clearance issued to aircraft to enter runway protected area	X		
Tht. 4. Loss of situational awareness by flight crew (caused by fatigue, workload, op pressure) leads to the aircraft entering the runway protected area	X		
Tht. 5. Vehicle driver misinterprets ATC clearance and erroneously enters runway protected area		X	
Tht. 6. Incorrect ATC clearance issued to vehicle to enter runway protected area		X	
Tht. 7. Loss of situational awareness by driver leads to the vehicle entering the runway protected area		X	
Tht. 8 Third party (person) or animal breaches aerodrome perimeter			X
Tht. 9. Loss of situational awareness by persons working in the vicinity of the runway protected area			X

Table 1 Runway Incursion Threats

Consideration situational awareness comprises a combination of perception, comprehensive and then projection. External factors such as workload, operational pressure or fatigue may impact a crew's performance, leading to a loss of situational awareness. Threat 4 describes a situation with the crew may lose situational awareness resulting in the aircraft entering the runway protected area.

An additional human performance consideration relating to Threat 2 – 'Flight crew misinterpret clearance and erroneously enters runway protected area' is *expectation bias*. A pilot may hear something that they *expect* from a clearance rather than the actual instruction.

Call to Action review and risk assess external influences that may impact a crew's loss of situational awareness during the taxi phase, such as the use of single engine taxi or the need to re-brief a departure in the event of a late runway change.

Preventive Controls

Prevention controls are barriers that prevent a threat from becoming a top event. Collectively prevention controls comprise the strategy to reduce and control the risk of having runway incursion. The table below lists preventive controls for each runway incursion precursor / threat.

Preventive controls against threats – Runway Incursion by Aircraft	Tht 1	Tht 2	Tht 3	Tht 4
2nd aircraft recognizes the aircraft is approaching the wrong runway	X			
Air traffic awareness of the environment - informed by 'lookout' + use of surveillance tools (ground radar)			X	
Air traffic monitor read back of an instruction to flight crew		X		
Air traffic provide instructions in accordance with standard operating procedures for the aerodrome			X	
Air traffic recognizes taxiing error via visual monitoring / surveillance tools* and issues 'hold position' instruction to flight crew		X		X
Air traffic use of lit stop bar / flight crew observe lit stop bars		X		X
ANSP SMS (including Fatigue risk management)			X	
Coordination between ground and tower controllers			X	
Flight crew are provided with accurate aerodrome charts, including low visibility taxi charts and information on hot spots (using standardized symbols)		X		X
Flight Crew Compliance with SOPs	X			X
Flight crew initiate go-around	X			
Flight crew receive ACAS X alert		X	X	X
Flight crew receive Runway Approaching Advisory Alerts		X		
Flight crew receive Runway Approaching Advisory Alerts				X
Flight Crew recognize incorrect clearance through lookout/monitoring radio			X	
Flight crew route familiarization training, including familiarity with Ops Manual Part C	X			X

Flight Crew Training in SOPs	X			
Flight Crew Training in SOPs (including six monthly Low Visibility Procedures sim session)				X
Flight crew utilize aerodrome runway and taxiway signs, markings and lighting	X	X		X
Global implementation of standardized RT (phraseology)		X		X
ICAO English Language Proficiency (ELP) Requirements - Level 4 English		X		X
Interim callsign usage to prevent callsign confusion		X		
Intervention by Air Traffic to inform flight crew of their incorrect approach path	X			
Operator SMS		X		
Operator SMS (including fatigue risk management)				X
Operator SMS, including assessment of route	X			
Operator SOPs	X			X

* includes Advanced Surface Movement Guidance and Control System

Table 2 Preventive controls to threats – aircraft incursion

Consideration Operator Standard Operating Procedures (SOPs) provide a key mitigation for several threats to runway incursion. Although varying from operator to operator, key aspects include to:

- Conduct a thorough briefing of the expected taxi route including the hotspots using accurate and current aerodrome charts.
- Observe sterile flight deck environment during taxi.
- Clarifying with ATC when in doubt of clearance.
- Using exterior lights when approaching/entering a runway especially at night.

Preventive controls against threats – Runway Incursion by Vehicle	Tht 5	Tht 6	Tht 7
Air traffic recognizes routing error via visual monitoring & surveillance* tools and issues 'hold position' instruction to driver	X		X
Air Traffic's use of lit stop bar and drivers observe lit stop bars	X		X
Aircraft conspicuity alerts the driver to the presence of an aircraft on the active runway			X
ATC awareness of the environment - informed by 'lookout' + use of surveillance tools* (ground based radar)		X	
Controller attention to the read back of an instruction by the driver	X		
Coordination between ground and tower controllers		X	
Driver holds a permit/licence to operate on the aerodrome	X		X
Driver is following Standard Operating Procedures	X		X
Driver is provided with accurate aerodrome charts, including low visibility taxi charts and information on hot spots			X

Flight crew observe vehicle moving towards runway protected area and inform air traffic who issues hold position instruction	X		X
Flight crew recognize driver reads back clearance incorrectly (on the same frequency)	X		
Flight Crew SA lookout/monitoring radio recognize incorrect clearance		X	
Global implementation of standardized RT	X	X	
ICAO English Language Proficiency (ELP) Requirements - Level 4 English	X	X	

* includes Advanced Surface Movement Guidance and Control System

Table 3 Preventive controls to threats – vehicle incursion

Preventive controls against threats – Runway Incursion by Person/Animal	Tht 8	Tht 9
Aerodrome SMS / SeMS	X	X
Aerodrome ops/security vehicle intercepts person/animal	X	
Aerodrome perimeter fencing	X	
Aerodrome wildlife management program	X	
Provision of aerodrome perimeter security	X	
Individuals are working in accordance with standard operating procedures		X
Air Traffic Controller recognises routing error via visual monitoring to and contacts individual(s) via RT		X
Flight crew observe individual(s) moving towards runway protected area and inform Air Traffic Controller who contacts individual via RT		X

Table 4 Preventive controls to threats – person/animal incursion

Call to action Identify controls that prevent each threat from leading to a runway incursion and ground collision. Use the provided controls as reference only as they vary from operator to operator. Additionally, ensure preventive controls listed in Table 2, 3 and 4 are documented, implemented, and trained as required.

Measuring Threats performance/behaviour enables operators to track deviations from the SOPs. It allows early detection of patterns and non-standard cases. Monitoring Lagging SPIs such as incidents and near misses will contribute to evaluating if the controls in place are working as expected.

Consideration. Evolving to a proactive and controls-oriented management approach is about understanding how and when safety controls become ineffective before an event occurs. It helps identify areas where resources could be allocated to proactively reduce the risks of runway incursion.

Adopting the controls-based proactive approach expands safety audits' scope beyond focusing on regulatory compliance. A control in place does not necessarily mean that it is effective. This concept is linked to the evolving Risk-based IOSA Program.

Measuring the effectiveness of safety controls has always been challenging. However, to ensure a comprehensive effectiveness assessment, IATA proposes to follow three essential steps, as shown in the following Figure.

