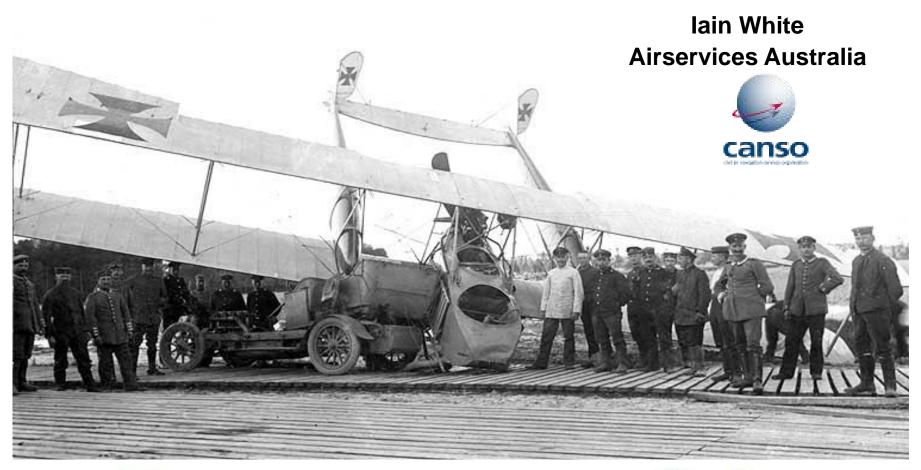
ICAO APRAST/5 Runway Safety Workshop

























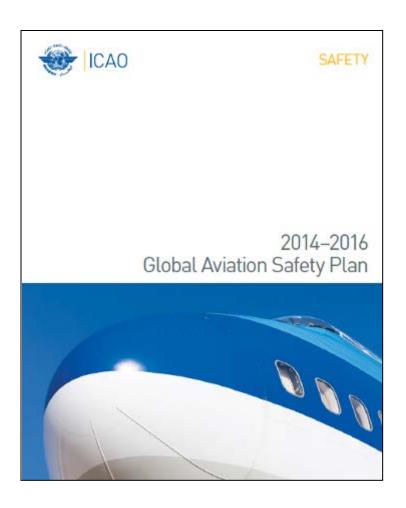




Scope

- Background
 - APRAST
- Runway Safety Basics
- Runway Safety Teams
- Runway Incursions and Runway Confusion
- Runway Excursions
- Tools to help you
- Regional example Australia (throughout)
- APRAST Runway Safety Sub Group

ICAO Guidance



ICAO Global Aviation Safety Plan

- → Runway Safety
- → Controlled Flight into Terrain (CFIT)
- → Loss of Control (LOC)

ICAO Guidance



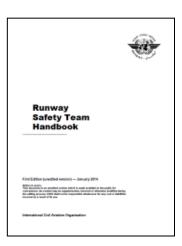
- → ICAO Doc 9870 Manual on the Prevention of Runway Incursions
- → ICAO Assembly Resolution A37-6
 - States urged to establish multidisciplinary runway safety programs

→ Asia/Pacific Air Navigation Planning and Implementation Regional Group

- States establish Runway Safety Teams comprising all the stakeholders at their airports...

→ ICAO Runway Safety Team Handbook

 Whilst there is no rule or requirement, generally, the aerodrome operator hosts the meeting and establishes a long-term schedule to allow adequate planning by the members



ICAO Program

- → Regional Aviation Safety Group (RASG)
 - → 25 May 10 ICAO approved establishment
 - → Support management of safety
- → Asia Pacific Regional Aviation Safety Team (APRAST)
 - → CFIT
 - → LOC
 - → RS
- → Runway Safety Sub Group
 - → APAC Runway Safety Team?
 - → Working together to improve runway safety in APAC
- → Regional Runway Safety Seminars
- → Safety Enhancement Initiatives (SEI)

It is all about working together

Local Runway Safety Team

State Runway SafetyProgram/Group

APAC Runway Safety Team

•ICAO Global



Definitions

→ Runway Incursion: 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.

→Not wildlife

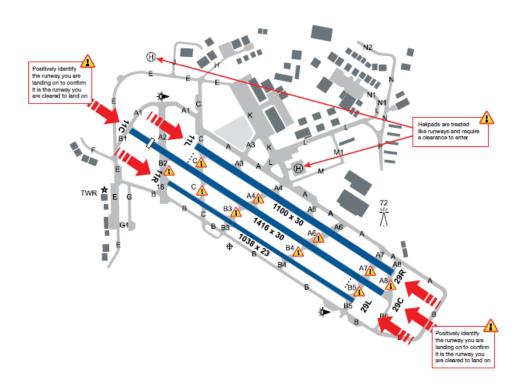


Runway Incursion



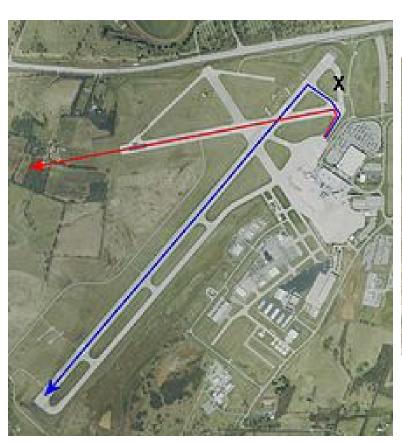
Definitions

→ Runway Confusion: The unintentional use of the wrong runway, or a taxiway, for landing or take-off



