Air China 129, Busan Korea

New Zealand ALAR Workshop Christchurch

21 July 2005

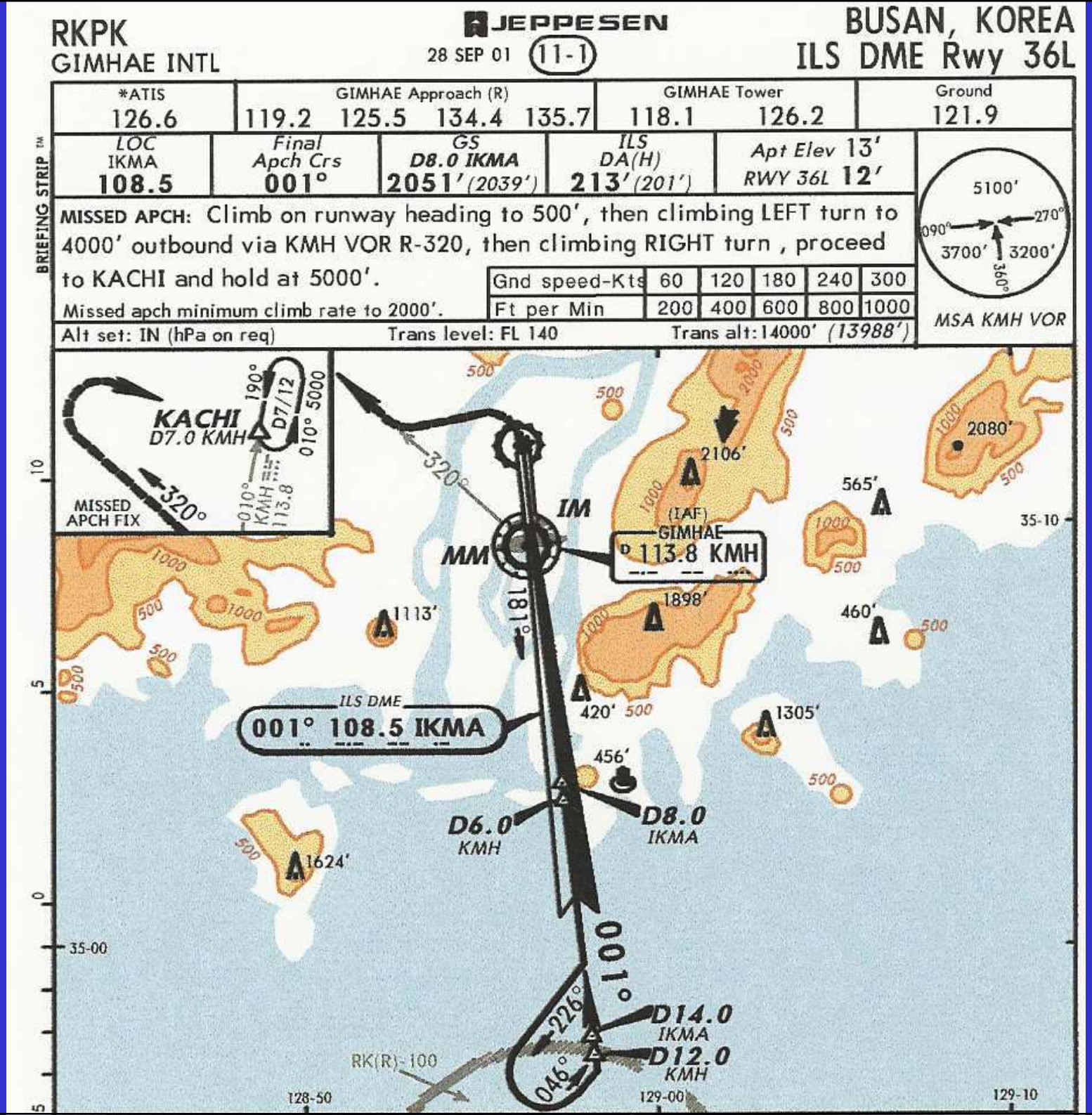
Captain Dave Carbaugh

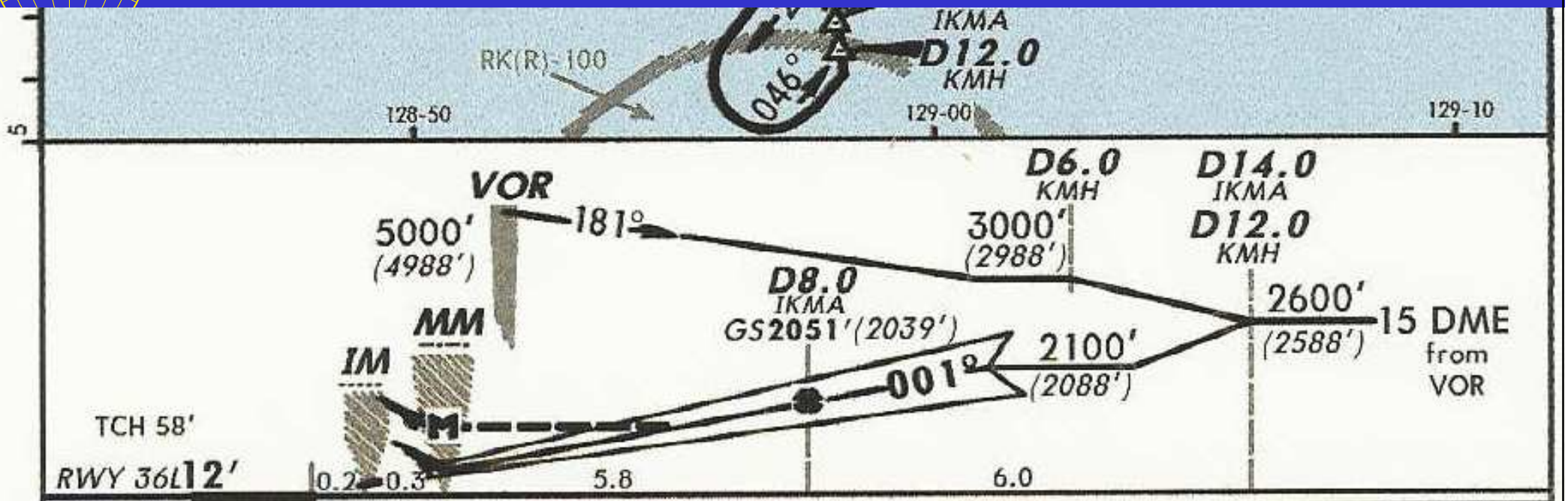
Circling Traps

- Air China Flight 129 CFIT accident
- April 15 2002
- B767-200
- Busan Korea
- 129 killed out of 166 passengers and crew
- First fatal accident on Air China in 47 years

Busan ATIS

- Crew initially briefed for an ILS 36L approach
- On arrival they received the following ATIS
- 500 scattered, 1000 broken, 2500 overcast, rain, mist, visibility 4000 meters, wind 200 14 knots gusting to 20 knots
- Captain elected to conduct a CAT C circling approach to R/W 18R, 10,500 feet long
- CAT C minimums 700 feet and 3200 meters


RKPK
GIMHAE INTL
JEPPESEN
28 SEP 01
11-1
BUSAN, KOREA
ILS DME Rwy 36L
*ATIS
126.6
GIMHAE Approach (R)
119.2 125.5 134.4 135.7