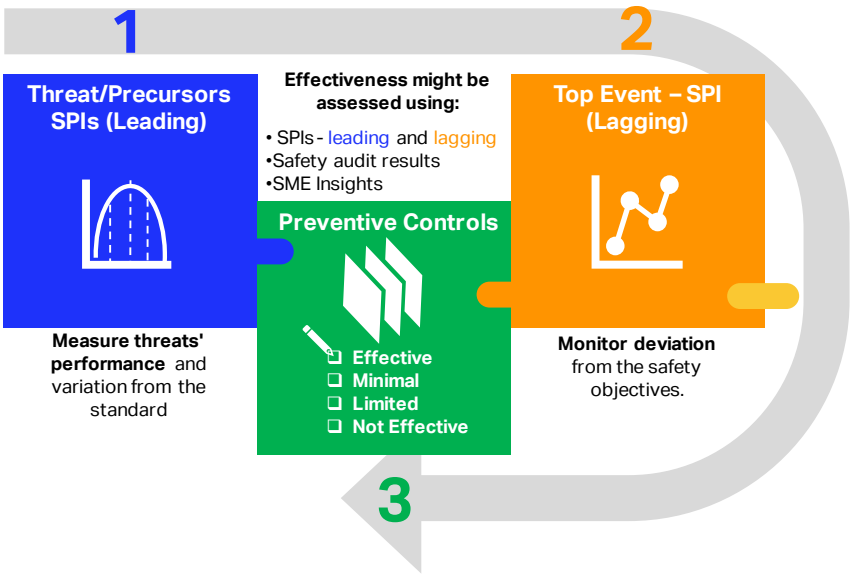


Figure 5 Assessing Controls Effectiveness

Measuring threats performance/behaviour enables operators to track deviations from the SOPs or a given threshold. *E.g. loss of situational awareness by flight crew during the taxi phase* (potentially caused by fatigue, operational pressure or workload) or discontinued approaches to an incorrect runway (runway misalignment) following recognition. It allows early detection of patterns and non-standard cases.

Table 5 provides general guidance on assessing the Runway Incursion risk model's safety controls effectiveness.

Threats SPIs	Top Event SPIs	Control Effectiveness
Trend Up	Trend Up	Non-effective, controls are in place but don't mitigate the risk
Trend Up	Constant	Non-Effective, controls are not working as expected
Trend Up	Trend Down	Most of the controls are non-effective, there is a control containing the risk
Constant	Trend Up	Non-Effective, Controls are not working as expected
Constant	Constant	Limited, Controls have a restricted action over the threads
Constant	Trend Down	Limited, there is a weak control unable to turn the threats trend down
Trend Down	Trend Up	Limited, there is a weak control failing to contain the top event trend
Trend Down	Constant	Limited, there is a weak control unable to turn the Top Event down
Trend Down	Trend Down	Effective, controls work as expected

Table 5 Control's Effectiveness Assessment

Gaining insights from subject matter experts is crucial in refining the effectiveness of runway incursion risk controls. It is important to consider the nature of the controls, which can be technology, procedures, regulations, or training, as they might be weakened by human performance.

The assessment of control effectiveness is relevant to allocate resources efficiently, strengthen the appropriate controls, and achieve an efficient and successful runway incursion mitigation strategy to avoid any further associated consequences.

Risk Control Tagging

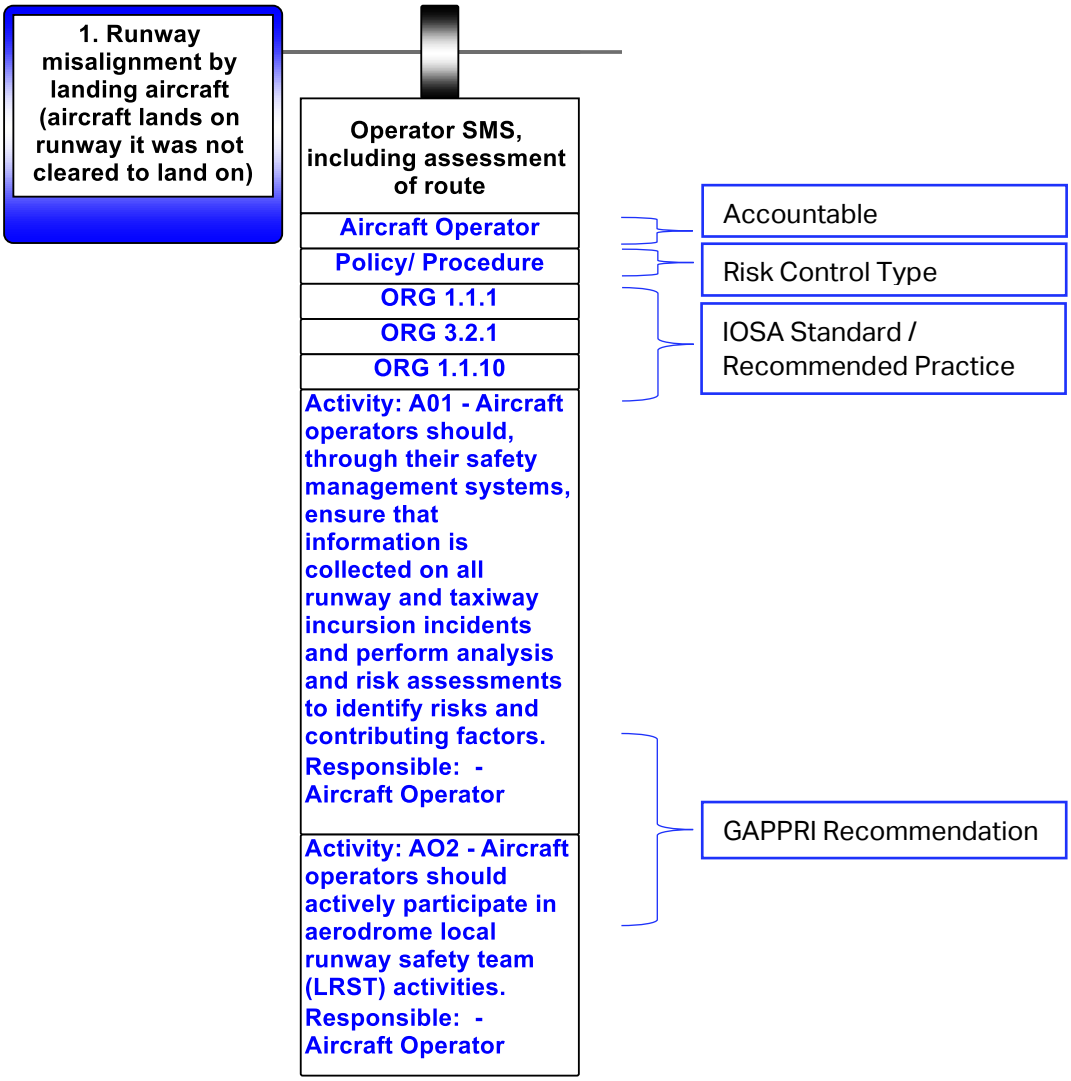
The identified risk controls that describe the mitigating activity have been tagged with additional information appended to the control:

- Accountable – the organization/actor primarily accountable for the risk control and typically able to directly impact its effectiveness. E.g. '*Aircraft operator*', '*aerodrome*' or 'MRO (Maintenance Repair Organization)'

- Risk control type – whether the control is an:
    - Engineered device
    - Human sensory action
    - Training/proficiency (including associated training specific policy)
    - Policy/procedure

- ISARP – identified IOSA standards and recommended practices from the IOSA Standards Manual (ISM) that link with the risk control activity. E.g. ORG 1.1.1. – Management System Overview

- GAPPRI Activity – Actions identified in the Global Action Plan for the Prevention of Runway Incursions that link with the risk control and which may improve the effectiveness of the risk control. For example "A01 - Aircraft operators should actively participate in aerodrome local runway safety team (LRST) activities"



Consideration Risk controls are annotated with recommendations from the GAPPRI. The implementation of recommendations will likely strengthen the effectiveness of the linked risk control.