For the runway safety program runway confusion causal factors and controls are very similar to runway incursions

Runway Confusion



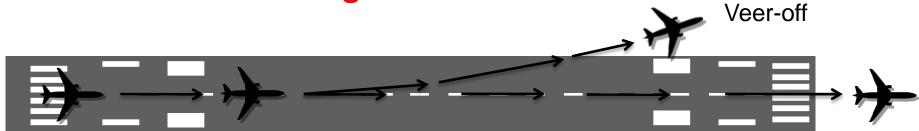


Comair Flight 5191 Blue Grass Airport 2006

Definitions

→ Runway Excursion: A veer off or overrun off the runway surface

→ Takeoff or landing



Over-run





Runway Safety Accident Data 1995–2008

431 out of 1429 Total Accidents Runway Related

Number Percent of Total

Incursions: 10 (.7/year) .6%

Confusion: 4 (.3/year) .3%

Excursions: 417 (29.8/year) 29%

(Source: Flight Safety Foundation)

The Australian Runway Safety Program



The Australian Aviation Organisation



Civil controlled	28
aerodromes	
Class C O	9
Class D O	13
Metropolitan Class D O	6

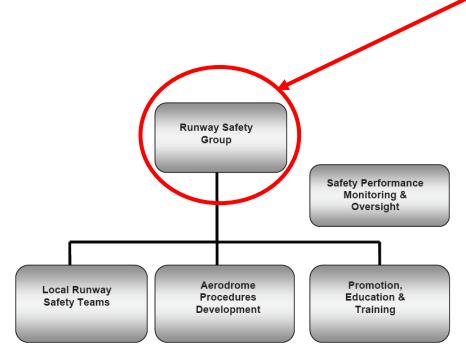


Australian Aviation Organisation

- Department of Infrastructure and Regional Development (DIRD)(State)
- Civil Aviation Safety Authority (CASA) (Regulator)
- Airservices Australia (ANSP)
- Australian Defence Force
- Australian Transport Safety Bureau (ATSB)
- Airports
 - Businesses
 - Council
- Aviation organisations & associations
 - Airlines, Flying Schools, AOPA, AusALPA etc



Runway Safety Program

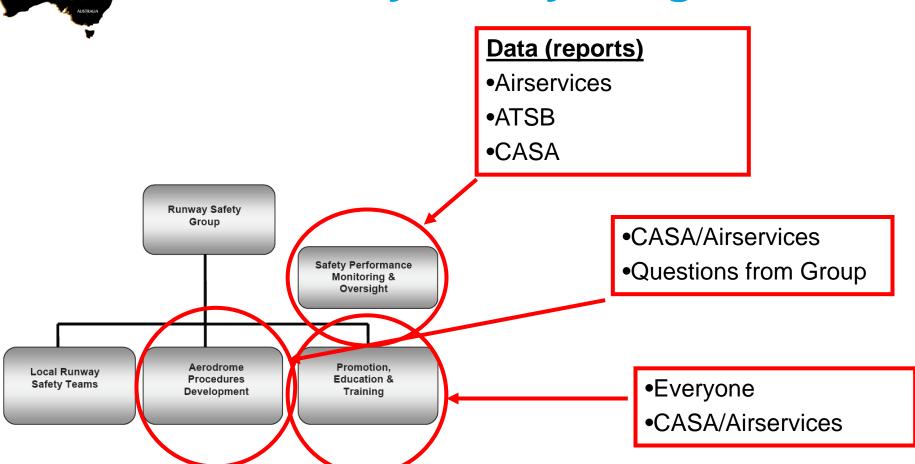


Current Members:

- Dept of Infrastructure and Regional Development
- ANSP (Airservices)
- Regulator (CASA)
- Investigator (ATSB)
- Australian Airports Association (AAA)
- Australasian Aviation Ground Safety Council (AAGSC)
- Aircraft Owners and Pilots Association (AOPA)
- Australian Airline Pilots Association (AusALPA)
- Defence

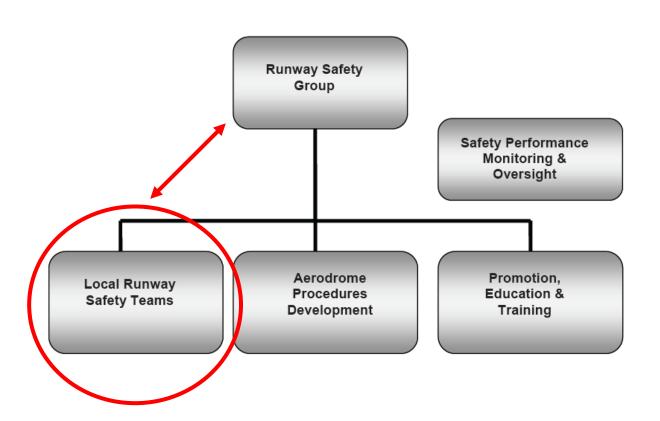


Runway Safety Program





Runway Safety Program





Local Runway Safety Teams

What

→ A team of <u>appropriate</u> local representatives who <u>work together</u> to <u>improve runway safety</u> at that particular location