GIMHAE Tower
118.1 126.2
Ground
121.9
LOC
IKMA
108.5
Final
Apch Crs
001°
GS
D8.0 IKMA
2051' (2039')
ILS
DA(H)
213' (201')
Apt Elev 13'
RWY 36L 12'
MISSED APCH: Climb on runway heading to 500', then climbing LEFT turn to 4000' outbound via KMH VOR R-320, then climbing RIGHT turn , proceed to KACHI and hold at 5000'.
Missed apch minimum climb rate to 2000'.
Gnd speed-Kts 60 120 180 240 300
Ft per Min 200 400 600 800 1000
Alt set: IN (hPa on req)
Trans level: FL 140
Trans alt:14000' (13988')
5100'
090°
270°
3700'
3200'
360°
MSA KMH VOR
BRIEFING STRIP
KACHI
D7.0 KMH
190°
D7/12
010° 5000
320°
010° KMH 113.8
MISSED APCH FIX
320°
IM
MM
(IAF)
GIMHAE
D 113.8 KMH
181°
ILS DME
001° 108.5 IKMA
D6.0
KMH
D8.0
IKMA
D14.0
IKMA
D12.0
KMH
001°
226°
046°
RK(R)-100
2106'
2080'
565'
1898'
1113'
460'
420'
1305'
456'
1624'
500
1000
2000
35-10
35-00
128-50
129-00
129-10



