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
**RKP**
RIMBAE INTL

**JEPPESSEN**

**BUSAN, KOREA**

**ILS DME RWY 36L**

<table>
<thead>
<tr>
<th><em>ATIS</em></th>
<th>126.6</th>
<th>119.2</th>
<th>125.5</th>
<th>134.4</th>
<th>135.7</th>
<th>118.1</th>
<th>126.2</th>
<th>121.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOC</td>
<td>IKMA</td>
<td><strong>Final</strong></td>
<td>Apch Crs</td>
<td><strong>GS</strong></td>
<td>D8.0</td>
<td>IKMA</td>
<td><strong>DA(H)</strong></td>
<td>Appt Elev</td>
</tr>
<tr>
<td><strong>108.5</strong></td>
<td></td>
<td>001°</td>
<td></td>
<td><strong>2051’</strong></td>
<td>(2039’)</td>
<td>213’</td>
<td>(201’)</td>
<td></td>
</tr>
</tbody>
</table>

**MISSP 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’.

<table>
<thead>
<tr>
<th>Gnd speed-Kts</th>
<th>60</th>
<th>120</th>
<th>180</th>
<th>240</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ft per Min</td>
<td>200</td>
<td>400</td>
<td>600</td>
<td>800</td>
<td>1000</td>
</tr>
<tr>
<td>Alt set: IN (hPa on req)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trans level: FL 140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trans alt: 14000’ (13988’)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MSA KMH VOR**

**KACHI**

**D7.0 KMH**

**D6.0 KMMA**

**D6.0 IKMA**

**D14.0 IKMA**

**D12.0 KMH**

**IM**

**GIMBAE**

**D 113.8 KMH**

**RK(R) 100**

**1624’**

**500’**

**220’**

**456’**

**220’**

**456’**

**565’**

**35-10**

**500’**

**1305’**

**2080’**

**500’**

**3500’**

**500’**

**3500’**

**500’**

**3500’**
Before entering E1 or E4 taxiways, aircraft should change from Ground frequency to Tower frequency.
<table>
<thead>
<tr>
<th>Rwy</th>
<th>Usable Lengths (Landing Beyond)</th>
<th>Take-off Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>18L</td>
<td>HIRL 197' (60m) SALS PAPI (angle 3.0°)</td>
<td>148'</td>
</tr>
<tr>
<td>36R</td>
<td>HIRL 197' (60m) ALSF-I PAPI (angle 3.0°) RVR</td>
<td>45m</td>
</tr>
<tr>
<td>18R</td>
<td>HIRL 98' (30m) CL SALS REIL PAPI (angle 3.0°)</td>
<td>197'</td>
</tr>
<tr>
<td>36L</td>
<td>HIRL 98' (30m) CL ALSF-II TDZ PAPI-L (angle 3.0°) RVR</td>
<td>60m</td>
</tr>
</tbody>
</table>

1. Grooved.
2. Circling guidance lights.

### TAKE-OFF

<table>
<thead>
<tr>
<th>Rwy 18L/R</th>
<th>Rwy 36L/R</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Eng</td>
<td>200' - 1600m</td>
</tr>
<tr>
<td>2 &amp; 3 Eng</td>
<td>200' - 800m</td>
</tr>
<tr>
<td>4 Eng</td>
<td>100' - 400m</td>
</tr>
</tbody>
</table>

### FOR FILING AS ALTERNATE

<table>
<thead>
<tr>
<th>Precision</th>
<th>Non-Precision</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>600' - 3200m</td>
</tr>
<tr>
<td>B</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
</tr>
</tbody>
</table>

### CHANGES:
- Rwys 18R and 36L added to take-off minimums.
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 2000 ft.
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):

<table>
<thead>
<tr>
<th>Aircraft category</th>
<th>Radius (NM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.3</td>
</tr>
<tr>
<td>B</td>
<td>1.5</td>
</tr>
<tr>
<td>C</td>
<td>1.7</td>
</tr>
<tr>
<td>D</td>
<td>2.3</td>
</tr>
</tbody>
</table>

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 or RWY 27L."
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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