Who

- Aerodrome operator
- Airlines or aircraft operators
- ALR
- CASA
- Pilot associations
- ATC
- ARFF
- Any other group with a direct involvement in runway operations





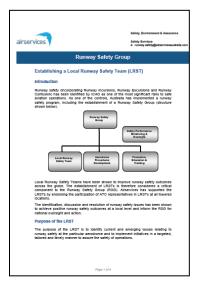


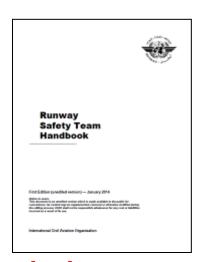




LRST Meeting Agenda

- → Data and Occurrences
- → Airport works (Planned/Ongoing)
- → Visual aids, signage and markings
- → Low visibility operations
- → Foreign Object Damage
- → Wildlife management
- → Communications Phraseology, language, equipment
- → Procedures, publications and practices
- → Lessons learnt (local and external)
- → Safety promotional and education programs
- > Technology, research and development





You can include these topics in another forum if that works better for your aerodrome



LRST Status

8/28 - Dedicated LRST	Mainly major airports
14/28 - Incorporated in other airport	Regional or smaller
meetingsAirside Safety, SMS, CFI/CP meeting	airports
3/28 - Liaising	Small airport









AUSTRALIA

Lessons Learnt

- → Every location is different
 - 'One size does not fit all locations'
- → No mandate not compulsory
- → Coordination/Workload
- → Participation during meetings
- → Continuation of effective meetings
 - Maintaining enthusiasm
- → Cost and complexity of solutions
- → Operational efficiency versus Safety



Tips for RST

- → Encourage participation
 - Food!!
- → Aerodrome host the RST meeting
 - Other organisations (ANSP, Regulator etc) support
- → The more you can get people talking, the better the outcomes!
- → Simple fixes (easy wins!)
- → Keep it interesting
 - You want people to want to come back!
 - Don't just focus on one topic (eg. Runway Incursions)

ICAO Runway Safety Toolkit

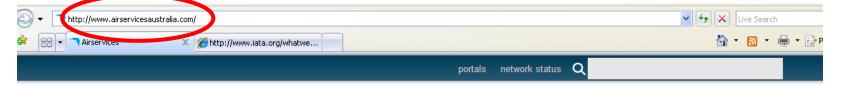


Runway Safety Programme
Working together to solve a complex problem



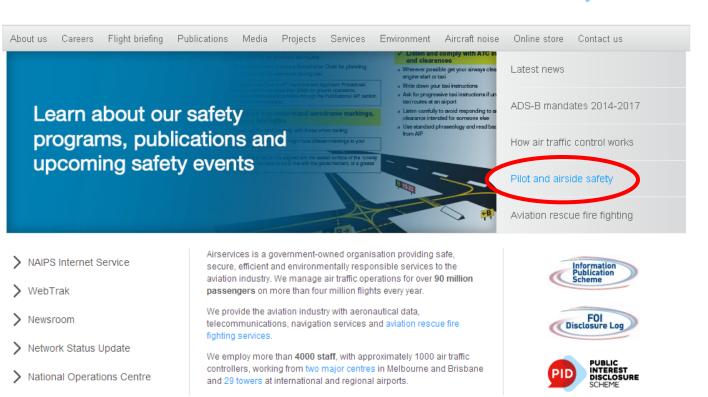
http://cfapp.icao.int/tools/RSP_ikit/story.html
http://www.icao.int/safety/RunwaySafety/Pages/default.aspx

Airservices Australia Website www.airservicesaustralia.com





connecting australian aviation



Runway Incursions







Runway Incursions



Runway Incursion Contributory Factors (Doc 9870)

Breakdown in Communications

- use of non-standardized phraseology
- incorrect readback of an instruction (ATC failure to confirm understanding)
- misunderstanding an instruction
- accepting a clearance intended for another aircraft or vehicle
- blocked and partially blocked transmissions
- overlong or complex transmissions

Pilot Factors

- loss of situational awareness
- Misunderstanding ATC clearance

Runway Incursion Contributory Factors

(Doc 9870)