Gnd speed-Kts		70	90	100	120	140	160
GS	3.00°	377	484	538	646	753	861
MAP at MM or FAF to MAP	5.8	4:58	3:52	3:29	2:54	2:29	2:10

ALSF-II
PAPI

500'

4000'
LT

KMH
via 113.8
R-320

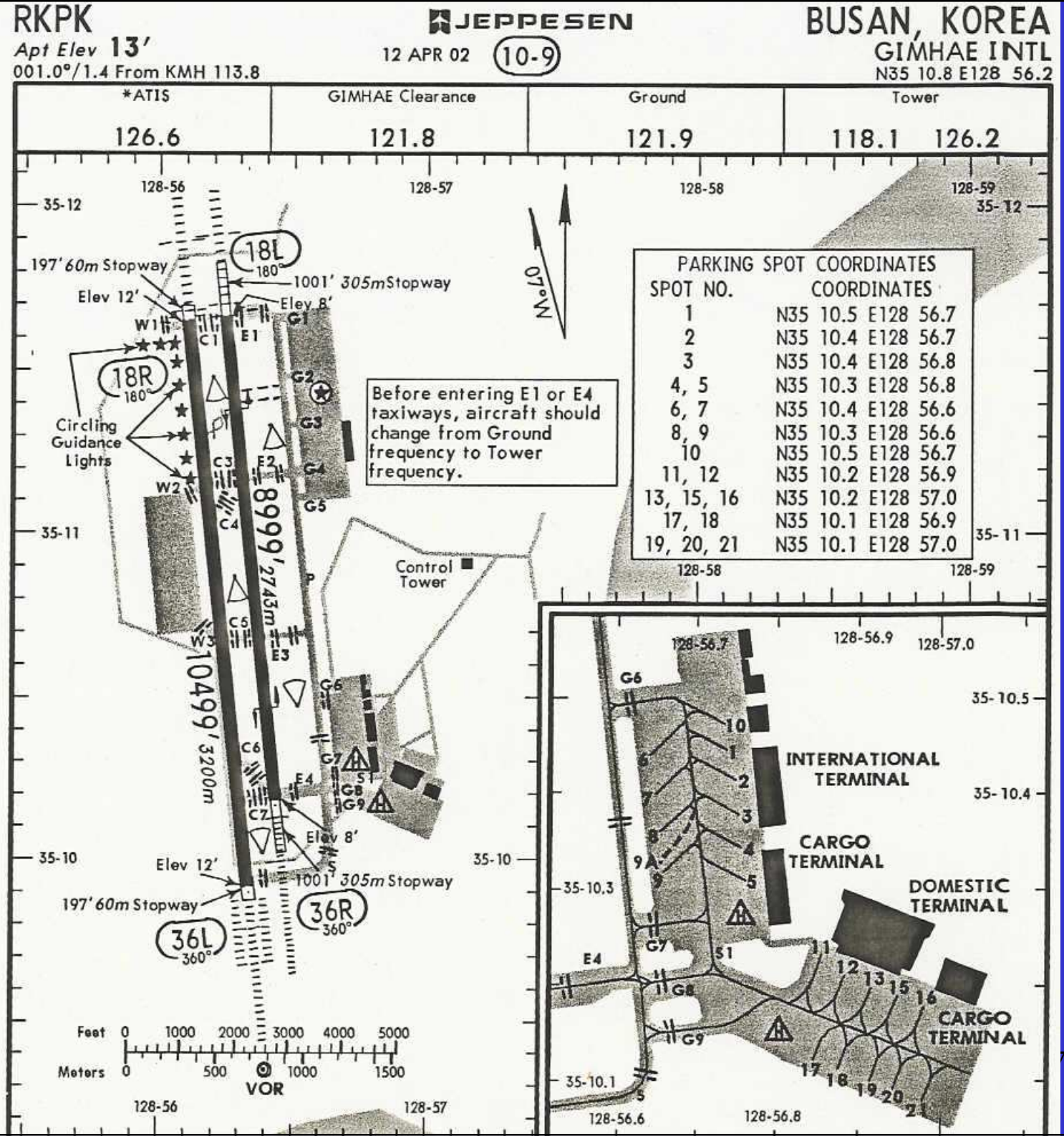
STRAIGHT-IN LANDING RWY 36L **CEILING REQUIRED** CIRCLE-TO-LAND

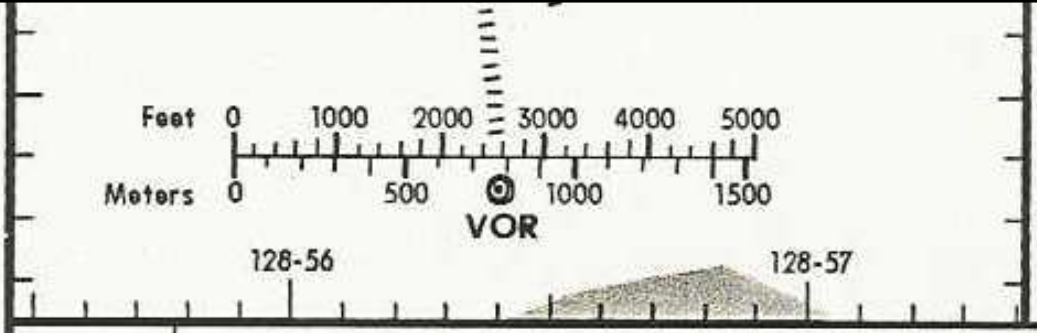
Not Authorized
East of Rwy 18R-36L

