THE BAHAMAS
CIVIL AVIATION DEPARTMENT

ADVISORY CIRCULAR
AC 10-004

ACCEPTABLE CREW STANDARD OPERATING PROCEDURES

SECTION 1 POLICY & GENERAL INFORMATION

1.1 PURPOSE

This advisory circular (AC) provides guidance for the development of acceptable crew standard operating procedures for operation of aircraft. It provides advice and recommendations about development, implementation, and updating of SOPs.

1.2 STATUS OF THIS AC

This AC is an original issuance.

1.3 BACKGROUND

A. Standard operating procedures (SOPs) are universally recognized as basic to safe aviation operations. The International Civil Aviation Organization (ICAO) has recognized the importance of SOPs for safe flight operations.

B. ICAO Annex 6, Operations of Aircraft, establish that each member state should require that SOPs for each phase of flight be contained in the operations manual used by pilots.

C. Effective crew coordination and crew performance, two central concepts of crew resource management (CRM), depend upon the crew's having a shared mental model of each task. That mental model, in turn, is founded on SOPs.

D. This advisory circular (AC) presents background, basic concepts, and philosophy in respect to SOPs. It emphasizes that SOPs should be clear, comprehensive, and readily available in the manuals used by flight deck crew members.

1.4 APPLICABILITY

A. The BCAA strongly advises all operators of aircraft to develop and use standard operating procedures and checklists for the operation of their aircraft.

B. All Bahamas AOC holders that operate multi-crew aircraft must have standard operating procedures approved by the BCAA in order to operate these aircraft in commercial air transport.

- Advisory Circulars are intended to priovide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.
- Where an AC is referred to in a 'Note' below the regulation, the AC remains as guidance material,
- ACs should always be read in conjunction with the referenced regulations.

1.5 RELATED REGULATIONS

The following Bahamas Aviation Safety Regulation (BASR) are applicable to the use of approved standard operating procedures—

- BASR Schedule 10 – Operations of Aircraft
- BASR Schedule 12 – AOC Certification and Administration

1.6 RELATED PUBLICATIONS

These related publications provide additional guidance regarding the development and use of standard operating procedures—

1) Transport Canada
   - ♦ Multi-Crew Aircraft Operating Procedures

This excellent example manual may be downloaded for the Transport Canada site: http://www.tc.gc.ca/

2) Federal Aviation Administration (FAA)
   - ♦ Advisory Circular AC 120-71

3) International Civil Aviation Organization (ICAO)
   - ♦ Document 7168

Copies may be obtained from Document Sales Unit, ICAO, 999 University Street, Montreal, Quebec, Canada H3C 5H7.

1.7 DEFINITIONS & ACRONYMS

A. The following definitions are used throughout this AC—

1) **Human Factors principles**. Principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

2) **Human performance.** Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

B. The following acronyms are used throughout this AC—

1) **AFM** – Aircraft Flight Manual
2) **BCAA** – Bahamas Civil Aviation Authority
3) **BCAA-FSI** – BCAA Flight Standards Inspectorate
4) **CDL** – Configuration Deviation List
5) CRM – Cockpit Resource Management
6) **ICAO** – International Civil Aviation Organization
7) **PF** – Pilot Flying
8) **PNF** – Pilot Not Flying
9) **SOP** – Standard Operating Procedure

SECTION 2 GENERAL POLICIES

2.1 BASIC REQUIREMENT

AOC holders and corporate operators are required by regulations to shall establish, and keep current, standard operating procedures (SOPs) appropriate to the type and variant of aircraft provide guidance to flight operational personnel for the safe operation of the aircraft.

2.2 THE EXTENT OF THE SOPS

As an integral part of its SOPs, the operators should establish and keep current—

1) Aircraft-specific expanded checklists;
2) Aircraft-specific condensed checklists
3) Aircraft-specific operational profiles for maneuvers;
4) Standard crew briefings;
5) Standard call-outs and responses; and
6) Critical safety procedures.

The AOC holder may not allow the use of SOPs and checklists by its crew member unless these documents have been approved by the Authority.

- There are a number of excellent templates for development of SOPs.
- The BCAA can provide a template or the operator may find guidance on the Internet or manufacturer's FCOMs.

2.3 CONTENT & DESIGN

A. Operators should ensure that approved SOPs and checklist procedures include each item necessary for flight crew members to check for safety—

1) Before starting engines,
2) Taking off,
3) Landing, and
4) For engine and systems abnormalities and emergencies.

More specific guidance on the contents of checklists are contained later in this AC.

B. Operators should ensure that the SOPs and checklist procedures are designed so that a flight crew member will not need to rely upon their memory for items to be checked.

- This AC contains amplified guidance for the design of the checklists.
- Human factor principles are an integral consideration of the design principles in this chapter.

- The design and utilization of the SOPs and checklists is required to observe relevant human factors principles.

2.4 USE DURING TRAINING

Operators should ensure that flight crews complete training for the use of the SOPs and checklists, including—

1) Initial aircraft-specific training;
2) Recurrent aircraft-specific training; and

- Only SOPs and checklist approved for the operator's use may be used for flight crew training.
- Approved training providers must use the AOC holder's approved SOPs.
- Operations inspectors will check for the availability and use of the approved checklist during inspections of operator training and checking.

3) Aircraft specific differences training for variants of aircraft types.

2.5 AVAILABLE & COMPLIANCE

A. Operators should ensure that the SOPs and checklists are readily usable in the cockpit of each aircraft in sufficient quantity for ground and flight operations.

B. Operators should require their flight crew to comply with the SOPs and checklists when operating the aircraft.

- These requirements for checklist availability, quantity and use are confirmed during ramp and enroute inspections.
- The operations manual will contain the requirement to conform to the SOPs and checklists.

2.6 FLIGHT CREW STANDARDIZATION PROGRAM

A. AOC holders are required to establish and maintain a comprehensive flight crew standardization program to ensure continuous conformance with the SOPs and checklists.

B. That program will consist of annual training, bi-annual proficiency checks, annual line checks and random line checks by designated check airman and flight operations inspectors.

C. If requirements to use and conform to the SOPs are not consistently enforced, flight crews too easily become participants in an undesirable double-standard condoned by instructors, check airmen, and managers.

- Flight crews may end up doing things one way to satisfy training requirements and check rides, but doing them another way in "real life" during line operations.

- When a double standard regard the conformance to an SOP is identified, it should be considered a red flag.
- Obviously the published SOP may not be practical or effective for some reason.
- That SOP should be reviewed and perhaps changed.

SECTION 3 OBJECTIVES OF STANDARD OPERATING PROCEDURES

3.1 GENERAL GUIDANCE

Operators are required to establish standard operating procedures (SOPs), including checklists and crew briefings, that provide guidance to flight operations personnel to ensure safe, efficient, logical and predictable means of carrying out flight procedures.

3.1.1 SEQUENCE OF TASKS & ACTIONS

SOPs must specify a sequence of tasks and actions to ensure that flight procedures can be carried out in standardized manner. To achieve these objectives, SOPs should unambiguously express—

1) What the task is;

2) When the task is to be conducted (time and sequence);

3) By whom the task is to be conducted;

4) How the task is to be done (actions);

5) What the sequence of actions consists of; and

6) What type of feedback is to be provided as a result of the actions (verbal call-out, instrument indication, switch position, etc.).