Other common factors

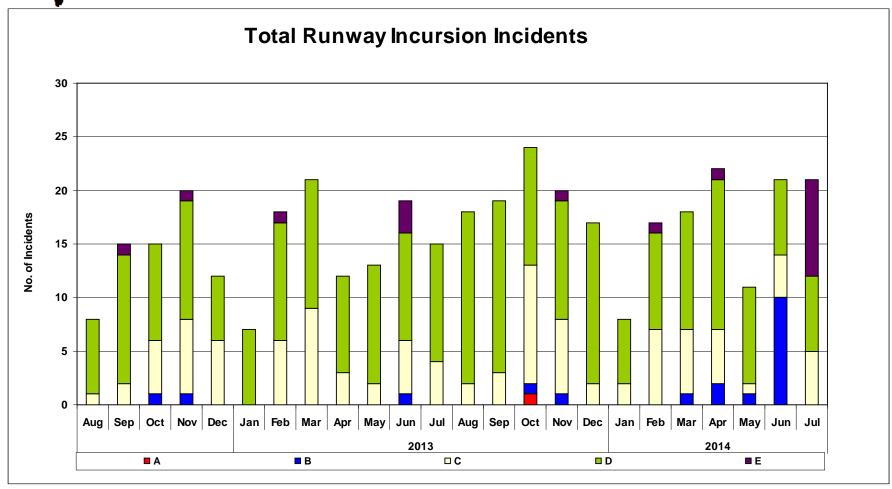
- inadequate signage and markings
- pilots performing mandatory head-down tasks
- controllers issuing instructions as the aircraft is rolling out after landing
- pilots being pressed by complicated and/or capacity enhancement procedures, leading to rushed behaviour;
- a complicated airport design where runways have to be crossed;
- incomplete, non-standard or obsolete information about the taxi routing to expect
- last-minute changes by ATC in taxi or departure routings.

ICAO Runway Incursion Severity Category

Α	A very serious incident in which a collision was narrowly avoided.
В	A major incident in which separation decreases and there is a significant potential for collision, which may result in a time-critical corrective/evasive response to avoid a collision.
С	A minor incident characterised by ample time and/or distance to avoid a collision.
D	Incident that meets the definition or runway incursion such as incorrect presence of a single vehicle/person/aircraft on the protected area of a surface designated for the landing and take-off of aircraft but with no immediate safety consequences.
E	Insufficient information inconclusive or conflicting evidence precludes severity assessment.



Runway Safety Occurrences

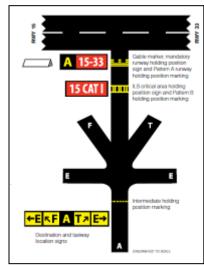


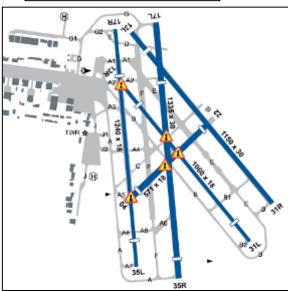
Total Runway Incursions - 488



General Trends

- → Aerodrome complexity
- → Aerodrome signage and markings
 - Standardisation across airports
 - Pilot/Driver understanding of signage and markings
- → Pilot/Driver knowledge of procedures
 - Eg. All runways active at all times and require clearance
- → Pilot/Airside driver distraction





ICAO Runway Safety Toolkit



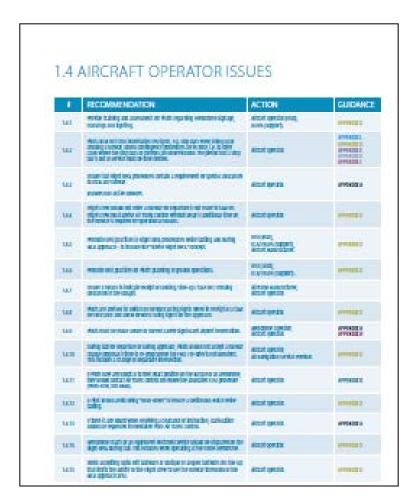
Runway Safety Programme
Working together to solve a complex problem



http://cfapp.icao.int/tools/RSP_ikit/story.html
http://www.icao.int/safety/RunwaySafety/Pages/default.aspx

