改善企業安全文化
落實航務風險管理

復興航空公司

陽卓霖 航務處

2016 年飛安資訊交流研討會

簡報大綱

- ★企業安全文化的提升與實踐 01
- ★興航安全文化的創造與維護 02
- ★航務安全文化的推動與成果 03

企業安全文化的提升與實踐

復興航空 TransAsia

2016 年飛安資訊交流研討會

安全文化的定義

安全文化是組織內每一個階層、每一個人、對工作人員生命安全及一般大眾生命安全所持之價值觀及信念。

企業安全文化提升與實踐

*依據台灣飛安基金會飛安專題講座簡報

- 透過訂定安全目標、安全計畫、安全績效指標把安全管理融入組織行為。

- 透過安全政策、風險管理、安全保證、安全提升等方式來具體改造企業安全文化。

- 透過組織進行航務安全績效改善，強化現行紀律政策，建立內部審查機制以確保安全績效指標持續進步和改善。

改造企業文化與人員行為塑造

興航安全文化的創造與維護

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興航安全文化的創造與維護

策略安全管理

強化組織管理以掌握資源的有效運用

程序安全管理

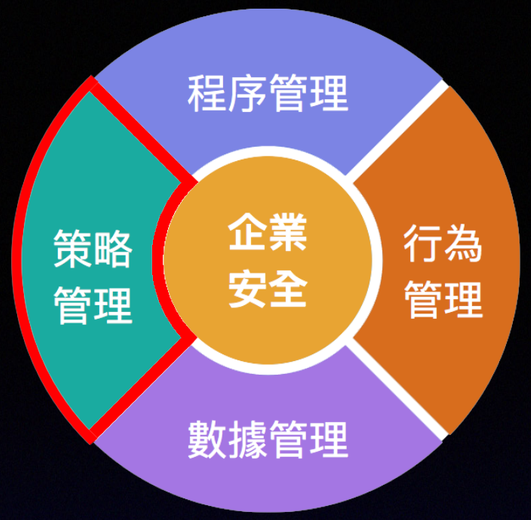
確保關鍵性的程序步驟被適當的執行

行為安全管理

建立作業標準化與落實工作紀律

數據安全管理

積極引進新科技，以整合及提昇作業系統功能



策略安全管理

強化組織管理以掌握資源的有效運用

+1

Corporate Safety & Security Division
企業安全處
VP x1
AVP x1

Upgrade

企業安全處

飛安管制室

+2

Security Management Department
保安管理部
Supervisor x1
Specialists x3

+3

Flight safety Management Department
飛安管理部
Supervisor x1
Engineers x5

+4

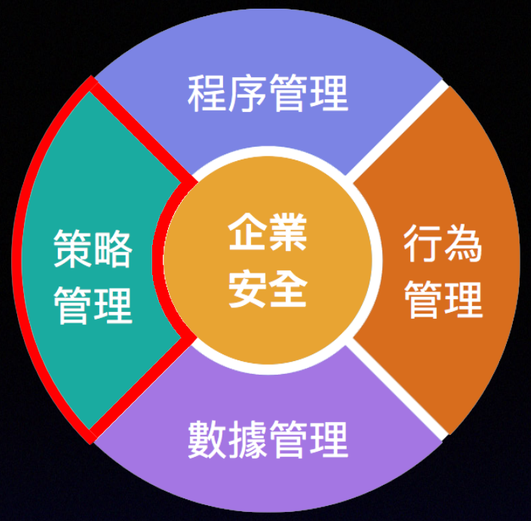
Safety Assurance Management Department
安全保證管理部
Manager x1
Specialists x3

+4

Data Analyzed Management Department
資料分析部
Manager x1
Engineers x2
Safety pilots x3

Reinforcement of the Safety Management team

Facilitated with qualified personnel



策略安全管理

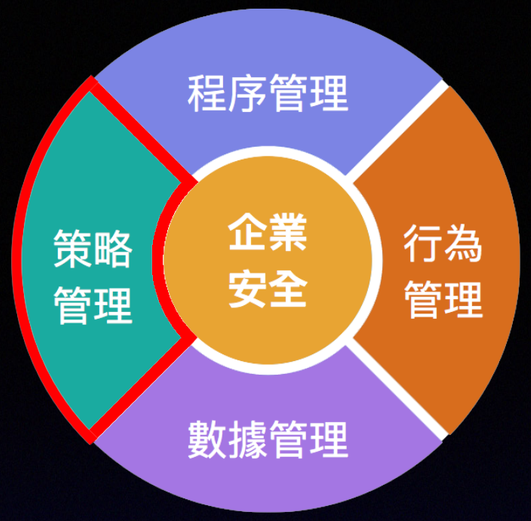
強化組織管理以掌握資源的有效運用

Flight Operations Division
航務處
AVP x1

Administration & Scheduling Department 行政派遣部	Fleet Management Department 機隊管理部	Training & Standard Department 訓練標考部	Planning & Development Department 計畫發展部
+4	+0	+6	+3
Manager x1 Coordinators x8	Manager x1 Chief Pilots x3	Manager x1 Supervisors x5 Coordinators x4	Manager x1 Engineers x4 Coordinators x3

Reinforce Training and Standards Department

Facilitated with 5 more Training and Standard Supervisors



策略安全管理

強化組織管理以掌握資源的有效運用

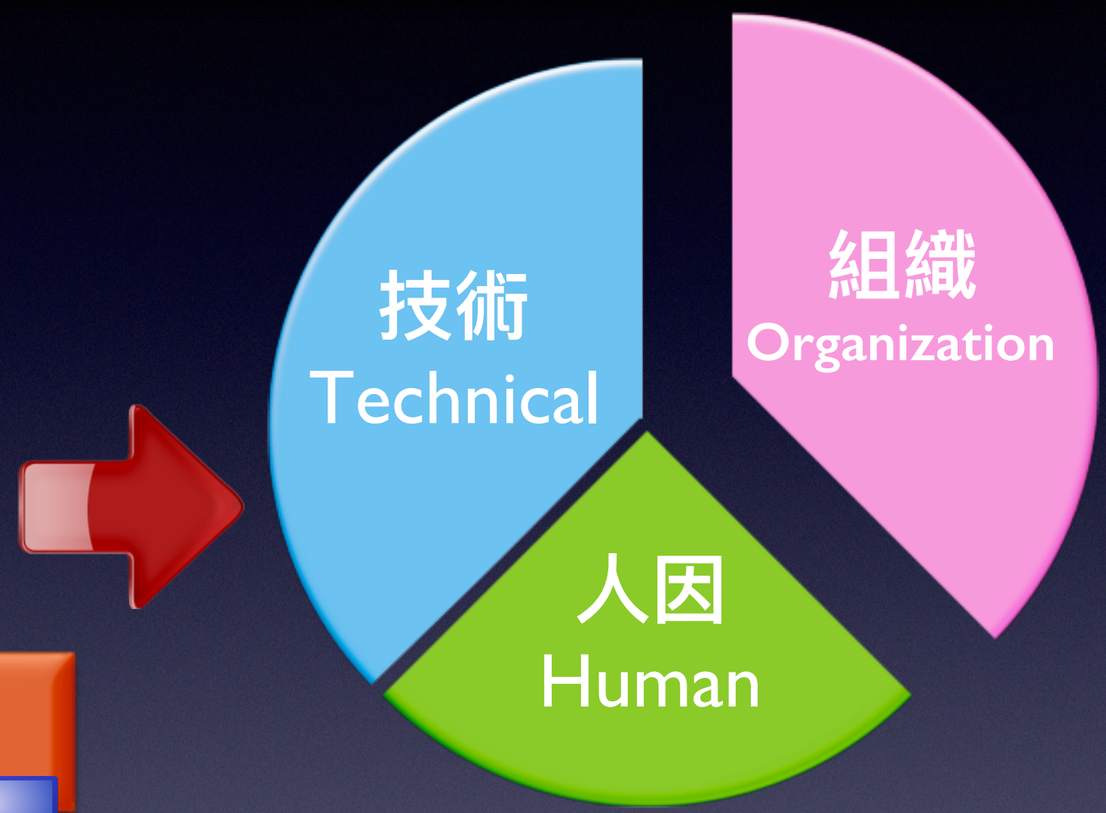
信任的安全文化(公正/通報)