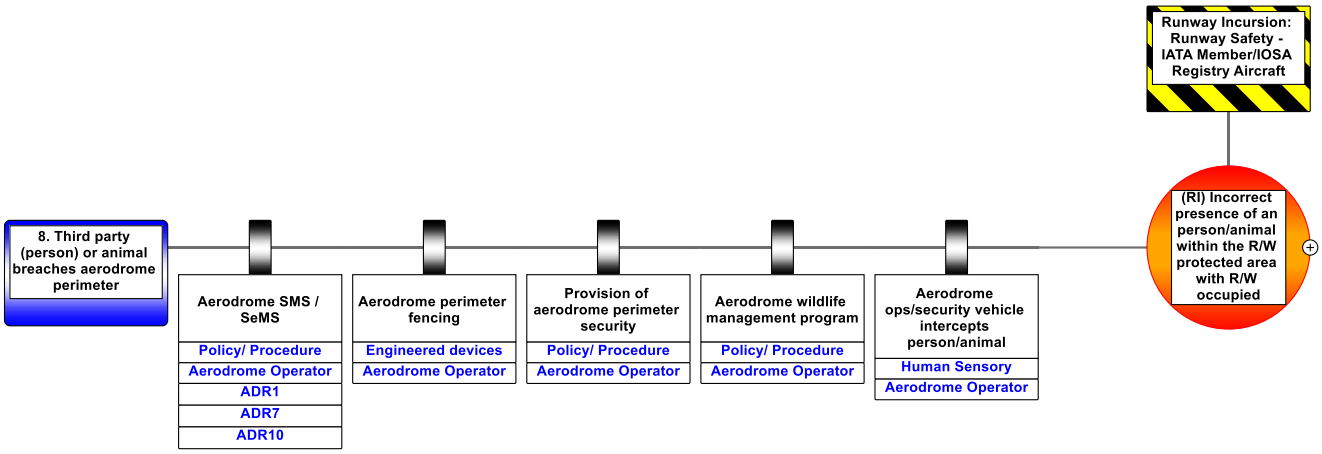
Call to action Conduct a gap analysis of your organization's runway incursion safety program to understand the organization's current position regarding Global Action Plan for the Prevention of Runway Incursions (GAPPRI).

Consideration In addition to assessing the effectiveness of individual risk controls, the combined effect of risk controls for an individual threat/consequence should be reviewed collectively. For robust mitigate of a threat, a combination of risk controls that are of different types, with differing accountable parties, should be sought.

Risk controls which are all procedural based may be less effective than a combination of controls that are also based on engineering devices and training/competency.

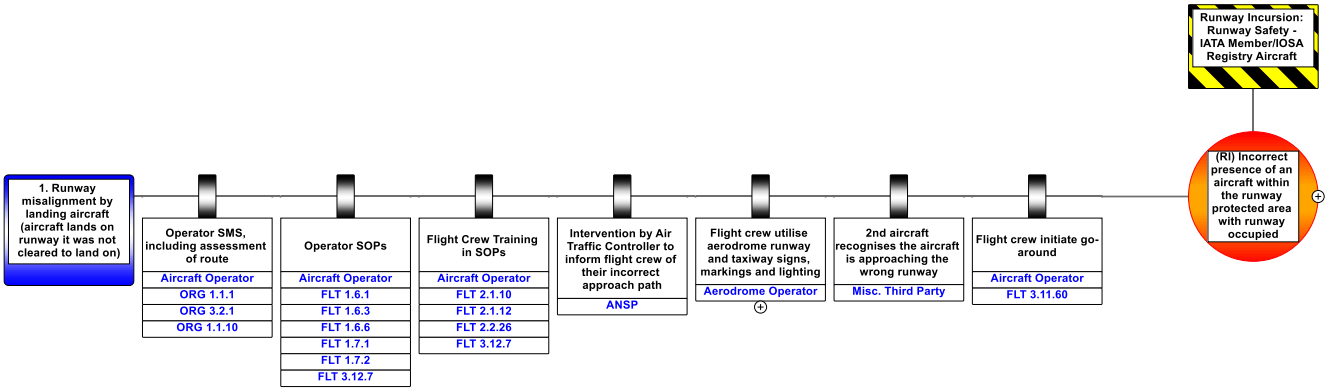
Call to action In developing your own generic risk assessment, aim to implement an approach to risk mitigation that utilises a combination of risk control types.

For some threats or consequences, the risk controls may relate to third party activities. As part of an operators' risk assessment, the effectiveness of these controls should still be considered as part of the overall risk assessment. For example, in the threat line below, all risk controls are owned by the aerodrome:



Call to action Consider and implement approaches to assess the effectiveness of third parties risk controls at your major departure /destination aerodromes / hubs.

Consideration Where applicable, IOSA Standards and Recommended Practices are identified and linked to risk controls (for risk controls where an operator is carrying out the activity associated with the risk control).



Call to action Develop controls-based audits (also known as safety audits) according to the risk model to assess the effectiveness of the controls in place, including compliance/quality assurance activities assessing conformity to the linked ISARPs.

Assessing the control effectiveness aims to determine to what extent preventive controls reduce the risk of runway incursions.

Consequence

Defined as a potential accident scenario resulting from the top event that directly results in loss or damage. Runway incursion may lead to the following accident scenarios.

Consequence	RI by Aircraft	RI by Vehicle	RI by Person/Animal
Cons. 1. Ground Collision between aircraft and aircraft resulting in fatalities	X		
Cons. 2/3 Ground Collision between aircraft and vehicle resulting in fatalities	X	X	
Cons. 4. Ground Collision between aircraft and animal/person resulting in fatalities			X

Table 6 Potential consequences.

Recovery controls

Considered as the barriers that prevent the top event from developing into an accident scenario or reduce the severity of the accident.

Recovery controls to Top event – Runway Incursion by Aircraft	Csq 1	Csq 2/3
Aerodrome Emergency Response Plan	X	X
Aerodrome Rescue and Fire Fighting Services (RFFS)	X	X
Air traffic recognise conflict and issues avoiding action to aircraft and/or vehicle		X
Air traffic recognises conflict and issues avoiding action to either/both aircraft to deconflict	X	
Flight crew of either aircraft recognise conflict and take action to deconflict (abort takeoff/landing, vacate runway or go-around)	X	
Flight crew recognise conflict and take action to deconflict (abort takeoff/landing, vacate runway or go-around)		X
Operator Emergency Response Plan	X	X
Vehicle driver recognises conflict and takes action to deconflict		X

Table 7 Recovery controls for consequences – incursion by aircraft

Recovery controls to Top event – Runway Incursion by Vehicle	Csq 2/3
Aerodrome Emergency Response Plan	X
Aerodrome Rescue and Fire Fighting Services (RFFS)	X
Air traffic recognise conflict and issues avoiding action to aircraft and/or vehicle	X
Flight crew recognise conflict and take action to deconflict (abort takeoff/landing, vacate runway or go-around)	X
Operator Emergency Response Plan	X
Vehicle driver recognises conflict and takes action to deconflict	