European Action Plan for the Prevention of Runway Incursions







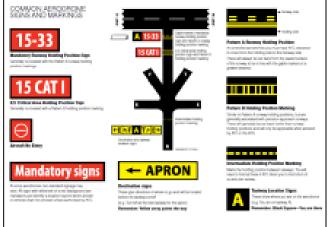
Australian Runway Incursion Products











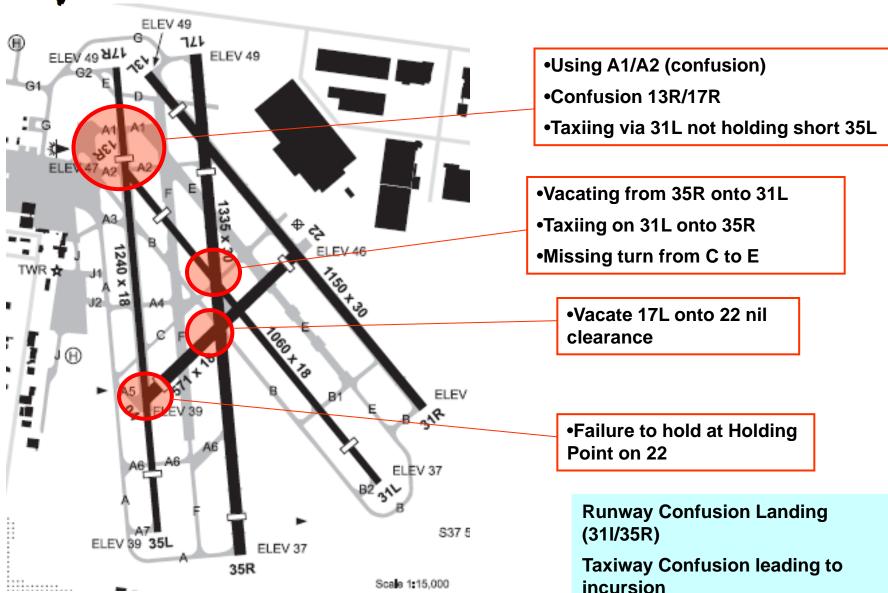


RST and RI Example



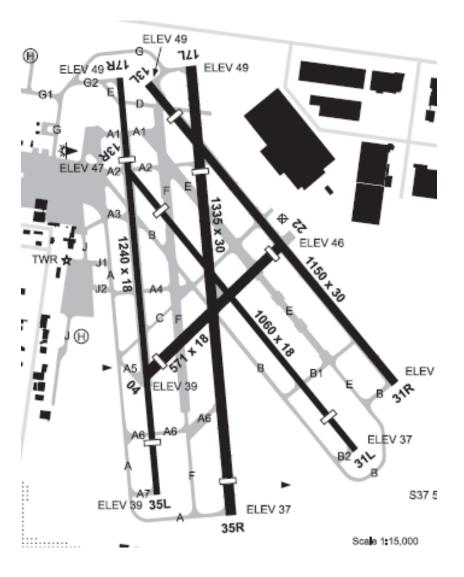
Moorabbin Hotspots

1 May 11 – 30 Apr 12 (76)





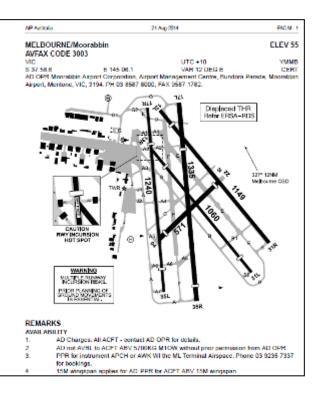
RST Activities



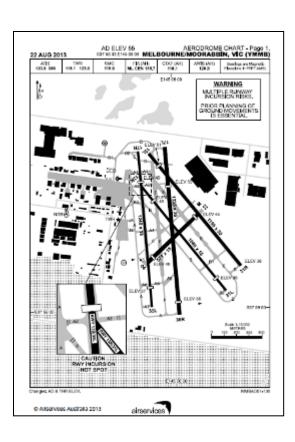
- Runway and Flying Safety Committee
- Hotspot tour
- Runway Guard lights
- Closing taxiways
- Repaint markings
- Review of MAG signs
- Review of taxiway and runway Requirements
- Flying school procedures
- Surveys



Runway Incursion Hotspots







- Safety forums
- Reduction of RI
 - 1 May 12 30 Apr 13 (47)
 - 8 Sep13-8 Sep 14 (33)



Runway Excursions



Background

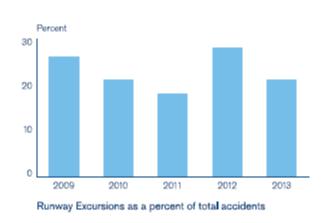
Flight Safety Foundation Report 1995-2008

- → 431/1429 Accidents Runway related
 - → 10 Incursion
 - → 4 Confusion
 - → 417 Excursion

IATA Data Report for Evidence-Based Training

- → 4% of all approaches were unstable.
- → 97% of unstable approaches are continued to landing.
 - →10% result in abnormal landings.

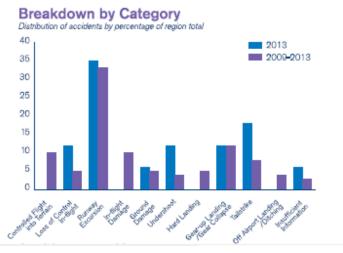
Runway Excursions (IATA Safety Report 2013)



Runway Excursions (global)

2013 – 17 RE Accidents

2009-2013 – 98 RE Accidents



Accidents Asia/Pacific

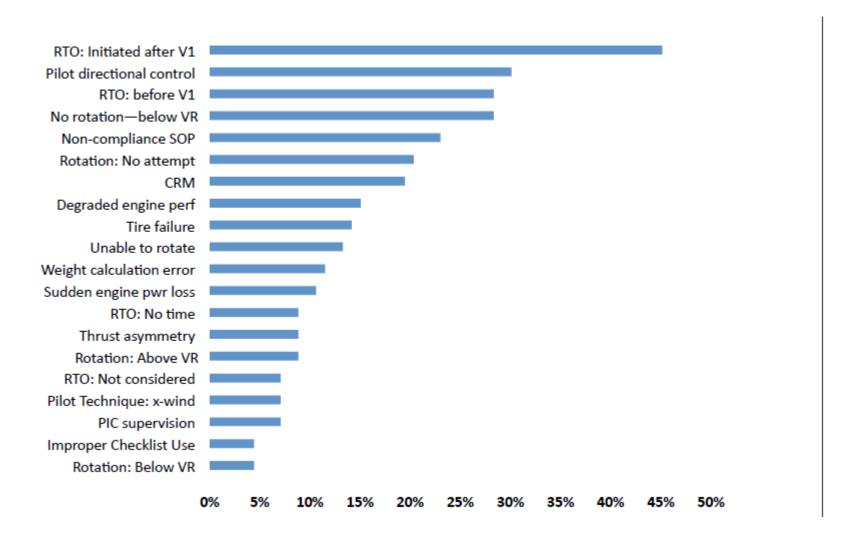
2013 – 17 Accidents

2009-2013 – 73 accidents

Graph 1 – Average 23% of accidents are Runway Excursions (Global)