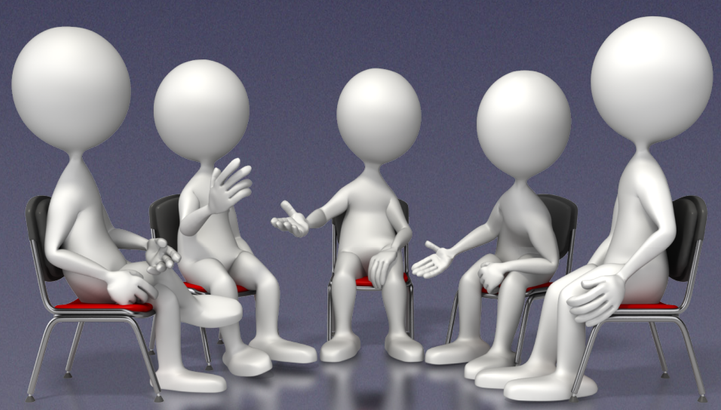
願意通報管理看不到的危險因子

資料正確，了解風險之所在

管理階層做出有品質的決策

將有限的資源將飛安有效管控





程序安全管理

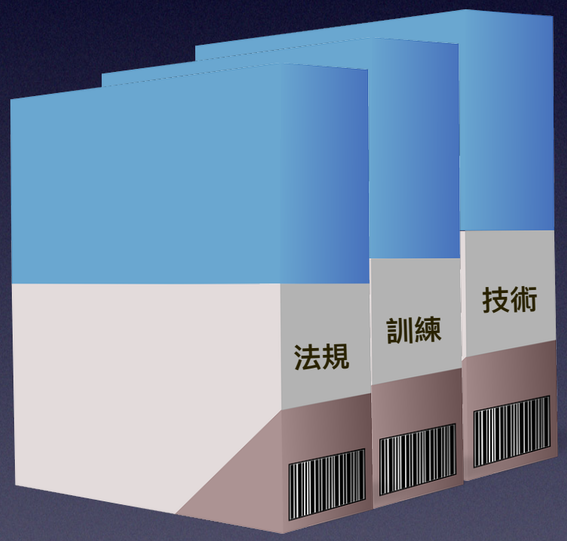
確保關鍵性的程序步驟被適當的執行

檢討SOP裡有哪些關鍵程序

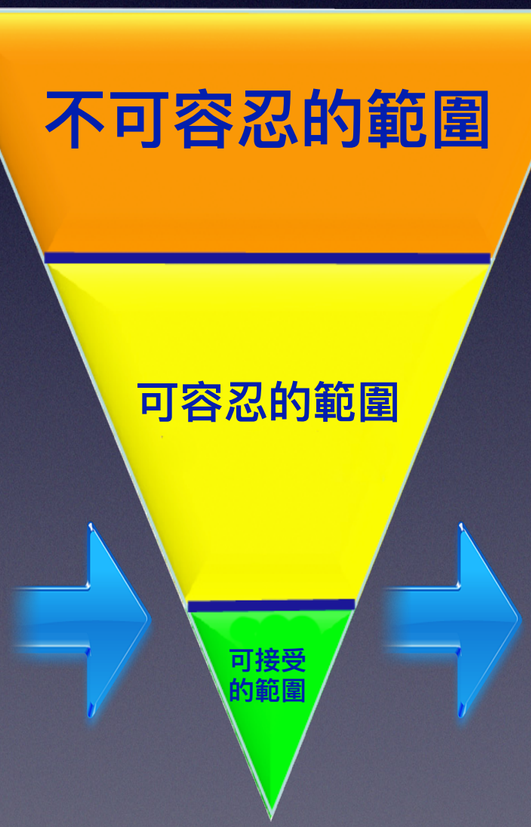
關鍵程序的風險評估

關鍵程序的控管與執行

沒有執行關鍵程序的風險



- 識別關鍵程序危害
- 風險發生率分析
- 風險嚴重度分析
- 評估風險的容忍度



- ☑手冊是否闡明關鍵性程序？
- ☑組員是否了解關鍵性程序相關作業風險？
- ☑組員是否在實際營運確實按照程序執行？

回饋

*依據民航局風險緩解模型

程序安全管理

ATR 原廠提供技術評估協助

確保關鍵性的程序步驟被適當的執行

Apart from CAA's in-depth inspection, ATR conducted an assessment of TNA ATR Flight Operations and provided assistance to strengthen a strong training and safety culture

4 Type Rating Instructors:
- **1 month** of Flight Operations Assessment
- **1 month** of Ground Courses
- **227** Line Training Flights and Line Checks
- **185** Flight hours
- **37** Training Simulator Sessions
- **148** Simulator Training hours

Jan 2015 | Feb 2015 | March 2015 | April 2015 | May 2015 | June 2015 | July 2015 | Aug 2015 | Sept 2015 | Oct 2015 | Nov 2015 | Dec 2015

4 Type Rating Instructors

Flight Operations Analysis

2 Field Support Representatives:
- Maintenance Assessment
- Technical and Line Maintenance Support

Jan 2015 | Feb 2015 | March 2015 | April 2015 | May 2015 | June 2015 | July 2015 | Aug 2015 | Sept 2015 | Oct 2015 | Nov 2015 | Dec 2015

程序安全管理

確保關鍵性的程序步驟被適當的執行

SOP's Revision

- Revise TNA ATR Fleet SOPs in line with ATR manufacturer SOPs
- Revise TNA Airbus A320 & A330 SOPs to harmonize task sharing policies
- All pilots have been trained on the new SOP by April 2015
- Safety Operations Audits are continuously conducted to monitor SOP implementations (102 audits conducted between Jan-July 2015)


TransAsia ATR72-600 SOP
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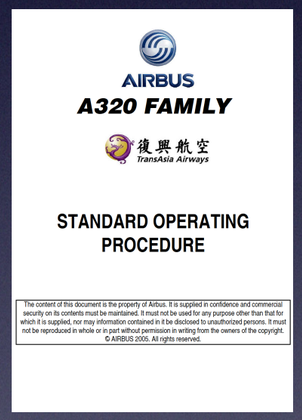
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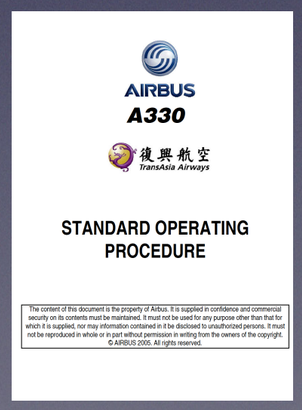
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起飛時高風險關鍵程序評估

關鍵程序的風險評估

識別關鍵程序危害

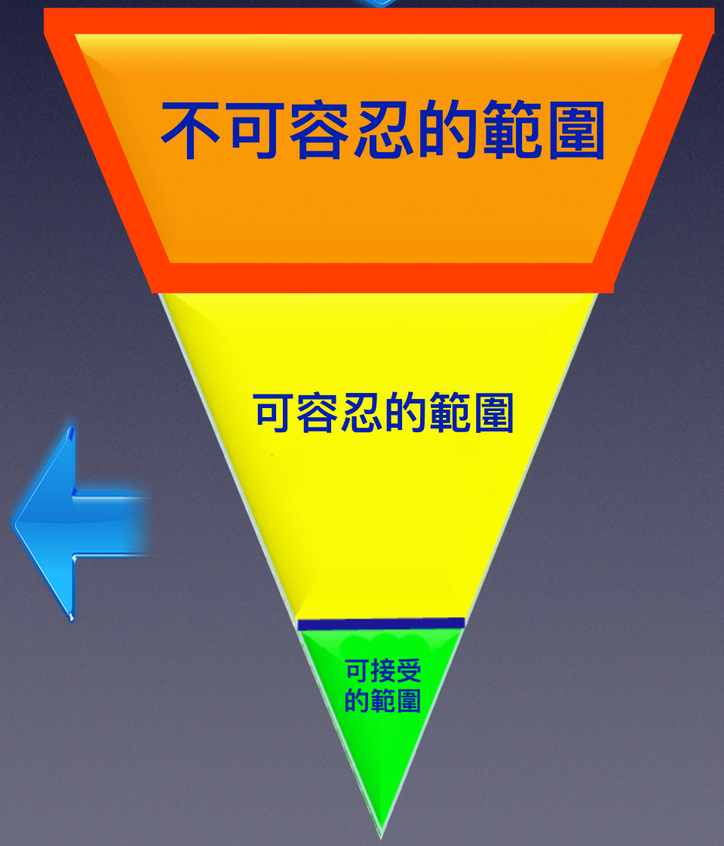
風險發生率分析

風險嚴重度分析

評估風險的容忍度

回饋

- ☑手冊是否闡明關鍵性程序？
- ☑組員是否了解關鍵性程序相關作業風險？
- ☑組員是否在實際營運確實按照程序執行？



起飛關鍵程序

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12 TAKE-OFF

CM1	- "TAKE OFF AT XX: XX, V1XXX"	ANNOUNCE
CM2	- "CHECKED"	CALL
	- CONTROL WHEEL	HOLD INTO WIND
CM1	- FUEL USED	CHECK
	- BRAKES	RELEASED
	- NWS	HANDLE
CM1	- PL 1 + 2	IN THE NOTCH
	- "POWER LEVERS SET"	CALL

Note: The PF's and PM's hand and feet must remain on the control system until leaving 3000 ft AAL after T/O no matter the AP is engaged or not.

CM2	- "CHECKED"	CALL
	- ATPCS ARM	CHECK ILLUMINATED
	- TO TQ	CHECK / ADJUST
	- ENGINE PARAMETERS	MONITOR

Check NP 100%, ITT.

Note: Parameters should be obtained at around 60 Kt

Note: If necessary, adjust PLs to obtain TO TQ (bugs)

Note: NP =100 % - 0.6% / +0.8%

	- TO INHIB	CHECK
	- "ATPCS ARMED,POWER SET"	CALL
CM1	- "CHECKED"	CALL

- ☑強調組員間之分工合作與交互檢查
- ☑ATPCS 功能檢查和引擎參數的監控
- ☑PF和PM手腳必須保持在操控系統上

PM	- "ROTATE"	ANNOUNCE
PF	- PITCH	ROTATE TO 8°

落地時高風險關鍵程序評估

關鍵程序的風險評估

識別關鍵程序危害

風險發生率分析

風險嚴重度分析

評估風險的容忍度

回饋

不可容忍的範圍

可容忍的範圍

可接受的範圍

- ☑手冊是否闡明關鍵性程序？
- ☑組員是否了解關鍵性程序相關作業風險？
- ☑組員是否在實際營運確實按照程序執行？

落地關鍵程序

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18 LANDING

AT AAL 1,000 ft STABILIZED:

PM - "ONE THOUSAND FEET, STABLE" ..... CALL
PF - "CHECKED, CONTINUE" ..... CALL

AT AAL 1,000 ft UNSTABILIZED:

PM - "ONE THOUSAND FEET, GO-AROUND" ..... CALL
PF - "GO-AROUND, SET POWER, FLAPS ONE NOTCH" ..... CALL

At DH +500 ft (Or MDA + 500ft)

PM - "FIVE HUNDRED ABOVE" ..... CALL
PF - "CHECKED" ..... CALL
- "AUTO PILOT OFF" ..... CALL & DO

AP Disconnect PB press twice

Note: 1.According to FOM 7-6-2 , the minimum Auto pilot disconnect altitude is MDA+100

2. In order to improve flight technique, PF can disconnect Auto pilot earlier.(Only if weather and traffic condition allows.)

PM - "CHECKED" ..... CALL
PF - "YAW DAMPER OFF" ..... CALL
PM - "YAW DAMPER OFF" ..... DISENGAGE & CALL
PF - "CHECKED" ..... CALL
PM - RUDDER TRIM ..... CENTER

Note: Rudder trim center must be ordered by PF.