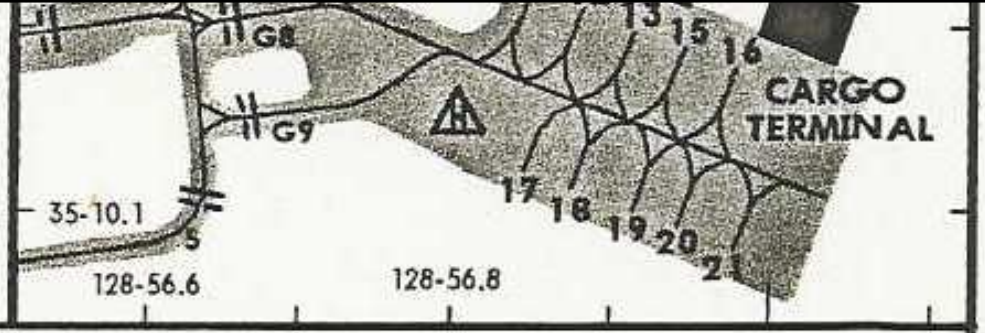
ILS

DA(H) 213' (201')

	FULL	TDZ/CL out CEIL-VIS	ALS out	LOC (GS out)	Max Kts	MDA(H)	CEIL-VIS
A	200'- RVR 550m VIS 800m	200'- 800m	200'- 1200m	When glide slope unusable, use LOC DME Rwy 36L procedure (11-2)	90	700' (687')	700'- 1600m
B					120		
C					140	700' (687')	700'- 3200m
D					165	1100' (1087')	1100'- 4800m


