

# BUILDING LOCAL RUNWAY EXCURSION ACTION PLAN “UNSTABILISED APPROACHES”

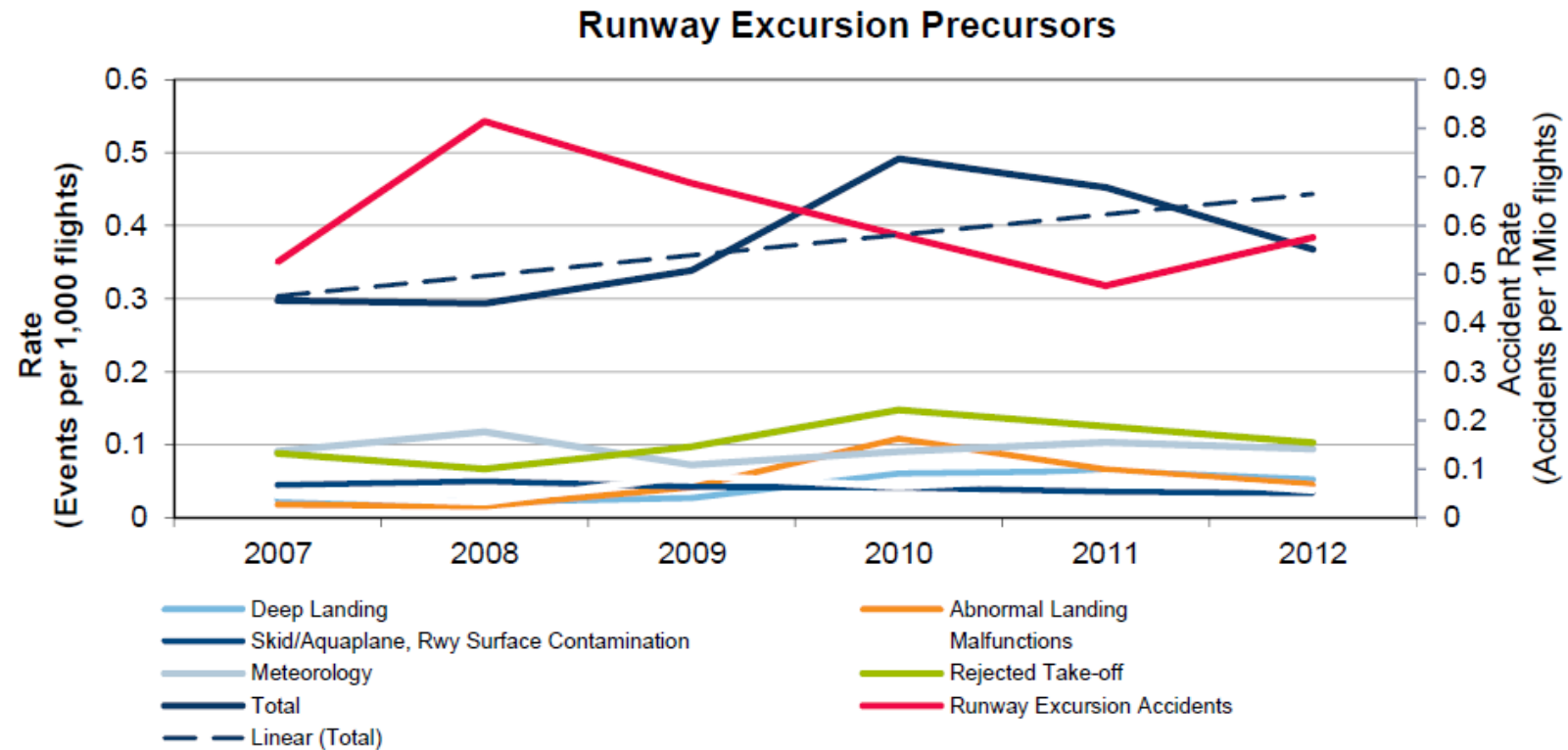


### Stabilised Approach (SAp)

- An approach which is flown in a controlled and appropriate manner in terms of configuration, energy and control of the flight path from a pre-determined point or altitude/height down to a point 50 feet above the threshold or the point where the flare manoeuvre is initiated if higher. (EASA)

# UNSTABILISED APPROACHES

## STEADES Precursors



## UNSTABILISED APPROACHES

### European Action Plan for the Prevention of Runway Excursions

Edition 1.0



### Appendix E

### Aircraft Operators

**RUNWAY EXCURSION** - An event in which an aircraft veers off or overruns the runway surface during either takeoff or landing.

# UNSTABILISED APPROACHES

## General

**Recommendation 3.4.1** Aircraft operators are encouraged to participate in safety information sharing networks to facilitate the free exchange of relevant information on actual and potential safety deficiencies.



**Recommendation 3.4.2** The aircraft operator should include and monitor aircraft parameters related to potential runway excursions in their Flight Data Monitoring (FDM) program.



## UNSTABILISED APPROACHES

**Recommendation 3.4.3** The aircraft operator should include runway excursion prevention in their training program. This training should be done using realistic scenarios.

6 monthly OPC alternating with a combined LPC/OPC, done in a realistic flight environment (LOFT style plus EBT) FSTD Level D.

**Recommendation 3.4.4** The aircraft operator should consider equipping their aircraft fleet with technical solutions to prevent runway excursions.

Head up **G**uidance **S**ystems, **B**rake-To-Vacate (basically to A350X) and **R**unway **O**verrun **P**revention **S**ystem

**Recommendation 3.4.5** The aircraft operator should consider equipping their aircraft fleet with data-link systems (e.g. **ACARS**) to allow flight crews to obtain the latest weather (D-ATIS) without one pilot leaving the active frequency.

ACARS

## UNSTABILISED APPROACHES

**Recommendation 3.4.6** The aircraft operator should report to the ANSP if approach procedures or ATC practices at an airport prevent flight crew from complying with the published approach procedure and their stabilised approach criteria.

TAP participate on Local Runway Safety Teams of the airports in their route network.

**Recommendation 3.4.7** The aircraft operator should ensure the importance of a stabilised approach and compliance with final approach procedures is included in briefing for flight crews. The commander should not accept requests from ATC to perform non-standard manoeuvres when they are conflicting with the safety of the flight.

Examples of this are:

- Controllers giving a tight base-turn
- Controllers asking to keep the speed up
- Controllers asking to expedite vacating the runway
- Controllers giving late runway changes

## UNSTABILISED APPROACHES

**Recommendation 3.4.8** The Commander should not accept a late runway change unless for safety reasons. A briefing and if needed flight management computer (FMC) preparation must be completed (e.g. before leaving the gate or starting the final approach).

- Rushed and unstabilised approaches
- Wrong radio and navigation settings for approach
- Flying the wrong approach

## WEATHER

**Recommendation 3.4.10** The Commander, shortly before takeoff and landing, shall verify that the actual weather conditions are similar or conservative compared to the weather data used for the takeoff performance calculations and the in-flight landing distance assessment.

Airbus Factored Inflight Landing Distance.