At DH +100 ft (Or MDA + 100ft)

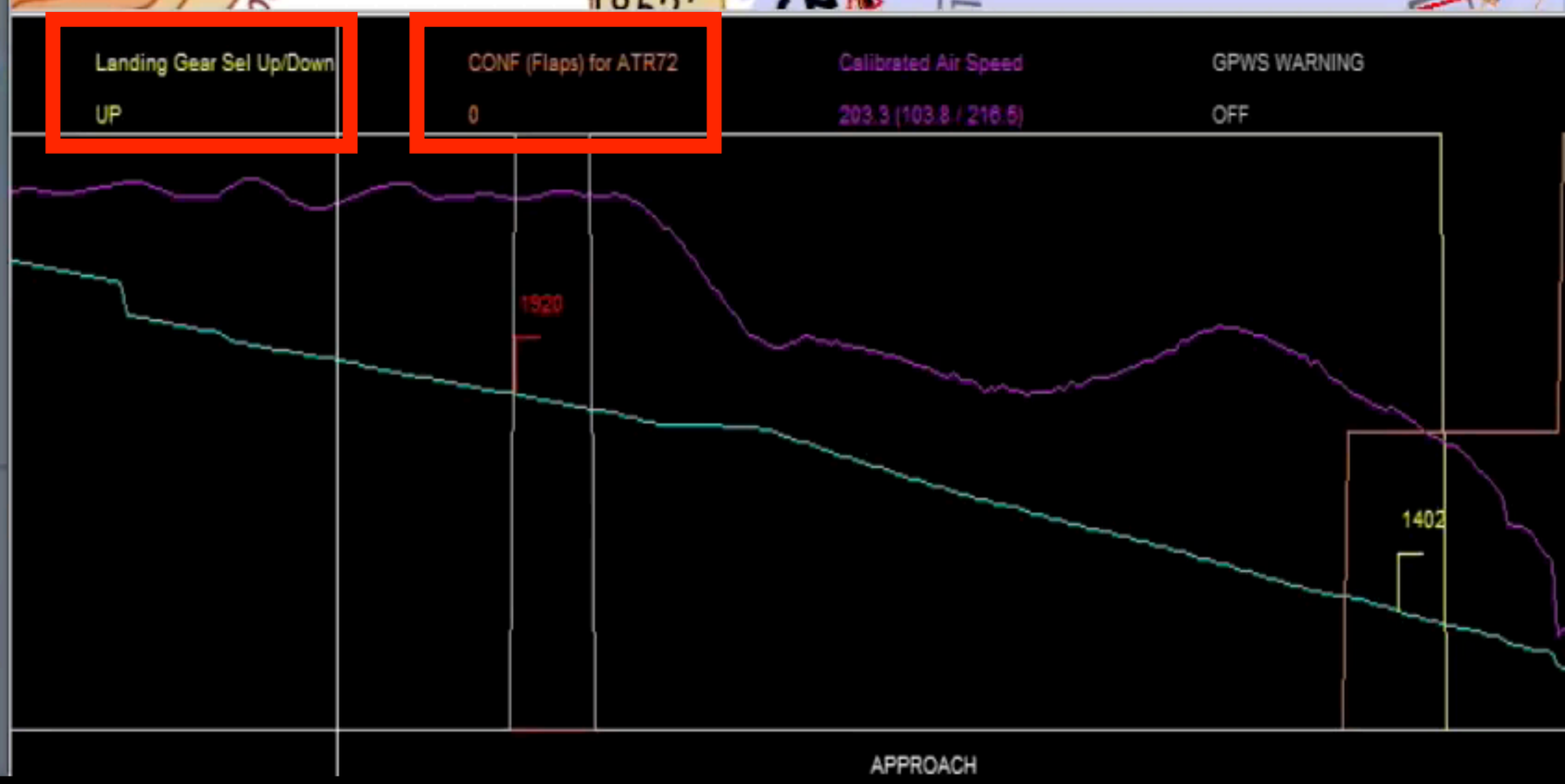
PM - "ONE HUNDRED ABOVE" ..... CALL
PF - "CHECKED" ..... CALL

- ☑強調組員間之分工合作與交互檢查
- ☑穩定性進場的要求和Callouts
- ☑解AP時必須依FOM新修訂規定

檢討案例 (1)


RH
V/S-700
ALT
LNAV
AP ENG
240
220
200
180
10
10
20
20
>045
>040
3600
1009
QNH
109.90
0.0 NM
32
33
34
35
TOROUE
81.4
81.4
39.9
42.9
CONF 0
LDG UP
GS 232.5
GW 17.6
L AIL
R AIL
L ELEV
R ELEV
0.8 down
DN
UP
L
R


4000
3000
1000
2990'
2065'
IHUA
1929
17 Knots
6670'
2000
1 (IF)
HUALIEN
280 HW
D12.0 IHUA
1980'
15 Knots
14 Knots
1801'
13 Knots
HLN
190°
114.1
1 Max IAS 210 Kts
2 Safeguard procedure fo
locator outage:
If not receiving HW bef
passing HLN R-190, adv
ATC & maintain 5000',
HLN R-190 to HLN then
to hold, or request rada
vector from ATC.


Landing Gear Sel Up/Down
UP
CONF (Flaps) for ATR72
0
Calibrated Air Speed
203.3 (103.8 / 216.5)
GPWS WARNING
OFF
1920
1402
APPROACH

檢討案例 (I) Risk Assessment

Probability **PI = Probability Index, PV= Probability Factor**

	Description	PI	PF
Frequent	Likely to occur many times (has occurred frequently)	5	10^{-1}
Occasional	Likely to occur sometimes (has occurred infrequently)	4	10^{-3}
Remote	Unlikely to occur, but possible (has occurred rarely)	3	10^{-5}
Improbable	Very unlikely to occur (not known to have occurred)	2	10^{-7}
Extremely improbable	Almost inconceivable that the event will occur	1	10^{-9}

檢討案例 (I) Risk Assessment

Probability **PI = Probability Index, PV= Probability Factor**

	Description	SE
Catastrophic	• Equipment destroyed • Multiple deaths	5
Hazardous	• A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely • Serious injury • Major equipment damage	4
Major	• A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency • Serious incident • Injury to persons	3
Minor	• Nuisance • Operating limitations • Use of emergency procedures • Minor incident	2
Negligible	Few consequences	1

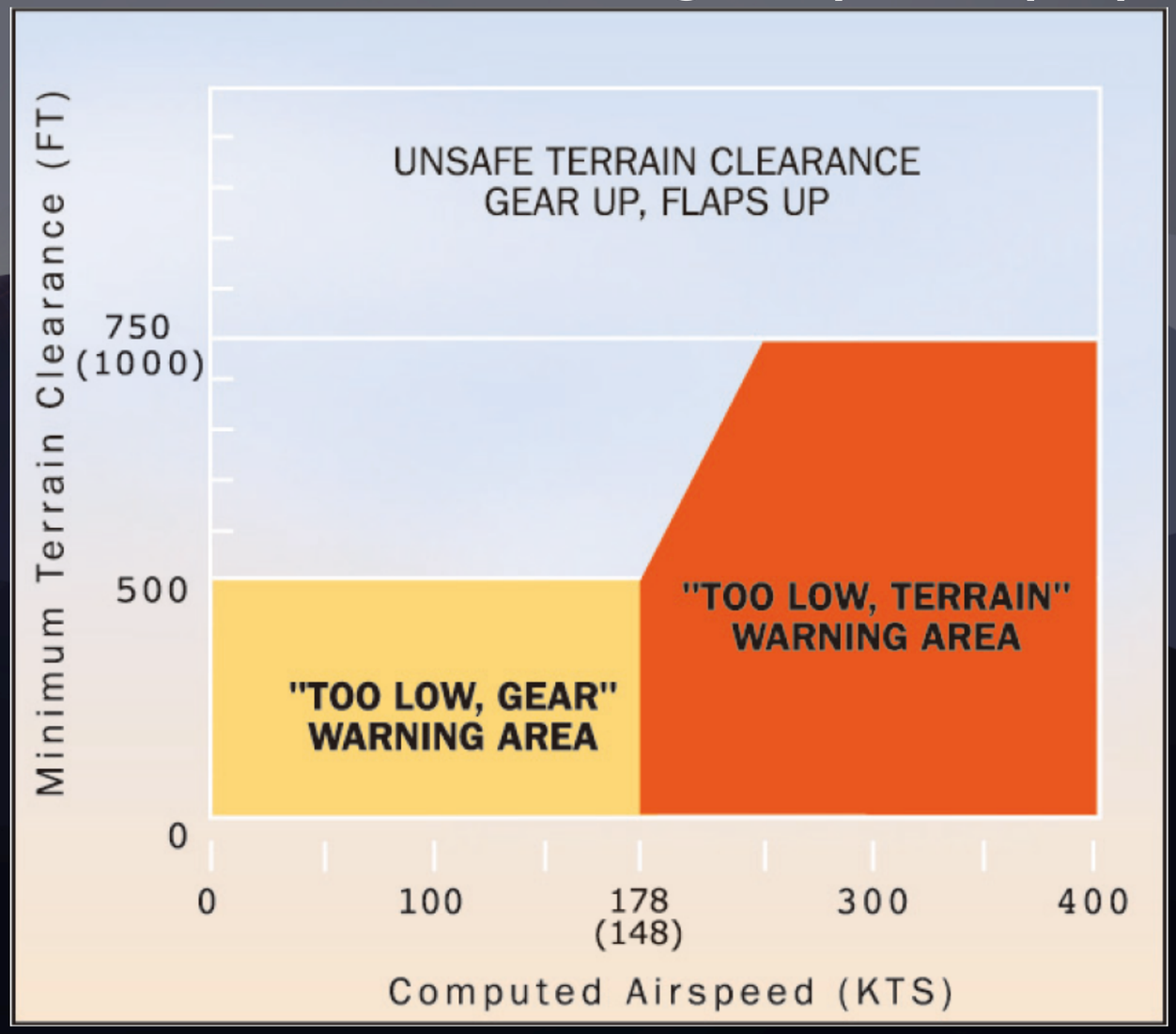
檢討案例 (I) Risk Assessment

Risk Probability		Risk Severity				
		Catastrophic 5	Hazardous 4	Major 3	Minor 2	Negligible 1
Frequent	5	25	20	15	10	5
Occasional	4	20	16	12	8	4
Remote	3	15	12	9	6	3
improbable	2	10	8	6	4	2
Extremely improbable	1	5	4	3	2	1

	Unacceptable under the existing circumstances
	Acceptable based on risk mitigation. It may require management decision
	Acceptable

ATR-600 EGPWS SYSTEM

Unsafe terrain clearance gear up turboprop



Honeywell

MK VI and MK VIII

(EGPWS)

Enhanced Ground Proximity Warning System

FIRM ATR-600 SOP ADHERENCE

GS GREEN	"GS GREEN"	"CHECKED"
Aircraft stabilized	"BEFORE LANDING CHECKLIST"	"BEFORE LANDING CHECKLIST" "BEFORE LANDING CHECKLIST COMPLETED"

NON PRECISION APPROACH		
EVENT	**PF**	**PM**
Clear for approach	"ACTIVATE APPROACH SPEED" "SPEED 170 MAGENTA" "NAV MODE SET"	"APPROACH SPEED ACTIVATED" "CHECKED" "CHECKED"
Establish on final approach track	"SET HEADING"	"FINAL TRACK CONFIRM" "HEADING SET"
4 NM before FAP/FAF	"FLAPS 15"	"SPEED CHECK"
Flaps 15° indicated	"SPEED 140 MAGENTA" "GEAR DOWN"	"FLAPS 15" "CHECKED" "SPEED CHECK"
Landing gear 3 green lights	"CHECKED"	"GEAR DOWN 3 GREEN"
1 NM before FAP/FAF	"FLAPS 30"	"SPEED CHECK"
FLAPS 30° indicated	"SPEED XXX MAGENTA" "SET GO-AROUND ALTITUDE" "CHECKED" "SET VS 0" "CHECKED"	"FLAPS 30" "CHECKED" "GO-AOURND ALTITUDE XXXX SET" "VS 0 SET"