RKPK
Apt Elev 13'
001.0°/1.4 From KMH 113.8
JEPPESEN
12 APR 02
10-9
BUSAN, KOREA
GIMHAE INTL
N35 10.8 E128 56.2
*ATIS
126.6
GIMHAE Clearance
121.8
Ground
121.9
Tower
118.1 126.2
128-56
128-57
128-58
128-59
35-12
35-11
35-10
18L
180°
18R
180°
36L
360°
36R
360°
197' 60m Stopway
1001' 305m Stopway
Elev 12'
Elev 8'
Circling Guidance Lights
07°N
Before entering E1 or E4 taxiways, aircraft should change from Ground frequency to Tower frequency.
PARKING SPOT COORDINATES
SPOT NO. COORDINATES
1 N35 10.5 E128 56.7
2 N35 10.4 E128 56.7
3 N35 10.4 E128 56.8
4, 5 N35 10.3 E128 56.8
6, 7 N35 10.4 E128 56.6
8, 9 N35 10.3 E128 56.6
10 N35 10.5 E128 56.7
11, 12 N35 10.2 E128 56.9
13, 15, 16 N35 10.2 E128 57.0
17, 18 N35 10.1 E128 56.9
19, 20, 21 N35 10.1 E128 57.0
8999' 2743m
10499' 3200m
Control Tower
INTERNATIONAL TERMINAL
CARGO TERMINAL
DOMESTIC TERMINAL
CARGO TERMINAL
Feet 0 1000 2000 3000 4000 5000
Meters 0 500 1000 1500
VOR





ADDITIONAL RUNWAY INFORMATION

RWY		USABLE LENGTHS — LANDING BEYOND Threshold	LANDING BEYOND Glide Slope	TAKE-OFF	WIDTH
18L	HIRL 197' *(60m)* SALS PAPI (angle 3.0°)				148' *45m*
36R	HIRL 197' *(60m)* ALSF-I PAPI (angle 3.0°) RVR		7894' *2406m*		
18R ❶	HIRL 98' *(30m)* CL SALS REIL PAPI (angle 3.0°) ❷				197' *60m*
36L	HIRL 98' *(30m)* CL ALSF-II TDZ PAPI-L (angle 3.0°) RVR		9478' *2889m*		

❶ Grooved.
❷ Circling guidance lights.

TAKE-OFF

	Rwy 18L/R	Rwy 36L/R
1 Eng	200'- *1600m*	500'- *1600m*
2 & 3 Eng	200'- *800m*	500'- *800m*
4 Eng	100'- *400m*	

FOR FILING AS ALTERNATE

	Precision	Non-Precision
A	600'-*3200m*	800'-*3200m*
B		
C		
D		1100'-*4800m*

CHANGES: Rwys 18R and 36L added to take-off minimums.

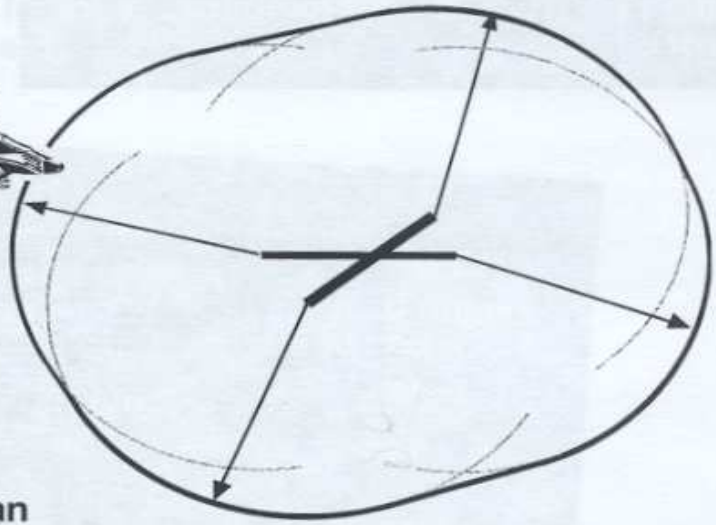

1,329'
1,709'
2,067'
1,122'
1,398'
1,240'
1,230'
1,155'
892'
1,237'
784' (adverse assumption)
Crash Site

The circling area is determined by drawing arcs, centred on each runway threshold and joining those arcs with tangential lines. The radius of the arcs is related to:

- Aircraft category — Specified on page B-1
- Speed

Aircraft category	MAX speed (kt IAS)
A	100
B	135
C	180
D	205

- Wind — 25 kt throughout the turn
- Bank angle — 20° or 3°/s whichever requires less bank



Area radius for aircraft categories (NM)

A	1.68
B	2.66
C	4.20
D	5.28

These values apply for an aerodrome elevation of 2 000 ft.