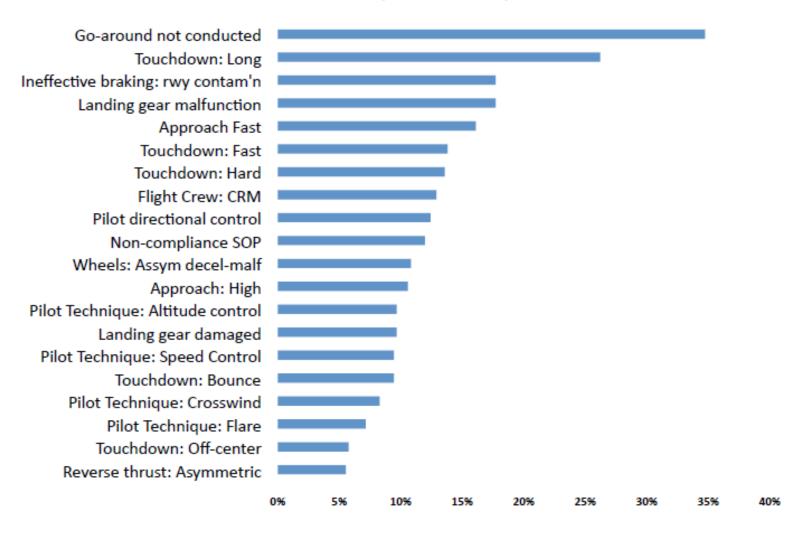
Graph 2 – Asia Pacific approx 33% of accidents are Runway Excursions

Takeoff Excursion Risk Factors (FSF Runway Safety Report)



Landing Excursion Risk Factors

(FSF Runway Safety Report)



Unstable Approach (significant precursor to runway excursion)

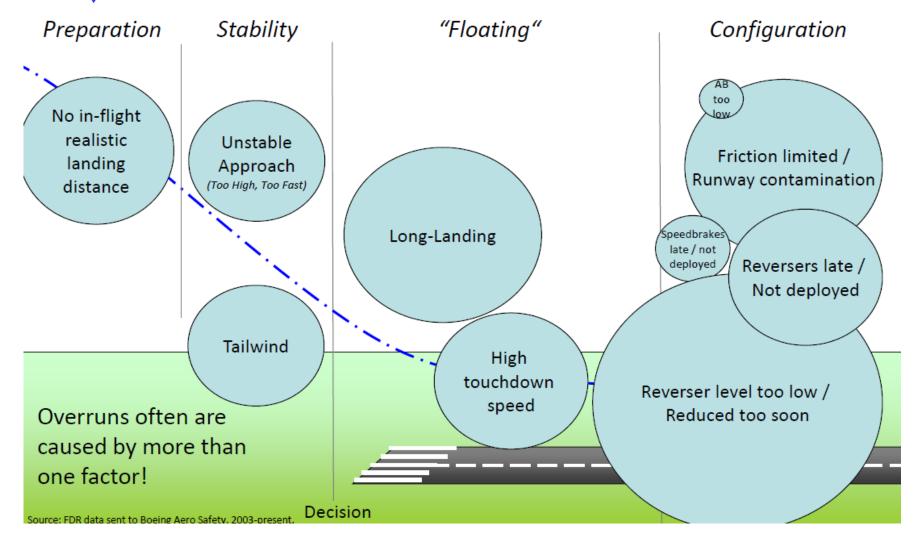
- An unstable approach occurs when one or more flight or aircraft configuration operational parameters have exceeded the company's tolerances:
 - ✓ Aircraft is on the correct flight path (ISL/GS aligned)
 - ✓ Aircraft speed (Vref+20 and not less than Vref)
 - ✓ Sink rate (no greater than 1000ft/min)
 - ✓ Aircraft is in the correct landing configuration
 - ✓ Power setting is appropriate for the aircraft configuration and is not below the minimum power for the approach as defined by aircraft ops manual
 - ✓ All briefings and checklists are completed

Landing Excursion Risk Factors



International Coordinating Council of Aerospace Industries Associations

Overrun Characteristics

















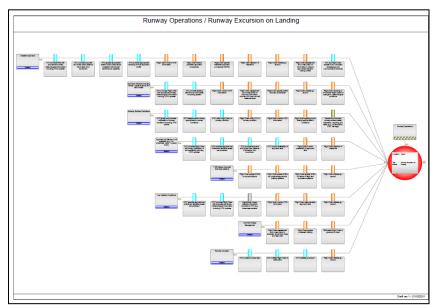


APRAST SEI/RE2

 CANSO (+ partners) developed a risk map on potential weaknesses in the ATM system in the final

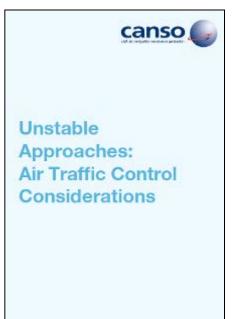
phase of flight.

