Flight Operations Briefing Notes

Operating Environment

Enhancing Terrain Awareness

I Introduction

Terrain awareness is defined as the combined awareness of:

- Aircraft position
- Aircraft altitude
- Applicable minimum safe altitude (MSA)
- Terrain location and features
- Other threats, such as man-made obstacles.

When and how to build and maintain terrain awareness?

This Flight Operations Briefing Note provides a set of operational recommendations and training guidelines to establish and maintain the desired level of terrain awareness.

II Background Information - Statistical Data

CFIT events account for approximately 45 % of approach-and-landing accidents but are the leading cause of fatalities.

(Source: Flight Safety Foundation Flight Safety Digest Volume 17 & 18 – November 1998 / February 1999.)

The absence of acquisition or the loss of visual references is the most common causal factor in CFIT accidents occurring during approach-and-landing; this includes:

- Descending below the MDA(H) or DA(H) without adequate visual references or with incorrect visual references (e.g., a lighted area in the airport vicinity, a road, a taxiway or an other runway); or,
- Continuing the approach after the loss of visual references (e.g., visual references lost because of a fast moving rain shower or fog patch).

CFIT events during initial approach usually result from a premature descent below the initial-approach minimum-safe-altitude.

Terrain Features	% of Events
Hilly or mountainous terrain	70 %
Area of flat terrain (often on runway extended-centerline and within 15 nm of runway threshold)	30 %

Table 1

Terrain Features in Approach-and-landing Accidents Involving a CFIT

When referring to terrain awareness, the following definitions need to be recalled.

Navigation (course) deviation:

- Operation of an aircraft beyond the course clearance issued by ATC or beyond the defined airway system.

Altitude deviation:

- Deviation from the assigned altitude (or flight level) equal to or greater than 300 ft (200 ft in RVSM airspace).

Inadequate terrain separation:

- Any operation with a terrain separation of less than 2000 ft in designated mountainous areas or less than 1000 ft in all other areas (except otherwise authorized and properly assigned by ATC in terminal areas).

Navigation (course) deviations and altitude deviations usually are caused by monitoring errors.

Monitoring errors involve the flight crew's failure to monitor the aircraft trajectory and instruments while performing autopilot or FMS entries, or while being interrupted or distracted.

Delayed recognition of monitoring errors is estimated to result in the following mean deviations from the intended vertical or lateral flight path, possibly resulting in inadequate terrain separation:

- 1000 ft, in case of altitude deviation
- 10 nautical miles, in case of course deviation.

III Applicable Standards / Flying Techniques / Best Practices

Cockpit Preparation – Departure Briefing

The computerized flight plan should be cross-checked against the ATC clearance and the FMS flight plan, using the SID and enroute charts, the FMS CDU and the ND to support and illustrate this cross-check.

The takeoff and departure briefing should include the following terrain-awareness-items, using all available charts and flight deck displays to support and illustrate the briefing:

- Significant terrain or obstacles along the intended departure course
- SID routing and minimum safe altitudes.

Standard Instrument Departure - SID

When flying a published SID, the flight crew should:

- Be aware of whether or not the departure is radar-monitored by ATC
- Maintain a sterile cockpit until reaching 10 000 ft or the sector minimum safe altitude, particularly at night or in IMC
- Monitor the correct sequencing of the flight plan at each waypoint and the correct guidance after sequencing the waypoint, particularly after a flight plan revision or after performing a DIR TO, i.e. :
  - Ensure that the direction of turn and the TO waypoint are in accordance with the SID
  - In case of incorrect flight plan sequencing and/or of incorrect lateral guidance, perform a DIR TO [an appropriate waypoint] or revert to selected lateral navigation.

Enroute Navigation

The enroute charts should be readily accessible, in readiness for a possible loss of FMS navigation or if any doubt exists about the FMS lateral guidance.

Flight Progress Monitoring

During climb, cruise and descent, flight crew should:

- Monitor FMS guidance and navigation accuracy
- Monitor instruments and navaids raw data (as applicable)
- Use all available information (i.e., cockpit displays, navaids raw data and charts)
- Request confirmation or clarification from ATC if any doubt exists about terrain clearance, particularly when being radar vectored.