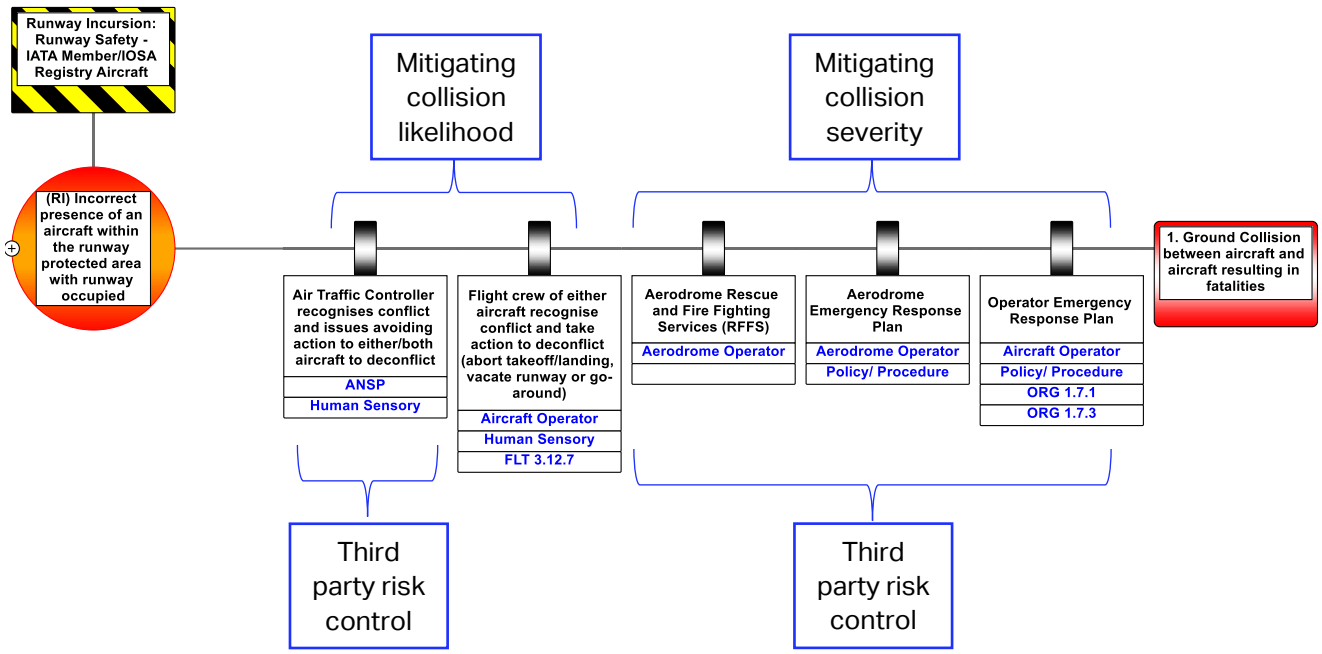
Table 8 Recovery controls for consequences – incursion by vehicle

Recovery controls to Top event – Runway Incursion by Person/Animal	Csq 4
Air traffic recognise conflict and issues avoiding action to aircraft	X
Flight crew recognise conflict and take action to deconflict (abort takeoff/landing, vacate runway or go-around)	X

Table 9 Recovery controls to consequences – incursion by person/animal

Consideration A number of the recovery controls relate to activities carried out by third parties. For example, air traffic recognizing a potential collision and issuing a hold position or "stop, stop, stop" instruction to flight crew.

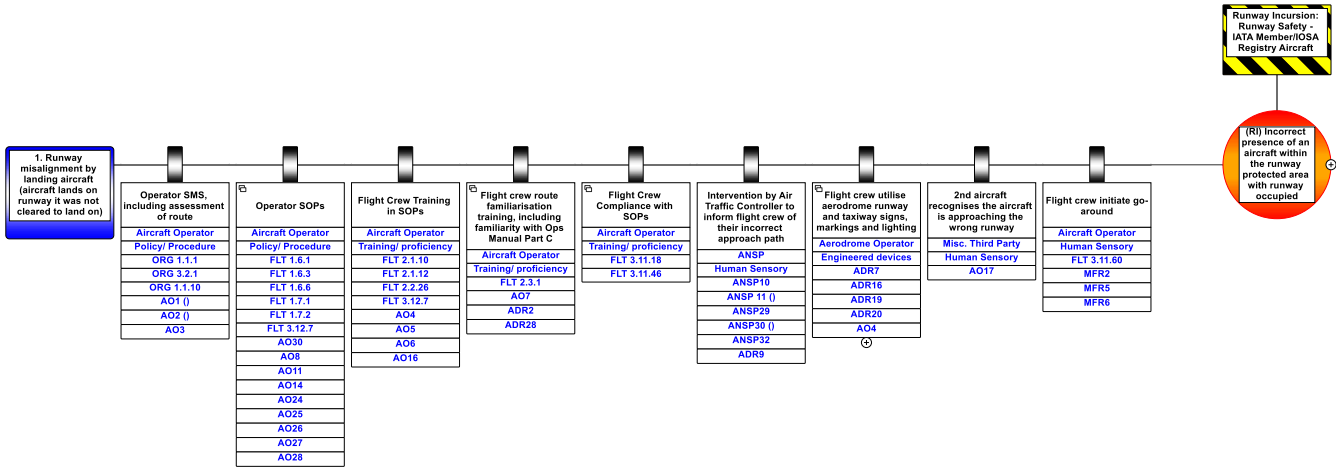
In addition, recovery controls are split into those that may lessen the like likelihood of the ground collision consequence and those that will not prevent the collision but may reduce the severity (e.g. aerodrome rescue and firefighting service).