- Runway excursion
 - on landing
 - on takeoff
- Unstable Approach
 - significant pre-cursor



APRAST SEI/RE2

Training for Pilots and Air Traffic Controllers to Avoid Unstabilized Approaches.





Essure the nameny sasignment is appropriate for the wind Excessive is heinds or occurrends can lead to unstable approaches and especially when the nameny is wet or contaminated, an

tame accurate and timely information related to weather conditions, wind and airport/namesy conditions. When conditions are rapidly changing, promptly inform the pilot of all significant/changes. Neapths overlying control





- SEI completed at APRAST/3 (May 13)
- Endorsed by RASG
- Released on 18 June 2013
- Available at <u>www.canso.org/safety</u>

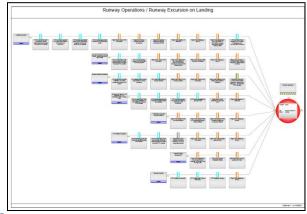
APRAST SEI/RS1

Runway Safety Maturity Checklist

ANSPs, Airlines, Airport Operators, Regulators and ATEL/ANAV providers

Checklist Elements

- Each element is a risk control
- For each element:
 - o Is there a practice?
 - o Is the practice written down?
 - o Are people trained, checked and assessed?
 - o Is it working? How do you know?
 - o How could you improve the element?
- Assessment is evidence-based (i.e., 'show me')





APRAST SEI/RS1 Runway Safety Maturity Checklist



ATC	Element What an you looking for? For example, "Do you have"	Objective Why are you looking for El	Does the element exist? Is it writes down (e.g. procedure)? Does it sold (e.g. equipment, signs, markings etc)? Details	Training Are people trained in the use of the element? Remodule and/or Refresher training? Details	Is it working? Now do you knew? je.g. Incident reports, analysis, correction action, feedback) Details	Improvement what could you do to Improve this element?	todex
ATC	ATC procedures for selection of author convey include consideration of convey surface smolltons.	To have runney in use suitable for prevailing conditions					
ARC	ATC procedures detail regularments for protection of orbital and sensible areas of approach side and sensible side bridge collinations of obstructions to flight own.	Plevent develope in guitance information					
AFC	ATC procedures require monitoring of approach and status.	Detect failure in approach all to leform plot					
APC.	ATC training, checking and assessment regimes rently use of CAO complete phrosestings including reached/deschack lectroques.	Standard phrase-tingy applied by all parties					
APC.	ATC procedures require belong and requests only to be provided to landing about after completion of the landing phase.	To enable plot to maintain directional control of the aircraft					
ATC	ATC provide a mechanism to gain bedisation. from Arthres regarding ongoing substitly of approach procedures.	Continual Improvement					
ARC.	Just culture policy and procedures	Robust and complete reporting trusting non-punitive environment					
ATC	Foligue Int. management system	Corticles filts duly					
AFC	Drug and abotic management program	Controllers ft for duly					

Hard copy released with Unstable Approach products

How to Access the Online Runway Safety Maturity Checklist

Send an email to:

rwysafety@eurocontrol.int

- Paper copy and weighting guide still available at:
 - www.canso.org/safety

ICAO Runway Safety Toolkit



Runway Safety Programme
Working together to solve a complex problem



http://cfapp.icao.int/tools/RSP_ikit/story.html
http://www.icao.int/safety/RunwaySafety/Pages/default.aspx

Guidance



ATC	Element What are you looking for? For example, "Do you have"	Objective Wity are you looking for it?	Does the element exist? is it written down (e.g. procedure)? Does it safe (e.g. equipment, signs, markings etc)? Details	Training Are people trained in the use of the element of the training? Details	is it working? now do you know? (a.g. knishet reports, analysis, correction action, feedback) Details	Improvement what could you do to improve this element?	Indu
ATC	ATC procedures for selection of author number textute consideration of number surface conditions.	To have runney in use suitable for prenating conditions					
ATT.	ATC procedures detail requirements for protection of critical and sensitive areas of approach able and survey ellip including sufficience of classications in Taylii serve	Prevent deviations in guidance information					
ATT.	ATC procedures require monitoring of approach and status.	Detect failure in approach set to below pilot					Γ
ARC.	ATC beining, shealting and assessment regimes verify use of EAC compliant phreses key industry medical/free lands lands square.	Mandard phrasedingy applied by all parties					
ATT.	ATC protectures require factority and requests only to be provided to tending almost after completion of the landing phase.	To enable pilot to resident directional control of the aircraft					
ATC	ATC provide a mechanism to pain feedback from Address regarding organing substicity of approach procedures.	Cortinual Improvement					Γ
ATT.	Juli culture policy and procedures	Robust and complete reporting, trusting non-purities and serion					
ATC	Falique (st. management system	Costolers II for 64y					
ATC.	Drug and alsohol management program	Controllers III for					т