3.2 SOP DESIGN CONSIDERATIONS

A. To ensure compatibility with specific operational environments and compliance by flight operations personnel, SOPs design should take into consideration—

1) The nature of the operator's environment and type of operation;

2) The operational philosophy, including crew coordination;

3) The training philosophy, including human performance training;

4) The operator's corporate culture, including the degree of flexibility to be built into SOPs design;

5) The levels of experience of different user groups, such as flight crews, aircraft maintenance engineers and cabin attendants;

6) Resource conservation policies, such as fuel conservation or wear on power plants and systems;

7) Flight deck automation, including flight deck and systems layout and supporting documentation;

8) The compatibility between SOPs and operational documentation; and

9) Procedural deviation during abnormal/unforeseen situations.

B. Flight operations personnel should be involved in the development of SOPs.

3.3 SOP IMPLEMENTATION & USE

Operators must establish a formal process of feedback from flight operations personnel to ensure standardization, compliance and evaluation of reasons for non-compliance during SOPs implementation and use.

SECTION 4 CHECKLISTS

4.1 GENERAL

A. Operators are required to establish checklists as an integral part of standard operating procedures (SOPs).

- Checklists should describe the actions relevant to specific phases of operations (engine start, taxi, take-off, etc.) that flight crews must perform or verify and which relate to flight safety.

B. Checklists should also provide a framework for verifying aircraft and systems configuration that guards against vulnerabilities in human performance.

4.2 CHECKLIST OBJECTIVES

A. Normal checklists should aid flight crews in the process of configuring the aircraft and its systems by—

1) Providing logical sequences of coverage of the flight deck panels;

2) Providing logical sequences of actions to meet both internal and external flight deck operational requirements;

3) Allowing mutual monitoring among flight crew members to keep all flight crew members in the information loop; and

4) Facilitating crew coordination to assure a logical distribution of flight deck tasks.

B. Checklists for use in abnormal situations and those for emergency situations should aid flight crews in coping with malfunctions of aircraft systems and/or emergency situations.

C. Use of checklist and other SOPs guard against vulnerabilities in human performance during high workload situations by fulfilling the objectives of checklists and, in addition, by—

1) Ensuring a clear allocation of duties to be performed by each flight crew member;

2) Acting as a guide to flight crews for diagnosis, decision making and problem solving, (prescribing sequences of steps and/or actions); and

3) Ensuring that critical actions are taken in a timely and sequential manner.

4.3 CHECKLIST DESIGN

4.3.1 ORDER OF CHECKLIST ITEMS

A. The following factors should be considered when deciding the order of the items in checklists—

1) The operational sequence of aircraft systems so that items are sequenced in the order of the steps for activation and operation of these systems;

2) The physical flight deck location of items so that they are sequenced following a flow pattern;

3) The operational environment so that the sequence of checklists considers the duties of other operational personnel such as cabin crew and flight operations officers;

4) Operator policies that may impinge on the operational logic of checklists, such as resource conservation policies such as single-engine taxi;

5) Verification and duplication of critical configuration-related items so that they are checked in the normal sequence and again immediately before the phase of flight for which they are critical; and

6) Sequencing of critical items in abnormal and emergency checklists so that items most critical are completed first.

B. Critical items should appear no more than twice on a given checklist.

- Critical items should be verified by more than one flight crew member.

4.3.2 NUMBER OF CHECKLIST ITEMS

The number of items in checklists should be restricted to those critical to flight safety.

The introduction of advanced technology in the flight deck, allowing for automated monitoring of flight status, may justify a reduction in the number of items required in checklists.

4.3.3 CHECKLIST INTERRUPTIONS

SOPs should include techniques to ensure a step-by-step, uninterrupted sequence of completing checklists. SOPs should unambiguously indicate the actions by flight crews in case of checklist interruptions.

4.3.4 CHECKLIST AMBIGUITY

Checklist responses should portray the actual status or the value of the item (switches, levers, lights, quantities, etc.). Checklists should avoid non-specific responses such as “set”, “checked” or “completed”.

4.3.5 CHECKLIST COUPLING

A. Checklists should be coupled to specific phases of flight (engine start, taxi, take-off, etc.).

- SOPs should avoid tight coupling of checklists with the critical part of a phase of flight (for example, completing the take-off checklist on the active runway).

B. SOPs should dictate a use of checklists that allows buffers for detection and recovery from incorrect configurations.

4.3.6 TYPOGRAPHY

A. Checklist layout and graphical design should observe basic principles of typography, including at least legibility of print (discriminatively) and readability under all flight deck lighting conditions.

B. If color coding is used, standard industry color coding should be observed in checklist graphical design, such as—

- Normal checklists should be identified by green headings
- System malfunctions by yellow headings
- Emergency checklists by red headings.

C. Color coding should not be the only means of identifying normal, abnormal and emergency checklists.

SECTION 5 CREW BRIEFINGS

5.1 GENERAL

A. Operators shall establish crew briefings as an integral part of standard operating procedures (SOPs).

B. Operators shall establish both individual and combined crew briefings for flight crew and cabin crew.

Crew briefings communicate duties, standardize activities, ensure that a plan of action is shared by crew members and enhance crew situational awareness.

5.2 CREW BRIEFING OBJECTIVES

Crew briefings should aid crews in performing safety-critical actions relevant to specific phases of flight by—

1) Refreshing prior knowledge to make it more readily accessible in real-time during flight;

2) Constructing a shared mental picture of the situation to support situational awareness;

3) Building a plan of action and transmitting it to crew members to promote effective error detection and management; and

4) Preparing crew members for responses to foreseeable hazards to enable prompt and effective reaction.

Without briefings, and under the pressure of time constraints and stress, retrieving information from memory may be an extremely unreliable process.

5.3 CREW BRIEFING PRINCIPLES

A. The following principles should be considered when establishing crew briefings—

1) Crew briefings should be short and should not include more than ten items. If more than ten items are necessary, consideration should be given to splitting the briefing into sequential phases of the flight;

2) Crew briefings should be simple and succinct, yet sufficiently comprehensive to promote understanding of the plan of action among all crew members;

3) Crew briefings should be interactive and where possible should use a question-and-answer format;

4) Crew briefings should be scheduled so as not to interfere with, and to provide adequate time for, the performance of operational tasks; and

5) Crew briefings should achieve a balance between effectiveness and continual repetition of recurring items.

> Crew briefings that become routine recitations do not refresh prior knowledge and are ineffective.

B. Any intended deviation from SOPs required by operational circumstances should be included as a specific briefing item.

5.4 CREW BRIEFING APPLICATION

A. Operators shall implement flight and cabin crew briefings for specific phases of operations to include actual conditions and circumstances, as well as special aspects of operations.

B. Flight crew briefings shall be conducted for, but not be limited to, the following phases of operations—

1) Pre-flight;

2) Departure; and

3) Arrival.

C. Cabin crew briefings shall be conducted for, but not be limited to, the following phases of operations—

1) Pre-flight; and

2) First departure of the day.

D. Cabin crew briefings should be conducted following changes of aircraft type or crew and before flights involving a stop of more than two hours.

5.5 CREW BRIEFING SCOPE

5.5.1 GENERAL BRIEFING GUIDANCE

A. Pre-flight briefings shall include both flight crew and cabin crew.

B. Pre-flight briefings should focus on crew coordination as well as aircraft operational issues. They should include, but not be limited to—

1) Any information necessary for the flight, including unserviceable equipment or abnormalities that may affect operational or passenger safety requirements;

2) Essential communications, and emergency and safety procedures; and

3) Weather conditions.