Descent Preparation – Approach and Go-around Briefing

A thorough briefing should be performed regardless of:

- How familiar the destination airport and the approach may be
- How often the crewmembers have flown together.

The briefing should help the PF (giving the briefing) and the PNF (receiving and acknowledging the briefing) to reach and share a common mental model of the approach.

In hilly or mountainous areas, the briefing should include the following terrain-awareness-items:

- Descent profile and descent management
- Terrain features
- Energy management (i.e., deceleration and configuration management)
- Other approach hazards (e.g., black hole).

The flight management system (FMS) operational pages and the ND should be used to guide and illustrate the briefing, and to confirm the various data entries.

An expanded review of the terrain-awareness-items that should be included in the approach briefing – as practical and appropriate for the conditions of the flight – is provided hereafter.

ATIS:

Review and discuss the following items:

- Runway in use (type of approach)
- Expected arrival route (STAR - or radar vectors)
- Altimeter setting (QNH or QFE, as required)
- Transition level (unless standard for the country).

Approach Chart:

Review and discuss the following terrain-awareness-items using the approach chart and the FMS/ND (as applicable):

- Designated runway and approach type
- Chart index number and date
- Minimum Safety Altitude (MSA) - reference point, sectors and altitudes
- Let-down navaid frequency and identification (confirm the correct navaid setup)
- Airport elevation
- Approach transitions (fixes, holding pattern, altitude and speed constraints/restrictions, required navaids setup)
- Initial approach fix (IAF) and intermediate approach fix (IF), as applicable (positions and crossing altitudes)
- Final approach course (and lead-in radial)
- Terrain features (location and elevation of hazardous terrain or man-made obstacles)
- Approach profile view :
  - Final approach fix (FAF)
  - Final descent point (if different from FAF)
  - Visual descent/decision point (VDP), as applicable
  - Missed-approach point (MAP)
  - Typical vertical speed at expected final approach ground speed (GS)
  - Touchdown zone elevation (TDZE).
- Missed approach :
  - Lateral and vertical navigation
  - Significant terrain or obstacles.

Airport Chart:

Review and discuss the following terrain-awareness-items using the airport charts:

- Approach and runway lighting, and other expected visual references
- Specific hazards (such as man-made obstacles, as applicable).

If another airport is located in the close vicinity of the destination airport, relevant details or procedures should be discussed for awareness purposes.

Use of automation:

Discuss the intended use of automation for vertical and lateral navigation:

- Use of FMS-managed guidance or selected modes
- Use of precision approach, constant-angle or step-down non-precision approach, as required.

Descent Management and Monitoring

Be aware of the relation between altitude and position (or track distance to runway threshold) to monitor the descent profile.

Before entering the terminal area (TMA), check the FMS navigation accuracy (using navaids raw data) against the applicable criteria for terminal or approach navigation.

If the accuracy criteria for lateral FMS navigation in terminal area and/or for approach is not met, revert to a selected lateral mode with ND in ROSE or ARC mode.

If flying with IRS ONLY navigation, do not descend below the sector MSA without positive confirmation of the aircraft position, using navaids raw data.

Standard Arrival - STAR

Be aware of whether or not the arrival is radar-monitored by the ATC.

Maintaining a sterile cockpit when below 10 000 ft or below the sector minimum safe altitude (MSA), particularly at night or in instrument meteorological conditions (IMC).

Monitor the correct sequencing of the flight plan at each waypoint and the correct guidance after sequencing the waypoint, particularly after a flight plan revision or after performing a DIR TO:

- Ensure that the direction-of-turn and the TO waypoint are in accordance with the STAR
- In case of incorrect flight plan sequencing and/or of incorrect lateral guidance, perform a DIR TO [an appropriate waypoint] or to revert to selected lateral navigation.

Changes in clearances should be fully understood before being accepted and implemented.

For example, being cleared to a lower altitude should never be understood as a clearance to descend (prematurely) below the charted sector or segment minimum safe altitude.