## UNSTABILISED APPROACHES

### CROSSWIND OPERATIONS

**Recommendation 3.4.11** The aircraft operator should publish the Aircraft's **Crosswind Limitations** with specific guidance on the runway condition and the gust component.

OM(B) Wind limitations and OM(C)-CCI- for specific aerodromes.

**Recommendation 3.4.12** The aircraft operator should publish specific guidance on takeoff and landing techniques with cross wind; and/or wet or contaminated runway conditions and the correct use of the nose wheel steering. Appropriate training must be provided.

OM(B) and AIB Docs.

# UNSTABILISED APPROACHES

## APPROACH

**Recommendation 3.4.17** When accepting the landing runway the Commander should consider the following factors: weather conditions (in particular cross and tailwind), runway condition (dry, wet or contaminated), inoperable equipment and aircraft performance. Except in conditions that may favour a non precision approach, when more than one approach procedure exists, a precision approach should be the preferred option.

However, it's recognised that to maintain the proficiency of manual flying skills flight crew should fly the aircraft manually on a regular basis when appropriate.

## UNSTABILISED APPROACHES

**Recommendation 3.4.18** The aircraft operator must publish Company Criteria for **stabilised approaches** in their Operation Manual. Flight crew should go-around if their aircraft does not meet the stabilised approach criteria at the stabilisation height or, if any of the stabilised approach criteria are not met between the stabilisation height and the landing. Company guidance and training must be provided to flight crew for both cases.



- The aircraft is on the correct lateral and vertical flight path
- The aircraft is in the landing configuration
- Thrust and speed are stabilised at the approach value
- The landing checklist is completed.

## UNSTABILISED APPROACHES

**Recommendation 3.4.16** The aircraft operator must publish the company policy, procedure and guidance regarding the go-around decision. It should be clearly stated that a **go-around** should be initiated at any time the safe outcome of the landing is not assured. Appropriate training should be provided.

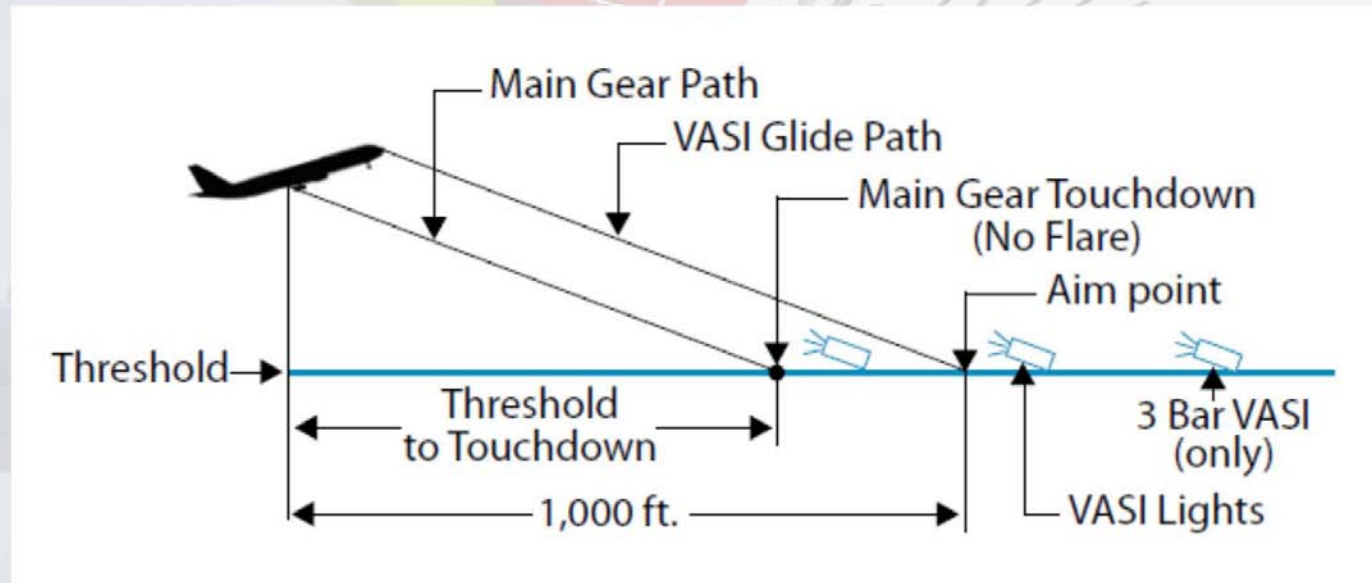


**Recommendation 3.4.19** The aircraft operator should publish a standard operating procedure describing the pilot non flying duties of closely monitoring the flight parameters during the approach and landing. Any deviation from company stabilised approach criteria should be announced to the pilot flying using standard call outs.

