

# Level Bust Briefing Notes

## Aircraft Operators

# Level Bust

# OPS 1

## Standard Operating Procedures

### 1. Introduction

- 1.1. Adherence to standard operating procedures (SOPs) is an effective method of preventing level busts, including those that lead to controlled flight into terrain (CFIT).
- 1.2. Crew resource management (CRM) is not effective without adherence to SOPs.

### 2. Manufacturer's SOPs

- 2.1. SOPs published by an aircraft manufacturer are designed to:
  - (a) Reflect the manufacturer's flight deck design philosophy and operating philosophy;
  - (b) Promote optimum use of aircraft design features; and,
  - (c) Apply to a broad range of company operations and environments.
- 2.2. The initial SOPs for a new aircraft model are based on the manufacturer's objectives and on the experience acquired during flight-testing programs and route-proving programs.
- 2.3. After they are introduced into service, SOPs are reviewed periodically and are improved based on feedback received from users (in training and in line operations).

### 3. Customised SOPs

- 3.1. An aircraft manufacturer's SOPs can be adopted by a company without amendment, or can be used to develop customised SOPs.
- 3.2. Changes to the airframe manufacturer's SOPs should be co-ordinated with the manufacturer and should be approved by the appropriate authority.
- 3.3. SOPs must be clear and concise; expanded information should reflect the company's operating philosophy and training philosophy.

- 3.4. The Flight Safety Foundation (FSF) developed a Standard Operating Procedures Template<sup>1</sup> adapted from the Federal Aviation Administration (FAA) Advisory Circular 120-71 – *Standard Operating Procedures for Flight Deck Crewmembers*. Appendix 1 to JAR-OPS 1.1045, Section 8 lists matters that should be the subject of SOPs but does not include a comparable SOP template.
- 3.5. The FSF template is a valuable aid in developing company SOPs, but operators should be aware of the differences between FARs and JAR-OPS when using this document. Company SOPs are usually developed to ensure standardisation among different aircraft fleets operated by the company.
- 3.6. Company SOPs should be reassessed periodically, based on revisions of the airframe manufacturer's SOPs and on internal company feedback, to identify any need for change.
- 3.7. Flight crews and cabin crews should participate with flight standards personnel in the development and revision of company SOPs to:
  - (a) Promote constructive feedback; and,
  - (b) Ensure that the SOPs, as well as the reasons for their adoption, are fully understood by users.

### 4. Scope of SOPs

- 4.1. The primary purpose of SOPs is to identify and describe the standard tasks and duties of the flight crew for each flight phase.
- 4.2. SOPs are generally performed from memory, but tasks related to the selection of systems and to the aircraft configuration should be cross-checked using normal checklists.
- 4.3. SOPs are usually supplemented by information about specific operating techniques or by

<sup>1</sup> [Flight Safety Foundation Standard Operating Procedures Template](#) – see FSF ALAR Toolkit, pages 6-8

recommendations for specific types of operations (e.g. operation on wet runways or contaminated runways, extended-range twin-engine operations [ETOPS] and/or operation in reduced vertical separation minima [RVSM] airspace).

- 4.4. SOPs assume that all aircraft systems are operating normally and that all automatic functions are used normally. (A system may be partially inoperative or totally inoperative without affecting the SOPs.)
- 4.5. SOPs should emphasise the following items:
  - (a) Operating philosophy;
  - (b) Task-sharing;
  - (c) Optimum use of automation;
  - (d) Sound airmanship;
  - (e) Standard calls<sup>2</sup>;
  - (f) Normal checklists;
  - (g) Briefings;
  - (h) Altimeter-setting and cross-checking procedures<sup>3</sup>;
  - (i) Descent profile management;
  - (j) Energy management;
  - (k) Terrain awareness;
  - (l) Radio altimeter;
  - (m) Level bust awareness.

## 5. General Principles

- 5.1. SOPs should contain safeguards to minimise the potential for inadvertent deviations from SOPs, particularly when operating under abnormal conditions or emergency conditions, or when interruptions/distractions occur.
- 5.2. Safeguards include:
  - (a) Action blocks – groups of actions being accomplished in sequence;
  - (b) Triggers - events that initiate action blocks;
  - (c) Action patterns – instrument panel scanning sequences or patterns supporting the flow and sequence of action blocks; and,

- (d) Standard calls – standard phraseology and terms used for effective crew communication.