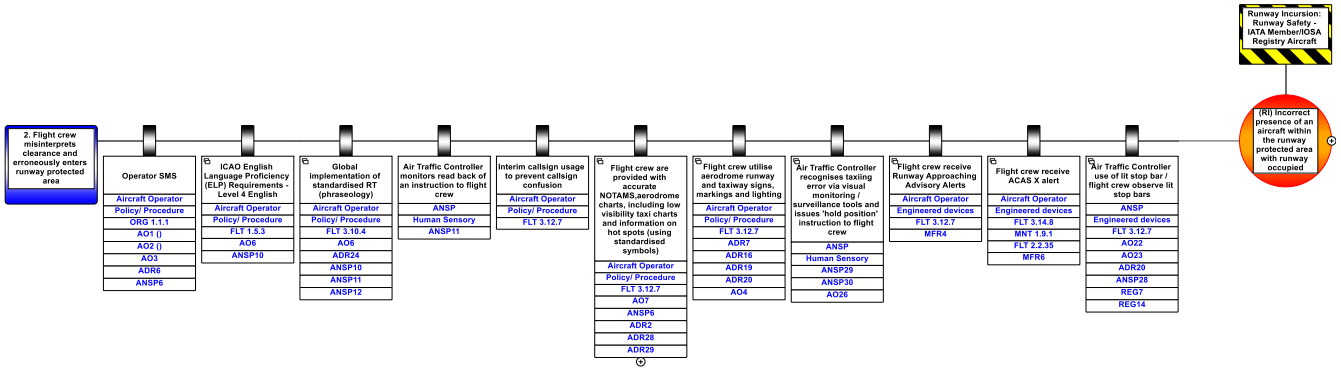


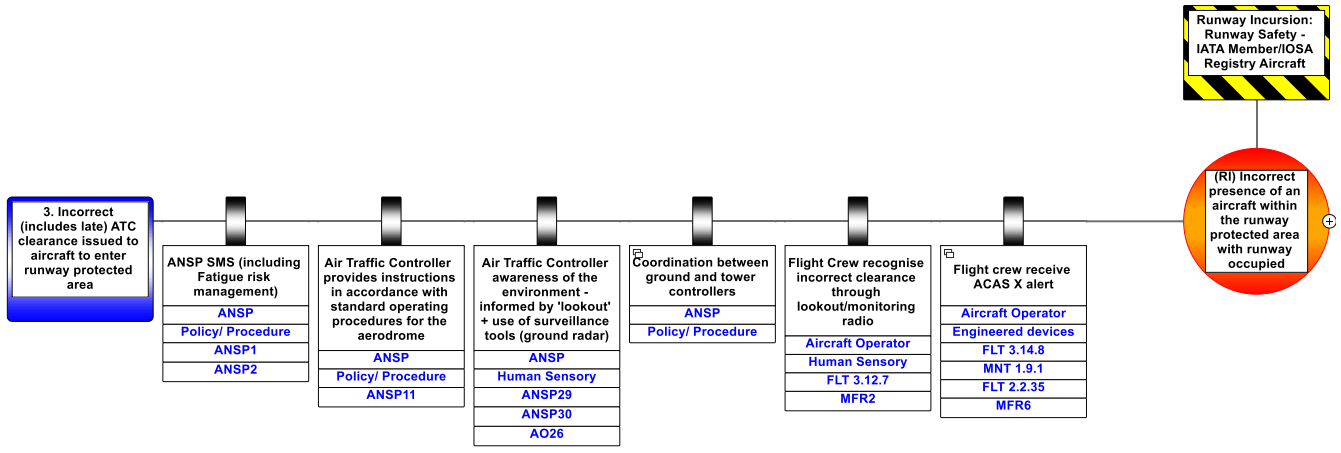
Annex A - Expanded Bow Tie Model

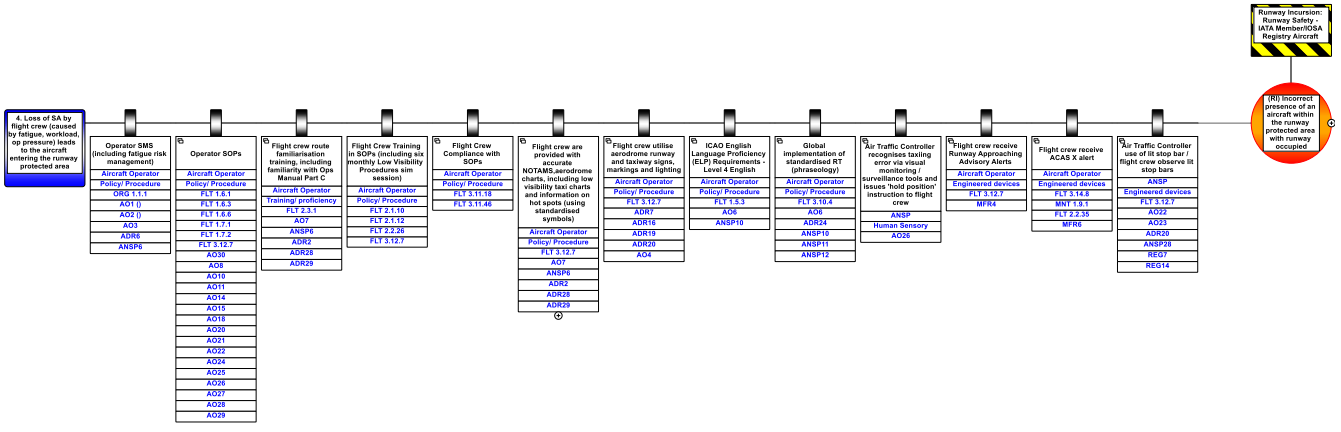
Runway Safety - Incorrect presence of an aircraft within the runway protected area