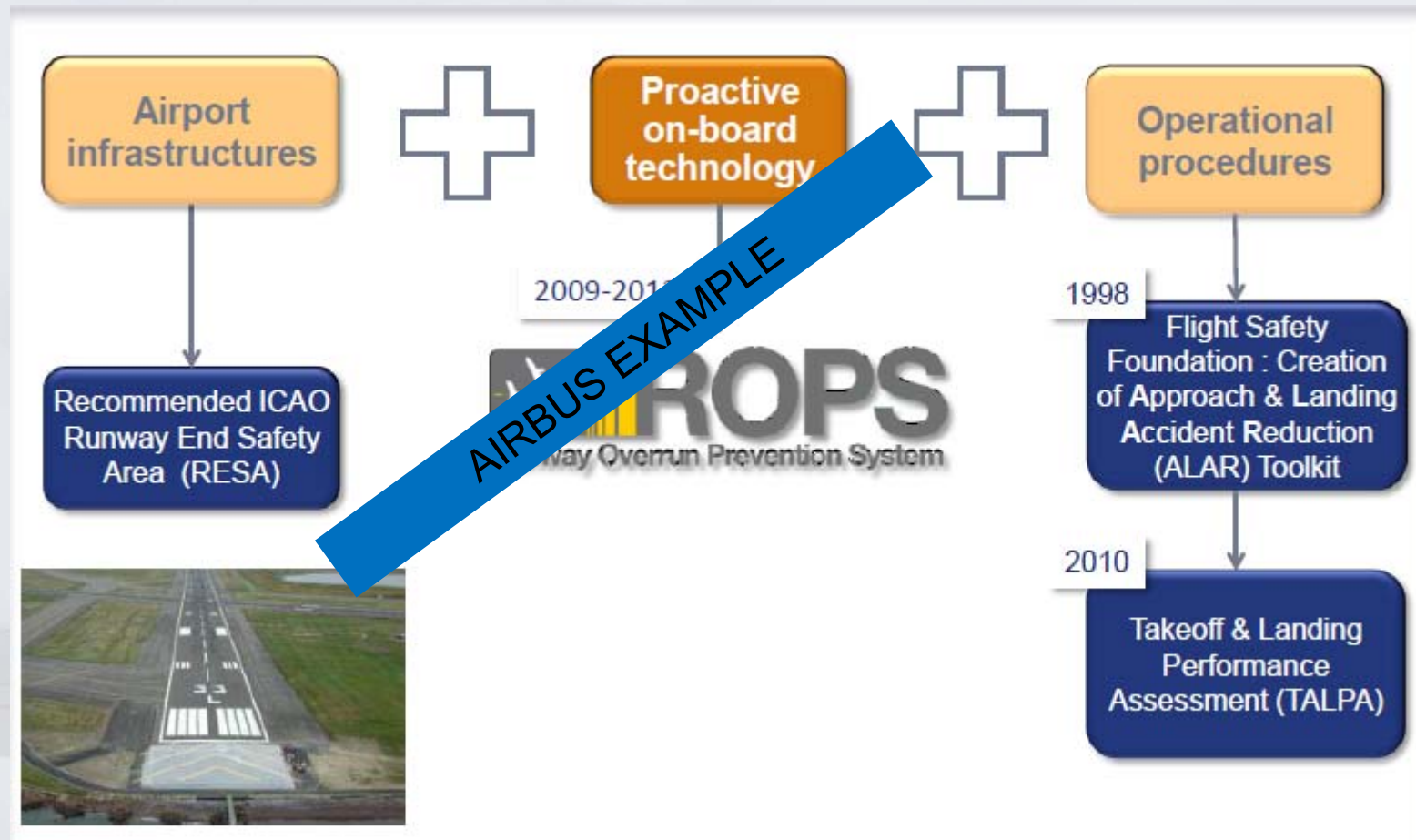


## UNSTABILISED APPROACHES

**Recommendation 3.4.21** The aircraft operator should publish the standard operating procedure regarding a touchdown within the appropriate **touchdown zone** and ensure appropriate training is provided.