When being radar vectored, make sure that :

- The controller has clearly identified your radar return by stating “radar contact”
- The controller can read obstacle clearance altitudes on his / her radar scope (awareness of minimum vectoring altitude (MVA) and responsibility for terrain separation)
- The controller does not forget that you are on a radar vector, possibly heading toward high or rising terrain
- The pilot / controller two-way communication remain effective at all times
- You maintain your own vertical and horizontal situational awareness
- You request confirmation or clarification from ATC without delay and in clear terms, in case of any doubt.

To prevent an excessive terrain-closure-rate, consider a maximum vertical speed and reduce this maximum limit with decreasing altitude (e.g., not exceeding – 5000 ft/mn when below 5000 ft AGL, - 4000 ft/mn below 4000 ft, - 3000 ft/mn below 3000 ft, – 2000 ft/mn below 2000 ft and – 1000 ft/mn when on the final descent segment).

During the final approach segment, the primary attention of PF and PNF should be directed to required altitude constraint or altitude / distance checks prior to reaching the MDA(H) or DA(H).

To enhance the flight crew’s terrain awareness, a callout “ Radio altimeter alive ”, should be announced by the first crewmember observing the radio altimeter activation at 2500 ft height AGL.

The radio altimeter reading should then be included in the instrument scan for the remainder of the approach.

Radio altimeter readings (i.e., feet’s AGL) below the minimum obstacle clearance (MOC) values listed below, should alert the flight crew (sources – ICAO-PANS-OPS and US TERPS):

- Initial approach segment (i.e., from IAF to IF) :
  - **1000 ft**;
- Intermediate approach segment (i.e., from IF to FAF) :
  - **500 ft**; and,

- Final approach segment (i.e., after FAF, for non-precision approaches with a defined FAF, until visual references or reaching MAP):
  - **250 ft**.

Flight crew should be alert to respond, as appropriate, to any unanticipated RA callout or to successive RA callouts that are not consistent with the aircraft rate of descent.

Unless the airport features high close-in terrain, the radio-altimeter reading (i.e., height AGL) should reasonably agree with the height above airfield elevation (i.e., height AFE), obtained by :

- Direct reading of the altimeter, if using QFE
- By subtracting the airport elevation from the altitude reading, if using QNH.

Preparedness to Go-around

In IMC or at night, immediately respond to any GPWS / TAWS warning.

Be prepared and committed to go-around if the conditions for a safe approach and landing are not met (e.g., unstabilized approach at or below the approach gate / stabilization height).

In response to any GPWS / TAWS warning, monitor vertical speed and altitude (radio altitude for terrain clearance and barometric altitude for a minimum safe altitude).

Circling Approaches

When performing a circling approach, be aware of the applicable obstacle clearance protected area (e.g., awareness of differences between ICAO PANS-OPS and US TERPS criteria for the design of protected areas).

IV Operational and Human Factors Affecting Terrain Awareness

The following operational and human factors often are cited as affecting the horizontal or lateral situational awareness and therefore the terrain awareness.

These factors should be addressed by developing related company prevention strategies and personal lines-of-defense, initiating appropriate actions with state agencies, operational authorities and service providers:

- **Aircraft equipment:**
  - Lack of navigation display with terrain display
  - Lack of radar display with mapping function
  - Lack of area navigation (RNAV) capability
  - Lack of radio altitude auto callout (e.g. 500 ft)

- Lack of GPS
- Lack of TAWS and/or latest enhanced functions:
  - Use GPS data for positioning the aircraft on each terrain function of TAWS
  - Use GPS data for geometric altitude
  - Man-made obstacles function
  - Peaks function to display the terrain with the elevation being relative to the Mean Sea Level (MSL), and the lowest and the highest terrain MSL elevation)

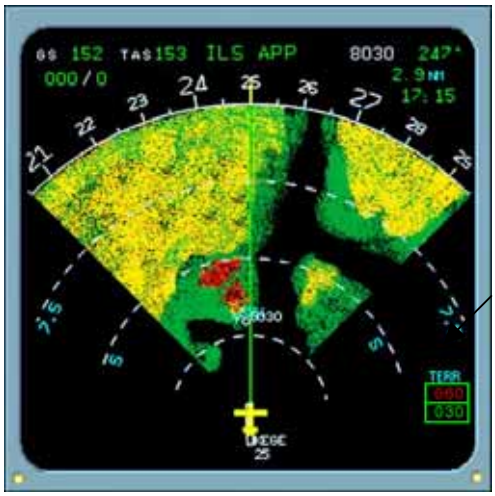

Figure 1

Peaks Function Display on ND

- Lack of TAWS terrain database update.