1,329'
1,709'
2,067'
1,122'
1,398'
1,240'
1,230'
1,155'
892'
1,237'
784' (adverse assumption)
Crash Site

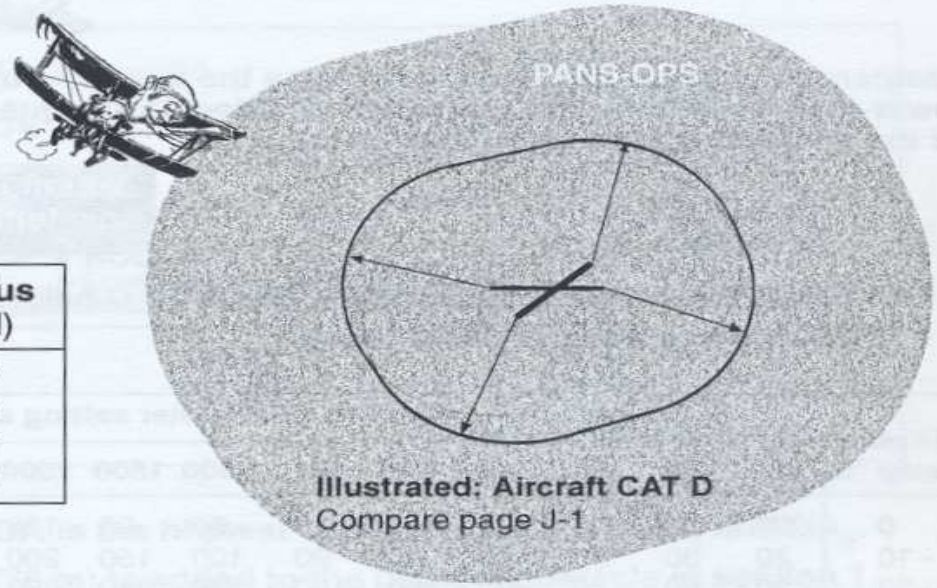
CIRCLING APPROACH AREA

FAA DEFINITION

The area in which aircraft circle to land under visual conditions after completing an instrument approach.

The circling area is determined by drawing arcs, centred on each runway threshold and joining those arcs with tangential lines.

The radius of the arcs varies with the aircraft category (specified on page L-2):