5.5.2 FLIGHT CREW DEPARTURE BRIEFINGS

Flight crew departure briefings should prioritize all relevant conditions that exist for the take-off and climb. They should include, but not be limited to—

1) Runway in use, aircraft configuration and take-off speeds;

2) Taxi-out route and relevant hot spots;

3) Departure procedures;

4) Departure routes;

5) Navigation and communications equipment set-up;
6) Aerodrome, terrain and performance restrictions, including noise abatement procedures (if applicable);
7) Take-off alternates (if applicable);
8) Any item(s) included in the minimum equipment list (if applicable);
9) Review of applicable emergency procedures; and
10) Applicable standard call-outs.

5.5.3 FLIGHT CREW ARRIVAL BRIEFINGS

Flight crew arrival briefings should prioritize all relevant conditions that exist for the descent, approach and landing. They should include, but not be limited to—

1) Terrain restrictions and minimum safe altitudes during descent;
2) Arrival routes;
3) Instrument or visual approach procedures and runway in use;
4) Operational minima, aircraft configuration, and landing speeds;
5) Navigation and communications equipment set-up;
6) Taxi-in route and relevant hot spots;
7) Missed approach procedures;
8) Alternate aerodromes and fuel considerations;
9) Review of applicable emergency procedures;
10) Applicable standard call-outs; and
11) Cold temperature correction.

5.5.4 CABIN CREW BRIEFINGS

Cabin crew briefings should prioritize all relevant conditions that exist for the departure. They should include, but not be limited to—

1) Assignment of take-off/landing positions;
2) Review of emergency equipment;
3) Passengers requiring special attention;
4) The silent review process;
5) Review of applicable emergencies;
6) Security or service-related topics that may impact on passenger or crew safety; and
7) Any additional information provided by the operator, including review of new procedures, equipment and systems.

The silent review process is the self-review of individual actions in the event of emergencies.

The Remainder Of This Page Intentionally Left Blank

APPENDIX A
Example Layout of SOP Manual

This is an example of an SOP manual table of contents for a corporate or air taxi operator.

A sample of the suggestions for contents may be obtained from the BCAA-FSI.

1. General Subjects

- Abbreviations and Acronyms
- Definitions
- Notes, Cautions, and Warnings
- Units of Measure
- Checks, Checklists, and Drills
- Aircraft Control
- Crew Coordination
- Communication
- Standard Calls – General
- Standard Calls – Altitude
- Barometric Altimeter Setting Procedures
- Altitude Alert
- Radio Altimeter Procedures
- Flight Guidance Systems and Navigation Systems
- Traffic Alert and Airborne Collision Avoidance Systems

2. Preflight Subjects

- Reporting for Duty
- Flight Planning
- Weight and Balance Control
- Crew Briefing
- Pre-Flight Inspections and Checks
- Aircraft Icing Operations – Before Engine Start
- FMS/GPS/INS/RNAV Initialization and Programming
- Auxiliary Power Unit
- Apron Safety and Embarking/Disembarking Passengers
- Fuelling With Passengers Onboard, Embarking or Disembarking
- Passengers – Seating Location Restrictions and Briefing
- Emergency Procedures Review
- Before Start Check
- Air Traffic Control Clearance
- Repositioning using Aircraft Engines

3. Normal Flight Procedures - Departure

- Engine Start
- Before Taxi
- Navigation Aids – Set-up for Departure
- Taxi Check and Procedures
- Aircraft Icing Operations – Taxi
- Run-up, Functional Checks, Systems Checks
- Take-off Briefing
- Before Take-off Check

- Take-off Procedure
- After Take-off Check
- Climb Procedures
- Holding/Shuttle Procedures Departure/Climb

4. Normal Flight Procedures - Cruise

- Cruise Check
- Engine Management
- Periodic Checks
- Navigation
- FMS/GPS/INS/RNAV Procedures
- Holding Procedures – En Route

5. Normal Flight Procedures - Arrival

- Standard Call-Outs
- Descent Check
- Approach Briefing
- Passenger Briefing
- Descent Procedures
- Holding/Shuttle Procedures – Arrival
- In-Range Check
- Downwind Check
- Before Landing Check
- Final Landing Check
- Approach Procedures – General
- Instrument Approach Procedures – Initial/Intermediate
- Instrument Approach Procedures Intermediate/Final
- Circling Procedures
- Contact/Visual Approach Procedures, VFR Patterns
- Missed Approach
- Landing Procedures
- After Landing Procedures, After Landing Check
- Shutdown Procedures, Shutdown Check

6. Post-Flight Procedures

- Apron Safety and Embarking/Disembarking Passengers
- Fuelling With Passengers Onboard, Embarking or Disembarking
- Repositioning using Aircraft Engines
- Auxiliary Power Unit
- Servicing
- Elementary Work
- Post-Flight Duties

7. Abnormal & Emergency Procedures

- General Policies
- Handling of Abnormal and Emergency Procedures
- Checks, Checklists, and Drills
- Emergency Landing
- Engine Failure/Fire – During Take-Off, After V1

- Engine Failure/Fire – In Flight
- Engine Shutdown (In Flight)
- Engine Hot Start, Failed Start, Clearing Procedure
- Propeller Overspeed
- Fuel Pressure #1 or #2 Engine
- Engine Hydraulic Pump
- Alternate Landing Gear Extension – Hand Pump
- Unsafe Landing Gear Down Indication
- DC Generator
- No Flap Landing
- Airframe De-ice Failure
- Airframe Fire
- Fuselage Fire/Smoke
- Rapid Decompression
- Ditching
- Forced Landing
- Abort/Rejected Take Off
- Evacuation
- Fire/Smoke on the Ground
- Abnormal Take-off
- Stall Recovery
- Pilot Incapacitation
- Bomb Threat and Hijacking
- Post Evacuation Actions
- Wind Shear

8. Safety Operating Practices

- Restrictions for Specified Operations
- Flight and Duty Limitations

9. Condensed Checklists

- Normal checklists
- Abnormal (or Non-Normal) checklists
- Emergency checklists

10. Flight Profiles & Descriptions

- Normal Take-off
- Visual Approach and Landing
- Touch & Go Landing
- Precision Instrument Approach
- Non Precision Instrument Approach
- Reject Take-off
- Engine Failure On Take-Off
- Single Engine Visual Approach and Landing
- Single Engine Precision Approach
- Single Engine Non-Precision Approach
- Circling Approach
- Rejected Landing

End of Appendix A

APPENDIX B
Example Call-outs

To reduce the likelihood of an incorrect interpretation of a request or command and to initiate corrective action for undesirable situations, a number of Standard Calls should be established by the operator.

Standard Calls are defined and referred to throughout the SOPs. This Appendix outlines recommended call-outs for specific situations. The BCAA will consider other phrases for these situations provided that they are uniformly used by the pilot cadre.

- These recommended calls have not been edited for specific types of aircraft.
- Depending on the type of power used, such as turbine, turboprop or reciprocating, some of the calls will have additional phrases.

This Appendix has fours groupings of callouts—

- Standard Calls: General
- Standard Calls: Altitude
- Standard Calls: Instrument Approaches
- Standard Call: Track Deviations

1. Standard Calls: General

Abnormal Bank

Upon observing Abnormal Bank the PNF should call "***Bank***."

The PF should respond with "***Check, correcting***" and correct the bank to less than 30^{o} or if excess bank is necessary, call "***Intentional***" and continue.