- **Airport environment:**
  - Night “black hole” and/or rising(sloping) terrain along the approach path.

- **Airport equipment:**
  - Lack of or restricted radar coverage
  - Lack of precision approach (i.e., ILS) and/or lack of VASI/PAPI
  - Limited and/or low-intensity approach and runway lighting
  - Lack of Minimum Safe Altitude Warning (MSAW) capability.

- **Navigation charts:**
  - Navigation or approach charts not reflecting recent changes to AIP’s

- Lack of published departure and/or approach procedures
- Lack of published information on minimum radar vectoring altitudes
- Absence of colored terrain contours on approach charts.

Figure 2

Typical Colored Terrain Contours on Approach Charts

- **Training :**
  - Absence of area and/or airport familiarization training
  - Inadequate knowledge of applicable obstacle clearance and/or sector minimum vectoring altitude.
- **Standard operating procedures:**
  - Unwarranted deviation from the standard PF / PNF task-sharing
  - Inadequate briefings
  - Monitoring errors (i.e., inability / failure to monitor the aircraft trajectory and instruments while performing FMS entries or while being interrupted or distracted, failure to monitor the radio altimeter, …)
  - Inadequate monitoring of flight progress (i.e., being behind the aircraft)
  - Incorrect use of or interaction with automation
  - Omission of a normal checklist or part of a normal checklist (usually because of interruption or distraction)
  - Deliberate or inadvertent non-adherence to procedures, including standard calls and/or excessive-deviation callouts
  - Failure to go around when warranted.
- **Pilot / Controller Communications** (refer to the Flight Operations Briefing Note on **Effective Pilot / Controller Communications**):
  - Omission of position report at first radio contact in an area without radar coverage (i.e., reducing the controller's situational awareness)
  - Breakdown in pilot / controller or intra-crew communications (e.g., readback / hearback errors, failure to resolve doubts or ambiguities, use of non-standard phraseology)

- Accepting an amended clearance without prior evaluation
- Tendency to place over-trust in ATC when confronted by a fast-changing environment while approaching hazardous terrain (source – NASA ASRS)
- Excessive or last-minute ATC instructions (e.g., radar vectors, altitude changes, speed restrictions, runway change, …) resulting in crew confusion and disorientation
- Incorrect ATC instructions resulting in lower-than-desired terrain separation.

- **Operational errors:**
  - Mis-reading of charts (e.g., MSA, altitude restrictions, …)
  - Premature descent to the MDA (i.e., before reaching the FAF)
  - Premature step-down, during a step-down (dive-and-drive) non-precision approach
  - Premature final descent (i.e., before reaching the VDP, as defined)
  - Non adherence to published missed-approach procedure when going around in IMC (e.g., course reversal for landing on opposite QFU)
  - Flight beyond the limit of the protected area during a circling approach (i.e., lack of awareness of protected area)
  - Incorrect identification of expected visual references (i.e., absence of cross-check with raw data) during an instrument approach procedures or a night visual approaches
  - Starting a second approach in IMC without understanding why the GPWS / TAWS was activated on the first approach.

- **Human Performance and CRM aspects:**
  - Lapse of concentration in monitoring the approach;
  - Incorrect CRM practices (absence of crosscheck and back-up for AP mode selections and AP/FMS data entries, late recognition of monitoring errors)
  - Incorrect workload management
  - Inadequate decision-making
  - Failure to resolve a doubt or confusion
  - Excessive focus on plan continuation, when conditions dictate a go-around and/or diversion
  - Fatigue (i.e., reduced vigilance / alertness)
  - Complacency
  - Lack of guidance awareness (e.g., lack of mode awareness or mode confusion)
  - Loss of vertical / horizontal situational awareness (refer to the Flight Operations Briefing Note on **Enhancing Situation(al) Awareness**)

- Spatial disorientation
- Visual illusions (refer to the Flight Operations Briefing Note on **Visual Illusions Awareness**).