17 BEFORE LANDING

- DU CONFIGURATION ..... CHECK

Check display:

PF: -ND (arc or rose mode) background: Terrain VCP: on COM VHF page

- MCDU = FPLN page - MCDU = PERF APP page

When cleared for approach:

PF -"ACTIVATE APPROACH SPEED" ..... ORDER
PM -ACTIVATE APPROACH SPEED BUTTON ..... PRESS
PM -"APPROACH SPEED ACTIVATE" ..... ANNOUNCE
PF -"SPEED 170 MAGENTA" ..... ANNOUNCE
BOTH - NAV SOURCES ..... CHECK
BOTH - FMA ..... X CHECK

When passing DECELERATION IAF POINT:

PF - PL 1+2 ..... RETARD AS RQD
BOTH - SPEED SEL ..... CHECK AUTO

At appropriate speed:

PF - "FLAPS 15" ..... COMMAND
PM - "SPEED CHECK" ..... CALL
PM - FLAPS LEVER ..... SELECT 15°

When FLAPS 15 are extended

PM - "FLAPS 15" ..... CALL

At appropriate speed:

PF - "GEAR DOWN 3 GREEN" ..... COMMAND
PM - "SPEED CHECK" ..... CALL
PM - LDG GEAR LEVER ..... DOWN
PM - PWR MGT ..... TO
PM - TAXI & TAKE OFF LIGHTS ..... ON

When 3 green lights are illuminated:

PM - "GEAR DOWN" ..... CALL

(Continued on Next Page)

檢討案例 (I) 處置流程

Risk Assessment

	Description	PI	PF
Frequent	Likely to occur many times (has occurred frequently)	5	10^{-1}
Occasional	Likely to occur sometimes (has occurred infrequently)	4	10^{-2}
Remote	Unlikely to occur, but possible (has occurred rarely)	3	10^{-3}
Improbable	Very unlikely to occur (not known to have occurred)	2	10^{-4}
Extremely improbable	Almost inconceivable that the event will occur	1	10^{-5}

Risk Assessment

Description	SE
Catastrophic • Equipment destroyed • Multiple deaths	5
Hazardous • A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely • Serious injury • Major equipment damage	4
Major • A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency • Serious incident • Injury to persons	3
Minor • Nuisance • Operating limitations • Use of emergency procedures • Minor incident	2
Negligible Few consequences	1

Risk Assessment

Risk Probability		Risk Severity: Catastrophic 5	Hazardous 4	Major 3	Minor 2	Negligible 1
Frequent	5	25	20	15	10	5
Occasional	4	20	16	12	8	4
Remote	3	15	12	9	6	3
Improbable	2	10	8	6	4	2
Extremely Improbable	1	5	4	3	2	1

Unacceptable under the existing circumstances
Acceptable based on risk mitigation. It may require management decision
Acceptable

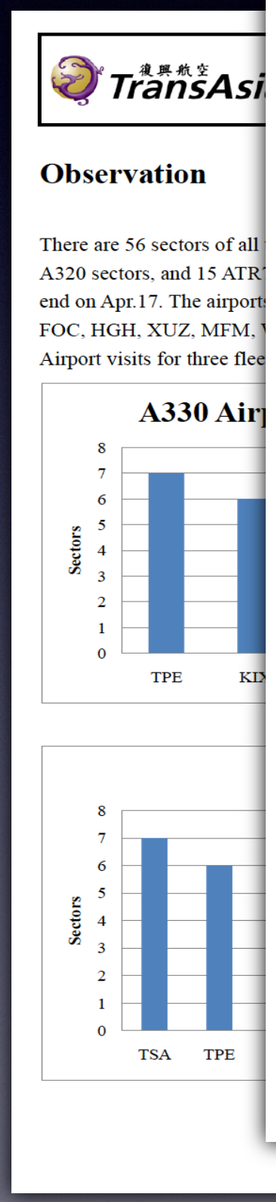
減速至
170kt

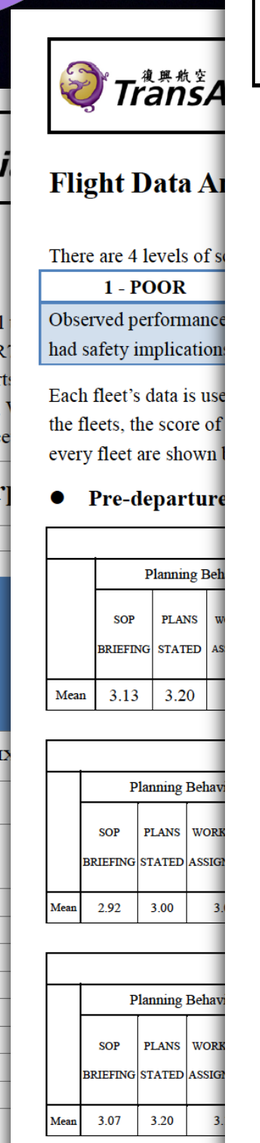
2015年12月ATR花蓮 FOQA監控已經無GPWS(Terrain Ahead)警告，表示控制有成效。