Abnormal Rate of Descent

Upon observing Abnormal Rate of Descent the PNF should call "***Descent Rate.***"

The PF should respond with "***Check, correcting***" and reduce the rate of descent to within normal parameters or, if abnormal rate is necessary, call "***Intentional***" and continue.

Abnormal Speed

Upon observing Abnormal Speed the PNF should call "***Speed.***"

The PF should respond with "***Check, correcting***" and correct the speed to within the normal parameters, or if abnormal speed is necessary, call "***Intentional***" and continue.

ATC Heading

Should ATC issue a heading for the aircraft to fly, the PNF should respond by reading back to ATC the heading to be flown (and altitude, and/or speed if included in the clearance or direction).

- "***Turning to xxx*** " if a turn is required;
- "***Steering xxx*** " if no turn is required;

ATC Speed

Should ATC issue a speed restriction, the PNF should respond by reading back to ATC the speed to be flown (and altitude, and/or heading if included in the clearance or direction).

The PF should change the aircraft speed to achieve the speed instructed and state "***Increasing Speed (or Decreasing Speed) to xxx knots***" or "***Stable at xxx knots***."

Climb Power

To command the setting of Climb Power call "***Set Climb Power.***"

The PNF should then set Climb Power as specified in the AFM.

Emergency Power

To command the setting of Emergency Power call "***Set Emergency Power.***"

This setting should be used only in the direst of situations.

The PNF should then set the engine controls to the limit of their travel to obtain the absolute maximum power available, and respond "***Emergency Power Set***."

Heading Deviation

Upon observing a Heading Deviation, the PNF should call "***Heading***."

If the PF believes that the aircraft heading is correct as indicated on the PF's display, the flight crew shall determine the source of the discrepancy and deal with it appropriately..

The PF should respond with "***Check, correcting***" and correct the aircraft heading.

Maximum Continuous Power

To command the setting of Maximum Continuous Power call "***Set Max Continuous Power***."

The PNF should then set Maximum Continuous Power as specified in the AFM and respond "***Max Continuous Power Set***."

Maximum Power

To command the setting of Maximum Power call "***Set Max Power.***"

The PNF should then set the maximum power that is specified in the AFM or, if applicable, the maximum power for a take-off with an engine out as specified in the AFM and respond "***Max Power Set***."

Take-off Power

To command the setting of Take-off Power call "***Set Take-off Power.***"

The PNF should then set the maximum power that is approved

2. Standard Calls: Altitude

Altitude Deviation

Upon observing an Altitude Deviation the PNF should call "***Altitude***."

The PF should respond with "***Check, correcting***" and correct the altitude to within the normal parameters or if, abnormal altitude is necessary call "***Intentional***" and continue.

Depending on the type of operation, it may be appropriate to add some calls where the rate of climb or descent must change when approaching an altitude.

Approaching an Altitude

Upon reaching 1000 ft away from a target altitude the PF shall confirm the altitude alert and flight guidance settings (if applicable) and should call "***(current altitude) for (target altitude), Altitude Select.***"

An example of such a call follows, "***Flight level one niner zero for eighteen thousand, Altitude Select***."

If the target altitude is less than 1000 ft away from the altitude that the aircraft is level at, no additional calls are required.

Arriving at an Altitude

Upon arriving at a target altitude the PF should call "***Level at (FL or Altitude)***."

The PNF will reply "***Check***" and if appropriate make any radio transmission to ATC that may be required.

Departing an Altitude

Upon departing an altitude the PF shall confirm the altitude alert and flight guidance settings and then should call "***Leaving (altitude or Flight Level vacated) for (target altitude), Altitude Select***, ***Vertical Mode set to (vertical mode setting, ie., IAS, VS, VNAV).***"

The PNF will confirm that the settings are appropriate and call "***Check.***"

Transition – Altimeter Setting / Standard Pressure Regions
Transition procedures and standard calls are found in the Barometric Altimeter Setting Procedures section of this chapter.

3. Standard Calls: Instrument Approaches

During the Intermediate/Final Approach phase some additional calls are required to those described in the "General" section. These additional calls are described in this section.

Intercepting Track
To reduce the likelihood of overshooting a desired track during the Intermediate/Final Approach phase, the PNF should warn the PF when approaching a track that will be followed using primarily the track bar display.

On initial movement of the track bar away from full deflection with the warning flags out of view, the PNF should call "***Localizer alive***."

The PF should confirm the movement and say "***Check***."

Intercepting Bearing
When approaching a track which will be followed using primarily a bearing display, the PNF should warn the PF when the display indicates that the aircraft is 10 degrees away from the desired track. For example the PNF would call "1***0 degrees to 140***", where 140 degrees is the desired track.

The PF would confirm the bearing and call "***Check***."

Approaching VNAV Computed Descent Path
The PNF should advise the PF when approaching a VNAV computed descent path. On initial movement of the vertical path indicator away from full deflection with the warning flags out of view, the PNF should call "***VNAV is alive***."

The PF should confirm the movement and say "***Check.***"

Approaching ILS Glide Path
When approaching an ILS or MLS Glide Path, on initial movement of the Glide Slope indicator away from full deflection with the warning flags out of view, the PNF should call ***"Glide Slope is alive***."

The PF should confirm the movement and say "***Check***."

4. Standard Calls: Instrument Approach Altitudes

All altitudes in this section are barometric

For the most part, the directions for altitude related calls that are described in the "General " Section apply. The intention of these calls is to reduce the possibility of missing a critical altitude during descent in the final approach.

Glide Path

For a Precision Approach, upon crossing the FAF, the PNF shall check the barometric altimeter against the published Altitude of the Nominal Glide Path at the FAF.

> It should be noted that several factors may cause the indicated and published height of the Glide Path at the FAF to differ by several hundred feet.

If the altitude is reasonably close the PNF should call "***Glide Path xxxx feet checks***" (where "xxxx" is the published Glide Path altitude).

100 feet Above Specified Altitudes

When approaching any of the following altitudes inside the FAF, the PNF shall advise the PF as the aircraft reaches 100 feet above the altitude.

- Minimum Altitude at a Step-down Fix;
- Minimum Altitude at a Facility;
- Minimum Descent Altitude (MDA) for a Non-Precision Approach;
- Decision Height (DH) for a precision approach.

Upon descending to within 100 feet of the above-listed altitudes the PNF should call "***100 Above.***"

> Note that should the aircraft travel beyond a Step-down Fix or facility before descending to within 100 feet of the altitude associated with it, no call should be made.

The PF should respond by saying "***Check***."

Minimum Altitude at a Step-down Fix or Facility

Where there is a published minimum altitude for crossing a step-down fix and/or facility that is inside the FAF the PNF shall advise the PF when the aircraft reaches it. The standard call by the PNF is the same in both instances "***Step-down Altitude***."

The PF shall respond "***Leveling***" and shall ensure that the aircraft remains in level flight until further descent is appropriate.

Required Visual Reference

Once the PNF assesses that required visual reference is available, the PF should be advised using the standard call "***Runway at xx o'clock***."or"***Visual at xx o'clock***"

The PF should then respond as follows: "***Check, continuing***"

If intending to continue flying the instrument approach procedure as published, the PF should respond "***Check, continuing***."

Landing

Once the PNF advises that Required Visual Reference is available the PF should confirm that the aircraft is in a position to continue for landing.

If the PF decides to continue for landing, the PNF should be advised of the intention by the standard call "***Landing***." The PNF should respond by saying "***Check***."