### Standardisation

- 5.3. SOPs are the reference for crew standardisation and establish the working environment required for CRM.

### Task-sharing

- 5.4. The following guidelines apply to any flight phase but are particularly important to the high-workload climb-out and approach-and-landing phases.
- 5.5. The pilot flying (PF) is responsible for controlling the horizontal flight path and the vertical flight path, and for energy management, by:
  - (a) Supervising autopilot operation and autothrottle operation (maintaining awareness of the modes armed or selected, and of mode changes); or,
  - (b) Hand-flying the aircraft, with or without flight director (FD) guidance, and with an appropriate navigation display (e.g., horizontal situation indicator [HSI]).
- 5.6. The pilot not flying (PNF) (pilot monitoring) is responsible for monitoring tasks and for performing the actions requested by the PF; this includes:
  - (a) Performing the standard PNF tasks:
    - SOP actions; and,
    - FD and flight management system (FMS) mode selections and target entries (e.g. altitude, airspeed, heading, vertical speed, etc.), when the PF is hand-flying the aircraft;
  - (b) Monitoring systems and aircraft configuration; and,
  - (c) Cross-checking the PF to provide backup as required (this includes both flight operations and ground operations).

### Automation

- 5.7. With higher levels of automation, flight crews have more options and strategies from which to select for the task to be accomplished.
- 5.8. Company SOPs should define accurately the options and strategies available for the various phases of flight and for the various types of approach.

<sup>2</sup> See [Briefing Note OPS 3 – Standard Calls](#)

<sup>3</sup> See also [Briefing Note OPS 2 – Altimeter Setting Procedures](#).

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### Briefings

- 5.9. The importance of briefing techniques is often underestimated, although effective briefings enhance crew standardisation and communication.
- 5.10. An interactive briefing style – e.g. confirming the agreement and understanding of the pilot not flying (PNF) after each phase of the briefing – will provide a more effective briefing than an uninterrupted recitation terminated by a final query, “Any questions?”
- 5.11. An interactive briefing fulfils two important purposes:
- (a) To provide the pilot flying (PF) and PNF with an opportunity to correct each other; and,
  - (b) To share a common mental image of the phase of flight being briefed.
- 5.12. The briefing should be structured (i.e. follow the logical sequence of the departure, approach and landing, etc.) and concise.
- 5.13. Routine and formal repetition of the same information on each flight may become counterproductive; adapting and expanding the briefing by highlighting the special aspects of the departure or approach, or the actual weather conditions, will result in more effective briefings.
- 5.14. Whether anticipated or not, changes in an ATC clearance, weather conditions, or runway in use require a partial review of the briefing.
- 7.2. In some intentional deviations from SOPs, the procedure that was followed in place of the SOP seemed to be appropriate for the prevailing situation.
- 7.3. The following factors and conditions are often cited in discussing deviations from SOPs:
- (a) Inadequate knowledge or failure to understand the procedure (e.g., wording or phrasing was not clear, or the procedure was perceived as inappropriate);
  - (b) Insufficient emphasis during transition training and recurrent training on adherence to SOPs;
  - (c) Inadequate vigilance (e.g. fatigue);
  - (d) Interruptions (e.g. communication with air traffic control);
  - (e) Distractions (e.g., flight deck activity);
  - (f) Task saturation;
  - (g) Incorrect management of priorities (e.g., lack of a decision-making model for time-critical situations);
  - (h) Reduced attention (tunnel vision) in abnormal conditions or high-workload conditions;
  - (i) Inadequate CRM (e.g., inadequate crew co-ordination, cross-check and backup);
  - (j) Company policies (e.g., schedules, costs, go-arounds and diversions);
  - (k) Other policies (e.g., crew duty time);
  - (l) Personal desires or constraints (e.g., schedule, mission completion);
  - (m) Complacency; and,
  - (n) Overconfidence.
- 7.4. These factors may be used to, assess company exposure to deviations and/or personal exposure to deviations, and to develop corresponding methods to help prevent deviations from SOPs.

### 6. Training

- 6.1. Disciplined use of SOPs and normal checklists should begin during transition training, because habits and routines acquired during transition training have a lasting effect.
- 6.2. Transition training and recurrent training provide a unique opportunity to discuss the reasons for SOPs and to discuss the consequences of failing to adhere to them.
- 6.3. Conversely, allowing deviations from SOPs and/or normal checklists during initial training or recurrent training may encourage deviations during line operations.