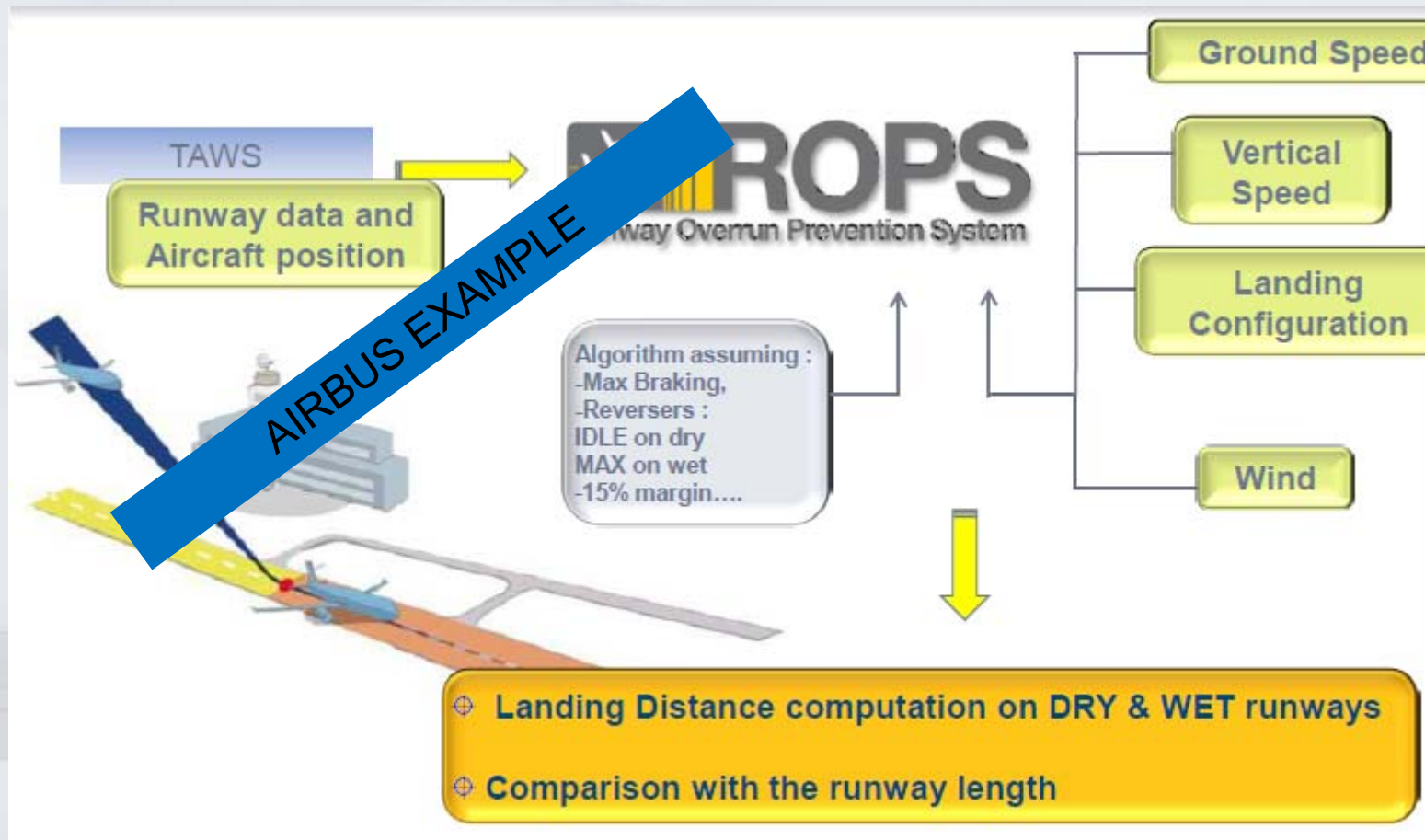
## UNSTABILISED APPROACHES



## UNSTABILISED APPROACHES



## UNSTABILISED APPROACHES



## UNSTABILISED APPROACHES



Runway Overrun Prevention System

AIRBUS EXAMPLE

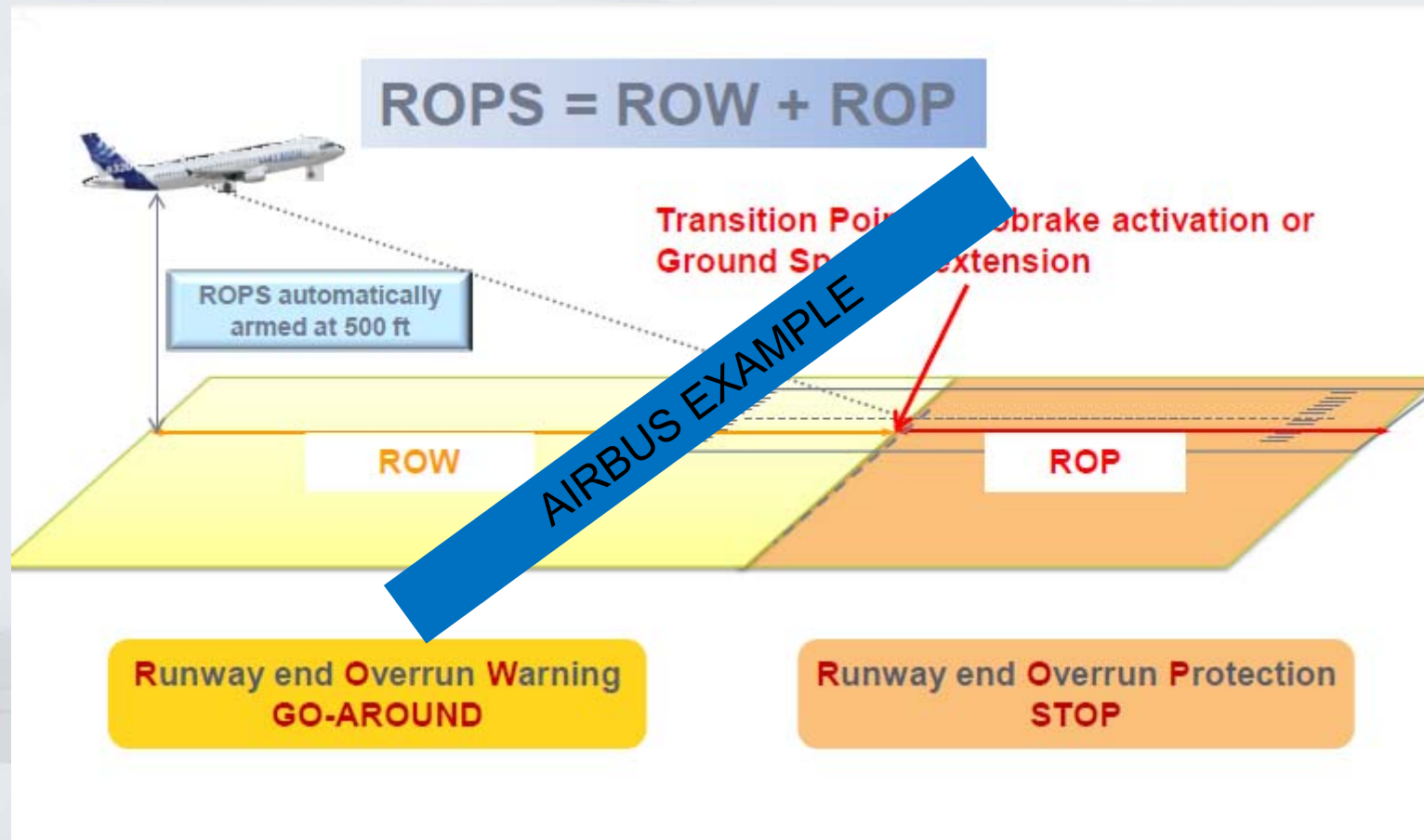
- ✓ Wind and /or Low visibility
- ✓ AP engaged or not
- ✓ Overweight Landing
- ✓ With aircraft landing configuration
- ✓ Contaminated runways not taken into account