Threats

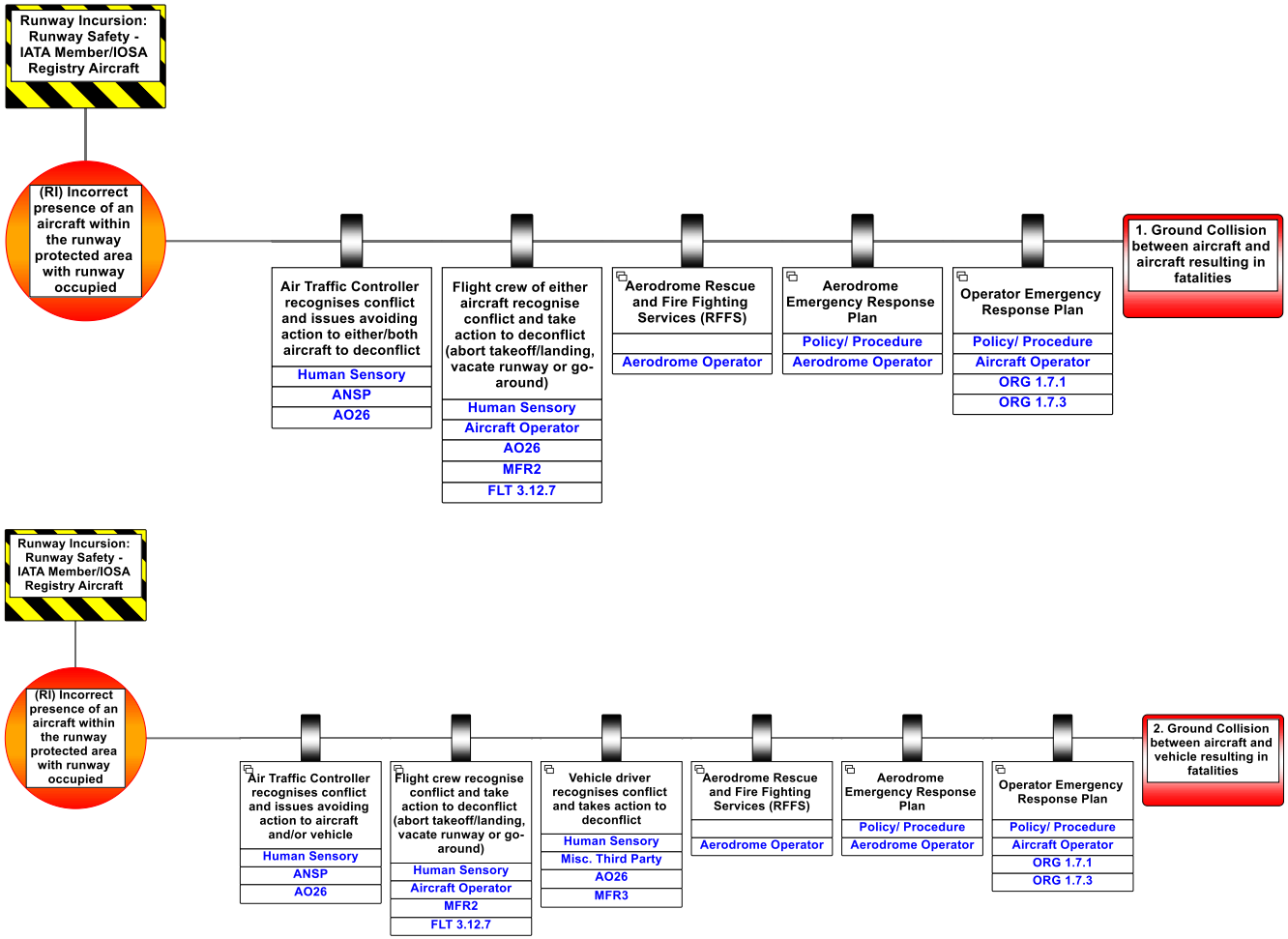



Runway Incursion: Runway Safety - IATA Member/IOSA Registry Aircraft
(RI) Incorrect presence of an aircraft within the runway protected area with runway occupied
2. Flight crew misinterprets clearance and erroneously enters runway protected area
Operator SMS
Aircraft Operator
Policy/ Procedure
ORG 1.1.1
AO1 ()
AO2 ()
AO3
ADR6
ANSP6
ICAO English Language Proficiency (ELP) Requirements - Level 4 English
Aircraft Operator
Policy/ Procedure
FLT 1.5.3
AO6
ANSP10
Global implementation of standardised RT (phraseology)
Aircraft Operator
Policy/ Procedure
FLT 3.10.4
AO6
ADR24
ANSP10
ANSP11
ANSP12
Air Traffic Controller monitors read back of an instruction to flight crew
ANSP
Human Sensory
ANSP11
Interim callsign usage to prevent callsign confusion
Aircraft Operator
Policy/ Procedure
FLT 3.12.7
Flight crew are provided with accurate NOTAMS,aerodrome charts, including low visibility taxi charts and information on hot spots (using standardised symbols)
Aircraft Operator
Policy/ Procedure
FLT 3.12.7
AO7
ANSP6
ADR2
ADR28
ADR29
Flight crew utilise aerodrome runway and taxiway signs, markings and lighting
Aircraft Operator
Policy/ Procedure
FLT 3.12.7
ADR7
ADR16
ADR19
ADR20
AO4
Air Traffic Controller recognises taxiing error via visual monitoring / surveillance tools and issues 'hold position' instruction to flight crew
ANSP
Human Sensory
ANSP29
ANSP30
AO26
Flight crew receive Runway Approaching Advisory Alerts
Aircraft Operator
Engineered devices
FLT 3.12.7
MFR4
Flight crew receive ACAS X alert
Aircraft Operator
Engineered devices
FLT 3.14.8
MNT 1.9.1
FLT 2.2.35
MFR6
Air Traffic Controller use of lit stop bar / flight crew observe lit stop bars
ANSP
Engineered devices
FLT 3.12.7
AO22
AO23
ADR20
ANSP28
REG7
REG14


Runway Incursion: Runway Safety - IATA Member/IOSA Registry Aircraft
(RI) Incorrect presence of an aircraft within the runway protected area with runway occupied
3. Incorrect (includes late) ATC clearance issued to aircraft to enter runway protected area
ANSP SMS (including Fatigue risk management)
ANSP
Policy/ Procedure
ANSP1
ANSP2
Air Traffic Controller provides instructions in accordance with standard operating procedures for the aerodrome
ANSP
Policy/ Procedure
ANSP11
Air Traffic Controller awareness of the environment - informed by 'lookout' + use of surveillance tools (ground radar)
ANSP
Human Sensory
ANSP29
ANSP30
AO26
Coordination between ground and tower controllers
ANSP
Policy/ Procedure
Flight Crew recognise incorrect clearance through lookout/monitoring radio
Aircraft Operator
Human Sensory
FLT 3.12.7
MFR2
Flight crew receive ACAS X alert
Aircraft Operator
Engineered devices
FLT 3.14.8
MNT 1.9.1
FLT 2.2.35
MFR6