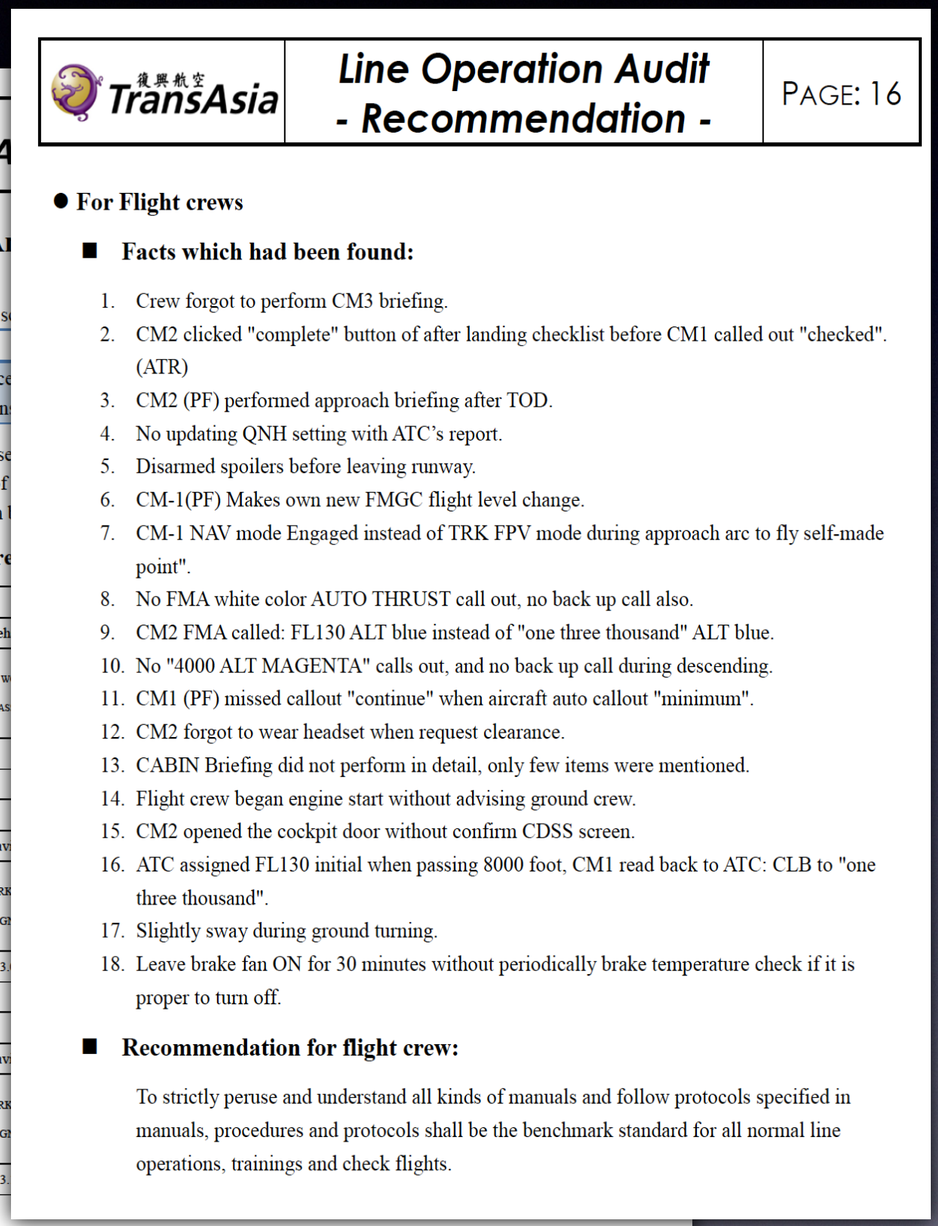
程序安全管理

2016 TLOA 執行計畫

確保關鍵性的程序步驟被適當的執行







TransAsia | Line Operation Audit - Recommendation - | PAGE: 16

● **For Flight crews**

■ **Facts which had been found:**

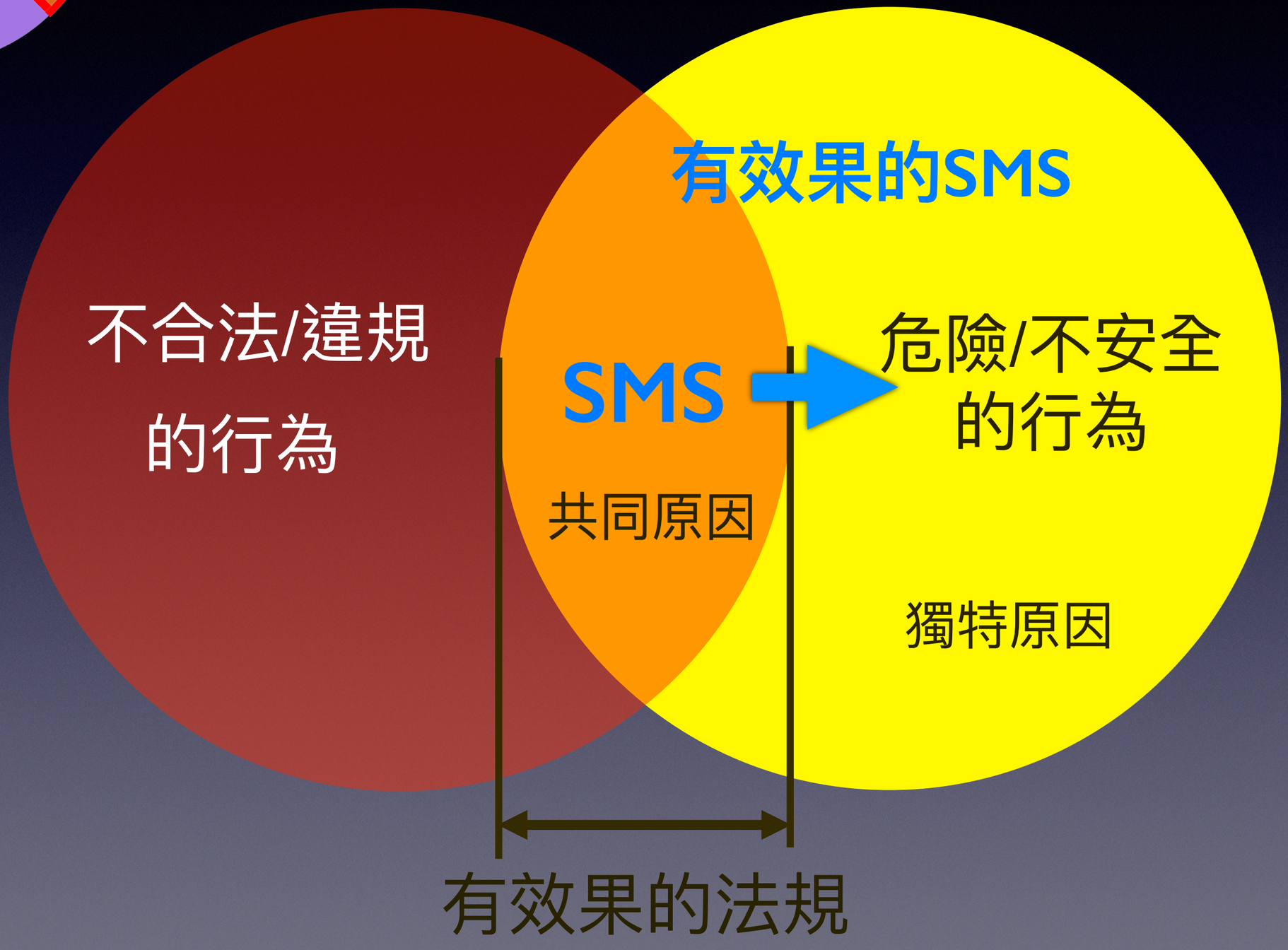
1. Crew forgot to perform CM3 briefing.
2. CM2 clicked "complete" button of after landing checklist before CM1 called out "checked". (ATR)
3. CM2 (PF) performed approach briefing after TOD.
4. No updating QNH setting with ATC's report.
5. Disarmed spoilers before leaving runway.
6. CM-1(PF) Makes own new FMGC flight level change.
7. CM-1 NAV mode Engaged instead of TRK FPV mode during approach arc to fly self-made point".
8. No FMA white color AUTO THRUST call out, no back up call also.
9. CM2 FMA called: FL130 ALT blue instead of "one three thousand" ALT blue.
10. No "4000 ALT MAGENTA" calls out, and no back up call during descending.
11. CM1 (PF) missed callout "continue" when aircraft auto callout "minimum".
12. CM2 forgot to wear headset when request clearance.
13. CABIN Briefing did not perform in detail, only few items were mentioned.
14. Flight crew began engine start without advising ground crew.
15. CM2 opened the cockpit door without confirm CDSS screen.
16. ATC assigned FL130 initial when passing 8000 foot, CM1 read back to ATC: CLB to "one three thousand".
17. Slightly sway during ground turning.
18. Leave brake fan ON for 30 minutes without periodically brake temperature check if it is proper to turn off.

■ **Recommendation for flight crew:**

To strictly peruse and understand all kinds of manuals and follow protocols specified in manuals, procedures and protocols shall be the benchmark standard for all normal line operations, trainings and check flights.

行為安全管理

建立作業標準化與落實工作紀律



行為安全管理

Flight Risk Assessment Tool

建立作業標準化與落實工作紀律

FRAT

- 一、航班基本資料
- 二、資格與任務型態 (01~15 項)
- 三、飛機裝備狀況 (16~18 項)
- 四、環境因素影響 (19~38 項)
- 五、每班分數總合

FLIGHT RISK ASSESSMENT TOOL

DATE : Jul 06 2015　　PAT : T11　　航班基本資料　　PIC :　　DISP :

CM1 :

CM2 :

FLT	GE342	GE341					
DEP/ARR	TPE/KWE	KWE/TPE					
STD/STA	2330/0245Z	0345/0630Z					
COR							
COR							

簽派員填寫預估分數

PIC 可針對風險進行最後評分

			DSP	PIC	DSP	PIC	DSP	PIC	DSP	PIC	DSP	PIC	DSP	PIC	DSP	PIC
Pilot Qualification & Experience																
1.	CM1 with less than 100 HR OR CCQ < 50 HR in type, and fly with CM2 with less than 2 years in type	5														
2.	CM2 with less than 300 HR in type	3														
3.	Multiple Flight Crewmembers Composition	-3	0		0											
4.	Duty day: AIB > 12 HR ; ATR > 10 HR	4														
5.	FLT time: AIB > 10 HR ; ATR > 6 HR in the duty day	4														
6.	Rest time < 10 HR prior to the duty day	5														
Mission Type																
7.	Pop up trip, crew notice time < 4 HR	3	0		0											
8.	International operation (Except Mainland China)	2														
9.	Night operation / 6 legs & ending with a night operation	2														
10.	Red-eye operation (2AM - 5AM)	5														
11.	Cold Weather operation	3	0		0											
12.	ETOPs operation	3	0		0											
13.	Repositioning flight (no passengers or cargo)	5														
14.	High Elevation Airport Operations (4 922 - 8 000 ft)	3														
15.	ETA or ETD margin with Curfew or RWY CLSD	3														
Total Factor Score - Section 1 (Item 1 - Item 15)			*0*		*0*											
Equipment		ACFT	B-22312													
16.	Special Flight Permit Operation (特種飛航許可)	5	0		0											
17.	MEL/CDL Items: A/4, B/3, C/2, D/1	4~2														
18.	Special flight limitations based on AFM equipment limitations	2														
Total Factor Score - Section 2 (Item 16 - Item 18)			*0*		*0*											

如未符合左列條件，則分數為0

當日執行之飛機

行為安全管理

建立作業標準化與落實工作紀律

人為錯誤
Human Error

通過以下方式管理

修訂程序
加強訓練
改善環境
更改設計

程序改正

有風險的錯誤
At-Risk Behavior

通過以下方式管理

移除風險因子
創造安全行為的激勵
提高狀況警覺

教導改正

蓄意的錯誤
Reckless Behavior

通過以下方式管理

糾正措施
紀律處分

懲罰改正

數據安全管理

積極引進新科技，以整合及提昇作業系統功能

FOQA TEAM → AirFase → FOD Fleet STD

FOQA Engineers (工程師)
Safety Pilot (安全機師)
– download
– data validate
– analyzed
– trend

FILTER

TNA CONCERING EVENT SETTING

SPI/SPT

Standard Pilot (技術機師)
– review event
– operation consideration
– corrective action taken
– evaluation
– feedback

檢討案例 (2)

附件一　　FOQA 監控項目定義表

項次 1：High normal acceleration (at landing)

機型	定義（單位 G）	備註
738	1.9	1 Sample
744	1.65	1 Sample
777	1.85	1 Sample
A320 / 321	1.6	
A330	1.6	
ATR	1.6	
ERJ-190	1.85	
MD 82	1.8	
MD 90	1.8	

項次 2：Long flare

	定義（單位 秒）	備註
Below 50 ft to T/D	17 sec	

項次 3：Descent rate high below 500ft

定義（單位 fpm）	備註
1500 fpm	2 sec

項次 4：Descent rate high between 2000 and 1000ft

定義（單位 fpm）	備註
2500 fpm	2 sec

項次 5：Pitch attitude high during takeoff

機型	定義（單位 度）	備註
738	9.0 deg	
744	12.0 deg	
777	10.0 deg	
A320/321	10.0 deg	
A332	10.0 deg	
A333	11.4 deg	
A340	10.5 deg	
ATR	8.0 deg	

1100 - Pitch High at Take Off

Operational Goal

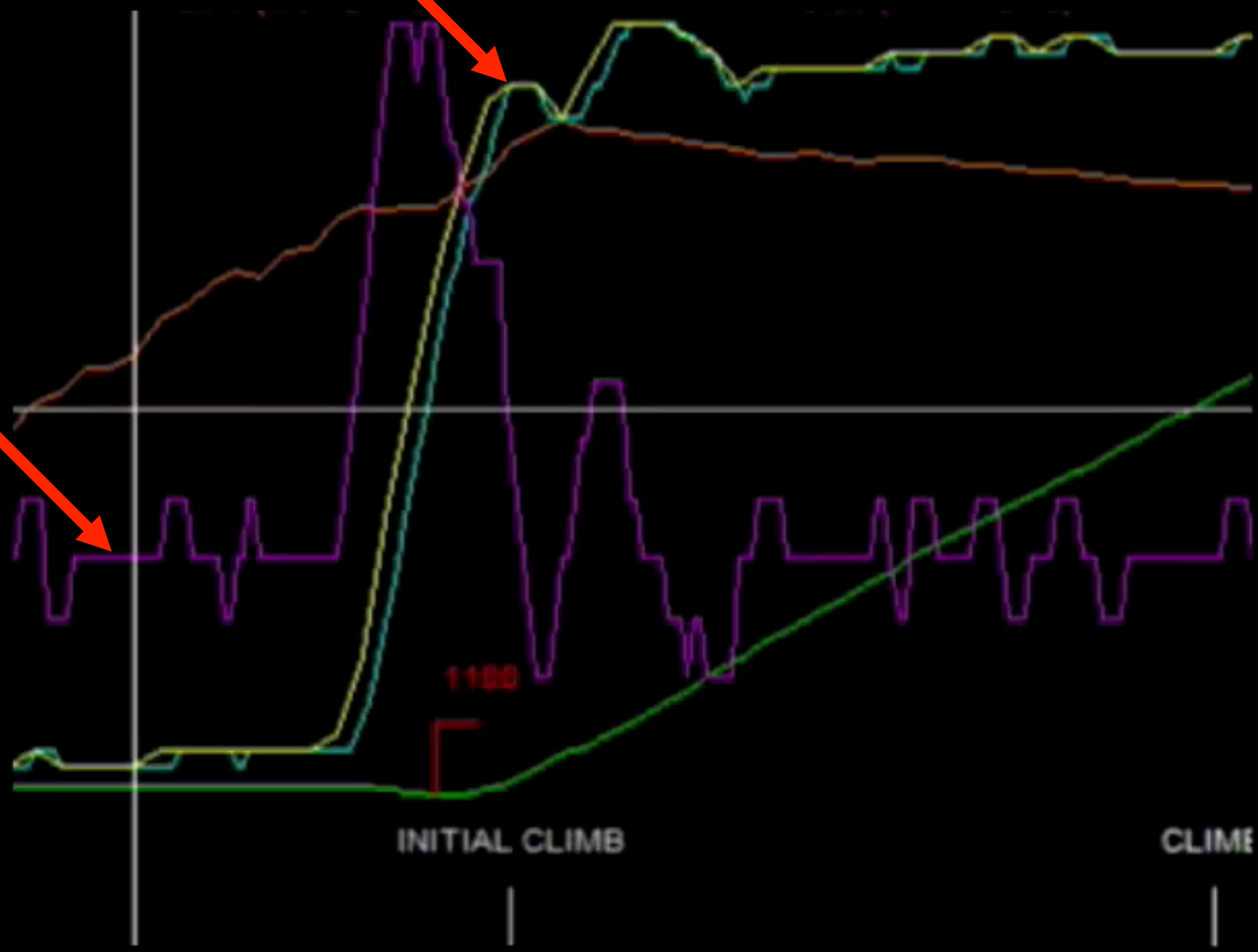
This event detects high pitch attitude at takeoff. If the HIGH limit of this event is exceeded, a tail strike may occur.