PEP ROPS alerts

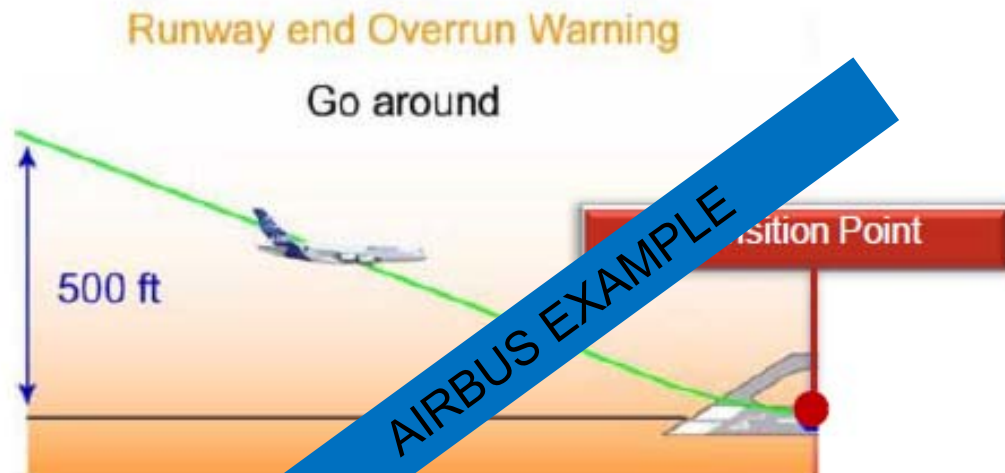


LOUDSPEAKERS: Audio ROPS alerts

## UNSTABILISED APPROACHES



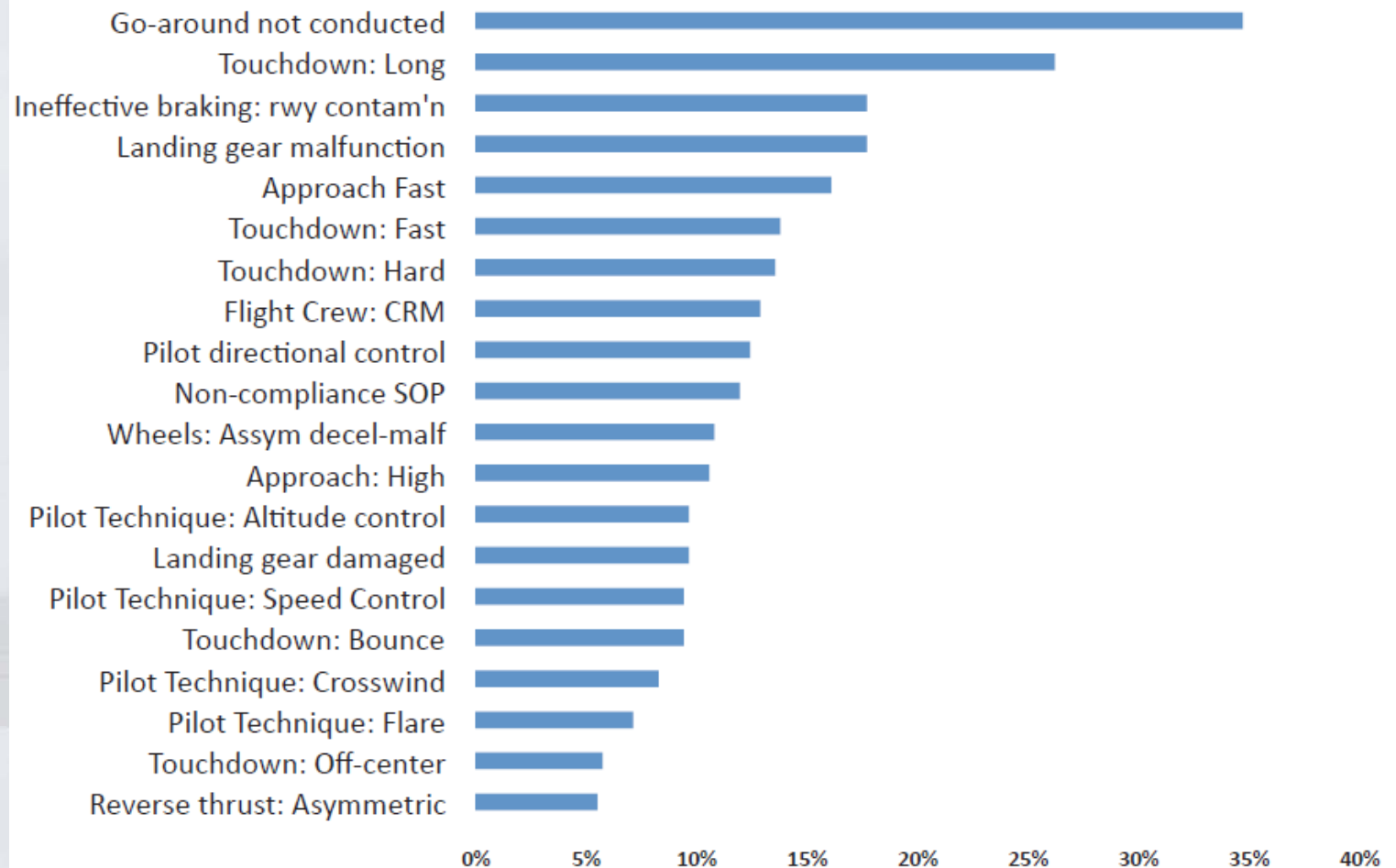
## UNSTABILISED APPROACHES



PFD (Below 500 ft)	Audio (Below 200 ft)	Pilot Action (Below 500 ft)
	<p>"RWY TOO SHORT !"</p>	<p>Go-Around Decision Whatever Runway Condition</p>


## UNSTABILISED APPROACHES

### Landing RWY Excursion Top Risk Factors



## UNSTABILISED APPROACHES

**“Approach and Landing” revised to better consistency with stabilized approach criteria according to IOSA FLT 3.11.59.**

 TAP PORTUGAL	<b>OPERATING PROCEDURES</b> FLIGHT PREPARATION INSTRUCTIONS Minimum Flight Altitudes	08.01.01
OPERATIONS MANUAL PART A		Page 4

### Departure

The minimum height for commencing a turn after takeoff is 400 ft AGL or AAL, unless otherwise specified on OM (C) RM.

### Approach and landing

The aeroplane shall be stabilised in the approach at 1000 ft AAL (500 ft in VMC) or a go around shall be initiated.

Stabilised Approach is an approach within the following criteria:

- ⇒ the aeroplane is on the correct lateral and vertical path;
- ⇒ the aeroplane is in the required landing configuration (gear + landing flaps);
  - constant rate of descend not exceeding 1000 feet per minute;
  - engine power stabilised or at least above IDLE POWER;
  - IAS not exceeding Vapp Target + 10 kt and not below Vapp Target – 5 Kt;
  - all required checklists performed.

All flights shall be stabilised by 1000 feet above touchdown in IMC or 500 feet above touchdown in VMC, otherwise flight crews shall consider making a go-around. Unique approaches, such as FNC require a special briefing.

## UNSTABILISED APPROACHES

**Stabilised Approach Procedure** is an approach procedure along the extended runway centreline with a **constant, in-flight descent gradient** from the final approach altitude **to the runway touchdown zone**. Except for offset-localizer approaches, an ILS approach is inherently a stabilised approach procedure.

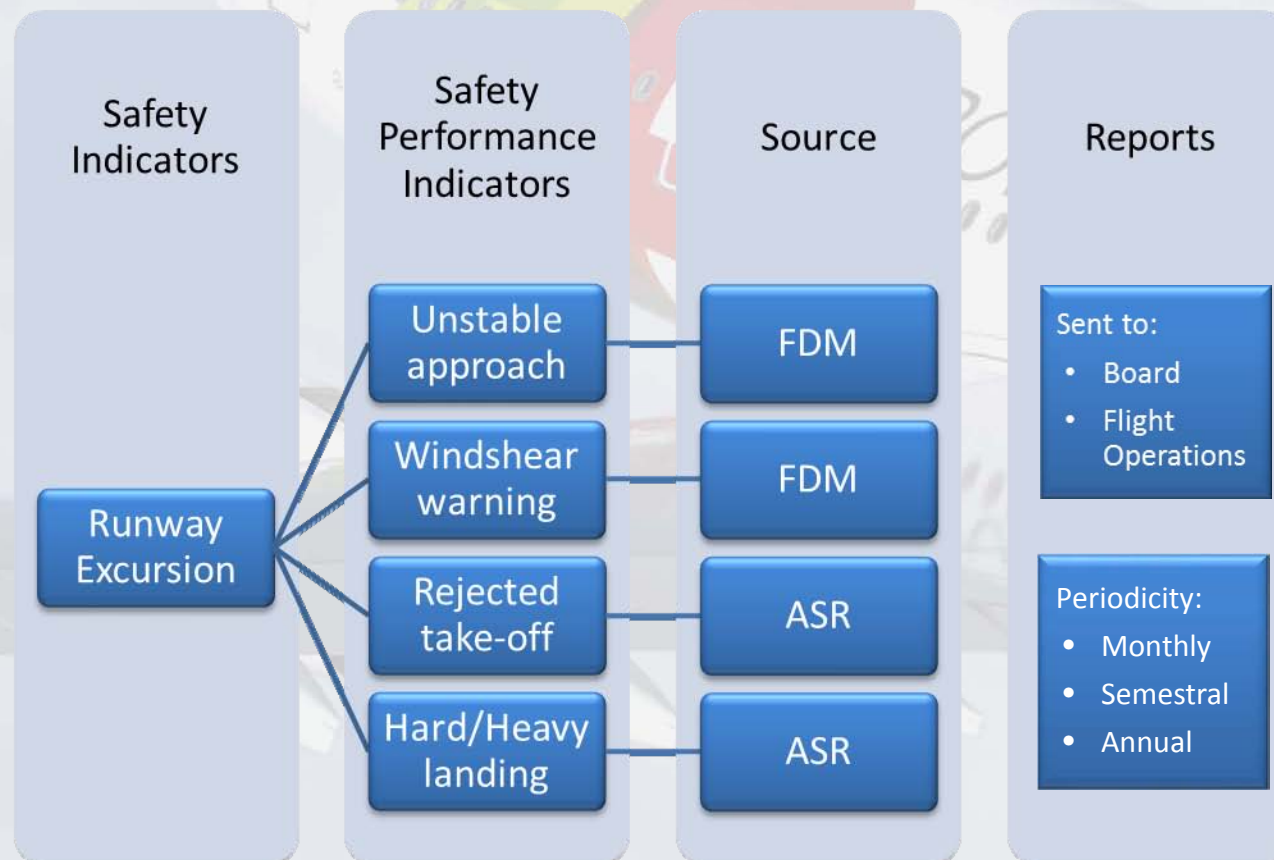
Non-precision approaches can be constructed as a stabilised approach procedure by choosing the FAF accordingly and by publishing a distance-versus-altitude (VOR + Distance-Measuring Equipment (DME), NDB+DME, localizer (LOC)+(DME) or way point-versus-altitude table (GPS) to be able to verify adherence to the (imaginary) glide path

. **The final segment of all approaches** (including non-precision approaches) should be planned **at a constant descent profile**. At or below 1000 ft AAL, the rate of descent shall be restricted to 1000 feet per minute

. The approach and landing **shall be planned** in such a way that the aeroplane will touchdown in the touchdown zone markings or a **go around shall be initiated**.