European Action Plan for the Prevention of Runway Excursions

Edition 1.0

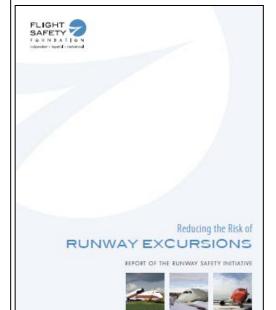


3.2 AERODROME OPERATOR

REF	RECOMMENDATION	OWNER	IMPLEMENTATION DATE	GUIDANCE
3.2.1	Ensure that nurways are constructed and refurbished to ICAO specifications, so that effective friction levels and drainage are achieved.	Aerodrome Operator	Immediate	APPENDIXB
32.2	An appropriate program should be in place to maintain the nanway surface thiction characteristics by removal of contaminants.	Aerodrome Operator	Immediate	APPENDIXB
323	If provided, ensure that appropriate navigation aids (e.g. ILS, AGL, PAPIs), and surface markings are maintained in accordance with ICAD standards and Recemmended Practices, to promote the accurate landing-fourthdown point.	Aerodrome Operator	02 January 2014	APPENDIX B
3.2.4	Ensure that the numezy holding points are clearly marked, signed and if required, IRL Consider the use of signage at the numery holding points used for intersection takeoffs to indicate the Takeoff Run Available (TORA).	Aerodrome Operator	02 January 2014	APPENDIX B
325	Ensure robust procedures are in place for calculating temporary reduced declared distances e.g. due to work in progress on the narway. When reduced declared distances are in perprise, nearth that the demonstry markings, lighting and signs accurably portray the reduced distances and that they are well-communicated, and transferred to States aeronautical informations services for publications.	Aerodrome Operator	Immediate	APPENDIX B
3.2.6	If runway contamination occurs or is changing assess the runway conditions.	Aerodrome Operator	immedate	APPENDIX B
32.7	Ensure robust procedures are in place for communicating safety significant information regarding changing surface conditions as frequently as practicable to the appropriate air traffic services.	Aerodrome Operator	Immediate	APPENDIX B
3.2.8	In accordance with ICAO provisions, wind sensors and wind direction indi- cators (wind soda) should be stind to give the best practicable indication of conditions along the nurway and touchdown zones.	Air Navigation Service Provider. MET Office, Aerodrome Operator.	02 January 2014	APPENDIX B
3.2.9	Consider equipping for digital transmission of ATIS, as appropriate.	Air Navigation Service Provider. MET Office, Aerodrome Operator.	02 January 2014	APPENDIX B

NOTE:

To mitigate the effect of a runway excursion it is agreed that runway end safety areas (which may include amenting systems) and runway stips are useful, although they are not excursion prevention measures. Burnway strips and RESAs are the subject of ICAO Standards and Recommended Practices.



Wildlife impact on runway safety



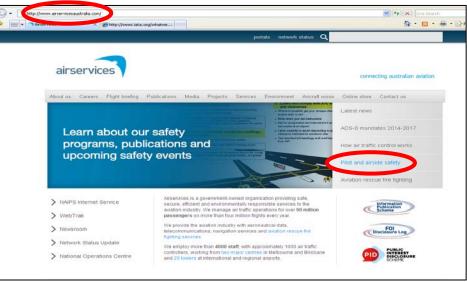
Runway Safety Focus

- LRST tend to focus on Runway Incursion
 - → Approx 20 per month vs 1.5 Runway Excursions
 - ₹ → Wildlife not contributory to RI
- Major causal factor (RE)
 - → Rejected Takeoff
 - → Failure to go-around
 - → Unstable approach
- Wildlife
 - → Distraction
 - → Unstable approach
 - → Operational impact



Runway safety guidance







Summary

- I have only scratched the surface
- Have a look through the links
- Ask someone:

Runway Safety

runway.safety@airservicesaustralia.com

lain White

iain.white@airservicesaustralia.com

Ph: +61 7 3860 8007

ICAO APRAST



RE2	Training for pilots and controllers to avoid unstabilised approaches	Champion – CANSO
RS1	Runway Safety Maturity Checklist	Champion - CANSO
RE6	Timely and accurate notification about runway conditions by AIS and ATS (Industry Best Practices Manual)	Champion - AAI

ICAO APRAST

In Progress Runway Safety Sub Group SEIs



RE7	Guidance materials and training program for runway pavement maintenance and operations from aerodrome operators perspective	Champion ACI Update APRAST5
RI1	RI Prevention and pilot training	Champion required
RI2	Runway Incursion SOPs (Prevention and pilot training)	Champion COSCAP
RI3	Enhanced surface marking and lighting	Champion APAC Office/ACI/IFALPA/IATA
RE8	Hazard Identification and Risk Management (Guidance to implement methods of RA and mitigation for operational issues related to runway excursions)	Champion AAPA
RE5	Monitor implementation of RESA. Publish guidance to air operators on non RESA equipped airports and guidance on risk assessment on the airfield environment	Champion IATA/IFALPA

Homework



Please think about

- -Your own runway safety program
- -Your runway safety team implementation
- Any runway safety issues you have
- -Any lessons you have learnt
- -Any programs (SEIs) that you think are required
- -The existing (in progress) SEIs we have

So that we can work together as the APAC Runway Safety Team and help each other to improve runway safety

Questions or Discussion

Thank you for your time