Go Around

If landing is inadvisable (due to an obstructed runway, inappropriate aircraft position, or other reason), the PF should call "***Go Around, Set Climb Power***."

Decision Height (Runway Visible)

Upon arriving at the Decision Height of a Category I Precision Approach, the following calls shall be made depending on the circumstance:

If the required visual reference is available the PNF should call "***Decision Height, Runway in sight, xx o'clock***."

The PF should respond with either "***Landing***" or "***Missed Approach, Set Climb Power, Flaps (XX)***", depending on the situation.

Decision Height (Runway Not Visible)

If the required visual reference is not available the PNF should call "***Decision Height, No Contact.***"

The PF should respond with "***Missed Approach, Set Climb Power, Flaps (XX).***"

Minimum Descent Altitude (Ground Visible)

Upon arriving at the Minimum Descent Altitude of a Non-Precision Approach the following calls shall be made depending on the circumstance:

If the required visual reference is available the PNF should call "***MDA, Ground Contact***." The PF should respond with "***Commencing Circling***", "***Go Around***", or "***Check, continuing***", depending on the situation

Minimum Descent Altitude (Runway Visible)

If the PF calls "***Check, continuing***", the PNF should then again call "***Runway in Sight***, at approximately the published visibility from the missed approach point.

The PF should then respond with either "***Landing***" or "Go Around."

Minimum Descent Altitude (Still Instrument)

If the required visual reference is not available the PNF should call "***Minima, No Contact***."

The PF should respond with "***Check, continuing***" and continue flying the approach as published.

Minimum Descent Altitude (Runway Visible)

Should required visual reference become available prior to the missed approach point, the PNF should call ***"Runway in sight xx o'clock***."

The PF should respond with "***Landing***", "***Commencing Circling***", or "***Go Around***", depending on the situation.

Minimum Descent Altitude (Missed Approach Point, Visual)

If the required visual reference is available the PNF should call "***Missed Approach Point, visual xx o'clock.***"

The PF should respond with either "***Landing***" or "***Go Around***", depending on the situation (see the paragraph on Required Visual Reference in this section).

Minimum Descent Altitude (Missed Approach Point, No Visual)

If the required visual reference is not available the PNF should call "***Missed Approach Point, No Contact.***"

The PF should respond with "***Go Around.***"

5. Standard Calls: Track & Glide Path Deviations

For the most part, the directions for calls related deviations that are described in the "General " section apply. However, some additional calls are needed during the Intermediate/Final Approach phase.

- The calls pertaining to glide slope, localizer and track, deviations are predicated on displays that have two index marks between centre and full deflection on each side of centre (five index marks.
- If your aircraft is equipped with another type of display, amend the following accordingly.

Glide Path or Localizer Alive

The provisions of this call-out apply after the front course localizer and/or glide path capture has occurred.

If the glide path or localizer display indicates that the aircraft has deviated from centre by one dot (the first index mark from centre) the PNF should advise the PF using the standard call "***Glide Path***" or "***Localizer***" as appropriate.

The PF should respond "***Check***", and correct the aircraft toward the glide path or localizer if in manual flight, or continue monitoring the autopilot if in autoflight.

Glide Path or Localizer Full Deflection

If the glide path or localizer display indicates that the aircraft has deviated from centre by full deflection the PNF shall advise the PF using the standard call "***Glide Path Full Deflection***" or "***Localizer Full Deflection***" as appropriate.

The PF shall respond "***Go Around***".

Back Course Localizer Deviation

The provisions of this call apply after back course localizer capture has occurred up to approximately one mile from the localizer antenna.

> In the area of about one mile to the antenna, the localizer may be sufficiently erratic that the crew will have to determine if any action is necessary for localizer deviations.

Prior to one mile from the antenna, if the back course localizer display indicates that the aircraft has deviated from centre by one dot (the first index mark from centre) the PNF should advise the PF using the standard call "***Localizer.***"

The PF should respond "***Check"*** and correct the aircraft toward the back course localizer if in tracking manually or continue monitoring the autopilot if in autoflight.

Back Course Localizer Full Deflection

If the back course localizer display indicates that the aircraft has deviated from centre by full deflection the PNF shall advise the PF using the standard call "***Localizer Full Deflection***."

The PF shall respond "***Check***" or "***Go Around***" depending on the circumstances.

Track Deviations (One Dot)

The provisions of this paragraph apply during an instrument final approach after a track has been captured.

> - If a specific NAVAID is providing approach track guidance (NDB, VOR, VORTAC), these provisions do not apply when the aircraft is within approximately one mile of the NAVAID.
> - Within one mile of the NAVAID the crew should determine actions required for deviations.

If the track indicator is the primary display and it shows that the aircraft has deviated from centre by one dot (the first index mark from centre) the PNF should advise the PF using the standard call "***Track.***"

The PF should respond "***Check***" and correct the aircraft toward the track centerline if tracking manually or continue monitoring the autopilot if in autoflight.

Track Deviations (Full Deflection)

If the track indicator shows that the aircraft has deviated from centre by full deflection, the PNF shall advise the PF using the standard call "***Track Full Deflection***."

The PF shall respond "***Check***" or "***Go Around***" depending on the circumstances.

Bearing Track Deviation (10 degrees)

If the bearing indicator is the primary display and it shows that the aircraft has deviated from the desired track by 10 degrees the PNF should advise the PF using the standard call "***Track.***"

The PF should respond "***Check***" and correct the aircraft toward the track centerline.

Bearing Track Deviation (20 degrees)

If the bearing indicator shows that the aircraft has deviated from the desired track by 20o the PNF should advise the PF using the standard call "***Track, 20 degrees***."

The PF shall respond "***Check***" or "***Go Around***" depending on the circumstances.

End of Appendix B

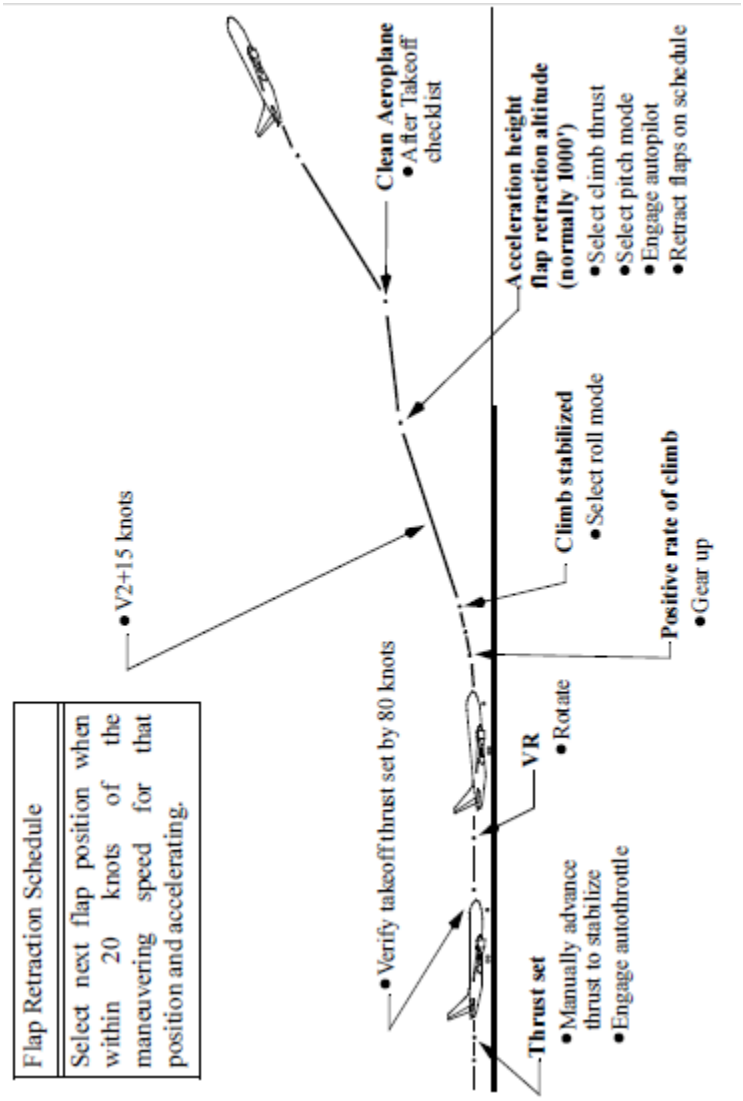
APPENDIX C
Example Takeoff Description: Large Aircraft