### 7. Deviations from SOPs

- 7.1. To ensure adherence to published SOPs, it is important to understand why pilots intentionally or inadvertently deviate from SOPs.

### 8. Summary

- 8.1. Deviations from SOPs occur for a variety of reasons; intentional deviations and inadvertent deviations from SOPs have been identified as causal factors in many level bust incidents.
- 8.2. CRM is not effective without adherence to SOPs, because SOPs provide a standard reference for the crew's tasks on the flight deck. SOPs are effective only if they are clear and concise.

- 8.3. Transition training provides the opportunity to establish the disciplined use of SOPs, and recurrent training offers the opportunity to reinforce that behaviour.

## 9. Resources

### Other Level Bust Briefing Notes

- 9.1. The following Level Bust Toolkit Briefing Notes contain information to supplement this discussion:

[GEN 2 – Pilot-Controller Communications;](#)

[OPS 2 – Altimeter Setting Procedures;](#)

[OPS 3 – Standard Calls;](#)

[OPS 4 – Aircraft Technical Equipment;](#)

[OPS 5 – Airborne Collision Avoidance Systems.](#)

### Access to Resources

- 9.2. Most of the resources listed may be accessed free of charge from the Internet. Exceptions are:

ICAO documents, which may be purchased direct from [ICAO](#);

Certain Flight Safety Foundation (FSF) Documents, which may be purchased direct from [FSF](#);

Certain documents produced by the Joint Aviation Authorities, which may be purchased from [JAA](#).

### Regulatory References

- 9.3. Documents produced by regulatory authorities such as ICAO, JAA and national aviation authorities are subject to amendment. Reference should be made to the current version of the document to establish the effect of any subsequent amendment.

[ICAO Annex 6 Part I Appendix 2 – Contents of an Operations Manual;](#)

[ICAO Doc 8168 – Procedures for Air Navigation Services – Operations \(PANS-OPS\);](#)

[ICAO Doc 9376 – Preparation of an Operations Manual;](#)

[JAR-OPS 1.1040 – Sub-part P and associated AMC and IEMs – General Rules for Operations Manuals;](#)

[JAR-OPS 1.1045 – Sub-part P and associated AMC and IEMs – Operations Manual – Structure and Contents.](#)

### Training Material – Safety Letters

[EUROCONTROL Safety Letter – Level Bust: a Shared Issue?;](#)

[EUROCONTROL Safety Letter – Reducing Level Bust;](#)

[EUROCONTROL Safety Letter – En Route to Reducing Level Bust;](#)

[EUROCONTROL Safety Letter – Airborne Collision Avoidance Systems \(ACAS\);](#)

[EUROCONTROL ACAS II Bulletin: “Follow the RAI”;](#)

### Training Material – Posters

Level Bust Prevention posters produced by the UK CAA:

[2 Many Things;](#)

[Low QNH – High Risk;](#)

[No Rush – No Mistake;](#)

[Wun Wun Zero.](#)

### Other Training Material

[FAA Advisory Circular 120-71 – Standard Operating Procedures for Flight Deck Crewmembers;](#)

[Flight Safety Foundation \(FSF\) Approach and Landing Accident Reduction \(ALAR\) Toolkit Briefing Note:](#)

1.3 – Operations Golden Rules;

1.4 – Standard Calls;

1.6 – Approach and Go-around Briefings.

[FSF Accident Prevention 1/99 – Aircraft Accidents Aren’t – Part 2;](#)

[FSF Accident Prevention 12/95 – Different Altimeter Displays and Crew Fatigue ...;](#)

[FSF Accident Prevention 4/98 – Boeing 737 Pilot selects Incorrect Altitude in Holding Pattern ...](#)

### Other Resources

[FSF Digest 7/94 – Sterile Cockpit Compliance;](#)

[FSF Digest 12/95 – Altitude Awareness Programs Can Reduce Altitude Deviations;](#)

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[FSF Digest 3/99 – Enhancing Flight Crew Monitoring Skills;](#)

[NASA article – What Goes Up Must Come Down;](#)

[UK CAA CAP 710 – “On the Level” & Recommendations.](#)



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