## UNSTABILISED APPROACHES

Safety Indicators (SI's)	Safety Performance Indicators (SPI's)	Source	Last 3 Months > Target Indicator
Runway Excursion (ESAp)	Unstable approach	Flight Data	●
	Windshear warning	Flight Data	●
	Rejected take-off	Reporting	●
	Hard/Heavy landing	Reporting	●



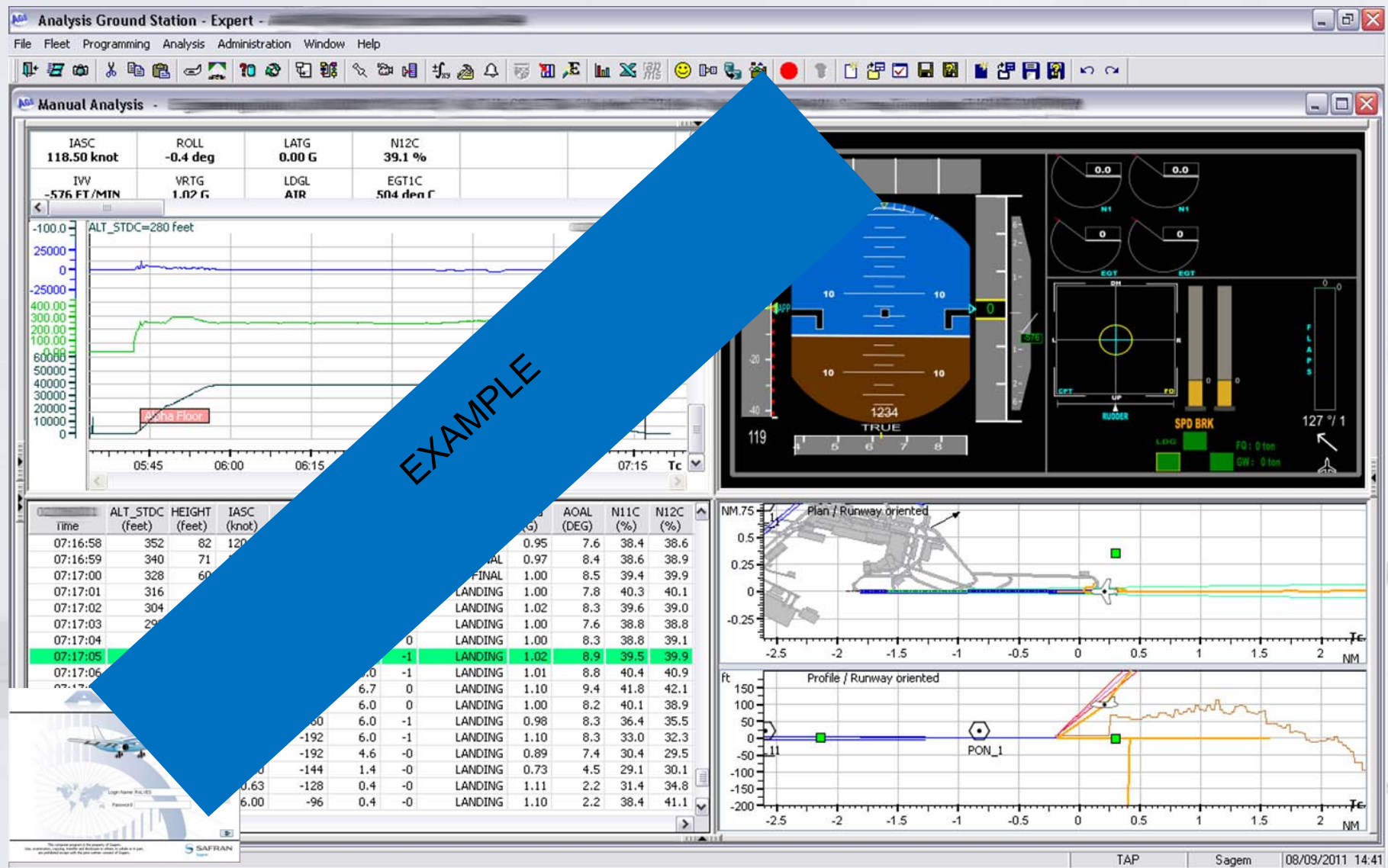
# UNSTABILISED APPROACHES

EXAMPLE



Flight Data Ground Station

# UNSTABILISED APPROACHES



# UNSTABILISED APPROACHES



**Flight Data Analysis and Cockpit Emulator for Flight Analysis**

## UNSTABILISED APPROACHES

ARRIVAL BRIEFING		
STATUS	APPROACH	LANDING
RWY__ STATE / WIND	TOP OF DESCENT	LAND CONFIG / DIST*
NOTAMS	STAR MSA / TL / IAF/ MINIMUMS*	AUTO BRK / REV*
ANTI-ICE / IGNITION	STAR / APP & GA CHECK*	RWY EXIT / ARPT LAYOUT / TAXI / HOTSPOTS*
RADAR / TERRAIN	ALT RTE / FUEL	CONSIDER ONE ENG TAXI ARRIVAL
	RADIO NAVS*	LOST COMM

Note: Items marked with \* shall be re-accomplished in the event of a runway change

# UNSTABILISED APPROACHES

## FINAL APPROACH

A/THR.....CHECK IN SPEED MODE OR OFF

Management and flight crews develop and regularly update  
SOPs

LDG MEMO.....CHECK NO BLUE LINE  
CABIN REPORT.....OBTAIN  
CABIN CREW ADVISE

### CM1 ANNOUNCE:

IF CM1 PF: "STABILIZED" or "GA/FLAPS"

IF CM2 PF: "STABILIZED" or "OVERSHOOT"

(If applicable, announcement may be delayed to 500ft  
all)

### • At 1000 ft RA :

CM2 MONITOR OR ANNOUNCE ..... "ONE  
THOUSAND"

### • At DA + 100 ft :

CM2 MONITOR or ANNOUNCE....."ONE HUNDRED  
ABOVE"

### • At DA :

CM2 MONITOR or ANNOUNCE....."MINIMUM"

*Continued on the following page*

TAP A330/A340 FOR A/C: A330

## UNSTABILISED APPROACHES

### LANDING

Landing performance shall be assessed prior to arrival at the destination or alternate airport in order to determine that sufficient landing distance exists for a landing to be accomplished with a safety margin factor of 1,15 on top of in-flight landing distance or landing distance with fail

Fact



## UNSTABILISED APPROACHES



CM1 landing is mandatory if:

- $LDA \leq 7000 \text{ ft (2133,6 m)}$
- LPMA, LPHR, LPPI and GGOV.
- Overweight
- Required by Airport Operating Regulations

For all runways with  $LDA \leq 7000 \text{ ft (2133,6 m)}$ :

- Use Configuration FULL
- No limitation affecting performance or requiring increased landing distance is allowed for this type of operation.

TAP A319/A320/A321  
FCAP

← B →

PRO-SOP P 12/14  
28 SEP 13

# UNSTABILISED APPROACHES

## OPERATIONAL INFORMATION

(4) Perform X-check of altimeters with radio altimeter alive.