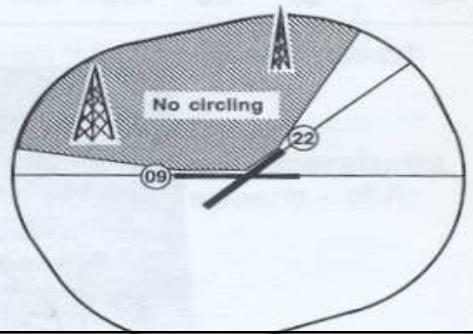


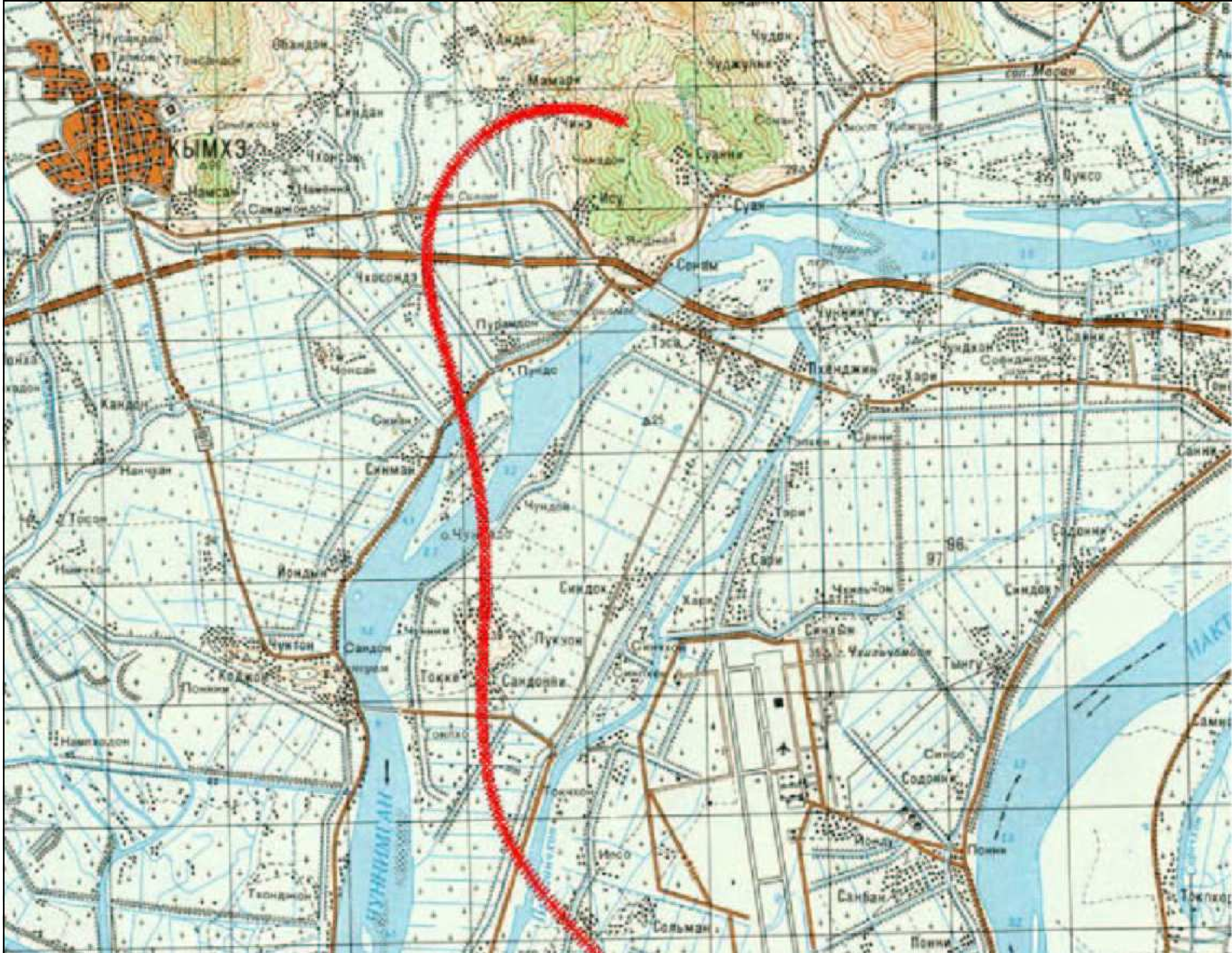
Illustrated: Aircraft CAT D
Compare page J-1