High pitch at take-off may be linked to a wrong pitch trim setting, an AC balance error, or a questionable rotation technique

Deviation Limits

	PITCH >: (At Lift Off);		
A/C Type	LOW	MEDIUM	HIGH
A300-600	11.0 °	12.0 °	13.0 °
A310	11.0 °	12.0 °	13.0 °
A318	12.0 °	13.0 °	14.0 °
A319	12.0 °	13.0 °	14.0 °
A320	10.0 °	11.0 °	12.0 °
A321	7.7 °	8.7 °	9.7 °
A330	10.5 °	11.5 °	12.5 °
A340	10.5 °	11.5 °	12.5 °
A340-500	10.5 °	11.5 °	12.5 °
A340-600	8.7 °	9.7 °	10.7 °
A380	9.0 °	10.0 °	11.0 °
ATR42	6.0 °	7.0 °	8.0 °
ATR72	6.0 °	7.0 °	8.0 °

檢討案例 (2)



Pitch rate computatio

0.00 (-1.41 / 3.16)

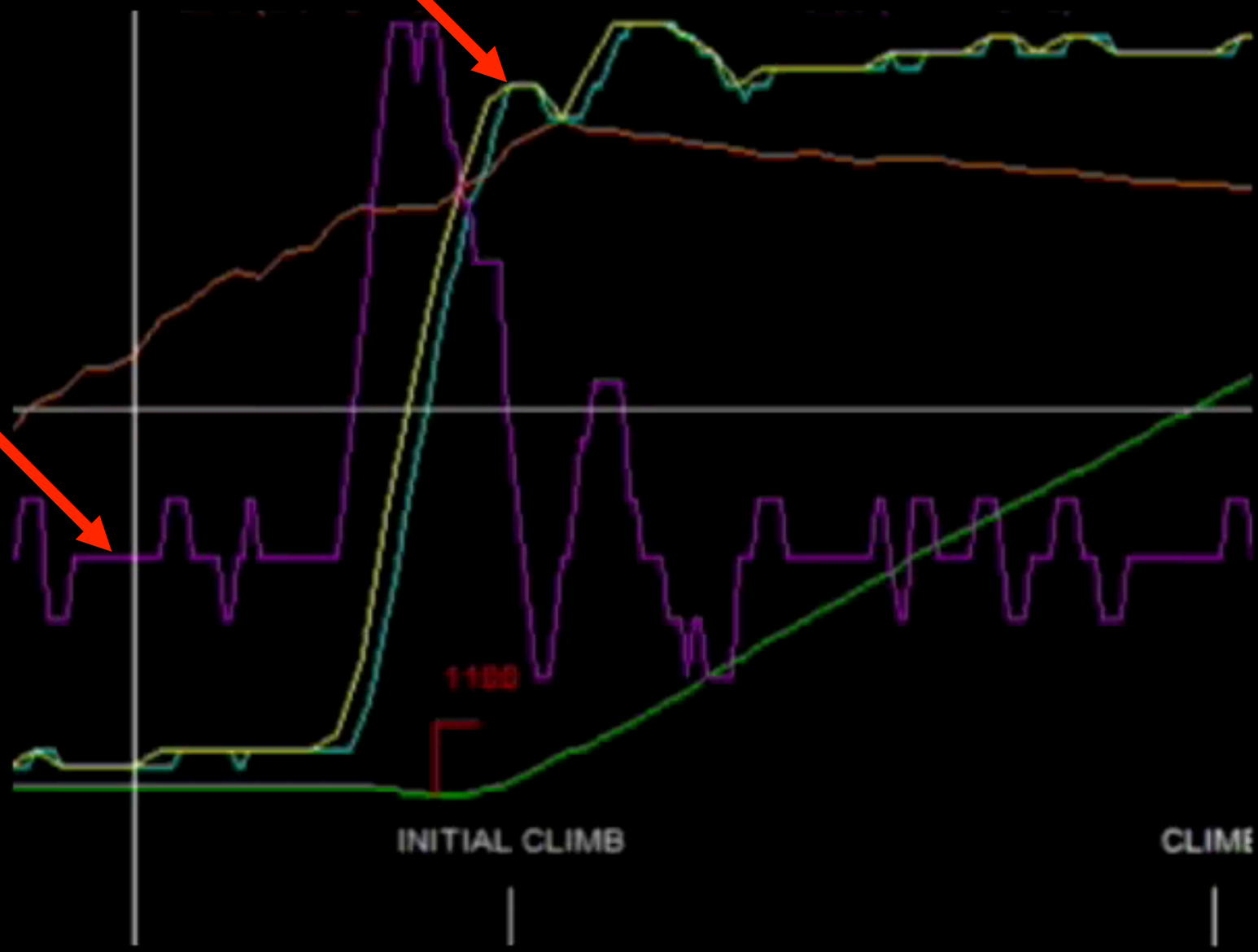
Maximum Pitch (1Hz)

+0.35 (-0.35 / 17.23)

Pitch angle

0.35 (-0.35 / 17.23)

檢討案例 (2)



Pitch rate computatio

0.00 (-1.41 / 3.16)

Maximum Pitch (1Hz)

+0.35 (-0.35 / 17.23)

Pitch angle

0.35 (-0.35 / 17.23)

檢討案例 (2) Risk Assessment

Probability **PI = Probability Index, PV= Probability Factor**

	Description	PI	PF
Frequent	Likely to occur many times (has occurred frequently)	5	10^{-1}
Occasional	Likely to occur sometimes (has occurred infrequently)	4	10^{-3}
Remote	Unlikely to occur, but possible (has occurred rarely)	3	10^{-5}
Improbable	Very unlikely to occur (not known to have occurred)	2	10^{-7}
Extremely improbable	Almost inconceivable that the event will occur	1	10^{-9}

檢討案例 (2) Risk Assessment

Probability **PI = Probability Index, PV= Probability Factor**

	Description	SE
Catastrophic	• Equipment destroyed • Multiple deaths	5
Hazardous	• A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely • Serious injury • Major equipment damage	4
Major	• A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency • Serious incident • Injury to persons	3
Minor	• Nuisance • Operating limitations • Use of emergency procedures • Minor incident	2
Negligible	Few consequences	1

檢討案例 (2) Risk Assessment

Risk Probability		Risk Severity				
		Catastrophic 5	Hazardous 4	Major 3	Minor 2	Negligible 1
Frequent	5	25	20	15	10	5
Occasional	4	20	16	12	8	4
Remote	3	15	12	9	6	3
improbable	2	10	8	6	4	2
Extremely improbable	1	5	4	3	2	1

	Unacceptable under the existing circumstances
	Acceptable based on risk mitigation. It may require management decision
	Acceptable

航務安全文化的推動與成果

復興航空 TransAsia

2016 年飛安資訊交流研討會

興航安全文化的建立

飛行人員招募與甄選的標準

創始人的信念與願景

塑造組織安全文化

高階主管的言行示範

飛行人員的績效和獎懲

- 安全文化中的組織承諾
- 安全文化中的獎懲規定
- 安全文化中的報告系統
- 安全文化中的培訓教育

安全文化中的組織承諾

復興航空安全政策聲明 Safety Policy Statement

安全是復興航空運作之基礎，安全範圍包含飛安、地安及保安等所有作業環節，我們承諾提供必要資源，確保四個安全重要理念運用於策略規劃及作業流程，分別是：預防(Proactiveness)、持續(Continuousness)、全面(Comprehensiveness)、開放(Openness)，使本公司航空相關運作符合本國與國際規範及最佳作法，以達到最高安全標準。

本公司各層級主管及全體員工須負有各項作業安全相關職責，並自總經理做起，承諾：

- 全力支持推動安全管理系統，於人力、財務、組織面投入所有相關資源，營造組織安全文化、深植安全素養、鼓勵安全報告和安全溝通，積極關注安全事務管理，如同組織其他事務。
- 堅守安全管理屬於所有主管及員工主要職責。
- 明確訂定所有主管及員工遵守安全管理系統規定，屢行作業安全績效責任。
- 建立風險識別和風險管理流程，包括：提報危害因子的安全報告系統，以消除或減緩具潛在危險後果的作業行為，將風險降至「合理可接收的程度」(As Low As Reasonably Practicable, ALARP)。
- 支持推行公正文化，員工依循安全報告系統揭露安全問題，不予以懲處，除非揭露內容屬非法行為、嚴重疏忽、或蓄意漠視法規和標準作業程序。
- 嚴格遵守法規要求和標準。
- 確保人力資源充足，且具有純熟技術、完備訓練，得以執行安全政策及相關作業。
- 確保所有員工能夠獲得充分、適當的航空安全資訊及訓練，使其具有能力處理安全事務。
- 建立符合實務的安全績效指標(SPI)和安全績效目標(SPT)，以量測我們的安全績效。
- 確保有效落實所有相關安全措施，並持續提高我們的安全績效。
- 確保外部提供支援本公司運作的系統和服務達到我們所要求的安全標準。