(5) Since the RWY is short, the approach shall be visually stabilized until 1000 ft.

(6) Be aware that Inflight Landing is not permitted. **MAXIMUM MANUAL BR**

(7) Maintain the normal PAPI

(8) Operation with anomalies INOP is not permitted.

(9) At landing, seek to touch down on the runway. If unable, a Go-around shall be performed.

(10) Back track shall be performed if necessary.

Turbulence and wind phenomena are as follows:

- wind from sector "SE – SW" (from 150° to 230°) with intensity > 10 kt produces strong wind-shear and downdrafts during approach.
- The recommended wind limitations are shown below:

MAGNETIC WIND DIRECTION (CLOCKWISE)	RECOMENDED MAX. WIND
030° TO 050 °	35 KT
050° TO 120 °	40 KT
120° TO 150 °	30 KT
150° TO 230 °	20 KT
230° TO 260 °	30 KT
260° TO 330 °	40 KT
330° TO 350 °	35 KT
350° TO 030 °	30 KT



"standing water". In case of rain, pilots should wait for its passage to avoid "wet runway" operation.

V folder.



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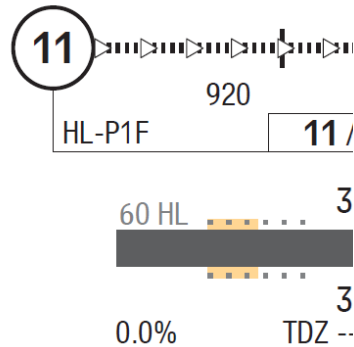
Page 4

North side view

(1) Operation is forbidden in case of "standing water". In case of rain shower, pilots should wait for its passage to avoid "wet runway" operation.

# UNSTABILISED APPROACHES

## Landing RWY system:



## OPERATIONAL INFORMATION

### 3) GROUND

- If RWY 11 full length is used for landing, back-track shall be performed on turning bay at the end of runway, caution should be addressed;

### 4) TAKEOFF

- Takeoff shall be performed by the CM1;
- Depending on T/O weight and wheather conditions, Takeoff up to TOGA or BUMP thrust and FLAPS 3 may be needed due to runway limitations;
- Maximum crosswind for Takeoff, gust included - 25KTS;
- When operating on narrow runways there are potential factors for Takeoff Offsides such as: Asymmetric spin-up; engine failure; slippery runway heavy rain; strong/gusty winds; asymmetric reverse thrust;
- Worst case for directional control is encountered on RTO when engine fails at slow speed with TOGA thrust;

### 5) APPROACH AND LANDING

- Landing shall be performed by the CM1;
- Maximum crosswind for Landing, gust included - 25KTS;
- RVAC is mandatory;
- ILS 11 - GS Interception at 2000' with FLAPS 2 and LDG GEAR down;
- VORDME Z 29 - MDA 550', Ceiling required 600', MAP after Threshold;
- VORDME Y 29 - MDA 500', Ceiling required 500', MAP after Threshold;
- Landing with FLAPS FULL;
- The use of MED Auto Brakes and Max Reverse is recommended;
- Approach and Landing with tailwind conditions, can lead to a fast/long Touchdown or Bounced Landing, and therefore, runway excursions are a potential threat;
- Tendency to flare late on narrow runways due to optical effect should be

CCI

ALEGRE Salgado Filho

Brazil

20-Sep-2012

POA - SBPA

## ATIONAL INFORMATION



Rwv11 view

# UNSTABILISED APPROACHES



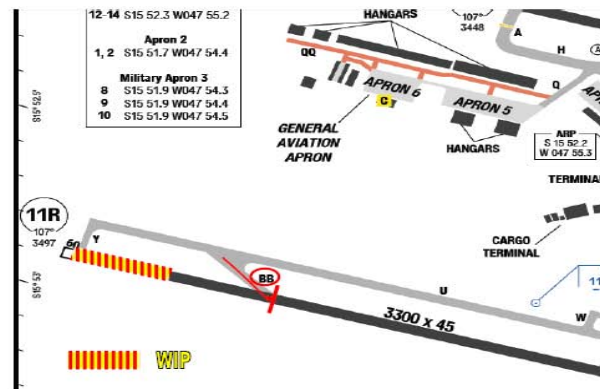
SBBR RWY 11R FST 420M CLSD

## NOTES:

1. Entrance and Take-Off from TWY "BB" only. Following declared distances are being considered:

	TORA	TODA	ASDA	LDA
RWY 11R	2500M	2500M	2560M	2880M
RWY 29L	2880M	2880M	2880M	2500M

2. No Back-Track allowed (If necessary contact Fleet)
3. Consider use of RWY 11L/29R at all times.



## AIRPORT ANALYSIS

A330 - 223

AM J0804/12 E J0805/12 \* \* \* \* \* SBBR  
IA (PRES J KUBITSCHKE) 11R (BB)  
TO.SHIFT 800M TORA 2500M DRY RWY  
/ 9402M ELEV 3497' ASDA 2560M A/C OFF  
TREF 23°C TODA 2500M TOGA  
BASIC TMAX 48°C SLOPE-0.71% ENTRY 90°

CONF 2				OAT
TAILWIND	WIND	HEADWIND		°C
-10 KT	0 KT	10 KT		
208.6 3-4	219.4 3-4	223.0 3-4		-13
131/35/44	140/44/52	143/47/55		
207.8 3-4	218.6 3-4	222.2 3-4		-9
130/34/43	139/43/51	142/46/54		
207.0 3-4	217.9 3-4	221.4 3-4		-5

ARD NOTAMs Layouts

## UNSTABILISED APPROACHES

CRM Recurrent training – 3 year cycle


### Case Study Air France 358



The glideslope and airspeed deviations on short final, following a normal, stabilized approach, can be attributed directly to expected or unexpected weather conditions

However, TAP Portugal Policy **recommend the use of the autothrust** in order to reduced the Flight Crew's workload and increase the Situation Awareness.

# UNSTABILISED APPROACHES

 TAP PORTUGAL OPERATIONS MANUAL PART D FLIGHT CREW A320F	<b>TRAINING SYLLABI AND CHECKING PROGRAMMES</b> <b>FLIGHT CREW</b> <b>RECURRENT TRAINING AND CHECKING</b>	02.01.06 PAGE 43
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☐ CM1: XXXXX TAP NR: XXXX ☒ A 3 2 0 F L C  
☐ CM2: XXXXX TAP NR: XXXX ☒  
 TRE: CARLOS BARROS TAP NR: 22896 ☒  
 DATE: 12 - 10 - 21 FLIGHT N°1016 /1017 LEG: LIS MAD/LIS



## Simulator & Line Checks



### CRUISE

21	Navigation						
22	Optimum Flight Level						
23	Fuel Management						
24	Meteo						
25	Arrival Preparation						
26	Alternate Preparation						
27	Arrival Briefing						

### DESCENT

28	Descent Procedures						
29	Arrival Procedures						

48	Use of ECAM						
49	Use of Checklists						
50	Systems Management						
51	Radio Communications						
52	MNPS/WATRS/RNP/RVSM						
53	E OPS						
54	FANS / CNS - ATM						
55	Passenger Information						
56	CRM						
57	Economy						
58	Security						
59	Safety						