V Prevention Strategies - Building and Maintaining Terrain Awareness

This paragraph provides an overview of:

- Opportunities available to enhance terrain awareness (e.g., operations manuals, technical training, navigation charts)
- Operational recommendations and techniques proposed to establish and maintain the desired level of terrain awareness.

This overview identifies the most important terrain-awareness-items (i.e., CFIT-critical item).

V.1 Standard Operating Procedures

Standard operating procedures (SOPs) should emphasize terrain-awareness by defining a robust operating philosophy in the following domains :

- Task sharing and standard calls for effective cross check and backup, particularly for mode selections and target entries
- Operations Golden Rules (refer to the Flight Operations Briefing Note **Operations Golden Rules**):

  The first operations golden rule states: *Fly*, *Navigate*, *Communicate and Manage*, *in that order*.

  Navigate can be defined by the following three " know where ... " statements:
  - Know where you are;
  - Know where you should be; and,
  - Know where the terrain and obstacles are.

- Approach and go-around briefings
- Altimeter setting and cross-check procedures:
  - When receiving an altitude clearance, immediately set the cleared altitude in the FCU altitude window and cross-check the new altitude target on PFD
  - Ensure that the selected altitude is cross-checked by both crewmembers
  - Ensure that the cleared altitude is above the applicable minimum safe altitude

- Positively confirm any altitude clearance below the MSA, when under radar vectoring (or be aware of applicable minimum vectoring altitude for the sector).

- Descent profile management
- Energy management
- Threat and hazards awareness
- Flying constant angle non-precision approaches, as opposed to step-down / dive-and-drive non-precision approaches (refer to the Flight Operations Briefing Note on **Flying Constant Angle Non-Precision Approaches**)
- Elements of a stabilized approach and approach gates
- Use of radio altimeter:

  The barometric-altimeter MDA(H) / DA(H) or the radio-altimeter DH should be set in line with Airbus' SOPs or company's SOPs.

  Callouts should be tailored to the airline operating policy and to the type of approach.

  To enhance the flight crew's terrain awareness at any time during the instrument approach procedure but particularly during the final approach segment, a callout Radio Altimeter Alive, should be announced by the first crewmember observing the radio altimeter activation at 2500 ft AGL.

  The RA reading should be included in the instrument scan for the remainder of the approach.

- Readiness and commitment to respond to a GPWS / TAWS alert
- Go-around policy
- Display of surrounding terrain on ND (**Figure 3**), when TAWS is available (i.e., positive navigation accuracy check or GPS PRIMARY available).

  In mountainous areas, the selection of TERR ON ND enhances pilot awareness and can be used in any phase of flight.

  Note

  If the use of weather radar is required, consider displaying the weather radar on the PF ND and the TERR display on the PNF ND.

Figure 3

Typical Terrain Display on ND

- Display of safety altitudes (MORA and MSA) and terrain on Vertical Display (VD) (*Specific to A380* – **Figure 4**). The VD enhances flight crew awareness of the vertical situation by allowing a situation assessment about the current and future aircraft position to:
  - Safe altitudes (check the flight path is compliant)
  - Terrain (check altitude constraints versus terrain).

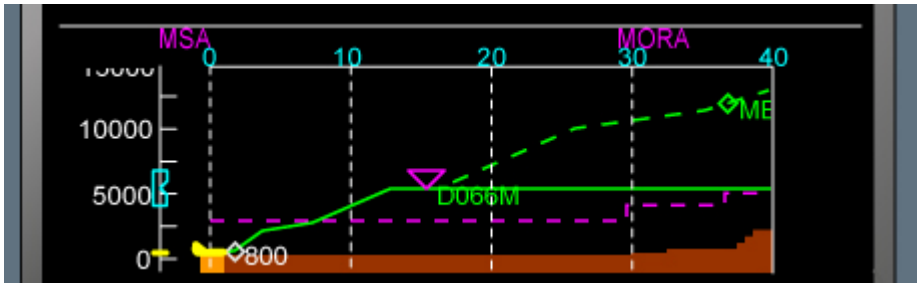

Figure 4

A380 Vertical Display

V.2 Training

Altitude Awareness Program:

The implementation of an altitude awareness program is an effective initiative for reducing the number of altitude deviations and situations that may result in a reduced terrain separation.