PILOT FLYING	PILOT NOT FLYING
Advance thrust levers to approximately 1.10 EPR. When both engines stabilized push EPR switch and make a callout to confirm anticipated take-off EPR i.e. **"SET TAKE-OFF THRUST ONE POINT SIX FIVE"**	Verify correct takeoff thrust set. **"THRUST SET"**
	Adjust takeoff thrust prior to 80 knots, if required. Monitor engine instruments throughout takeoff.
Note: After takeoff thrust is set, the commander must keep his hand on the thrust levers until V_1	
Check airspeed indicator Verify 80 knots by responding: **"CHECKED"**	Accelerating through 80kts. **"EIGHTY"** Check autothrottle revert to THR HOLD on flight mode display.
Monitor airspeed noting V_1 Rotate at V_R Establish a positive climb	**"VEE ONE"** At V_R **"ROTATE"** Monitor airspeed, vertical speed and pressure altimeter. **"POSITIVE CLIMB"** when indicated on pressure altimeter.

PILOT FLYING	PILOT NOT FLYING
"GEAR UP" when positive climb is established.	Position landing gear lever UP.
"LNAV" or **"HDG"** select. when established in climb.	Push LNAV/HDG selection switch.
At flap retraction altitude. **"CLIMB THRUST, VNAV"** **"____AUTOPILOT"** * Push A/P engage command switch.	Select CLB thrust Push VNAV switch
Verify climb thrust set and autopilot engaged in CMD	
"FLAPS FIVE-ONE-UP" according to flap retraction schedule.	Position flap lever as directed.
	When flaps are up, landing gear and door lights extinguished position landing gear lever to off **"CLEAN AEROPLANE"**
	"TRANSITION"
At transition altitude set altimeter to 1013 hPa and external bug to ZERO. If initially levelling of at a flight level both primary altimeters may at commanders discretion be set at 1013 hPa before passing TA.	
When time permits **"AFTER TAKEOFF CHECKLIST"**	Accomplish after takeoff checklist.

End of Appendix C

APPENDIX D
Example Takeoff Profile: Large Aircraft



End of Appendix D

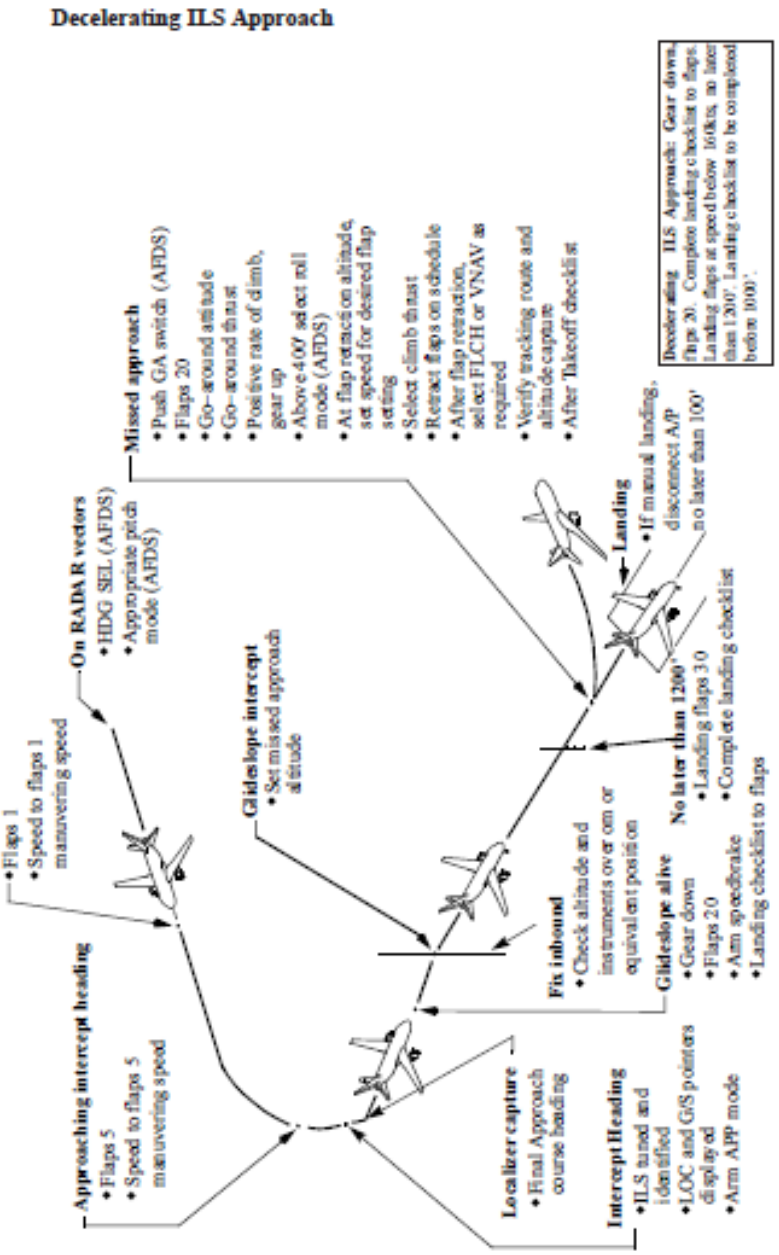
APPENDIX E
Example ILS Approach Description: Large Aircraft

CONDITIONS	PILOT FLYING	PILOT NOT FLYING
On radar vectors. When appropriate. If a procedural approach is being flown, cross the fix outbound at flaps 5, manoeuvring speed	**"FLAPS ONE"** Adjust speed to flaps 1 manoeuvring speed.	Select flaps to 1.
	"FLAPS FIVE" Adjust speed to flaps 5 manoeuvring speed.	Select flaps to 5.
On intercept heading and cleared for approach.	Look for LOC and G/S pointers properly displayed on ADI Arm APP mode. Monitor flight mode annunciation on ADI. **"G/S ARMED LOC ARMED"**	Monitor proper flight mode annunciation. **"CHECKED"**
Localizer alive.	**"CHECKED"**	**"LOCALIZER ALIVE"**
Glide slope alive.*[1)]	**"CHECKED"** **"GEAR DOWN FLAPS TWENTY"** Adjust speed to flaps 20 manoeuvring speed or ATC speed. Arm speedbrake. *Note: Commander shall arm Speedbrake.*	**"GLIDE SLOPE ALIVE"** Select gear down and flaps to 20.
Glide slope captured	**"FLAPS THIRTY"** *[2)] **"LANDING CHECKLIST"** Adjust speed to final approach speed.	Select flaps to 30. Read landing checklist. Set missed approach altitude on MCP altitude.
Fix inbound	Check altitude and instruments over OM or equivalent position.	
	"CHECKED NO FLAGS."	Call: (Example) **"OUTER MARKER 1470' NO FLAGS".**