陳菴洲

總經理　陳菴洲

中華民國一百零五年一月三十日

Transasia Flight Safety Committee

安全文化中的獎懲規定


Reporting
Just Culture
Values
Blame-F
Cultu
Punitive
Culture

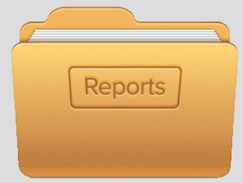
安全文化中的報告系統

1 被告知的文化

員工充份瞭解其作業中的風險，而能夠提高注意加以防範

2 主動報告的文化

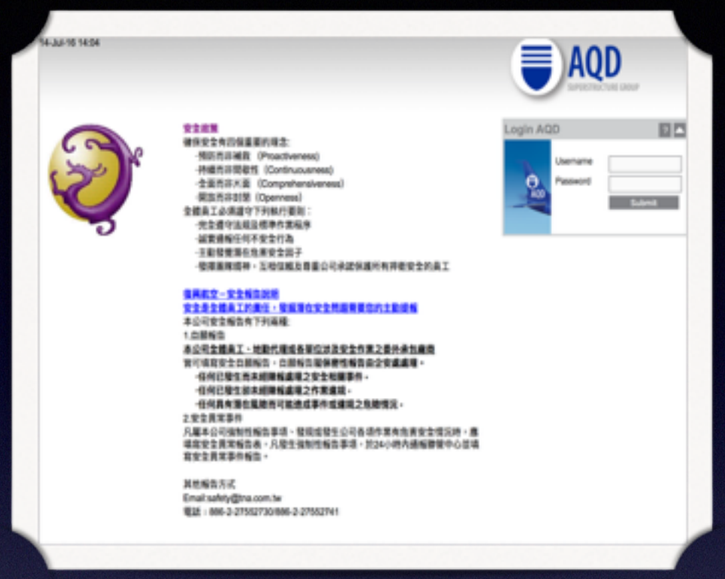
員工信任報告處理系統，不會因為誠實報告而受到處罰

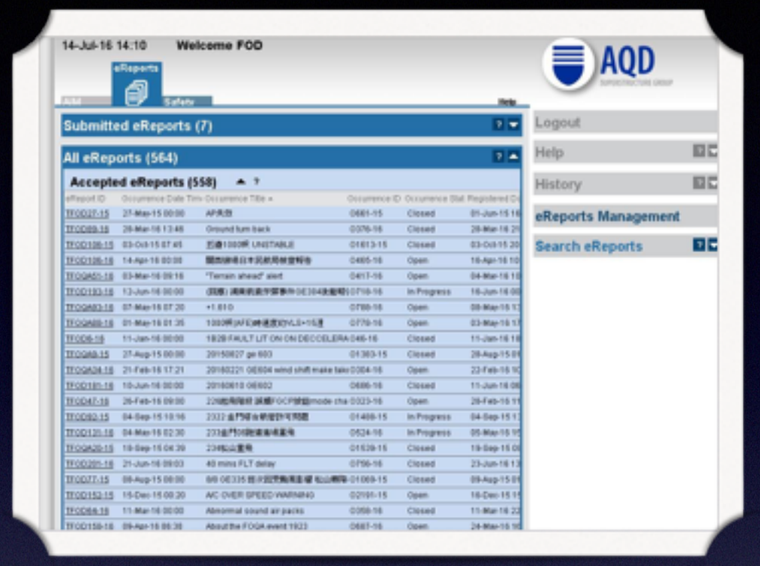


3 公開誠實的文化

當事件發生時，所有員工皆信賴公平、公正的調查結果

安全文化中的報告系統


AQD
Login AQD
Username
Password


14-Jul-16 14:10
Welcome FOO
AQD
Submitted eReports (7)
All eReports (564)
Accepted eReports (558)
Logout
Help
History
eReports Management
Search eReports


Occurrence
• Reporting
• FDA
Occurrence Reached Criticality
Immediate Action
Statistics Single Event
Safety Log
Safety Issue
Risk Assessment
Mitigation Action

安全文化中的報告系統

Area	Reports
Ground Operations	Ground Handling Safety Report
Flight Operations	Flight Operations Division (FOD) Safety Report FOQA Report Cabin Safety Report Flight Control Center Safety Report
Maintenance & Engineering	Quality Control Center (QCC) Safety Report Maintenance (MNT) Safety Report
All personnel	Voluntary Safety Report

E-REPORTS

TNA Risk Management Process

Data collection → Analysis → Mitigate → Manage → Disseminate

安全文化中的培訓教育

定期審查

鑒定和定期審查所有培訓記錄，初訓和複訓學科記錄，學科測試以及後續的改正措施的記錄

建立流程

建立流程為確保人員的培訓和主管執行訓練計畫時應肩負的職責

強化評鑑

建立課程評鑑標準及推廣雙向評鑑制度，運用評鑑結果以改進未來課程發展

落實培訓

具體落實人員培訓所需的技術訓練，強化人力資本並且落實現職人員訓用合一，建置訓練與陞遷有效結合之體制，深化訓練內涵，創新教學方法

Proficiency Enhancement Programs

Advance Qualification Program

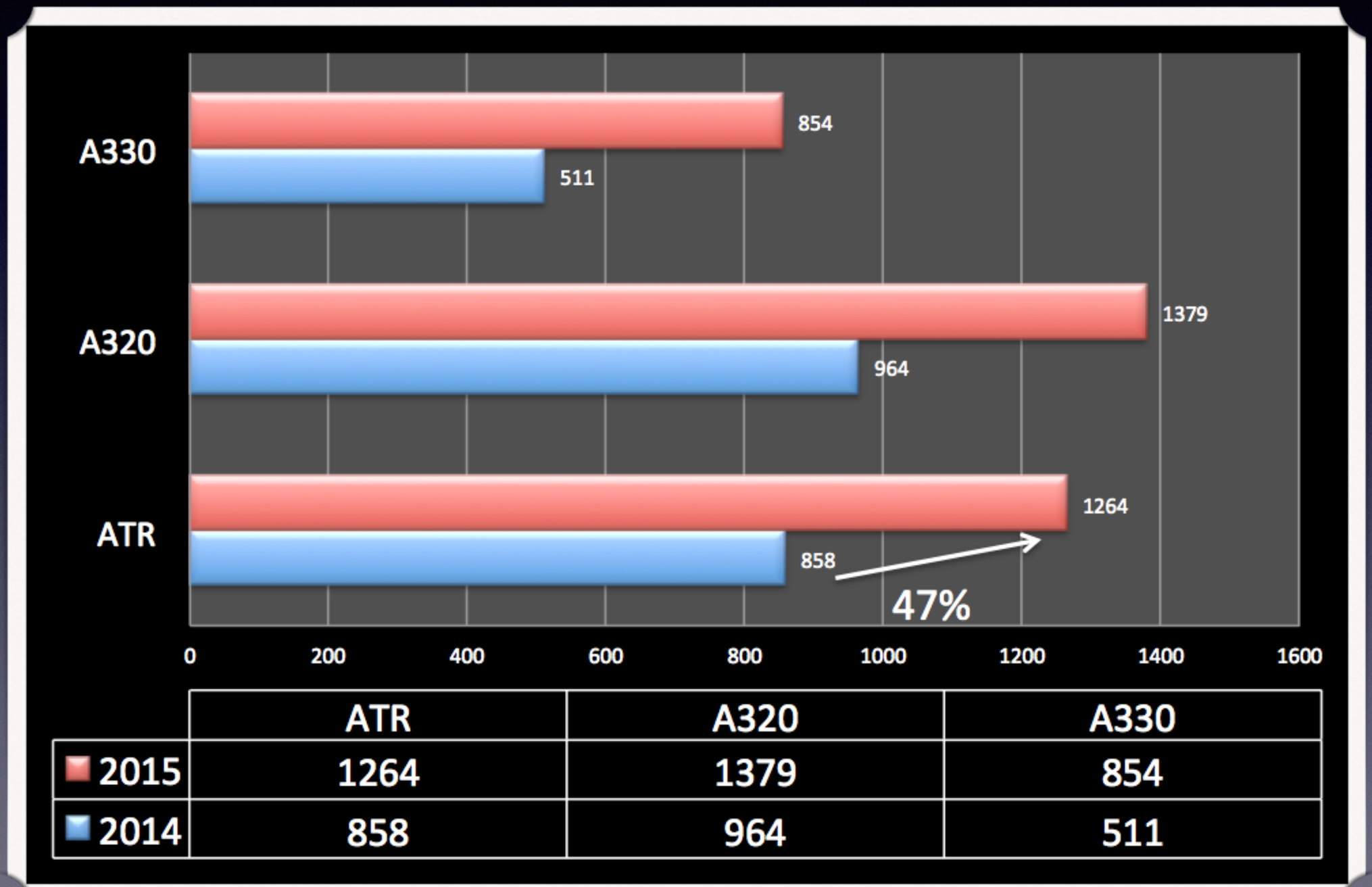
Enhance CRM Training

SMS training for All Staffs

Technical Workshops

安全文化中的培訓教育

Simulator Training Hours Increased



	ATR	A320	A330
2015	1264	1379	854
2014	858	964	511

安全文化中的培訓教育

TNA IOSA Conformance Auditor Training

Captain Richard Powers (IOSA Lead Auditor) from ARGUS PROS conduct TNA IOSA Conformance Training from 7 Dec 2015 to 10 Dec 2015 at TNA head quarter with 25 trainee, all of them passed the examination and received the completion certification.

Safety Training Program

Safety Promotion

- **Safety Education & Training Program:**

Include crew recurrent training (flight crew, cabin crew and dispatcher), all employees' safety training, initial safety training and security assurance training.