An altitude awareness program can be developed based on the contents of the Flight Operations Briefing Notes on **Altimeter Setting – Use of Radio Altimeter** and **Preventing Altitude Deviations / Level Busts**.

The altitude awareness program should emphasize the following aspects:

- Awareness of altimeter setting errors
- Awareness of altitude corrections for low OAT operations and awareness of pilot's and/or controller's responsibility in applying these corrections.

Pilot / Controller Communications:

A company awareness and training program on pilot / controller communications should be developed and implemented, involving pilots and ATC personnel (refer to the Flight Operations Briefing Note on **Effective Pilot / Controller Communications**).

Route Familiarization Program:

A training program should be implemented for departure, route, approach and airport familiarization, using:

- High-resolution paper material
- Video program
- Simulator with enhanced visual capability.

Whenever warranted, new pilots should conduct a route familiarization check:

- As flight crewmember with a check airman
- As observer with a qualified flightcrew.

CFIT Training program:

The CFIT training program should include the following aspects:

- Understanding of each GPWS / TAWS mode, this should include:
  - Associated operational scenario(s)

- Protection envelope, in terms of:
  - Aircraft configuration (i.e., landing gear / flaps configurations)
  - Barometric-altitude range or radio-altitude range
  - Airspeed range.
- Alert or warning activation logic, based on:
  - Barometric-altitude
  - Vertical speed
  - Radio-altimeter closure rate
  - Radio altitude
  - Glide slope deviation.
- Recognition of voice messages.

- Terrain avoidance (pull-up) maneuver (refer to the Flight Operations Briefing Note **Terrain Avoidance (Pull-up) Maneuver**).

VI Summary of Key points

The following key points and recommendations should be used in the development of company prevention strategies and actions enhancing terrain awareness:

- **Approach charts**

  Provide flight crews with departure and approach charts featuring terrain with color shaded contours.

- **Altimeter setting**

  Promote the strict adherence to adequate SOPs to reduce altimeter-setting errors and for optimum use of radio-altimeter.

- **Flight progress monitoring**

  Promote the basic elements of flight monitoring for terrain awareness, i.e.:
  - Monitoring FMS guidance and FMS navigation accuracy
  - Monitoring instruments and navaids raw data
  - Using all available information available (i.e., cockpit displays, navaids raw data and charts)
  - Requesting confirmation or clarification from ATC if any doubt exists about terrain clearance, particularly when being radar vectored.

- **Approach and go-around briefing**

  Include the following terrain awareness critical items in the approach and go-around briefing:

  – Minimum safety altitudes

  – Terrain and man-made obstacles features

  – Applicable approach minimums (visibility or RVR, ceiling as applicable)

  – Applicable stabilization height (approach gate)

  – Final approach descent flight path angle (and vertical speed)

  – Go-around altitude and missed-approach initial steps.

- **Preparedness and commitment for go-around**

  Stress the following aspects of a terrain-proof go-around policy :

  – Being committed for an immediate response to any GPWS / TAWS warning (particularly at night or in IMC)

  – Being prepared and minded to go-around.

- **Pilot / controller communications**

  An awareness and training program to improve pilot / controller communications should be developed based on the contents of Flight Operations Briefing Note **Effective Pilot / Controller Communications**.

  Cross-check that the cleared / assigned altitude is above the sector minimum safe altitude (unless crew is aware of applicable minimum vectoring altitude for the sector).