CONDITIONS	PILOT FLYING	PILOT NOT FLYING
1000' AAL (QNH)	**"CHECKED"**	**"ONE THOUSAND"** Callout significant deviations from programmed airspeed descend and instrument indications.
500' AAL (QNH)	**"CHECKED"**	**"FIVE HUNDRED"**
100' Above DH	**"CHECKED"**	**"HUNDRED ABOVE"**
Reaching DH	**"LANDING/GO AROUND"** *3) For manual landing disconnect A/P no later than 100' *4)	**"MINIMUM"**

End of Appendix E

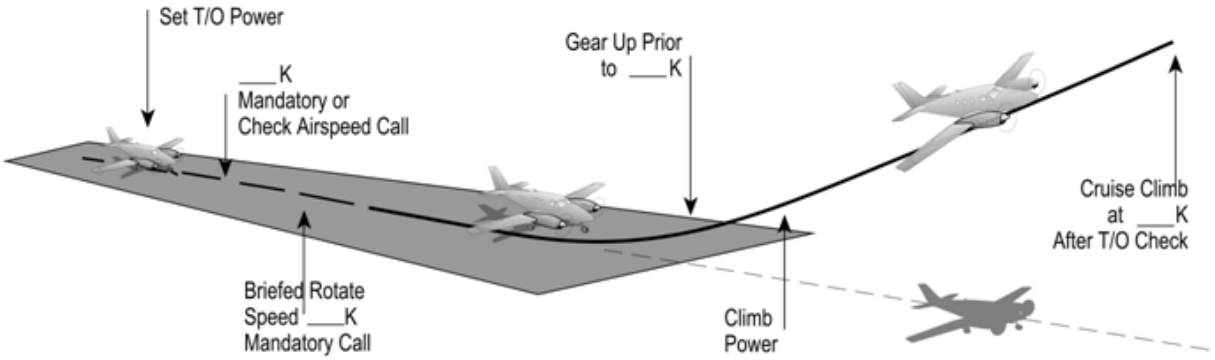
APPENDIX F
Example ILS Approach Profile: Large Aircraft