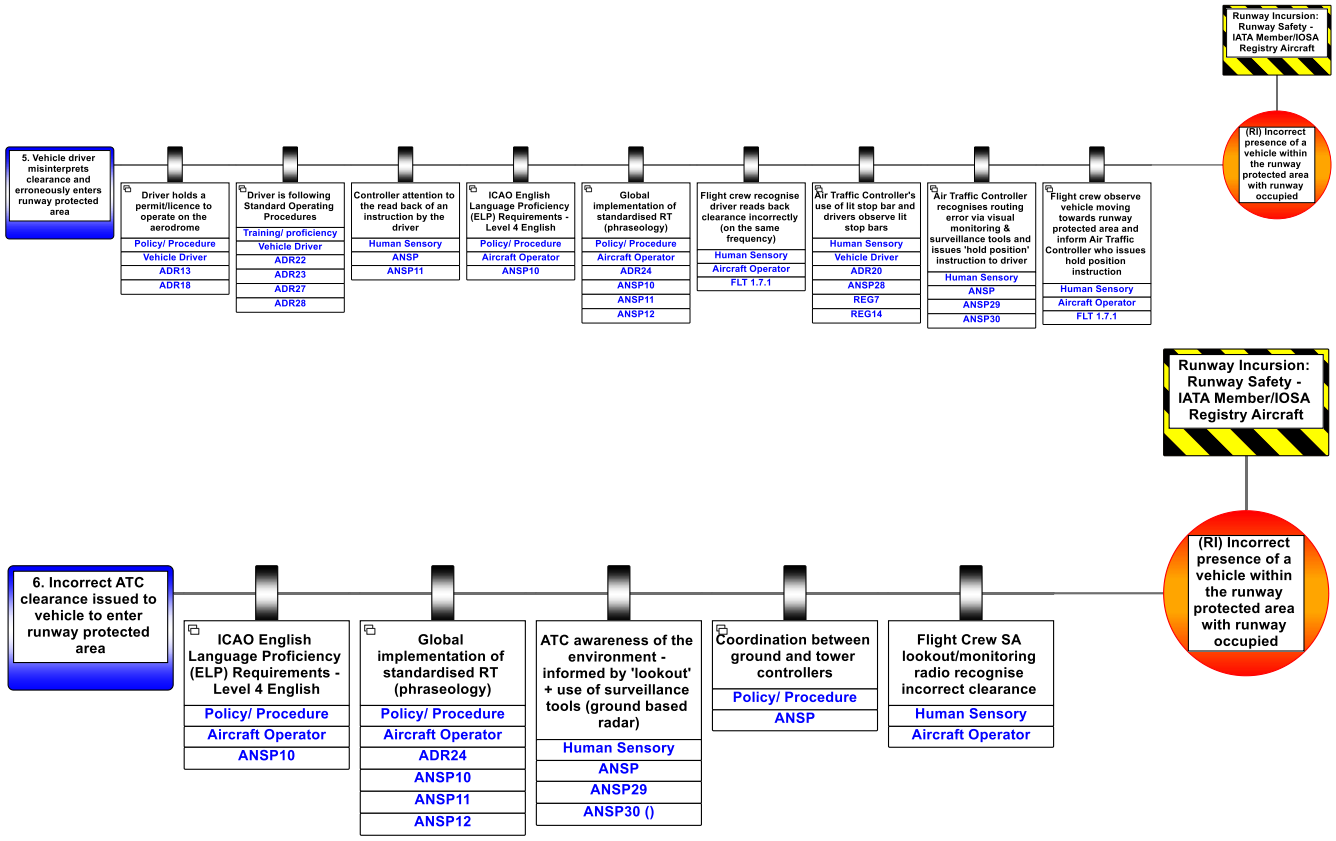

Runway Incursion: Runway Safety - IATA Member/IOSA Registry Aircraft
(RI) Incorrect presence of an aircraft within the runway protected area with runway occupied
4. Loss of SA by flight crew (caused by fatigue, workload, op pressure) leads to the aircraft entering the runway protected area
Operator SMS (including fatigue risk management)
Aircraft Operator
Policy/ Procedure
ORG 1.1.1
AO1 ()
AO2 ()
AO3
ADR6
ANSP6
Operator SOPs
Aircraft Operator
Policy/ Procedure
FLT 1.6.1
FLT 1.6.3
FLT 1.6.6
FLT 1.7.1
FLT 1.7.2
FLT 3.12.7
AO30
AO8
AO10
AO11
AO14
AO15
AO18
AO20
AO21
AO22
AO24
AO25
AO26
AO27
AO28
AO29
Flight crew route familiarisation training, including familiarity with Ops Manual Part C
Aircraft Operator
Training/ proficiency
FLT 2.3.1
AO7
ANSP6
ADR2
ADR28
ADR29
Flight Crew Training in SOPs (including six monthly Low Visibility Procedures sim session)
Aircraft Operator
Policy/ Procedure
FLT 2.1.10
FLT 2.1.12
FLT 2.2.26
FLT 3.12.7
Flight Crew Compliance with SOPs
Aircraft Operator
Policy/ Procedure
FLT 3.11.18
FLT 3.11.46
Flight crew are provided with accurate NOTAMS,aerodrome charts, including low visibility taxi charts and information on hot spots (using standardised symbols)
Aircraft Operator
Policy/ Procedure
FLT 3.12.7
AO7
ANSP6
ADR2
ADR28
ADR29
Flight crew utilise aerodrome runway and taxiway signs, markings and lighting
Aircraft Operator
Policy/ Procedure
FLT 3.12.7
ADR7
ADR16
ADR19
ADR20
AO4
ICAO English Language Proficiency (ELP) Requirements - Level 4 English
Aircraft Operator
Policy/ Procedure
FLT 1.5.3
AO6
ANSP10
Global implementation of standardised RT (phraseology)
Aircraft Operator
Policy/ Procedure
FLT 3.10.4
AO6
ADR24
ANSP10
ANSP11
ANSP12
Air Traffic Controller recognises taxiing error via visual monitoring / surveillance tools and issues 'hold position' instruction to flight crew
ANSP
Human Sensory
AO26
Flight crew receive Runway Approaching Advisory Alerts
Aircraft Operator
Engineered devices
FLT 3.12.7
MFR4
Flight crew receive ACAS X alert
Aircraft Operator
Engineered devices
FLT 3.14.8
MNT 1.9.1
FLT 2.2.35
MFR6
Air Traffic Controller use of lit stop bar / flight crew observe lit stop bars
ANSP
Engineered devices
FLT 3.12.7
AO22
AO23
ADR20
ANSP28
REG7
REG14

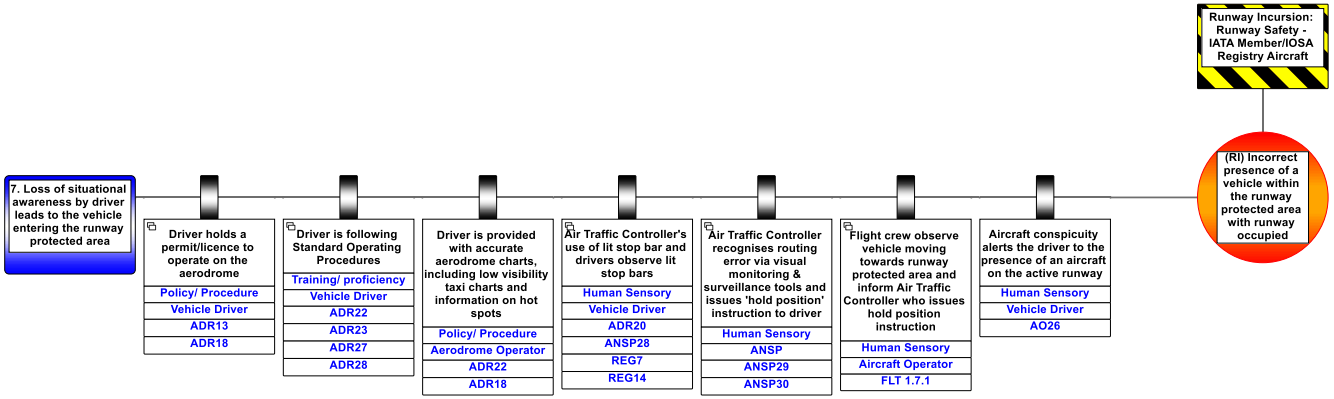
Consequences



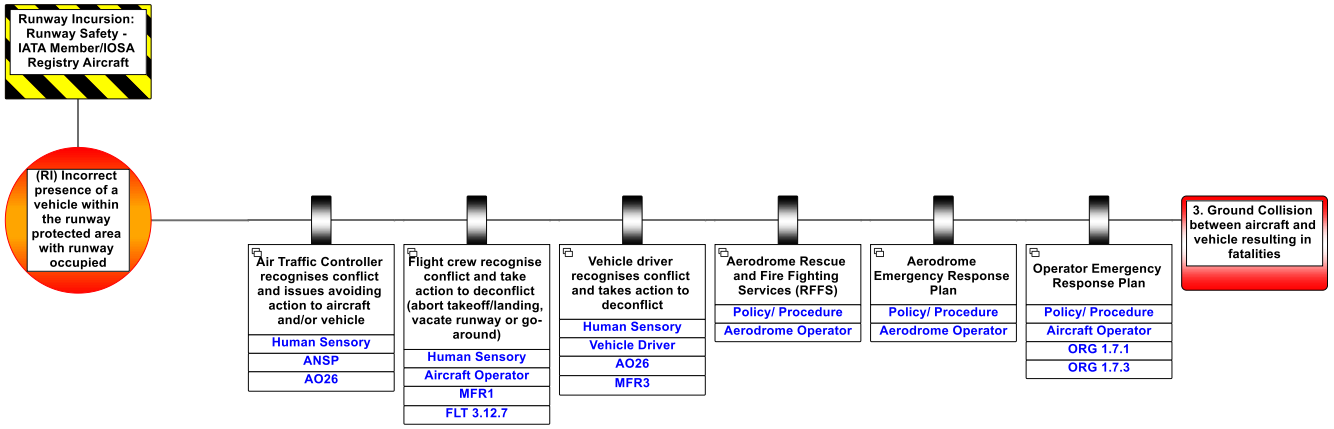
Runway Safety - Incorrect presence of a vehicle within the runway protected area