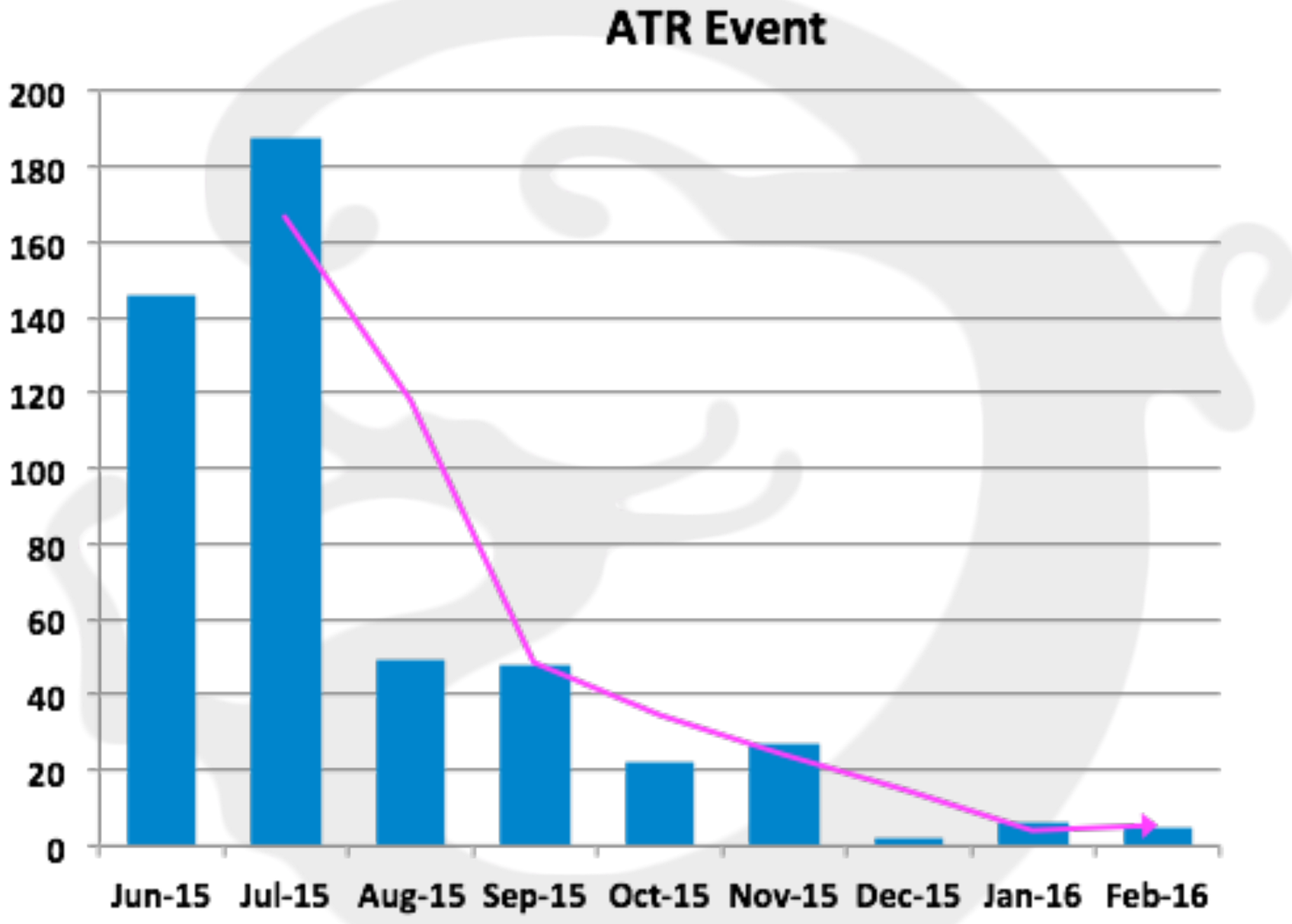
- **Safety Meeting & Conference:**

Include Annual Flight Safety Conference, Quarterly Flight Safety Conference, Flight Safety Review Board and Safety Committee.

- **Safety Circular**
  - ✓ Available on the intranet
  - ✓ To share some lessons learnt from safety issues
  - ✓ To ensure TNA employees' awareness on safety issue

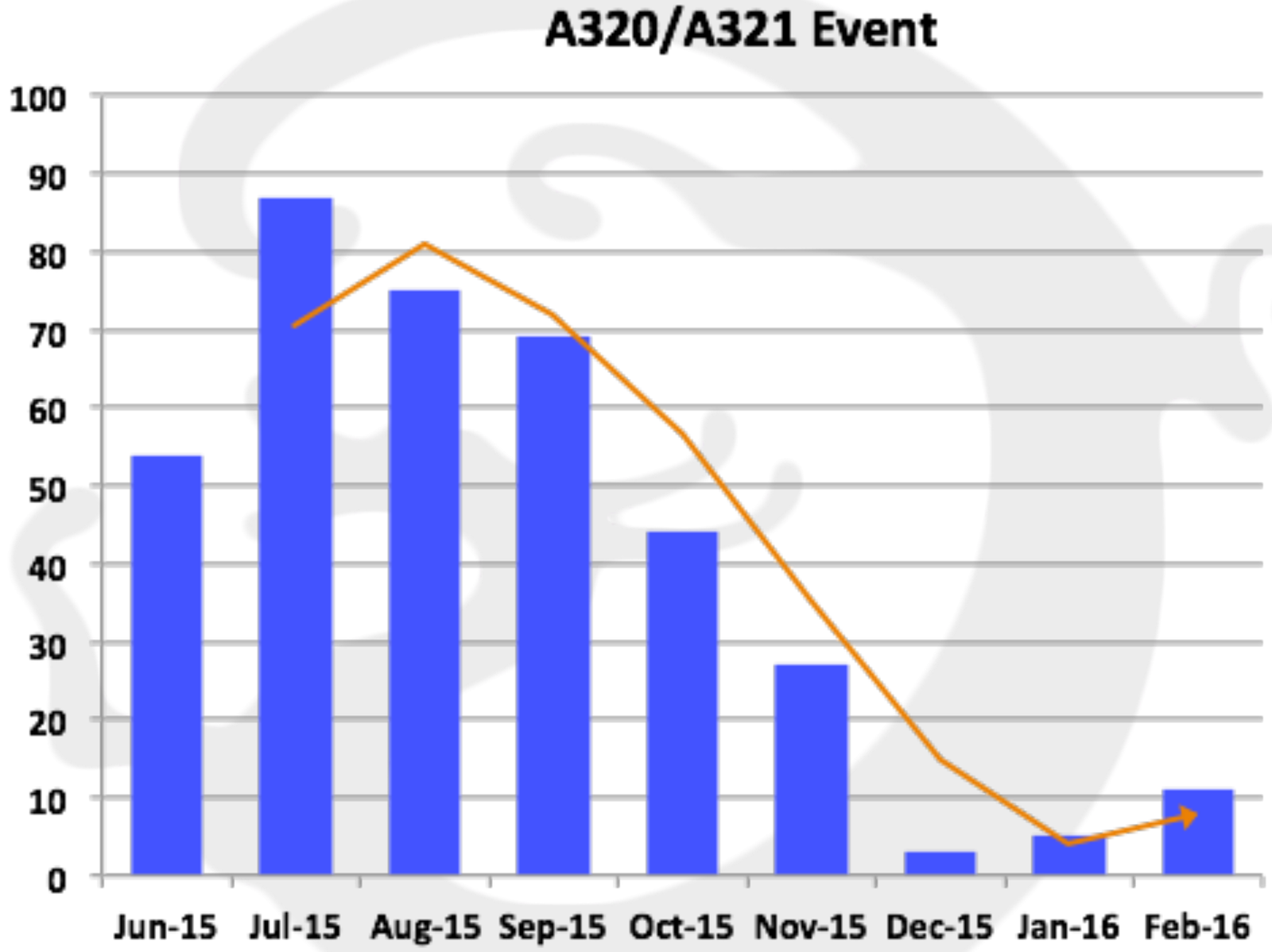
- **SMS Posters and Cards**
  - ✓ SMS posters in every office and working area.
  - ✓ SMS cards distributed to every employee

風險管理的成果 ATR 72-600 FOQA



	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16
Event	146	188	49	48	22	27	2	6	5

風險管理的成果 A320/A321 FOQA



	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16
Event	54	87	75	69	44	27	3	5	11

SMS Future Development

Safety Management System

Completed | On-going

Phase 1	Phase 2	Phase 3	Phase 4
1. SMS Element 1.1 (i) a) identify the SMS accountable executive b) establish an SMS implementation team; c) define the scope of the SMS; d) perform an SMS gap analysis. **2. SMS Element 1.5 (i):** a) develop an SMS implementation plan. **3. SMS Element 1.3:** a) establish a key person/ office responsible for the administration and maintenance of the SMS. **4. SMS Element 4.1 (i):** a) establish an SMS training programme for personnel, with priority for the SMS implementation team **5. SMS Element 4.2 (i):** a) initiate SMS/safety communication channels.	**1. SMS Element 1.1 (ii):** a) establish the safety policy and objectives, **2. SMS Element 1.2:** a) define safety management responsibilities and accountabilities across relevant departments of the organization; b) establish an SMS/safety coordination mechanism/ committee; c) establish departmental/ divisional SAGs where applicable. **3. SMS Element 1.4:** a) establish an emergency response plan. **4. SMS Element 1.5 (ii):** a) initiate progressive development of an SMS document/manual and other supporting documentation.	**1. SMS Element 2.1 (i):** a) establish a voluntary hazard reporting procedure. **2. SMS Element 2.2:** a) establish safety risk management procedures. **3. SMS Element 3.1 (i):** a) establish occurrence reporting and investigation procedures; b) establish a safety data collection and processing system for high-consequence outcomes; c) develop high-consequence SPIs and associated targets and alert settings. **4. SMS Element 3.2:** a) establish a management of change procedure that includes safety risk assessment. **5. SMS Element 3.3 (i):** a) establish an internal quality audit programme; b) establish an external quality audit programme.	**1. SMS Element 1.1 (iii):** a) enhance the existing disciplinary procedure/ policy with due consideration of unintentional errors or mistakes from deliberate or gross violations. **2. SMS Element 2.1 (ii):** a) integrate hazards identified from occurrence investigation reports with the voluntary hazard reporting system; b) integrate hazard identification and risk management procedures with the subcontractor's or customer's SMS where applicable. **3. SMS Element 3.1 (ii):** a) enhance the safety data collection and processing system to include lower consequence events; b) develop lower-consequence SPIs and associated targets/alert settings. **4. SMS Element 3.3 (ii):** a) establish SMS audit program or integrate them into existing internal and external audit program; b) establish other operational SMS review/survey program where appropriate. **5. SMS Element 4.1 (ii):** **a) ensure that the SMS training program for all relevant personnel has been completed.** **6. SMS Element 4.2 (ii):** a) promote safety information sharing and exchange internally and externally.
SMS Element 1.5: SMS documentation+ SMS Elements 4.1 and 4.2: SMS training, education and communication			

1 2 3 4

Pilot Training Future Development

結論

- 民航業者應致力於提升安全文化，其基礎在於最高管理者對所有員工書面公告安全承諾，並具體展現其對安全管理系統的承諾。
- 安全文化是安全管理的根本，所有管理階層更應持續改進系統、政策及相關程序以符合相關法規要求,貫徹執行安全風險管理作業。
- 航務部門應推動主動積極(Proactive)的安全管理，並且持續實施危害辨識及風險管理。