### HOLDING

	PF	PNF	1	2	3	4	5
30	Navigation						
31	Fuel Management						

### APPROACH

	PF	PNF	1	2	3	4	5
32	Approach Procedures						
33	Precision Approach - CAT						
34	Non Precision Approach						
35	Visual Approach						

### LANDING

	PF	PNF	1	2	3	4	5
36	Landing Procedures						
37	Use of Reverse						
38	Use of Brakes/Autobrakes						
39	Autoland						

# UNSTABILISED APPROACHES

EXAMPLE



# UNSTABILISED APPROACHES

## Pilot Performance Self Assessment

PILOT PERFORMANCE SELF ASSESSMENT AT LDG  
A32X PPSA REPORT LANDING <076> V02

A/C ID DATE UTC FROM TO FLT PH  
C1 CS-TMW FEB22 000000 0000 00

VAPP GW CG MHDG FLP TRIG UTC PRT  
KT KG X10 DEG X10 CODE HHMMSS  
C2 144 00000 000 0000 0000 7600 145352

IAS10 RA10 UTC10 IAS05 RA05 UTC05  
KT FEET HHMMSS KT FEET HHMMSS  
C3 137 0999 000000 140 0503 000000

	LDG	RALT	PTCH	IAS	VRTA	IVV
	LNR	FEET	X10	KT	X100	FT/M
C4	000	0000	0000	000	0000	000000
C5	000	0000	0000	000	0000	000000
C6	000	0000	0000	000	0000	000000
C7	000	0000	0000	000	0000	000000
C8	000	0000	0000	000	0000	000000
C9	000	0000	0000	000	0000	000000
C0	000	0000	0000	000	0000	000000
E1	000	0000	0000	000	0000	000000

E2	101	0000	0000	000	0000	000000
E3	101	0000	0000	000	0000	000000
E4	101	0000	0000	000	0000	000000
E5	111	0000	0000	000	0000	000000
E6	111	0000	0000	000	0000	000000

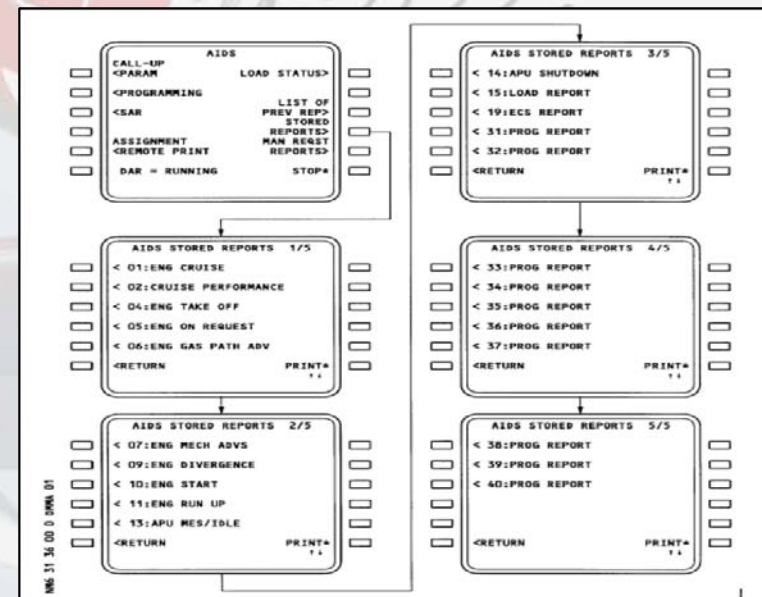
MAX VALUES AT AIR-GROUND  
WD WS PTCH ROLL IVV DRIFT  
E7 000 000 0000 0000 00000 0000

YAWR PTCR ROLR VRTA LATA LONA  
E8 0000 0000 0000 0000 0000 0000

## MCDU

MENU<AIDS<STORED

REPORTS<76:A32X PPSA REPORT



## UNSTABILISED APPROACHES

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Portal DOV - Consultar Eventos GSV

TAP TAP PORTUGAL

Portal de Utilizadores de Controlo de Voo

Resumo Documentos Planeamentos Directório Dados Pessoais Escala GSV LogOut 00000.0 - Cabin Safety

Consultar Eventos

> GSV > CONSULTAR EVENTOS

Nº TAP: Desde: 01-01-2011 Até: 22-08-2011

### Avisos Importantes

Novos eventos 7022 e 7431:  
7022 > A informação sobre o PF deve ser interpretada do seguinte modo: Se o PF é o CM1 então o evento está desenhado de acordo com os critérios estabelecidos em OM(A) 00.01 p29 e Será registado um evento 7431 sempre que numa aterragem com:  
- Flaps 3, aos 1000ft se verificar uma falha de configuração (Trem ou Flaps) ou duas outras falhas (S  
- Flaps Full, se verificarem as condições anteriores, à excepção dos Flaps que terão que estar select  
A altitude atribuída ao evento corresponderá ao último momento em que a aproximação da aeronave  
Critério de identificação do PF num evento:  
O critério em vigor à data de início de produção do serviço EoD, era considerar que o PF seria o piloto  
feedback da atribuição indevida de eventos ao CM2 como PF em aproximações ao FNC.  
Nestes voos para o FNC, tipicamente é o CM2 que descola e aligeira a meio caminho o PF passa a s  
de ter havido a troca de AP2 > AP1), os últimos inputs de sidestick registados são os do CM2, ficando  
Este critério já foi revisto e para já, só os voos processados a partir de 23SET09 é que beneficiarão  
Com tempo serão re-processados os voos retroactivamente.  
Estamos ao dispor dos Srs. Pilotos que sintam necessidade de confirmar pontualmente quem era o P  
contactos em baixo.  
As nossas desculpas pelo inconveniente.

### Período de Pesquisa

Done

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Create PDF Combine Files Export Start Meeting Secure Sign Forms Review & Comment

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TAP TAP PORTUGAL

## EVENT REPORT

From 01-01-2011 to 22-08-2011

Issued on 12/09/2011

### Fleet A319 - Events by Arrival Airport

Arrival Airport	Events (%)
OPO (2)	16.7%
FNC (2)	16.7%
LIS (1)	8.3%

### Fleet A319 - Events per Flight Phase

Flight Phase	Events (%)
T.OUT	-
TO	-
RTO	-
2ND	-
I.CLB	-
CLB	-
CRZ	-
DES	-
APP (1)	8.3%
FIN (2)	16.7%
LDG (2)	16.7%
GA	-
T.IN	-

T.OUT = TAXI OUT TO = TAKE OFF RTO = ABORTED TO 2ND = 2 SEGMENT I.CLB = IN CLIMB CLB = CLIMB CRZ = CRUISE DES = DESCENT APP = APPROACH FIN = FINAL LDG = LANDING GA = GO AROUND T.IN = TAXI IN

Page 3 of 5

## Events on Demand

## UNSTABILISED APPROACHES



Think Safety, Act Safely and Be Safe.

## UNSTABILISED APPROACHES



Obrigado!...