Aircraft category	Radius (NM)
A	1.3
B	1.5
C	1.7
D	2.3

OBSTACLE CLEARANCE

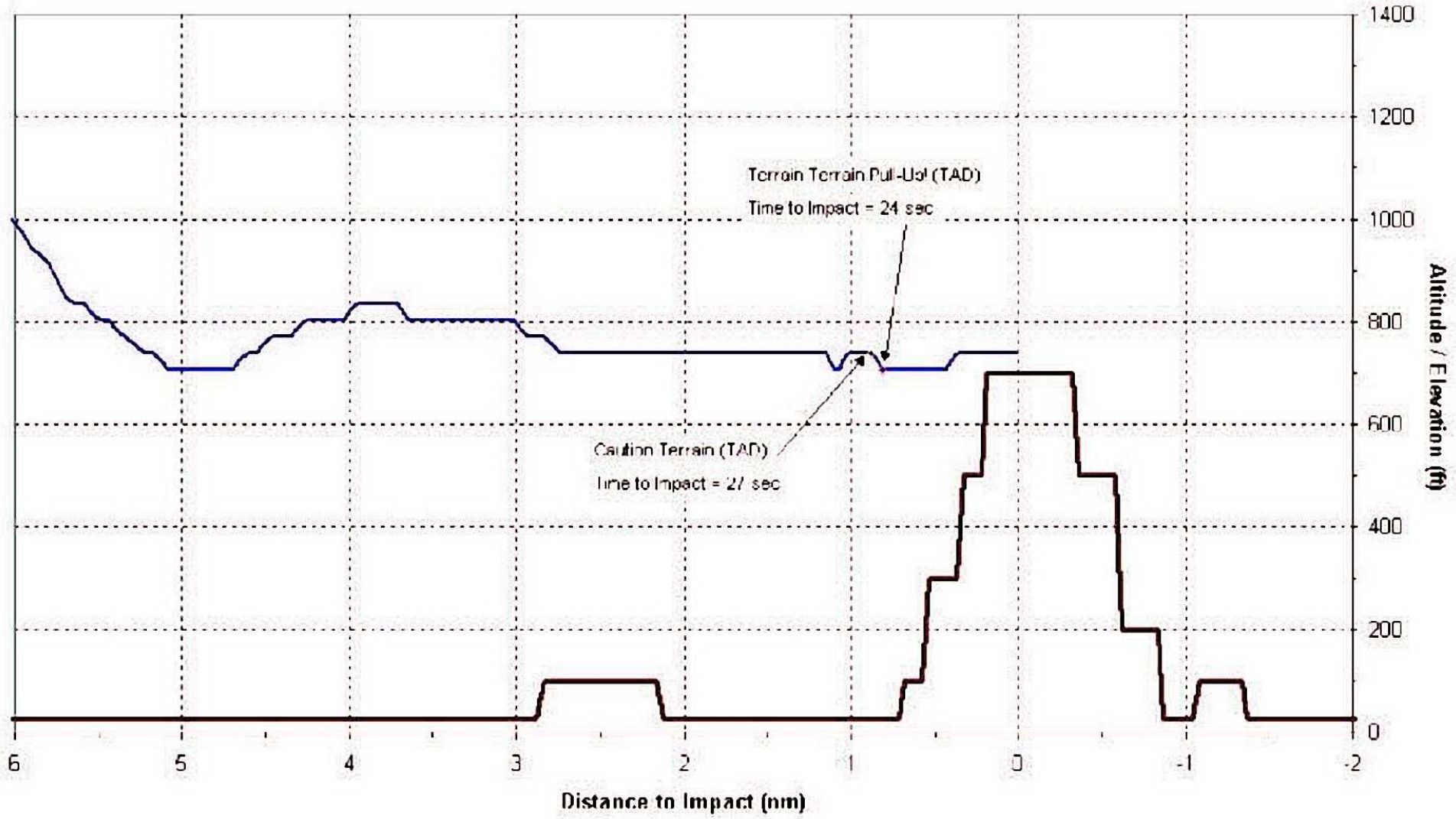
- **At least 300 ft within the entire circling area.**
- **There is no secondary area**
- **It is permissible to eliminate from consideration a sector where a prominent obstacle exists.**
  Circling thus will be prohibited in this sector and the restriction will be shown on the relevant approach chart:
  "Circling N/A in the sector N RWY 09





КЫМХЭ
Намсан
Синдан
Чхонсон
Мамари
Андан
Чудон
Сунни
Ису
Суан
Чхосондэ
Пурамдон
Пундо
Чонсан
Синмаи
Нанчхан
Чуктон
Сандон
Токке
Сандори
Синдок
Сари
Тари
Хари
Тэса
Пукхон
Садонми
Синдок
Тынгу
Содрик
Санбан
Сольман
Инсо
Пукхо
Тонпхо
Ноксан
Пукхонгу

Busan, Korea
Accident: April 15, 2002
B767-300ER



Traps on this approach?

- No notice of obstacles within 4 NM of the 18R PAPI
- Downwind too close from using the same sight picture at 700 feet as used at 1500 feet to determine downwind spacing
- Forced to circle because no better approach was available
- Tailwind - started base leg late

Traps on this approach?

- Crew not aware of TERPS Vs PANS-OPS
- Chart centered South, no terrain shown North
- Captain flying right visual approach
- Threat hidden beneath nose
- No local knowledge, “Stay South of freeway”

ALAR Risk Awareness Tool

- How to use the RAT
- How high were the risks for this flight?

Risk Mitigation

- What we can do when the risks are high
- Improving Tactical Decision Making

“From Takeoff to Landing” by Olle Akerlind

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