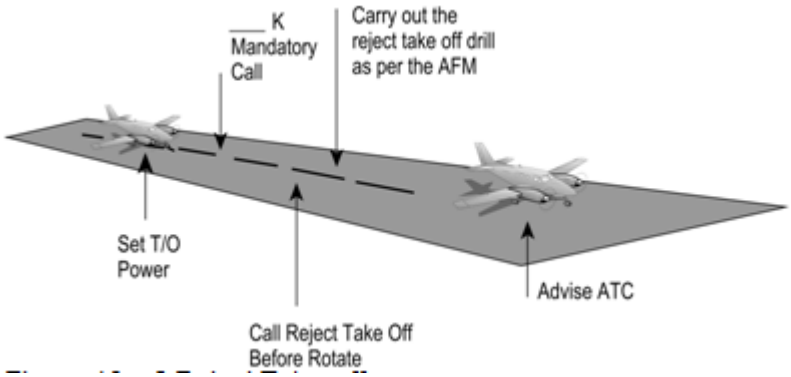
End of Appendix F

APPENDIX G
Example Profiles for Light Twin SOP

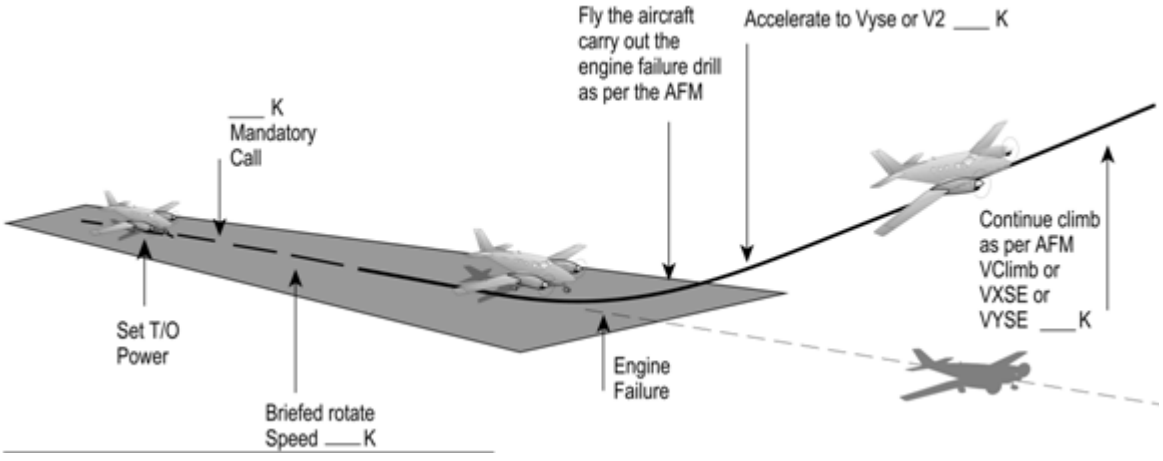
1. Normal Takeoff



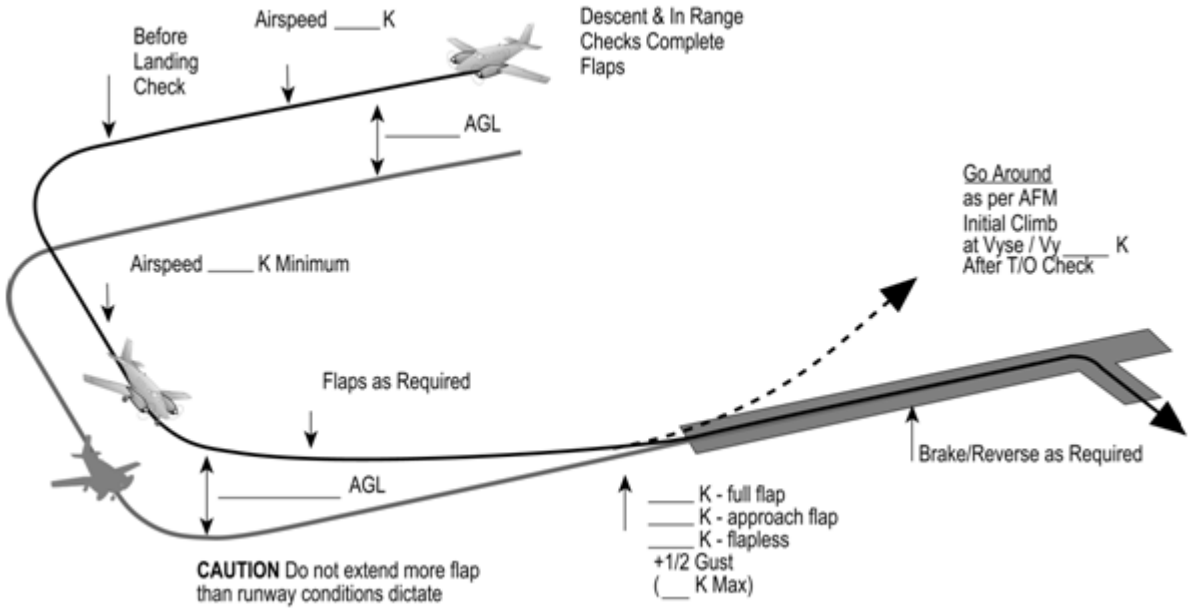
2. Rejected Takeoff



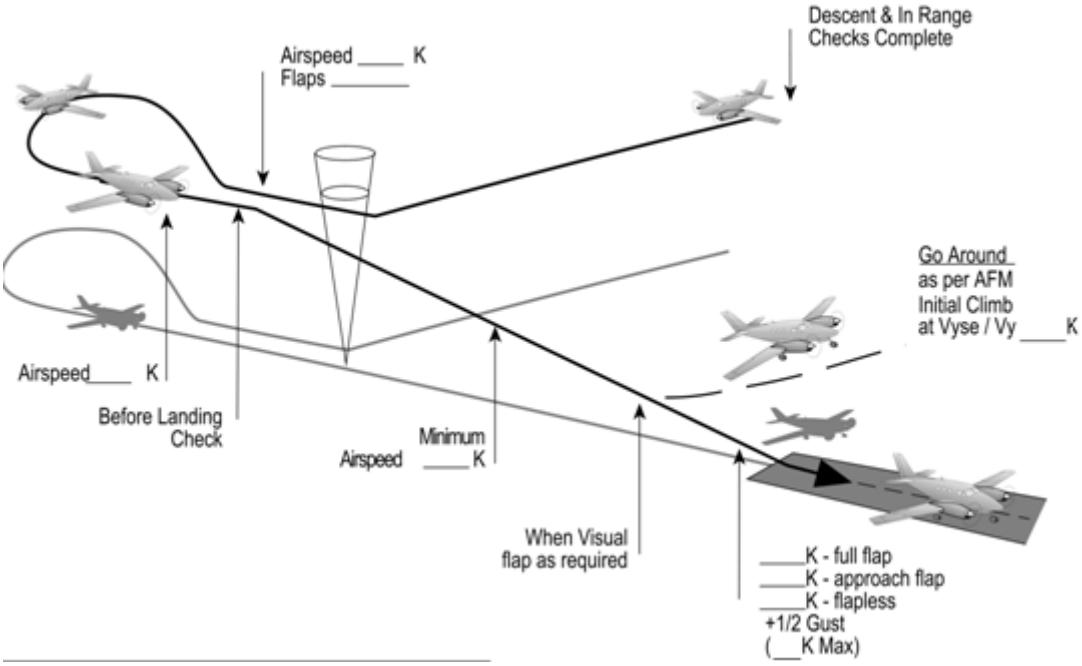
3. Engine Failure During Takeoff



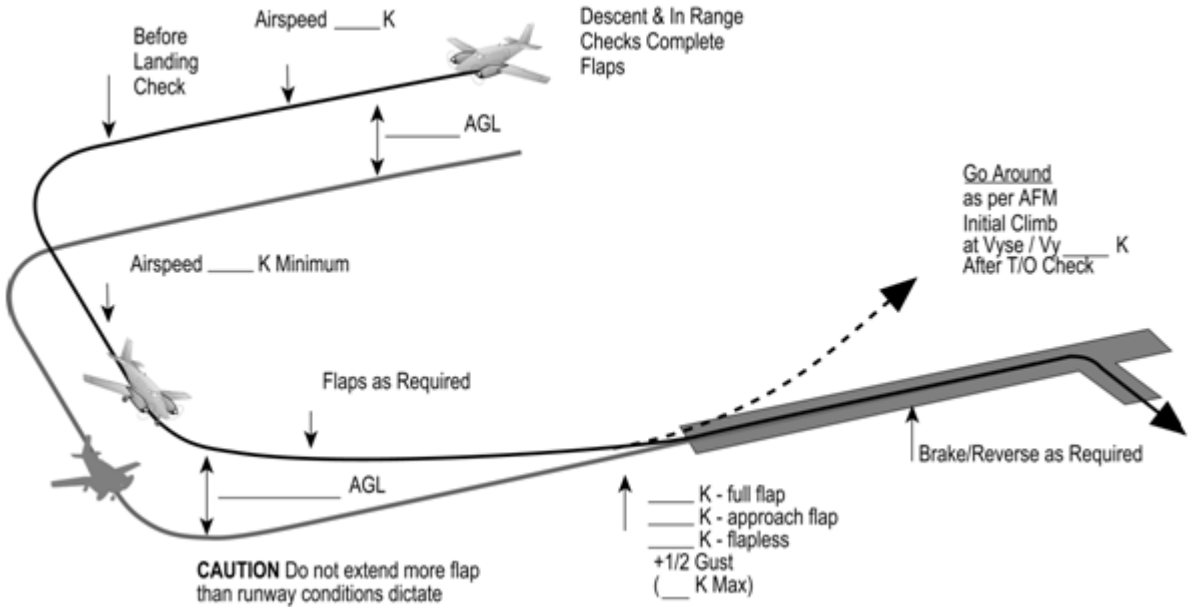
4. Visual Approach to Landing



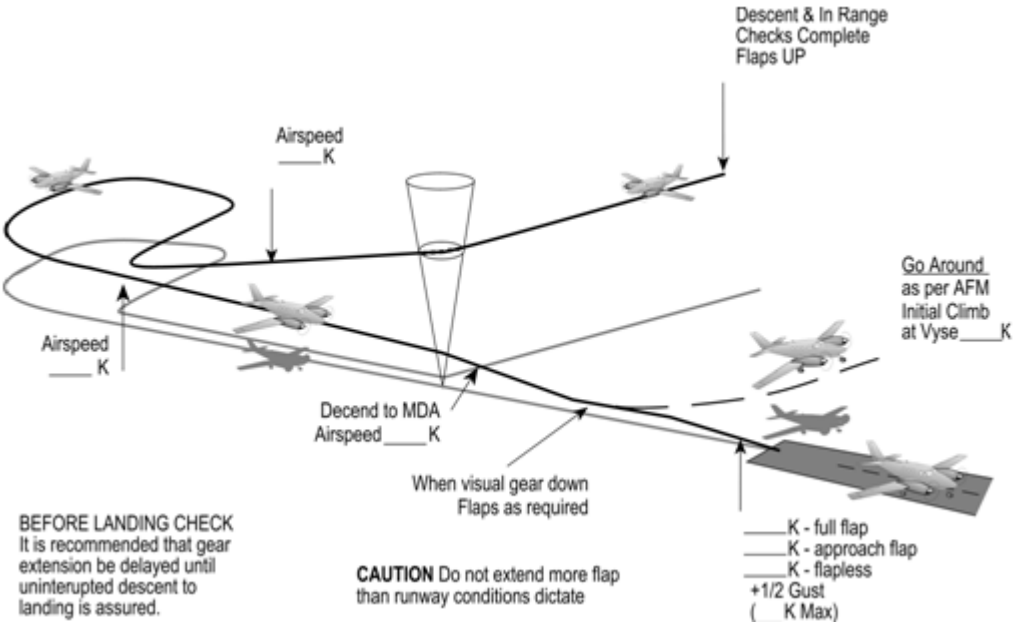
5. Precision Approach to Landing



6. Engine-Out Visual Approach to Landing



7. Engine-Out Non-Precision Approach



End of Advisory Circular