Threats



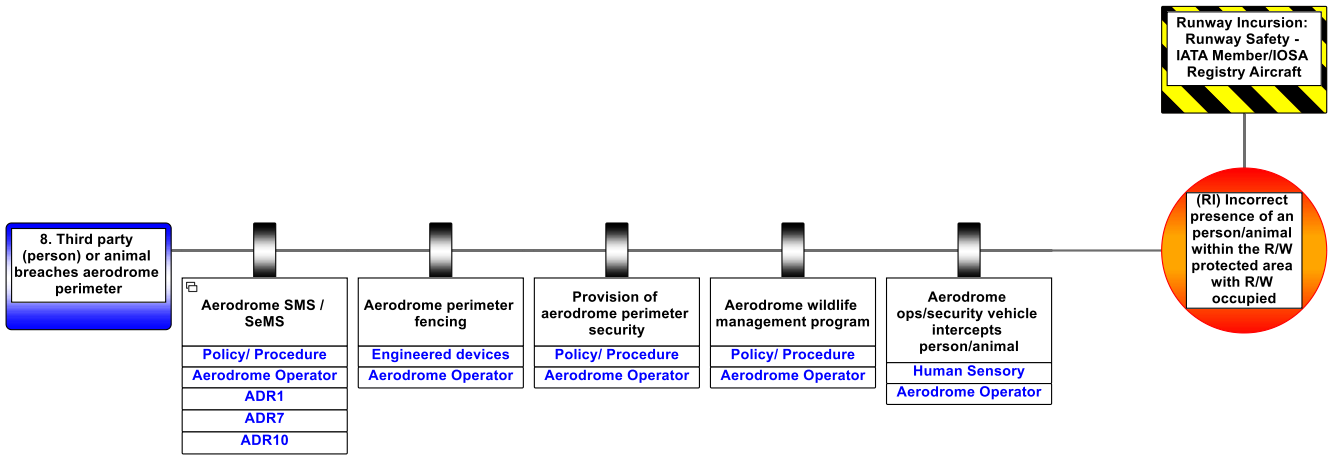


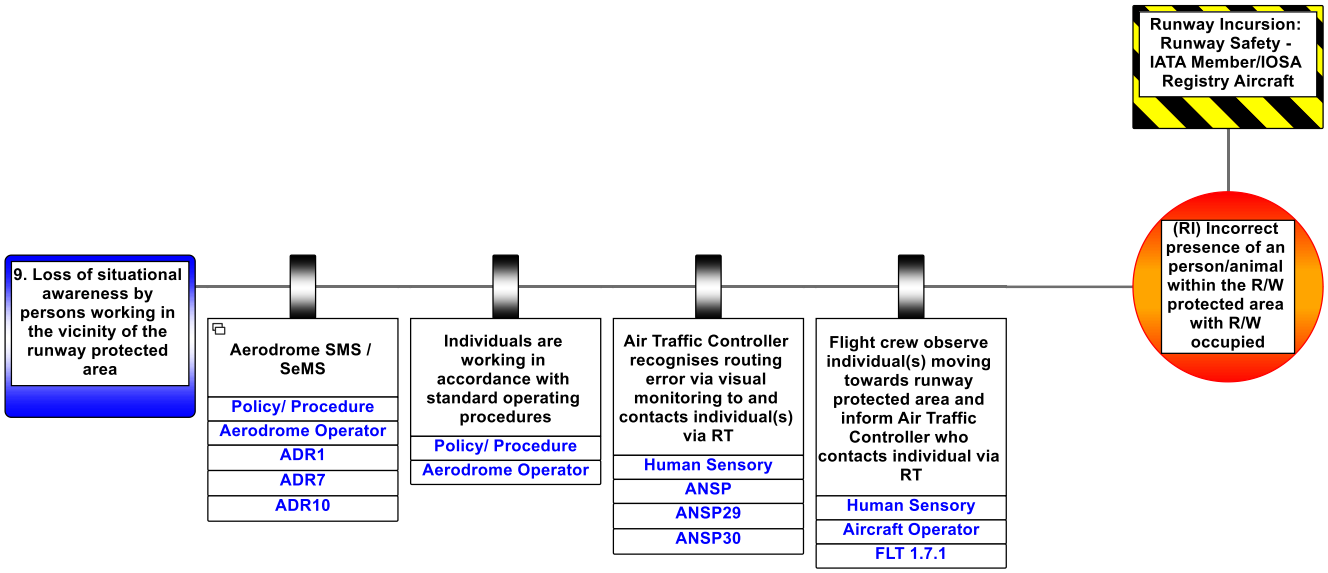
Consequences



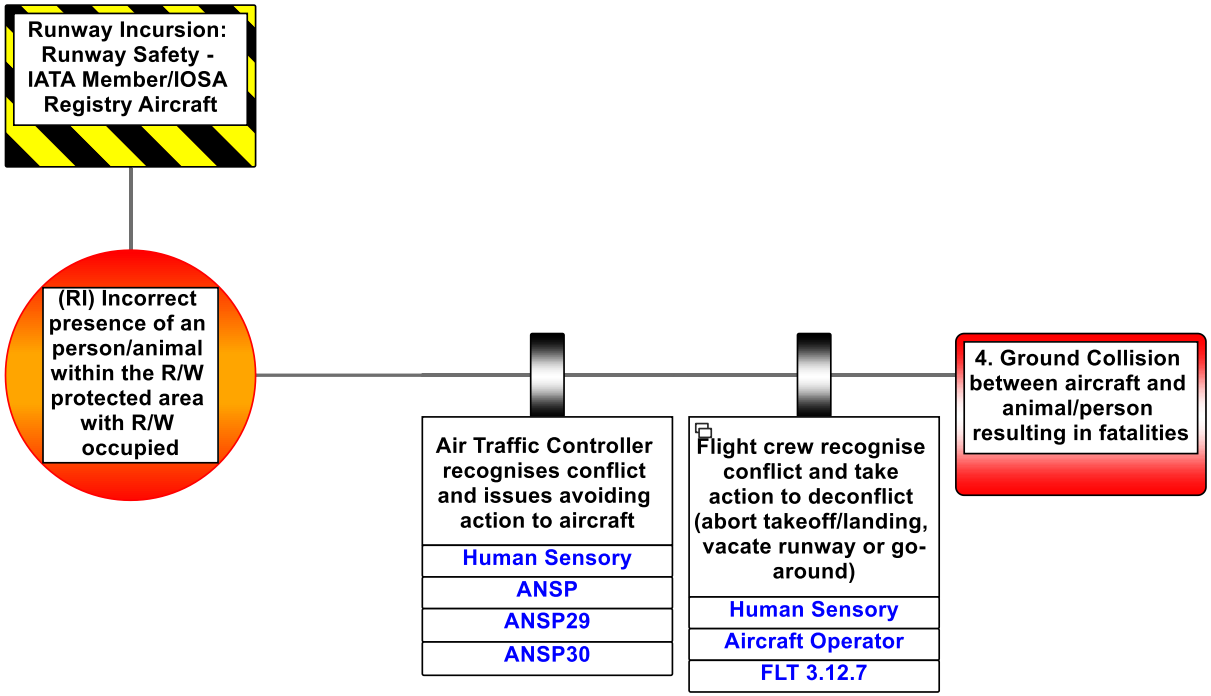
Runway Safety - Incorrect presence of a person/animal within the runway protected area

Threats




Runway Incursion: Runway Safety - IATA Member/IOSA Registry Aircraft
(RI) Incorrect presence of an person/animal within the R/W protected area with R/W occupied
9. Loss of situational awareness by persons working in the vicinity of the runway protected area
Aerodrome SMS / SeMS
Policy/ Procedure
Aerodrome Operator
ADR1
ADR7
ADR10
Individuals are working in accordance with standard operating procedures
Policy/ Procedure
Aerodrome Operator
Air Traffic Controller recognises routing error via visual monitoring to and contacts individual(s) via RT
Human Sensory
ANSP
ANSP29
ANSP30
Flight crew observe individual(s) moving towards runway protected area and inform Air Traffic Controller who contacts individual via RT
Human Sensory
Aircraft Operator
FLT 1.7.1

Consequences



Back to Reduced Version