- **Crew coordination, cross-check and back-up**

  Emphasize the following terrain-awareness elements of an effective cross-check and back-up:

  – Assertive challenging by PNF (i.e., maintaining situational awareness and voicing any concern about the safe progress of the flight)

  – Standard calls (particularly, altitude calls)

  – Excessive-parameter-deviation callouts

  – Task sharing and standard calls for the acquisition of visual references.

  The role and tasks of the PNF should be emphasized by highlighting his/her role as pilot monitoring.

- **Awareness of other approach hazards**

  Provide pilots with education and training on visual illusions and spatial disorientation.

- **Safety-awareness information / training**

  Ensure the effective implementation safety-awareness information / training programs on:

  – Altitude Awareness

  – Pilot / Controller Communications

  – Route Familiarization

  – Terrain Awareness and Avoidance.

VII Associated Flight Operations Briefing Notes

The following Flight Operations Briefing Notes provide expanded information on subjects and matters related to terrain awareness:

- **Operations Golden Rules**
- **Conducting Effective Briefing**
- **Effective Pilot / Controller Communications**
- **Altimeter setting – Use of radio Altimeter**
- **Preventing Altitude Deviations / Level Busts**
- **Being Prepared for Go-around**
- **Terrain-Avoidance (Pull-up) Maneuver**
- **Enhancing Situation(al) Awareness**
- **Visual Illusions Awareness**

VIII Regulatory References

The following regulatory references are provided to assist the reader in a quick and easy reference to the related regulatory material:

- ICAO DOC 8126 - Aeronautical Information Services Manual
- ICAO DOC 8697 – Aeronautical Chart Manual
- ICAO PANS-OPS DOC 8168 Volume 1 - Flight Procedures & Volume 2 - Construction of Instrument and Visual Procedures
- US FAR 97 – Standard Instrument Approach Procedures – Terminal Instrument Approach Procedures (TERPS)
- US FAR 121.443 and 121.445 – Route, Special areas and airports qualification for pilot in command (PIC).

IX Airbus References

- Service Information Letter 34-080: Terrain and Awareness Warning System on Airbus Aircraft

X Additional Reading Material / Website References

The following Flight Safety Foundation documents can be used to further illustrate and complement the information contained in this Briefing Note:

- CFIT Education and Training Aid
- CFIT Checklist – Evaluate the Risk and Take Action
- Flight Safety Digest Volume 17 & 18 – November 1998 / February 1999
- Flight Safety Digest – Approach-and-Landing Accident Reduction (ALAR) Briefing Notes – Aug.-Nov. 2000:
  - ALAR Risk Awareness Tool / Checklist
  - ALAR Risk Reduction Planning Guide
  - ALAR Briefing Notes.

Note:

These Flight Safety Foundation Publications are available on the Flight Safety Foundation website ***http://www.flightsafety.org/ap_home.html****.*

TAWS Terrain Data Base Update:

- **http://www.honeywell.com/sites/aero/Egpws-Home.htm**
- **http://www.acsscustomerservices.com/CustomerServices/**

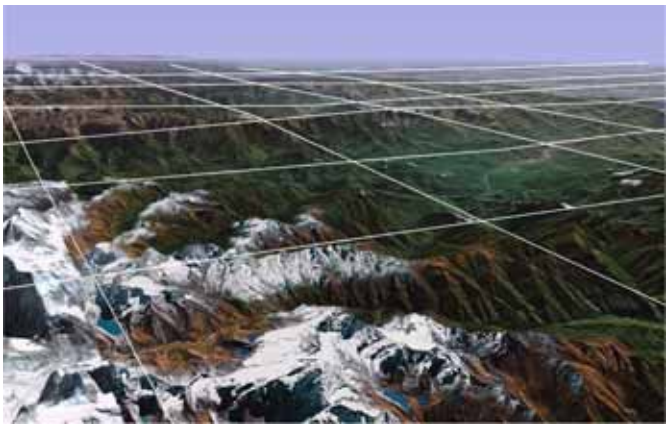

Figure 5

Grid Set for Terrain Data Base

Airbus Customer Services

Flight Operations Support and Services

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FOBN Reference : FLT_OPS – OPS_ENV – SEQ 02 – REV 03 – JUN. 2007